

Face 2 Face

CAT

Common Admission Test



Sectionwise & Topicwise
PREVIOUS 27 YEARS' (1993-2019)
Questions with Detailed Solutions



Including
3 Practice
Sets

BS Sijwali • Indu Sijwali

 **arihant**

Face 2 Face

CAT

Common Admission Test

Sectionwise & Topicwise

PREVIOUS 27 YEARS' (1993-2019)

Questions with Detailed Solutions



Face 2 Face CAT

Common Admission Test

Sectionwise & Topicwise
PREVIOUS 27 YEARS' (1993-2019)
Questions with Detailed Solutions

BS Sijwali • Indu Sijwali

 **arihant**

ARIHANT PUBLICATIONS (INDIA) LTD



ARIHANT PUBLICATIONS (INDIA) LIMITED

All Rights Reserved

© **Authors**

No part of this publication may be re-produced, stored in a retrieval system or by any means, electronic, mechanical, photocopying, recording, scanning, web or otherwise without the written permission of the publisher. Arihant has obtained all the information in this book from the sources believed to be reliable and true. However, Arihant or its editors or authors or illustrators don't take any responsibility for the absolute accuracy of any information published and the damage or loss suffered thereupon.

All disputes subject to Meerut (UP) jurisdiction only.

✚ **Administrative & Production Offices**

Regd. Office

'Ramchhaya' 4577/15, Agarwal Road, Darya Ganj, New Delhi -110002
Tele: 011- 47630600, 43518550

✚ **Head Office**

Kalindi, TP Nagar, Meerut (UP) - 250002
Tel: 0121-7156203, 7156204

✚ **Sales & Support Offices**

Agra, Ahmedabad, Bengaluru, Bareilly, Chennai, Delhi, Guwahati,
Hyderabad, Jaipur, Jhansi, Kolkata, Lucknow, Nagpur & Pune.

✚ **ISBN 978-93-24194-34-3**

Published by Arihant Publications (India) Ltd.

For further information about the books published by Arihant, log on to
www.arihantbooks.com or e-mail at info@arihantbooks.com

Follow us on    

CONTENTS

Introduction : CAT (About the Exam & How to Succeed in it?)

CAT Solved Paper 2019	1-28
CAT Solved Paper 2018	1-24
CAT Solved Paper 2017	1-23

SECTION-I

Quantitative Aptitude

1. Number System	1-24
2. Percentage	25-29
3. Profit, Loss and Ratio, Proportion	30-39
4. Time, Speed and Distance	40-58
5. Interest and Average	59-62
6. Mensuration	63-80
7. Geometry	81-100
8. Algebra	101-122
9. Permutations, Combinations and Probability	123-130
10. Functions	131-144
11. Miscellaneous	145-154

SECTION-II

Data Interpretation and Logical Reasoning

12. Data Sufficiency	155-175
13. Analytical Reasoning	176-230
14. Logical Reasoning	231-242
15. Data Interpretation	243-362

SECTION-III

Verbal Ability and Reading Comprehension

16. English Usage	363-419
17. Para Jumbles	420-457
18. Reading Comprehension	458-630
• Practice Sets (1-3)	3-47

CAT

COMMON ADMISSION TEST

ABOUT THE EXAMINATION

Common Admission Test or CAT is only entrance exam for admission in MBA and PGDM programs conducted by Indian Institute of Management (IIMs). As of today, it is viewed as one of the most desired career routes by the young graduates of our country. Moreover, CAT score is also accepted by more than 75 non-IIM institutes across India, some of which are as reputed as the IIMs.

CAT is an aptitude test, the pattern of which is unstable, varying almost every passing year. The question paper is divided into 3 sections. CAT mandates, that the candidate perform equally well in every individual section. To make it more clear, a candidate should be able to score a certain number of marks in each of the section in order to qualify for the Group Discussion (GD) and Interview stage. The minimum cut-off of IIM required in each section could vary from IIM to IIM and also for each of the other 75+ institutes that use CAT scores for their selection process. However, it would be fair to assume that the cut-off scores required for many of the other institutes would be slightly lower than those required for the IIMs.

The Indian Institutes of Management (IIM) have adopted a **computer based model** for CAT (CBT-CAT), since 2010. The primary reason behind this decision is, the manifold increase in number of CAT applicants in recent years.

Under the present system, CAT is conducted at various prometric centers across the country. The applicants can select a test date from the prescribed dates. The locations of these centers are determined, generally only after all applications have been received.

The IIMs believe that computer based CAT is resulting in flexibility of choice in selection of test date, ease of registration process, better physical environment and test experience. There is enhanced security in terms of biometric identification of candidates and video monitoring. The format is also improving communication between candidates and IIMs, in terms of programme information, test delivery, receipt of admit cards and receipt of score reports.

COURSES OFFERED IN IIMs

CAT conducted by IIMs serves as a pre-requisite for admission to various management programmes of IIMs. *These programmes are*

A. Post Graduate Programmes in Management

IIM Ahmedabad	PGP and PGP-FABM	IIM Nagpur	PGP
IIM Amritsar	PGP	IIM Raipur	PGP and PGP WE
IIM Bengaluru	PGP, PG-PEM and PGPPM	IIM Ranchi	PGDM and PGDHRM
IIM Bodh Gaya	PGP	IIM Rohtak	PGP and EPGP
IIM Kolkata	PGP- PGDM	IIM Sambalpur	PGP
IIM Indore	PGP and EPGP	RGIIIM Shillong	PGP and PGPEX
IIM Jammu	PGP	IIM Sirmaur	PGP
IIM Kashipur	PGP and EPGPM	IIM Tiruchirappalli	PGP and PGPBPM
IIM Kozikhode	PGP	IIM Udaipur	PGP
IIM Lucknow	PGP, PGP-ABM and PGPSM	IIM Visakhapatnam	PGP

- PGPM–Post Graduate Programme in Management
- PGP–FABM–Post Graduate Programme in Food and Agri-Business Management
- PGPPM–Post Graduate Programme in Public Policy and Management
- PGPEX–Post Graduate Programme in Management for Executives
- PG–PEM– Post Graduate Programme in Enterprise Management
- PGDM–Post Graduate Diploma in Management
- EGP–Executive Post Graduate Programme
- PGPSM–Post Graduate Programme in Securities Markets
- PGPMWE–Post Graduate Programmes in Management for Working Executive
- PGDHRM–Post Graduate Diploma in Human Resource Management
- PGPB–Post Graduate Programme in Business Management
- PGABM–Post Graduate Programmes in Agri-Business Management

B. Fellow Programmes in Management (FPM) (equivalent to Ph.D)

IIM Ahmedabad, IIM Bengaluru, IIM Kolkata, IIM Indore, IIM Kashipur, IIM Kazikhode, IIM Lucknow, IIM Raipur, IIM Ranchi, IIM Rohtak, RGIIM Shillong, IIM Tiruchirappalli, IIM Udaipur and EFPM & EPGPM programme of IIM Kashipur.

ELIGIBILITY CRITERIA (Eligibility Criteria)

In order to appear in CAT a candidate must hold a Bachelor's degree, with at least 50% marks or equivalent CGPA [45% in case of the candidates belonging to Scheduled Caste (SC), Scheduled Tribe (ST) or Person With Disability (PWD) Category] awarded by any recognised University of India, or possess an equivalent qualification recognised by the Ministry of HRD, Government of India. The bachelor's degree of equivalent qualification obtained by the candidate must entail a minimum 3 years of education after completing Higher Secondary schooling (10+2) or equivalent.

The percentage of marks obtained by the candidate in the Bachelor's degree would be calculated based on the practice followed by the university/institution from where the candidate has obtained the degree.

In case, the candidates are awarded grades/CGPA instead of marks, the conversion of grades/CGPA to percentage of marks would be based on the procedure certified by the university/institution from where they have obtained the bachelor's degree. In case, the university/ institution does not have any schema for converting CGPA into equivalent marks, the equivalence would be established by dividing the candidate's CGPA by the maximum possible CGPA and multiplying the result with 100.

Candidates appearing for the final year of bachelor's degree/equivalent qualification examination and those, who have completed degree requirements and are awaiting results can also apply. IIMs may verify eligibility at various stages of the selection process.

Such candidate must produce a certificate from the Principal/Head of the Department / Registrar / Director of the University/ Institution certifying that the candidate is currently in final year is awaiting final result and has obtained atleast 50% marks or equivalent (45% in case of candidate belonging to SC/ST/PWD category) based on latest available grades/ marks.

COURSE SPECIFIC

Post Graduate Programme in Management (PGPM)

The applicants should possess Bachelor's degree of a recognised university in any stream, with not less than 50% marks in aggregate. Exemption of 5% is there for SC/ST candidates. The candidates waiting for results of the final year exam can also apply.

Post Graduate Programme in Agri-Business Management (PGP-ABM) Conducted in IIM Ahmedabad and Lucknow

The candidates, who have Bachelor's or Master's Degree in Agriculture Sciences or in Agriculture related disciplines, with minimum 50% marks in total, are eligible. Relaxation of 5% is there for SC/ST or Persons With Disability (PWD) candidates. The candidate with Bachelor's degree of a recognised university with at least 50% marks in aggregate are also eligible. In order to seek admission in IIM Lucknow, the applicants should also have minimum 2 yrs experience in Agriculture or allied sector along with Bachelor's degree in any discipline.

Post Graduate Programme in Software Enterprise Management (PGPSEM), Conducted in IIM Bengaluru and Kolkata

The candidate must have passed graduation from a recognised university. Besides, he/she should possess 2 yrs of work experience in software industry.

Post Graduate Diploma in Computer Aided Management (PGDCM) Programme, Conducted in IIM Kolkata

The candidate should have completed graduation in any field, with at least 50% aggregate marks. Relaxation of 5% is there in case of candidates belonging to SC and ST categories.

Post Graduate Programme in Public Policy and Management (PGPPM), held in IIM Bengaluru

The candidates, who are government official, civil society functionary, mid career executive belonging to PSUs and corporate undertakings, are eligible. Besides, any other individual with not less than 7 yrs of professional experience can also apply.

Executives Post Graduate Programme in Management (EPGP), held in IIM Indore

The applicants with Bachelor's degree in any field securing not less than 50% marks along with minimum 5 yrs of managerial/entrepreneurial/ professional experience after graduation are eligible. Exemption of 5% is there for SC/ST or Persons With Disability (PWD) candidates.

TEST DURATION AND PATTERN OF CAT

No. of Q.100, No. of Section 3, Total Marks 300, Marks @ Q.3, Negative Marks @ Q.1, Duration 180 minutes

The complete paper had three sections. The first section focused on Verbal Ability and Reading Comprehension with 34 questions. The second section had questions on Data Interpretation and Logical Reasoning with 32 questions and the third section comprised of Quantitative Aptitude with 34 questions and each section had a time limit of 1 hr. Candidates were not allowed to switch from one section to another while answering questions in a section.

Before the start of the test candidates were given 15 min to go through the test related instructions on the console rather than tutorial, which was provided in the previous years' exam. Candidates were advised to go through it carefully before starting the main examination.

HOW TO APPLY FOR CAT?

One can register online for CAT by logging to www.catiim.in, and follow the instructions given there.

The candidate can fill the form only through online mode between August to September of the intended year for taking the test.

A candidate needs to fill only one form irrespective of how many IIMs he/she is applying to. At the time of registration, the candidates have to select any four test cities as per their preference from the drop down menu. After the last date of registration, candidates will be allotted one among the 4 preferred cities and either of the two session, candidates must pay the registration fee through online payment modes only, which include credit cards, debit cards and net banking.

Candidate must provide a valid and unique email address. All correspondence pertaining to CAT and subsequent information during the selection stages will be communicated to the registered email address.

Candidates should ensure that they meet the eligibility criteria of the programme in which they are interested, before apply for CAT

CAT application forms of ineligible candidates and application forms with incomplete information will be summarily rejected. No claim of refund will be entertained.

FAQs

1. How is the computer-based format different from the paper-based format?

The format of the test is more or less the same except that a candidate reads a question on a computer terminal and clicks on the correct answer, instead of reading on a paper booklet and using a pencil to darken the ovals on an answer sheet. Additionally, the timer on the computer screen tells you the remaining time to complete the current section.

2. Can I take the test from any computer?

No, a candidate will have to test on a pre-assigned workstation in the testing venue chosen by him/her during the time of registration and will not have a choice to choose his or her workstation.

3. How many sections are there in the test?

There will be three separately timed sections in the test. The sections are

(a) Verbal and Reading Comprehension, (b) Data Interpretation and Logical Reasoning and (c) Quantitative aptitude

4. How many questions are there in each of these sections?

There will be 34 questions in Section I (Verbal Ability and Reading Comprehension), 32 questions in Section II (Data Interpretation and Logical Reasoning) and 34 questions in Section III (Quantitative Aptitude).

5. What is the duration of the test?

CAT test is for a total duration of 180 min or 3 hrs.

6. What are the categories available when applying for CAT?

The different categories are the following

General, Scheduled Caste (SC), Scheduled Tribe (ST), Non-Creamy Layer Backward Class, (NC-OBC) NC-OBC-Minority

Until further communication, all candidates applying under the NC OBC Minority category shall be inevitably considered under the NC OBC category provided they meet the NC OBC eligibility as already explained. No changes in the category will be entertained after the closure of registration window.

7. How many seats are reserved for each category?

SC —15%, ST —7.5%, NC-OBC —27%

8. Will I be provided with any scratch paper for rough work and calculations during the test?

At the test centre, each candidate will be seated at a desk with a computer terminal and he/she will be provided with a pencil, eraser and scratch paper for calculations. Rough work cannot be done on any other paper/sheet, as nothing will be allowed inside the testing room. On completion of the test, candidates will have to hand all the scratch paper and stationery back to the administrator.

9. How will my initial raw scores be calculated?

Your raw scores will be calculated for each section based on the number of questions you answered correctly, incorrectly, or omitted. You will be given +3 points for each correct answer and –1 point for each incorrect answer. There will be no points for questions that are not answered. There will be no negative marking in TITA questions. This scoring methodology ensures that candidates are only awarded points for what they know. For further details, refer to the development, scoring and equating process.

10. What is a percentile ranking?

A percentile rank is the percentage of scores that fall below a given score. e.g. a 75 percentile would imply that your score is greater than or equal to 75% of the total CAT test-takers. For details, refer to the development, scoring and equating process.

SYLLABUS

VERBAL ABILITY AND READING COMPREHENSION

Comprehension of passage.

Contextual usage, antonyms, fill in the blanks, jumbled paragraphs with 4 or 5 sentences, jumbled paragraphs (6 sentences with first and last fixed), sentence correction, foreign language words used in English, sentence completion, sentence correction, odd man out, Idioms, one word substitution, different usage of same word, etc.

DATA INTERPRETATION AND LOGICAL REASONING

Data interpretation based on text, data interpretation based on graphs and tables.

Graphs can be column graphs, bar graphs, line charts, pie chart, graphs representing area, venn diagram, etc.

Critical reasoning, visual reasoning, assumption-premise- conclusion, assertion and reasons, statements and assumptions, identifying valid inferences, identifying strong arguments and weak arguments, statements and conclusions, cause and effect, identifying probably true, probably false, definitely true, definitely false kind of statement, larrangements, matrix arrangements.

Puzzles, syllogisms, functions, family tree-identifying relationship among group of people. Symbol based problems, coding and decoding, sequencing, identifying next number in series, etc.

QUANTITATIVE APTITUDE

Geometry (Lines, Angles, Triangles, Spheres, Rectangles, Cube, Cone etc)

Ratio and Proportion

Percentages

In-equations

Quadratic and Linear Equations

Algebra

Squares and Cubes of Numbers

Logarithms

Profit and Loss

Averages

Time, Speed & Distance

Work and Time

Number system; (HCF, LCM, Geometric Progression, Arithmetic progression, Arithmetic mean, Geometric mean,

Harmonic mean, Median, Mode, Number Base System, BODMAS)

Mensuration

Alligation and Mixture

Work, Pipe and Cistern

Simple Interest and Compound Interest

Set Theory, Venn Diagram

Instalment Payments

Partnership

Clocks

Probability

Permutation and Combination

Face 2 Face

CAT

**SOLVED
PAPER**
(2019)

CAT

Common Admission Test

Solved Paper 2019

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carries equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

SECTION I Verbal Ability and Reading Comprehension (VARC)

Passage 1

Directions (Q. Nos. 1-5) *Read the following passage carefully and answer the questions that follows.*

“Free of the taint of manufacture”—that phrase, in particular, is heavily loaded with the ideology of what the Victorian socialist William Morris called the “anti-scrape”, or an anti-capitalist conservatism (not conservatism) that solaced itself with the vision of a pre-industrial golden age. In Britain, folk may often appear a cosy, fossilised form, but when you look more closely, the idea of folk - who has the right to sing it, dance it, invoke it, collect it, belong to it or appropriate it for political or cultural ends—has always been contested territory.

In our own time, though, the word ‘folk’ has achieved the rare distinction of occupying fashionable and unfashionable status simultaneously. Just as the effusive floral prints of the radical William Morris now cover genteel sofas, so the revolutionary intentions of many folk historians and revivalists have led to music that is commonly regarded as parochial and conservative. And yet—as newspaper columns periodically rejoice—folk is hip again, influencing

artists, clothing and furniture designers, celebrated at music festivals, awards ceremonies and on TV, reissued on countless record labels. Folk is a sonic ‘shabby chic’, containing elements of the uncanny and eerie, as well as an antique veneer, a whiff of Britain’s heathen dark ages. The very obscurity and anonymity of folk music’s origins open up space for rampant imaginative fancies.

Cecil Sharp, who wrote about this subject, believed that folk songs existed in constant transformation, a living example of an art form in a perpetual state of renewal.

“One man sings a song and then others sing it after him, changing what they do not like” is the most concise summary of his conclusions on its origins. He compared each rendition of a ballad to an acorn falling from an oak tree; every subsequent iteration sows the song anew. But there is tension in newness. In the late 1960s, purists were suspicious of folk songs recast in rock idioms. Electrification, however, comes in many forms. For the early-20th-century composers such as Vaughan Williams and Holst, there were thunderbolts of inspiration from oriental mysticism, angular modernism and the body blow of the first world war, as well as input from the rediscovered folk tradition itself.

For the second wave of folk revivalists, such as Ewan MacColl and AL Lloyd, starting in the 40s, the vital spark was communism's dream of a post-revolutionary New Jerusalem. For their younger successors in the 60s, who thronged the folk clubs set up by the old guard, the lyrical freedom of Dylan and the unchained melodies of psychedelia created the conditions for folkrock's own golden age, a brief Indian summer that lasted from about 1969 to 1971. Four decades on, even that progressive period has become just one more era ripe for fashionable emulation and pastiche. The idea of a folk tradition being exclusively confined to oral transmission has become a much looser, less severely guarded concept. Recorded music and television, for today's metropolitan generation, are where the equivalent of folk memories are seeded.

1. All of the following are causes for plurality and diversity within the British folk tradition, except
 - (a) paradoxically, folk forms are both popular and unpopular.
 - (b) the fluidity of folk forms owing to their history of oral mode of transmission.
 - (c) that British folk forms can be traced to the remote past of the country.
 - (d) that British folk continues to have traces of pagan influence from the dark ages.

→ (a) According to the given passage, folk traditions belong to the remote past of Britain and has been associated with the pagan influence of the dark ages. The oral mode by transmission of folk traditions leaves it in obscurity and anonymity. Consequently, as time changes, folk tradition also changes, thus resulting in its plurality and diversity.
2. At a conference on a folk forms, the author of the passage is least likely to agree with which one of the following views?
 - (a) Folk forms, despite their archaic origins, remain intellectually relevant in contemporary times.
 - (b) Folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.
 - (c) The power of folk resides in its contradictory ability to influence and be influenced by the present while remaining rooted in the past.
 - (d) The plurality and democratising impulse of folk forms emanate from the improvisation that its practitioners bring to it.

→ (b) In the given passage (para 3) the author suggests that while folk forms are constantly renewed, the new form derived exists in tension. The changed form does not easily adapt to the changing world. In this tension, folk tradition does not exhibit any poise or homogeneity. Therefore, at a
- conference on folk forms, the author of the passage will not agree with a view that folk forms, in their ability to constantly adapt to the changing world, exhibit an unusual poise and homogeneity with each change.
3. The primary purpose of the reference to William Morris and his floral prints is to show
 - (a) that what is once regarded as radical in folk, can later be seen as conformist.
 - (b) that despite its archaic origins, folk continues to remain a popular tradition
 - (c) the pervasive influence of folk on contemporary art, culture and fashion.
 - (d) that what was once derided as genteel is now considered revolutionary.

→ (a) The primary purpose of the reference to William Morris and his floral prints is to show that what is once regarded as radical in folk, can later be seen as conformist. It depicts a change of the radical and revolutionary towards conservatism. In other words, something that was once regarded as new became limited in its scope.
4. Which of the following statements about folk revivalism of the 1940s and 1960s cannot be inferred from the passage?
 - (a) Electrification of music would not have happened without the influence of rock music.
 - (b) It reinforced Cecil Sharp's observation about folk's constant transformation.
 - (c) Even though it led to folk-rock's golden age, it wasn't entirely free from critique.
 - (d) Freedom and rebellion were popular themes during the second wave of folk

→ (a) According to the passage (para 3), in 1960's folk songs were recasted in rock music which resulted in electrification of music. The above fact is supported by "there were thunderbolts of inspiration from oriental mysticism input from the rediscovered folk tradition itself."
5. The author says that folk "may often appear a cosy, fossilised form" because
 - (a) the notion of folk has led to several debates and disagreements.
 - (b) of its nostalgic association with a pre-industrial past.
 - (c) it has been arrogated for various political and cultural purposes.
 - (d) folk is a sonic 'shabby chic' with an antique veneer.

→ (b) In the passage, folk tradition refers to these materials that existed in the pre-industrial golden age. This age saw folk as free from the "taint of manufacture". The form of folk is idealised and in the present, is associated with nostalgia of that glorious past.

Passage 2

Directions (Q. Nos. 6-10) *Read the following passage carefully and answer the questions given below.*

As defined by the geographer Yi-Fu Tuan, topophilia is the affective bond between people and place. His 1974 book set forth a wide-ranging exploration of how the emotive ties with the material environment vary greatly from person to person and in intensity, subtlety, and mode of expression. Factors influencing one's depth of response to the environment include cultural background, gender, race and historical circumstance, and Tuan also argued that there is a biological and sensory element. Topophilia might not be the strongest of human emotions—indeed, many people feel utterly indifferent toward the environments that shape their lives—but when activated it has the power to elevate a place to become the carrier of emotionally charged events or to be perceived as a symbol.

Aesthetic appreciation is one way in which people respond to the environment. A brilliantly coloured rainbow after gloomy afternoon showers, a busy city street alive with human interaction—one might experience the beauty of such landscapes that had seemed quite ordinary only moments before or that are being newly discovered. This is quite the opposite of a second topophilic bond, namely that of the acquired taste for certain landscapes and places that one knows well. When a place is home or when a space has become the locus of memories or the means of gaining a livelihood, it frequently evokes a deeper set of attachments than those predicated purely on the visual. A third response to the environment also depends on the human senses but may be tactile and olfactory, namely a delight in the feel and smell of air, water, and the Earth.

Topophilia—and its very close conceptual twin, sense of place—is an experience that, however elusive, has inspired recent architects and planners. Most notably, new urbanism seeks to counter the perceived placelessness of modern suburbs and the decline of central cities through neo-traditional design motifs. Although motivated by good intentions, such attempts to create places rich in meaning are perhaps bound to disappoint. As Tuan noted, purely aesthetic responses often are suddenly revealed, but their intensity rarely is longlasting. Topophilia is difficult to design for and impossible to quantify, and its most articulate interpreters have been self-reflective philosophers such as Henry David Thoreau, evoking a marvelously intricate sense of place at Walden Pond, and Tuan, describing his deep affinity for the desert.

Topophilia connotes a positive relationship, but it often is useful to explore the darker affiliations between people and place. Patriotism, literally meaning the love of one's terra patria or homeland, has long been cultivated by governing elites for a range of nationalist projects, including war preparation and ethnic cleansing. Residents of upscale residential developments have disclosed how important it is to maintain their community's distinct identity, often by casting themselves in a superior social position and by reinforcing class and racial differences. And just as a beloved landscape is suddenly revealed, so too may landscapes of fear cast a dark shadow over a place that makes one feel a sense of dread or anxiety—or topophobia.

6. The word 'topophilia' in the passage is used
 - (a) to represent a feeling of dread towards particular spaces and places.
 - (b) to signify feelings of fear or anxiety towards topophilic people.
 - (c) to signify the fear of studying the complex discipline of topography.
 - (d) as a metaphor expressing the failure of the homeland to accommodate non-citizens.

→ (a) Topophilia, as defined by the passage, refers to an emotional attachment with a place. Often this attachment has negative connotations as it is associated with the feeling of fear or dread.
7. Which one of the following best captures the meaning of the statement, "Topophilia is difficult to design for and impossible to quantify"?
 - (a) People's responses to their environment are usually subjective and so cannot be rendered in design.
 - (b) Philosopher-architects are uniquely suited to develop topophilic design.
 - (c) The deep anomie of modern urbanisation led to new urbanism's intricate sense of place.
 - (d) Architects have to objectively quantify spaces and hence cannot be topophilic.

→ (a) As per the passage, Topophilia is difficult to design for and impossible to quantify as each and every person reacts differently to different places. In other words, what one person may associate with care and love, other would associate with loneliness. This makes topophilia subjective for each individual. Thus, a generic design for all is impossible.
8. Which of the following statements, if true, could be seen as not contradicting the arguments in the passage?
 - (a) The most important, even fundamental, response to our environment is our tactile and olfactory response.
 - (b) New Urbanism succeeded in those designs where architects collaborated with their clients.

- (c) Patriotism, usually seen as a positive feeling, is presented by the author as a darker form of topophilia.
- (d) Generally speaking, in a given culture, the ties of the people to their environment vary little in significance or intensity.

➔ (c) In the given passage, patriotism as an emotion is used to explain the darker affiliations between people and places. Patriotism is a positive emotion but in topophobia results in fear, dread or anxiety.

It has been used for a range of nationalist projects which may include war preparation and ethnic cleansing. All the other options, stand in complete opposition to the passage.

9. Which one of the following comes closest in meaning to the author's understanding of topophilia?

- (a) The French are not overly patriotic, but they will refuse to use English as far as possible, even when they know it well.
- (b) The tendency of many cultures to represent their land as 'motherland' or 'fatherland' may be seen as an expression of their topophilia.
- (c) Scientists have found that most creatures, including humans, are either born with or cultivate a strong sense of topography.
- (d) Nomadic societies are known to have the least affinity for the lands through which they traverse because they tend to be topophobic.

➔ (b) In the given passage, Topophilia is defined as a feeling of fear or dread towards particular places. To explain all aspects of the term, patriotism is used according to which, many dark actions are legitimised for nationalistic project. One aspect of such a patriotism is considering land as 'motherland' and 'fatherland'. All other options are not appropriate according to the passage.

10. In the last paragraph, the author uses the example of "Residents of upscale residential developments" to illustrate the

- (a) social exclusivism practised by such residents in order to enforce a sense of racial or class superiority.
- (b) introduction of nationalist projects by such elites to produce a sense of dread or topophobia.
- (c) manner in which environments are designed to minimise the social exclusion of their clientele.
- (d) sensitive response to race and class problems in upscale residential developments.

➔ (a) To explain the darker side of Topophilia, the author of the passage uses the example of "Residents of upscale residential developments." According to the author, such people consider themselves as superior and reinforce class and racial differences. In other words, they practice social exclusivism.

Passage 3

Directions (Q. Nos. 11-15) Read the following passage carefully and answer the questions that follow.

Contemporary internet shopping conjures a perfect storm of choice anxiety. Research has consistently held that people who are presented with a few options make better, easier decisions than those presented with many. Helping consumers figure out what to buy amid an endless sea of choice online has become a cottage industry unto itself. Many brands and retailers now wield marketing buzzwords such as curation, differentiation, and discovery as they attempt to sell an assortment of stuff targeted to their ideal customer. Companies find such shoppers through the data gold mine of digital advertising, which can catalogue people by gender, income level, personal interests, and more. Since Americans have lost the ability to sort through the sheer volume of the consumer choices available to them, a ghost now has to be in the retail machine, whether it's an algorithm, an influencer or some snazzy ad tech to help a product follow you around the internet. Indeed, choice fatigue is one reason so many people gravitate toward lifestyle influencers on Instagram—the relentlessly chic young moms and perpetually vacationing 20-somethings—who present an aspirational worldview, and then recommend the products and services that help achieve it.

For a relatively new class of consumer-products start-ups, there's another method entirely. Instead of making sense of a sea of existing stuff, these companies claim to disrupt stuff as Americans know it. Casper (mattresses), Glossier (makeup), Away (suitcases), and many others have sprouted up to offer consumers freedom from choice: The companies have a few aesthetically pleasing and supposedly highly functional options, usually at mid-range prices. They're selling nice things, but may be more importantly, they're selling a confidence in those things and an ability to opt out of the stuff rat race.

One-thousand-dollar mattresses and \$300 suitcases might solve choice anxiety for a certain tier of consumer, but the companies that sell them, along with those that attempt to massage the larger stuff economy into something navigable, are still just working within a consumer market that's broken in systemic ways. The presence of so much stuff in America might be more valuable if it were more evenly distributed, but stuff's creators tend to focus their energy on those who already have plenty. As options have expanded for people with disposable income, the opportunity to buy even basic things such as fresh food or quality diapers has contracted for much of America's lower classes.

For start-ups that promise accessible simplicity, their very structure still might eventually push them toward overwhelming variety. Most of these companies are based on hundreds of millions of dollars of venture capital, the investors of which tend to expect a steep growth rate that can't be achieved by selling one great mattress or one great sneaker. Casper has expanded into bedroom furniture and bed linens. Glossier, after years of marketing itself as no-makeup that requires little skill to apply, recently launched a full line of glittering colour cosmetics. There may be no way to opt out of stuff by buying into the right thing.

11. Which one of the following best sums up the overall purpose of the examples of Casper and Glossier in the passage?

- (a) They are increasing the purchasing power of poor Americans.
- (b) They are facilitating a uniform distribution of commodities in the market.
- (c) They might transform into what they were exceptions to.
- (d) They are exceptions to a dominant trend in consumer markets.

→ (c) The given passage uses the examples of Casper and Glossier initially to present that these companies provide fewer options in the mid price range that makes decisions easier. However, as one moves forward one realises that both these companies are expanding in different products which brings them into those categories that they were exceptions to.

12. A new food brand plans to launch a series of products in the American market. Which of the following product plans is most likely to be supported by the author of the passage?

- (a) A range of 25 products priced between \$5 and \$10.
- (b) A range of 10 products priced between \$5 and \$10.
- (c) A range of 25 products priced between \$10 and \$25.
- (d) A range of 10 products priced between \$10 and \$25.

→ (b) In the given passage, the author supports that to make decisions easier, only few options of commodities must be available in the mid-price range. Hence, out of the given options a range of 10 products priced between \$ 5 and \$ 10 will be supported by the author.

13. Based on the passage, all of the following can be inferred about consumer behaviour except that

- (a) having too many product options can be overwhelming for consumers.
- (b) consumers are susceptible to marketing images that they see on social media.
- (c) too many options have made it difficult for consumers to trust products.
- (d) consumers tend to prefer products by start-ups over those by established companies.

→ (d) According to the given passage, start-ups offers consumers a freedom of choice with their few aesthetically pleasing options that fall in mid price range. As a result, the consumers develop confidence on these companies and prefer them over established companies that offers a wide variety of products in high price range. However, the passage also asserts that such a preference and tendency is dependent on the disposable income.

Hence, one cannot be assert that option (d) can be inferred from the passage.

14. Which of the following hypothetical statements would add the least depth to the author's prediction of the fate of start-ups offering few product options?

- (a) Start-ups with few product options are no exception to the American consumer market that is deeply divided along class lines.
- (b) With Casper and Glossier venturing into new product ranges, their regular customers start losing trust in the companies and their products.
- (c) An exponential surge in their sales enables start-ups to meet their desired profit goals without expanding their product catalogue.
- (d) With the motive of promoting certain rival companies, the government decides to double the tax-rates for these start-ups.

→ (c) The author of the given passage points out that to increase their sales, start-up companies like Casper and Glossier expand their product range/catalogue. So, without expanding their product catalogue, the start-up companies would not meet their desired goal. Hence, option (c) is the correct choice.

15. All of the following if TRUE would weaken the author's claims EXCEPT

- (a) the annual sales growth of companies with fewer product options were higher than that of companies which curated their products for target consumers.
- (b) the empowerment felt by purchasers in buying a commodity were directly proportional to the number of options they could choose from.
- (c) product options increased market competition, bringing down the prices of commodities, which, in turn, increased purchasing power of the poor.
- (d) the annual sale of companies that hired lifestyle influencers on Instagram for marketing their products were 40% less than those that did not.

→ (a) The focus of the given passage, is on the stuff American market wherein companies with few options within mid-price range gains higher number of consumers. With increased sales, the annual growth of such companies were higher than those which curated their products for target consumers. Therefore, such a statement would not weaken the author's claims.

Passage 4

Directions (Q. Nos. 16-19) *Read the following passage carefully and answer the questions that follow.*

Scientists recently discovered that Emperor Penguins—one of Antarctica's most celebrated species—employ a particularly unusual technique for surviving the daily chill. As detailed in an article published today in the journal *Biology Letters*, the birds minimise heat loss by keeping the outer surface of their plumage below the temperature of the surrounding air. At the same time, the penguins' thick plumage insulates their body and keeps it toasty....

The researchers analysed thermographic images ... taken over roughly a month during June 2008. During that period, the average air temperature was 0.32 degrees Fahrenheit. At the same time, the majority of the plumage covering the penguins' bodies was even colder: the surface of their warmest body part, their feet, was an average 1.76 degrees Fahrenheit, but the plumage on their heads, chests and backs were -1.84, -7.24 and -9.76 degrees Fahrenheit respectively. Overall, nearly the entire outer surface of the penguins' bodies was below freezing at all times, except for their eyes and beaks. The scientists also used a computer simulation to determine how much heat was lost or gained from each part of the body—and discovered that by keeping their outer surface below air temperature, the birds might paradoxically be able to draw very slight amounts of heat from the air around them. The key to their trick is the difference between two different types of heat transfer: radiation and convection.

The penguins do lose internal body heat to the surrounding air through thermal radiation, just as our bodies do on a cold day. Because their bodies (but not surface plumage) are warmer than the surrounding air, heat gradually radiates outward over time, moving from a warmer material to a colder one. To maintain body temperature while losing heat, penguins, like all warm-blooded animals, rely on the metabolism of food. The penguins, though, have an additional strategy. Since their outer plumage is even colder than the air, the simulation showed that they might gain back a little of this heat through thermal convection—the transfer of heat via the movement of a fluid (in this case, the air). As the cold Antarctic air cycles around their bodies, slightly warmer air comes into contact with the plumage and donates minute amounts of heat back to the penguins, then cycles away at a slightly colder temperature.

Most of this heat, the researchers note, probably doesn't make it all the way through the plumage and back to the penguins' bodies, but it could make a slight difference. At the very least, the method by which a penguin's plumage wicks heat from the bitterly cold air that surrounds it helps to cancel out some of the heat that's radiating from its interior. And given the

Emperors' unusually demanding breeding cycle, every bit of warmth counts Since penguins trek as far as 75 miles to the coast to breed and male penguins don't eat anything during the incubation period of 64 days conserving calories by giving up as little heat as possible is absolutely crucial.

16. Which of the following best explains the purpose of the word 'paradoxically' as used by the author?
 - (a) Heat loss through radiation happens despite the heat gain through convection.
 - (b) Heat gain through radiation happens despite the heat loss through convection.
 - (c) Keeping their body colder helps penguins keep their plumage warmer.
 - (d) Keeping a part of their body colder helps penguins keep their bodies warmer.

→ (d) The word 'paradoxically' means 'containing two opposite or contradictory facts.' In the passage the word is used to explain usual technique of penguin in which penguins by keeping a part of their body colder keeps their body warmer.
17. All of the following, if TRUE, would negate the findings of the study reported in the passage EXCEPT
 - (a) the average air temperature recorded during the month of June 2008 in the area of study were -10 degrees Fahrenheit.
 - (b) the temperature of the plumage on the penguins' heads, chests and backs were found to be 1.84, 7.24 and 9.76 degrees Fahrenheit respectively.
 - (c) the penguins' plumage were made of a material that did not allow any heat transfer through convection or radiation.
 - (d) the average temperature of the feet of penguins in the month of June 2008 were found to be 1.76 degrees Fahrenheit.

→ (d) It is stated in the passage that the average temperature of the feet of penguins in the month of June 2008 were found to be 1.76 degrees Fahrenheit.
18. In the last sentence of paragraph 3, 'slightly warmer air' and "at a slightly colder temperature" refer to—and—respectively:
 - (a) the cold Antarctic air whose temperature is higher than that of the plumage and the fall in temperature of the Antarctic air after it has transmitted some heat to the plumage.
 - (b) the air inside penguins' bodies kept warm because of metabolism of food and the fall in temperature of the body air after it transfers some heat to the plumage.
 - (c) the air trapped in the plumage which is warmer than the Antarctic air and the fall in temperature of the trapped plumage air after it radiates out some heat.
 - (d) the cold Antarctic air which becomes warmer because of the heat radiated out from penguins' bodies and the fall in temperature of the surrounding air after thermal convection.

- (a) In the given passage, the air is mentioned in the process of convection. Accordingly after some of the heat from the penguins body is lost, the air is warmer than penguins plumage. This air is referred as "slightly warmer air". After this, heat is transferred from this warm air to penguins plumage the air gets slightly cool. This air is at as slightly cool temperature.

19. Which of the following can be responsible for Emperor Penguins losing body heat?

- (a) Thermal convection (b) Plumage
(c) Reproduction process (d) Food metabolism

- (c) According to the given passage, an emperor penguin loses a lot of its body heat in the breeding cycle or reproduction process.

Passage 5

Directions (Q. Nos. 20-24) Read the following passage carefully and answer the questions that follow.

In the past, credit for telling the tale of Aladdin has often gone to Antoine Galland ... the first European translator of ... Arabian Nights which started as a series of translations of an incomplete manuscript of a medieval Arabic story collection ... But, though those tales were of medieval origin, Aladdin may be a more recent invention. Scholars have not found a manuscript of the story that predates the version published in 1712 by Galland, who wrote in his diary that he first heard the tale from a Syrian storyteller from Aleppo named Hanna Diyab ...

Despite the fantastical elements of the story, scholars now think the main character may actually be based on a real person's real experiences Though Galland never credited Diyab in his published translations of the Arabian Nights stories, Diyab wrote something of his own: a travelogue penned in the mid-18th century. In it, he recalls telling Galland the story of Aladdin and describes his own hard-knocks upbringing and the way he marveled at the extravagance of Versailles. The descriptions he uses were very similar to the descriptions of the lavish palace that ended up in Galland's version of the Aladdin story. Therefore, author Paulo Lemos Horta believes that "Aladdin might be the young Arab Maronite from Aleppo, marveling at the jewels and riches of Versailles." ...

For 300 years, scholars thought that the rags-to-riches story of Aladdin might have been inspired by the plots of French fairy tales that came out around the same time or that the story was invented in that 18th century period as a byproduct of French Orientalism, a fascination with stereotypical exotic Middle Eastern luxuries that was prevalent then. The idea that Diyab might have based it on his own life—the experiences of a Middle Eastern man encountering the French, not *vice-versa*—flips the script. According to Horta, "Diyab

was ideally placed to embody the overlapping world of East and West, blending the storytelling traditions of his homeland with his youthful observations of the wonder of 18th-century France." ...

To the scholars who study the tale, its narrative drama isn't the only reason storytellers keep finding reason to return to Aladdin. It reflects not only "a history of the French and the Middle East, but also a story about Middle Easterners coming to Paris and that speaks to our world today," as Horta puts it. "The day Diyab told the story of Aladdin to Galland, there were riots due to food shortages during the winter and spring of 1708 to 1709, and Diyab was sensitive to those people in a way that Galland is not. When you read this diary, you see this solidarity among the Arabs who were in Paris at the time.... There is little in the writings of Galland that would suggest that he was capable of developing a character like Aladdin with sympathy, but Diyab's memoir reveals a narrator adept at capturing the distinctive psychology of a young protagonist, as well as recognising the kinds of injustices and opportunities that can transform the path of any youthful adventurer."

20. All of the following serve as evidence for the character of Aladdin being based on Hanna Diyab except

- (a) Diyab's humble origins and class struggles, as recounted in his travelogue.
(b) Diyab's cosmopolitanism and cross-cultural experience.
(c) Diyab's narration of the original story to Galland.
(d) Diyab's description of the wealth of Versailles in his travelogue.

- (c) All of the given statements serve as evidence for the character of Aladdin being based on Hanna Diyab except Diyab's narration of the original story to Galland.

According to the given passage, Diyab's travelogue clearly indicates that Galland's Aladdin is based on Hanna Diyab. The fact the story of Aladdin may be narrated to Galland points to its recent origins.

21. Which of the following is the primary reason for why storytellers are still fascinated by the story of Aladdin?

- (a) The tale of Aladdin documents the history of Europe and Middle East.
(b) The archetype of the rags-to-riches story of Aladdin makes it popular even today.
(c) The traveller's experience that inspired the tale of Aladdin resonates even today.
(d) The story of Aladdin is evidence of the eighteenth century French Orientalist attitude.

- (c) As given in the passage, the storytellers are still fascinated by the story of Aladdin as the traveller's experience that inspired the tales of Aladdin resonates even today. It reflects on a history of the French and the middle Easterners coming to Paris, that is still relevant today.

22. The author of the passage is most likely to agree with which of the following explanations for the origins of the story of Aladdin?

- (a) Galland received the story of Aladdin from Diyab who, in turn, found it in an incomplete medieval manuscript.
- (b) Basing it on his own life experiences, Diyab transmitted the story of Aladdin to Galland who included it in Arabian Nights.
- (c) Galland derived the story of Aladdin from Diyab's travelogue in which he recounts his fascination with the wealth of Versailles.
- (d) The story of Aladdin has its origins in an undiscovered, incomplete manuscript of a medieval Arabic collection of stories.

→ (b) As clearly stated in the passage, it was Diyab who narrated the story of Arabian Nights to Galland. In addition, the similarity of description between Diyab's travelogues and the descriptions in Arabian Nights make one agree that Diyab based his narration on his own life experiences which Galland presented through Aladdin.

23. Which of the following does not contribute to the passage's claim about the authorship of Aladdin?

- (a) The depiction of the affluence of Versailles in Diyab's travelogue.
- (b) Galland's acknowledgement of Diyab in his diary.
- (c) The narrative sensibility of Diyab's travelogue.
- (d) The story-line of many French fairy tales of the 18th century.

→ (d) As stated in the passage, it was the depictions of the affluence of Versailles, and the narrative sensibility of Diyab's travelogue along with Galland's acknowledgement in his diary that contributed to the passages claiming about the authorship of Aladdin. The reference to French fairy tales was made for its similarity of story line.

24. Which of the following, if true, would invalidate the inversion that the phrase 'flips the script' refers to?

- (a) The French fairy tales of the eighteenth century did not have rags-to-riches plot lines like that of the tale of Aladdin.
- (b) Galland acknowledged in the published translations of Arabian Nights that he heard the story of Aladdin from Diyab.
- (c) The description to opulence in Hanna Diyab's and Antoine Galland's narratives bore no resemblance to each other.
- (d) Diyab's travelogue described the affluence of the French city of Bordeaux, instead of Versailles.

→ (c) The phrase 'flips the script' in the passage refers to a reversal of a usual situation. Accordingly, the inversion of only option (c) would be invalidate.

Direction (Q. No. 25) The four sentences (labelled a, b, c, d) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.

25. (a) If you've seen a little line of text on websites that says something like "customers who bought this also enjoyed that" you have experienced this collaborative filtering firsthand.
- (b) The problem with these algorithms is that they don't take into account a host of nuances and circumstances that might interfere with their accuracy.
- (c) If you just bought a gardening book for your cousin, you might get a flurry of links to books about gardening, recommended just for you!—the algorithm has no way of knowing you hate gardening and only bought the book as a gift.
- (d) Collaborative filtering is a mathematical algorithm by which correlations and co-occurrences of behaviors are tracked and then used to make recommendations.

→ (dabc) In any paragraph a generic statement is always followed by examples. Accordingly, dabc is the correct sequence. So, sentence (d) comes first followed by sentence (a). Sentence (b) follows sentence (a) and sentence (c).

So, the correct sequence of the given four sentences is 'dabc'.

Directions (Q. Nos. 26) Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

26. (a) His idea to use sign language was not a completely new idea as Native Americans used hand gestures to communicate with other tribes.
- (b) Ancient Greek philosopher Aristotle, for example, observed that men who are deaf are incapable of speech.
- (c) People who were born deaf were denied the right to sign a will as they were "presumed to understand nothing; because it is not possible that they have been able to learn to read or write."
- (d) Pushback against this prejudice began in the 16th century when Pedro Ponce de Leon created a formal sign language for the hearing impaired.
- (e) For millennia, people with hearing impairments encountered marginalisation because it was believed that language could only be learned by hearing the spoken word.

→ (b) Out of the given 5 sentences, sentences labelled a, c, d, e talk of sign language and thus can be put into a meaningful and coherent short paragraph. Only sentence (b) is about the views of Aristotle regarding speech.

Directions (Q. No. 27) *Five sentences related to a topic are given below in a jumbled order. Four of them form a coherent and unified paragraph. Identify the odd sentence that does not go with the four. Key in the number of the option that you choose.*

27. (a) 'Stat' signaled something measurable, while 'matic' advertised free labour; but 'tron', above all, indicated control.
- (b) It was a totem of high modernism, the intellectual and cultural mode that decreed no process or phenomenon was too complex to be grasped, managed and optimised.
- (c) Like the heraldic shields of ancient knights, these morphemes were painted onto the names of scientific technologies to proclaim one's history and achievements to friends and enemies alike.
- (d) The historian Robert Proctor at Stanford University calls the suffix '-tron', along with '-matic' and '-stat', embodied symbols.
- (e) To gain the suffix was to acquire a proud and optimistic emblem of the electronic and atomic age.
- (b) Out of the given 5 sentences, sentences labelled a, c, d, e are about morphemes (suffix). Thus they can be put together in a meaningful paragraph. Sentence (b), on the other hand, seems to present a characteristic of high modernism.

Direction (Q. No. 28) *The four sentences (labelled a, b, c, d) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.*

28. (a) People with dyslexia have difficulty with print-reading, and people with autism spectrum disorder have difficulty with mind-reading.
- (b) An example of a lost cognitive instinct is mind-reading: our capacity to think of ourselves and others as having beliefs, desires, thoughts and feelings.
- (c) Mind-reading looks increasingly like literacy, a skill we know for sure is not in our genes, since scripts have been around for only 5,000-6,000 years.
- (d) Print-reading, like mind-reading varies across cultures, depends heavily on certain parts of the brain and is subject to developmental disorders.
- (bcda) The given sentences present information on examples of lost cognitive thinking. Hence, sentence (b) should come first as it gives an idea of what the paragraph would be about and sentence (b) will be followed by sentence (c) as both presents some information about mind reading. Sentence (a) will come at last as it provides information about both mind reading as well as print reading.
- Hence, the correct sequence of the given four sentence is 'bcda'.

Directions (Q. Nos. 29-31) *The passages given below are followed by four alternate summaries. Choose the option that best captures the essence of the passages.*

29. Physics is a pure science that seeks to understand the behaviour of matter without regard to whether it will afford any practical benefit. Engineering is the correlative applied science in which physical theories are put to some specific use, such as building a bridge or a nuclear reactor. Engineers obviously rely heavily on the discoveries of physicists, but an engineer's knowledge of the world is not the same as the physicist's knowledge. Infact, an engineer's know-how will often depend on physical theories that, from the point of view of pure physics, are false. There are some reasons for this. First, theories that are false in the purest and strictest sense are still sometimes very good approximations to the true ones, and often have the added virtue of being much easier to work with. Second, sometimes the true theories apply only under highly idealised conditions which can only be created under controlled experimental situations. The engineer finds that in the real world, theories rejected by physicists yield more accurate predictions than the ones that they accept.
- (a) The relationship between pure and applied science is strictly linear, with the pure science directing applied science, and never the other way round.
- (b) The unique task of the engineer is to identify, understand and interpret the design constraints to produce a successful result.
- (c) Though engineering draws heavily from pure science. It contributes to knowledge by incorporating the constraints and conditions in the real world.
- (d) Engineering and physics fundamentally differ on matters like building a bridge or a nuclear reactor.
- (c) The given passage states that engineers rely heavily from physicists, those people who study pure science. They, then apply this knowledge of theory in real world conditions to produce more knowledge and contribute to pure science.
30. A distinguishing feature of language is our ability to refer to absent things, known as displaced reference. A speaker can bring distant referents to mind in the absence of any obvious stimuli. Thoughts, not limited to the here and now, can pop into our heads for unfathomable reasons. This ability to think about distant things necessarily precedes the ability to talk about them. Thought precedes meaningful referential communication. A prerequisite for the emergence of human-like meaningful symbols is that the mental categories they relate to can be invoked even in the absence of immediate stimuli.

- (a) Thoughts are essential to communication and only humans have the ability to think about objects not present in their surroundings.
 - (b) Thoughts precede all speech acts and these thoughts pop up in our heads even in the absence of any stimulus.
 - (c) Displaced reference is particular to humans and thoughts pop into our heads for no real reason.
 - (d) The ability to think about objects not present in our environment precedes the development of human communication.
- (d) The passage states the principle of displaced reference, a characteristic of human language, by virtue of which humans can refer to absent things. Consequently, our thoughts, the ability to think about object not present comes prior to the meaningful human acts of communication.
- 31.** Vance Packard's *The Hidden Persuaders* alerted the public to the psychoanalytical techniques used by the advertising industry. Its premise was that advertising agencies were using depth interviews to identify hidden consumer motivations, which were then used to entice consumers to buy goods. Critics and reporters often wrongly assumed that Packard was writing mainly about subliminal advertising. Packard never mentioned the word subliminal, however and devoted very little space to discussions of 'subthreshold' effects. Instead, his views largely aligned with the notion that individuals do not always have access to their conscious thoughts and can be persuaded by supraliminal messages without their knowledge.
- (a) Packard argued that advertising as a 'hidden persuasion' understands the hidden motivations of consumers and works at the subliminal level, on the subconscious level of the awareness of the people targeted.
 - (b) Packard argued that advertising as a 'hidden persuasion' works at the supraliminal level, wherein the people targeted are aware of being persuaded, after understanding the hidden motivations of consumers and works.
 - (c) Packard held that advertising as a 'hidden persuasion' builds on peoples' conscious thoughts and awareness, by understanding the hidden motivations of consumers and works at the subliminal level.
 - (d) Packard held that advertising as a 'hidden persuasion' understands the hidden motivations of consumers and works at the supraliminal level, though the people targeted have no awareness of being persuaded.
- (d) In the given passage, Packard points that advertising uses hidden persuasion means, by using motivations of consumers and persuades them without them being aware of it. They use sensory stimulations (supraliminal stimulations) that attracts and then persuades the consumers.

Directions (Q. Nos. 32 and 33) *The four sentences (labelled a, b, c, d) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence of the order of the sentences and key in the sequence of the four numbers as your answer.*

- 32.** (a) Metaphors may map to similar meanings across languages, but their subtle differences can have a profound effect on our understanding of the world.
- (b) Latin scholars point out *carpediem* is a horticultural metaphor that, particularly seen in the context of its source, is more accurately translated as "plucking the day," evoking the plucking and gathering of ripening fruits or flowers, enjoying a moment that is rooted in the sensory experience of nature, unrelated to the force implied in seizing.
- (c) The phrase *carpediem*, which is often translated as "seize the day and its accompanying philosophy," has gone on to inspire countless people in how they live their lives and motivates us to see the world a little differently from the norm.
- (d) It's an example of one of the more telling ways that we mistranslate metaphors from one language to another, revealing in the process our hidden assumptions about what we really value.
- (cbda) Out of the given 4 sentences, two sentences talk of the phrase *carpediem*, while the others derive implications from it. Hence, the paragraph must start with sentence (c) which introduces the term. This must be followed by sentence (b), which further develops upon the phrase. Sentence (b) is followed by sentence (d) which draws implication followed by a general implication given in sentence (a).
Hence, the correct sequence of the given sentences is 'cbda'.
- 33.** (a) We'll all live under mob rule until then, which doesn't help anyone.
- (b) Perhaps we need to learn to condense the feedback we receive online so that 100 replies carry the same weight as just one.
- (c) As we grow more comfortable with social media conversations being part of the way we interact every day, we are going to have to learn how to deal with legitimate criticism.
- (d) A new norm will arise where it is considered unacceptable to reply with the same point that dozens of others have already.
- (cbda) The given sentence deal with social media conservations. Thus, sentence (c) which introduces the topic of the paragraph must come first. This must be followed by sentence (b). Sentence (d) will be followed by sentence (a) which presents the implications of the new norm.
So, the correct sequence is 'cbda'.

Direction (Q. No. 34) *Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.*

34. (a) One argument is that actors that do not fit within a single, well-defined category may suffer an 'illegitimacy discount'.
- (b) Others believe that complex identities confuse audiences about an organisation's role or purpose.
- (c) Some organisations have complex and multi-dimensional identities that span or combine categories, while other organisations possess narrow identities.

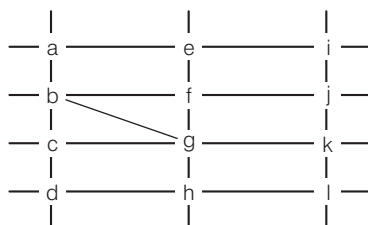
- (d) Identity is one of the most important features of organisations, but there exist opposing views among sociologists about how identity affects organisational performance.
- (e) Those who think that complex identities are beneficial point to the strategic advantages of ambiguity and organisations' potential to differentiate themselves from competitors.

→ (a) Out of the given five sentences, four sentences labelled b, c, d, e are about organisations identities. Sentence (a) deals with actors. Thus, sentence (a) is the odd one out.

SECTION II Data Interpretation and Logical Reasoning (DILR)

Directions (Q. Nos. 1-4) *Study the following information carefully and answer the questions asked.*

The figure below shows the street map for a certain region with the street intersections marked from a through l. A person standing at an intersection can see along straight lines to other intersections that are in her line of sight and all other people standing at these intersections. For example, a person standing at intersection g can see all people standing at intersections b, c, e, f, h and k. In particular, the person standing at intersection g can see the person standing at intersection e irrespective of whether there is a person standing at intersection f.



Six people U, V, W, X, Y and Z are standing at different intersections. No two people are standing at the same intersection.

The following additional facts are known.

1. X, U and Z are standing at the three corners of a triangle formed by three street segments.
 2. X can see only U and Z.
 3. Y can see only U and W.
 4. U sees V standing in the next intersection behind Z.
 5. W cannot see V or Z.
 6. No one among the six is standing at intersection d.
- 1.** Who is standing at intersection a?
 (a) V (b) Y (c) No one (d) W
- 2.** Who can V see?
 (a) U, W and Z (b) U only
 (c) Z only (d) U and Z only

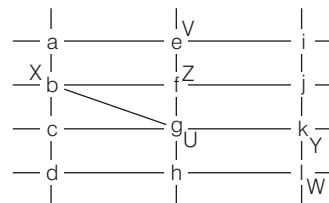
- 3.** What is the minimum number of street segments that X must cross to reach Y?

- (a) 1 (b) 4
 (c) 2 (d) 3

- 4.** Should a new person stand at intersection d, who among the six would he see?

- (a) U and W (b) V and X
 (c) W and X (d) U and Z

→ Sol. (Q. Nos. 1-4)

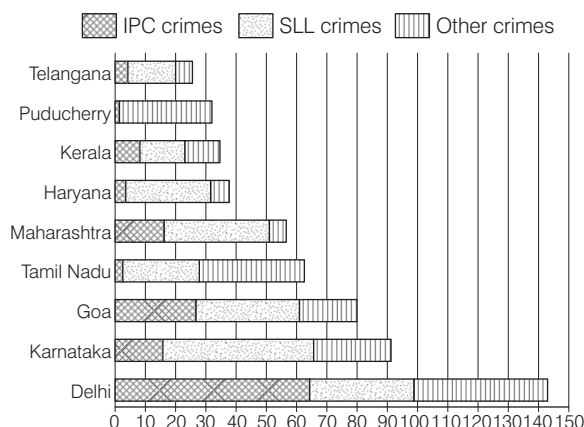


1. (c) No one is standing at intersection a.
2. (d) V can see U and Z.
3. (c) Minimum 2 street segments X must cross to reach Y viz. bg and gk.
4. (c) The new person standing at intersection d will see W and X only.

Directions (Q. Nos. 5-8) *Study the following information carefully and answer the questions asked.*

The Ministry of Home Affairs is analysing crimes committed by foreigners in different states and union territories (UT) of India. All cases refer to the ones registered against foreigners in 2016.

The number of cases classified into three categories: IPC crimes, SLL crimes and other crimes—for nine states/UTs are shown in the figure below. These nine belong to the top ten states/UTs in terms of the total number of cases registered. The remaining state (among top ten) is West Bengal, where all the 520 cases registered were SLL crimes.



The table below shows the ranks of the ten states/UTs mentioned above among all states/UTs of India in terms of the number of cases registered in each of the three category of crimes. A state/UT is given rank r for a category of crimes if there are $(r-1)$ states/UTs having a larger number of cases registered in that category of crimes. For example, if two states have the same number of cases in a category and exactly three other states/UTs have larger numbers of cases registered in the same category, then both the states are given rank 4 in that category. Missing ranks in the table are denoted by *.

	IPC crimes	SLL crimes	Other crimes
Delhi	*	*	*
Goa	*	4	*
Haryana	8	6	*
Karnataka	3	2	*
Kerala	*	9	*
Maharashtra	3	4	8
Puducherry	13	29	*
Tamil Nadu	11	7	*
Telangana	6	9	8
West Bengal	17	*	16

- What is the rank of Kerala in the 'IPC crimes' category?
- In the two states where the highest total number of cases are registered, the ratio of the total number of cases in IPC crimes to the total number in SLL crimes is closest to
 - 3 : 2
 - 19 : 20
 - 1 : 9
 - 11 : 10
- Which of the following is definitely true about the ranks of states/UTs in the 'Other crimes' category?
 - Tamil Nadu : 2
 - Puducherry : 3
 - Neither (i), nor (ii)
 - Only (ii)
 - Only (i)
 - Both (i) and (ii)

- What is the sum of the ranks of Delhi in the three categories of crimes?

→ Sol. (Q. Nos. 5-8)

- Kerala is ranked higher than Telangana and since Telangana is rank 6.

Kerala will be below that. Kerala can be 5 as 4 states/UTs are higher in rank than Kerala.

Hence, Kerala rank is 5.

- (c)

	IPC crimes	SLL crimes
Delhi	65	35
WB	0	520
Total	65	555

∴ Required ratio = 65 : 555

= 1 : 9

- (d) In other crimes,

Puducherry 32.53

Tamil Nadu ≈ 40

Delhi > 40

Maharashtra < 40

Goa < 40

Karnataka < 40

All other states are also < 40.

Therefore, Rank for Puducherry is 3,

Tamil Nadu is 2, and Delhi is 1.

Hence, both (i) and (ii) are correct.

- In IPC rank of Delhi is 1.

SLL rank of Delhi is 3.

Other crimes rank of Delhi is 1.

Therefore, the sum of the ranks of Delhi in all the three categories of crimes will be

$1 + 3 + 1 = 5$

Directions (Q. Nos. 9-12) Study the following information carefully and answer the questions asked.

A supermarket has to place 12 items (coded A to L) in shelves numbered 1 to 16. Five of these items are types of biscuits, three are types of candies and the rest are types of savouries. Only one item can be kept in a shelf. Items are to be placed such that all items of same type are clustered together with no empty shelf between items of the same type and atleast one empty shelf between two different types of items. At most two empty shelves can have consecutive numbers.

The following additional facts are known.

- A and B are to be placed in consecutively numbered shelves in increasing order.
- I and J are to be placed in consecutively numbered shelves both higher numbered than the shelves in which A and B are kept.
- D, E and F are savouries and are to be placed in consecutively numbered shelves in increasing order after all the biscuits and candies.

4. K is to be placed in shelf number 16.
5. L and J are items of the same type, while H is an item of a different type.
6. C is a candy and is to be placed in a shelf preceded by two empty shelves.
7. L is to be placed in a shelf preceded by exactly one empty shelf.
9. In how many different ways can the items be arranged on the shelves?
(a) 4 (b) 8 (c) 2 (d) 1
10. Which of the following items is not a type of biscuit?
(a) B (b) A
(c) G (d) L
11. Which of the following can represent the numbers of the empty shelves in a possible arrangement?
(a) 1,7,11,12 (b) 1,2,6,12
(c) 1,2,8,12 (d) 1,5,6,12
12. Which of the following statements is necessarily true?
(a) There are atleast four shelves between items B and C
(b) All biscuits are kept before candies
(c) All candies are kept before biscuits
(d) There are two empty shelves between the biscuits and the candies

→ **Sol. (Q. Nos. 9-12)** From the statements given following table can be drawn.

Arrangement 1		Arrangement 2
X	1	X
X	2	L
C	3	A
G/H	4	B
H/G	5	I/J
X	6	J/I
L	7	X
A	8	X
B	9	C
I/J	10	G/H
J/I	11	H/G
X	12	X
D	13	D
E	14	E
F	15	F
K	16	K

Biscuits—L, A, B, I, J
Candies—C, G, H
Savouries —D, E, F, K

9. (b) In 8 different ways the items can be arranged on the shelves.
10. (c) G is not a type of biscuit.
11. (b) 1, 2, 6, 12 can be the empty shelves.
12. (a) There are atleast four shelves between items B and C.

Directions (Q. Nos. 13-16) Study the following information carefully and answer the questions asked.

A new game show on TV has 100 boxes numbered 1, 2, ... , 100 in a row, each containing a mystery prize. The prizes are items of different types, a, b, c, ... , in decreasing order of value. The most expensive item is of type a, a diamond ring, and there is exactly one of these. You are told that the number of items atleast doubles as you move to the next type. For example, there would be atleast twice as many items of type b as of type a, atleast twice as many items of type c as of type b and so on. There is no particular order in which the prizes are placed in the boxes.

13. What is the minimum possible number of different types of prizes?
14. What is the maximum possible number of different types of prizes?
15. Which of the following is not possible?
(a) There are exactly 75 items of type e
(b) There are exactly 45 items of type c
(c) There are exactly 60 items of type d
(d) There are exactly 30 items of type b
16. You ask for the type of item in box 45. Instead of being given a direct answer, you are told that there are 31 items of the same type as box 45 in boxes 1 to 44 and 43 items of the same type as box 45 in boxes 46 to 100. What is the maximum possible number of different types of items?
(a) 6 (b) 3 (c) 5 (d) 4

→ **Sol. (Q. Nos. 13-16)**

13. Given, there are total 100 boxes each containing an item, also the number of items **atleast** doubles every time. So, minimum types can be 2 as 1st prize having 1 item of type a and 2nd having 99 items of type b.

14. According to the question, number of prize items can be of;

a = 1
b = 2
c = 4
d = 8
e = 16
f = 32
Total = 63

Now, if we take g = 64, then total items become 63 + 64 = 127 i.e. greater than 100.

So, the maximum possible number of different types of prizes can be 6.

15. (b) For option (a),

$$a = 1, b = 3, c = 6, d = 15, e = 75$$

Now, total = $1 + 3 + 6 + 15 + 75 = 100$

So, statement (a) is possible.

For option (b), if there are exactly 45 items of type c, then there must be 2 to 22 items of type b only. This results summing upto 48 or 68 items.

Now, type d must have atleast 90 (double of 45) items but it is not possible.

For option (c), $a = 1, b = 9, c = 30, d = 60$

Now, $a + b + c + d = 100$

So, statement (c) is possible.

For option (d), $a = 1, b = 30, c = 69$

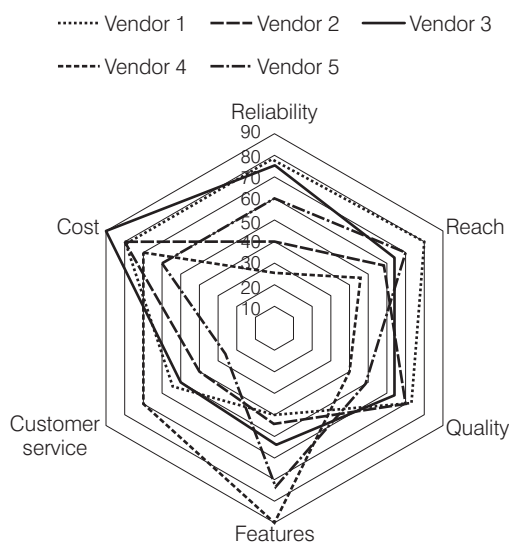
$\Rightarrow$ Now, $a + b + c = 1 + 30 + 69 = 100$

So, statement (d) is possible.

16. (c) As, type 'a' has only 1 item, this can be type b, c, d, e and f. So, the maximum possible number of different types of item can be 5.

Directions (Q. Nos. 17-20) Study the following information carefully and answer the questions asked.

Five vendors are being considered for a service. The evaluation committee evaluated each vendor on six aspects—Cost, Customer Service, Features, Quality, Reach and Reliability. Each of these evaluations are on a scale of 0 (worst) to 100 (perfect). The evaluation scores on these aspects are shown in the radar chart. For example, Vendor 1 obtains a score of 52 on Reliability, Vendor 2 obtains a score of 45 on Features and Vendor 3 obtains a score of 90 on Cost.



17. On which aspect is the median score of the five vendors the least?

- (a) Customer Service
- (b) Cost
- (c) Quality
- (d) Reliability

18. A vendor's final score is the average of their scores on all six aspects. Which vendor has the highest final score?

- (a) Vendor 1
- (b) Vendor 2
- (c) Vendor 4
- (d) Vendor 3

19. List of all the vendors who are among the top two scorers on the maximum number of aspects is

- (a) Vendor 2, Vendor 3 and Vendor 4
- (b) Vendor 1 and Vendor 5
- (c) Vendor 1 and Vendor 2
- (d) Vendor 2 and Vendor 5

20. List of all the vendors who are among the top three vendors on all six aspects is

- (a) Vendor 1 and Vendor 3
- (b) Vendor 1
- (c) Vendor 3
- (d) None of the Vendors

→ Sol. (Q. Nos. 17-20)

17. (a) From the graph,

Median for Reliability—51.6

Median for Reach—55

Median for Quality—52

Median for Features—55

Median for Customer Service—50

Median for Cost—75

Therefore, the last median score is for Customer Service.

18. (d) Average for Vendor 1 = $\frac{52 + 80 + 70 + 40 + 52 + 75}{6} = 61.5$

$$\text{Average for Vendor 2} = \frac{40 + 58 + 70 + 45 + 40 + 80}{6} = 55.5$$

$$\text{Average for Vendor 3} = \frac{78 + 63 + 62 + 55 + 50 + 90}{6} = 66.33$$

$$\text{Average for Vendor 4} = \frac{28 + 45 + 40 + 90 + 70 + 70}{6} = 57.16$$

$$\text{Average for Vendor 5} = \frac{60 + 70 + 50 + 72 + 28 + 60}{6} = 56.66$$

Therefore, highest final average score is for Vendor 3.

19. (b) V-Vendors

Reliability— V_3, V_5

Reach— V_1, V_5

Quality— V_1, V_2

Features— V_4, V_5

Customer Service— V_4, V_1

Cost— V_3, V_2

The top two scores on the maximum number of aspects is V_1 and V_5 .

20. (c) Reliability— V_3, V_5, V_1

Reach— V_1, V_5, V_3

Quality— V_1, V_2, V_3

Features— V_4, V_5, V_3

Customer Service— V_4, V_1, V_3

Cost— V_3, V_2, V_1

Therefore, Vendor 3 is among the top three vendors on all six aspects.

Directions (Q. Nos. 21-24) Study the following information carefully and answer the questions asked.

The following table represents addition of two six-digit numbers given in the first and the second rows, while the sum is given in the third row. In the representation, each of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 has been coded with one letter among A, B, C, D, E, F, G, H, J, K with distinct letters representing distinct digits.

		B	H	A	A	G	F
+		A	H	J	F	K	F
	A	A	F	G	C	A	F

21. Which digit does the letter A represent?
22. Which digit does the letter B represent?
23. Which among the digits 3, 4, 6 and 7 cannot be represented by the letter D?
24. Which among the digits 4, 6, 7 and 8 cannot be represented by the letter G?

→ Sol. (Q. Nos. 21-24)

0	F
1	A
2	C
3	J/D
4	G/D/K
5	H
6	D/J
7	K/G/J
8	D
9	B

21. 1 is represented by A.
As, the digit 1 should be carried forward.
22. 9
As, $9 + 1 + 1 = 11$
 $B + A + A$
23. D cannot represent 7 as takes K/G or J.
24. G cannot represent 6.

Directions (Q. Nos. 25-28) Study the following information carefully and answer the questions asked.

Six players - Tanzi, Umeza, Wangdu, Xyla, Yonita and Zeneca competed in an archery tournament. The tournament had three compulsory rounds, Rounds 1 to 3. In each round every player shot an arrow at a target. Hitting the centre of the target (called bull's eye) fetched the highest score of 5. The only other possible scores that a player could achieve were 4, 3, 2 and 1. Every bull's eye score in the first three rounds gave a player one additional chance to shoot in the bonus rounds, Rounds 4 to 6. The possible scores in Rounds 4 to 6 were identical to the first three.

A player's total score in the tournament was the sum of his/her scores in all rounds played by him/her. The table below presents partial information on points scored by the players after completion of the tournament. In the table, NP means that the player did not participate in that round, while a hyphen means that the player participated in that round and the score information is missing.

	Round-1	Round-2	Round-3	Round-4	Round-5	Round-6
Tanzi	–	4	–	5	NP	NP
Umeza	–	–	–	1	2	NP
Wangdu	–	4	–	NP	NP	NP
Xyla	–	–	–	1	5	–
Yonita	–	–	3	5	NP	NP
Zeneca	–	–	–	5	5	NP

The following facts are also known.

1. Tanzi, Umeza and Yonita had the same total score.
2. Total scores for all players, except one, were in multiples of three.
3. The highest total score was one more than double of the lowest total score.
4. The number of players hitting bull's eye in Round 2 was double of that in Round 3.
5. Tanzi and Zeneca had the same score in Round 1 but different scores in Round 3.

25. What was the highest total score?

- (a) 24 (b) 21
(c) 23 (d) 25

26. What was Zeneca's total score?

- (a) 23 (b) 24 (c) 21 (d) 22

27. Which of the following statements is true?

- (a) Xyla's score was 23
(b) Xyla was the highest scorer
(c) Zeneca was the highest scorer
(d) Zeneca's score was 23

28. What was Tanzi's score in Round 3?

- (a) 3 (b) 5 (c) 4 (d) 1

→ Sol. (Q. Nos. 25-28)

	Round-1	Round-2	Round-3	Round-4	Round-5	Round-6
Tanzi	5	4	1	5	NP	NP
Umeza	2	5	5	1	2	NP
Wangdu	4	4	4	NP	NP	NP
Xyla	5	5	5	1	5	4
Yonita	2	5	3	5	NP	NP
Zeneca	5	5	4	5	5	NP

Total Scores

Tanzi–15
 Umeza–15
 Wangdu–12
 Xyla–25
 Yonita–15
 Zeneca–24

25. (d) Xyla scored 25, which is the highest.

26. (b) Zeneca's total score was 24.

27. (b) Xyla was the highest scorer.

28. (d) Tanzi's score in Round 3 was 1.

Directions (Q. Nos. 29-32) Study the following information carefully and answer the questions asked.

Princess, Queen, Rani and Samraghi were the four finalists in a dance competition. Ashman, Badal, Gagan and Dyu were the four music composers who individually assigned items to the dancers. Each dancer had to individually perform in two dance items assigned by the different composers. The first item performed by the four dancers were all assigned by different music composers. No dancer performed her second item before the performance of the first item by any other dancers. The dancers performed their second items in the same sequence of their performance of their first items.

The following additional facts are known.

- (i) No composer who assigned item to Princess, assigned any item to Queen.
- (ii) No composer who assigned item to Rani, assigned any item to Samraghi.
- (iii) The first performance was by Princess; this item was assigned by Badal.
- (iv) The last performance was by Rani; this item was assigned by Gagan.
- (v) The items assigned by Ashman were performed consecutively. The number of performances between items assigned by each of the remaining composers was the same.

29. Which of the following is true?

- (a) The second performance was composed by Dyu
- (b) The third performance was composed by Ashman
- (c) The second performance was composed by Gagan
- (d) The third performance was composed by Dyu

30. Which of the following is false?

- (a) Samraghi did not perform in any item composed by Ashman
- (b) Princess did not perform in any item composed by Dyu
- (c) Queen did not perform in any item composed by Gagan
- (d) Rani did not perform in any item composed by Badal

31. The sixth performance was composed by

- (a) Badal (b) Ashman (c) Dyu (d) Gagan

32. Which pair of performances were composed by the same composer?

- (a) The second and the sixth (b) The first and the seventh
- (c) The third and the seventh (d) The first and the sixth

→ Sol. (Q. Nos. 29-32)

Dancer	Order	Composer
Princess	1	Badal
Samraghi	2	Dyu
Queen	3	Gagan
Rani	4	Ashman
Princess	5	Ashman
Samraghi	6	Badal
Queen	7	Dyu
Rani	8	Gagan

29. (a) From the table it is clear that "The second performance was composed by Dyu."

30. (c) "Queen did not perform in any item composed by Gagan" is false.

31. (a) The sixth performance was composed by Badal.

32. (d) The first and the sixth performances were composed by the same composer i.e. Badal.

SECTION III Quantitative Aptitude (QA)

1. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{x} - \frac{1}{y}$ is

- (a) $\frac{2}{3}$ (b) $\frac{1}{3}$
(c) 1 (d) 3

→ (b) We have

$$(5.55)^x = 1000$$

$$\Rightarrow (5.55)^x = 10^3$$

Taking log on both sides, we get

$$x \log_{10}(5.55) = 3 \log_{10} 10$$

$$x \log_{10}(5.55) = 3$$

$$[\because \log_{10} 10 = 1]$$

$$\Rightarrow \log_{10}(5.55) = \frac{3}{x}$$

$$\Rightarrow \log_{10}(10 \times 0.555) = \frac{3}{x}$$

$$\therefore \log_{10}(a \times b) = \log_{10} a + \log_{10} b$$

$$\Rightarrow \log_{10}(0.555) + 1 = \frac{3}{x}$$

... (i)

We are also given

$$(0.555)^y = 1000 = (10)^3$$

Taking log on both sides,

$$y \log_{10}(0.555) = 3 \log_{10} 10$$

$$y \log_{10}(0.555) = 3$$

$$\Rightarrow \log_{10}(0.555) = \frac{3}{y}$$

... (ii)

From Eqs. (i) and (ii),

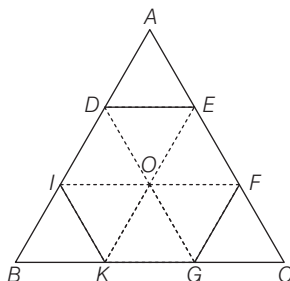
$$1 = \frac{3}{x} - \frac{3}{y}$$

$$\Rightarrow \frac{1}{x} - \frac{1}{y} = \frac{1}{3}$$

2. Corners are cut off from an equilateral triangle T to produce a regular hexagon H . Then, the ratio of the area of H to the area of T is

- (a) 2 : 3 (b) 3 : 4
(c) 4 : 5 (d) 5 : 6

→ (a)



ABC is an equilateral triangle (T) and $DEFGHI$ is a regular hexagon (H).

$$\therefore AB = BC = AC$$

$$\text{and } DE = EF = GF = KG = KI = ID$$

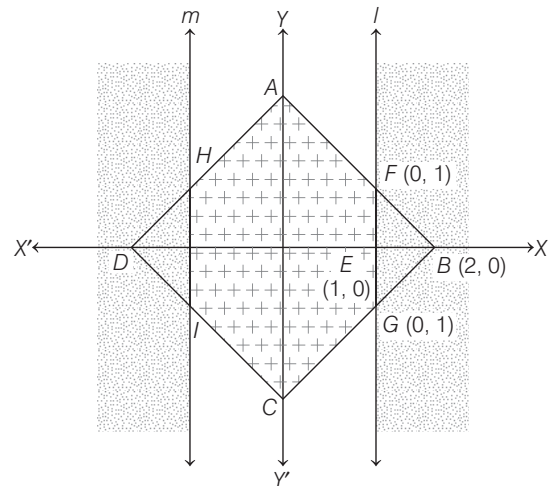
$$= AD = AE = BK = BI = GC = CF$$

Since, $\triangle ABC$ can be divided into 9 triangles of equal area and hexagon is divided into 6 triangles of equal area.

$$\therefore \frac{\text{Area of } H(\text{Hexagon } DEFGKI)}{\text{Area of } T(\triangle ABC)} = \frac{6}{9} = \frac{2}{3}$$

3. Let S be the set of all points (x, y) in the XY -plane such that $|x| + |y| \leq 2$ and $|x| \geq 1$. Then, the area (in square units) of the region represented by S equals

→ Sol.



$$AB \Rightarrow x + y = 2 \quad \left. \begin{array}{l} BC \Rightarrow x - y = 2 \\ AD \Rightarrow -x + y = 2 \\ CD \Rightarrow -x - y = 2 \end{array} \right\} |x| + |y| \leq 2$$

$$\left. \begin{array}{l} l \Rightarrow x = 1 \\ m \Rightarrow x = -1 \end{array} \right\} |x| \geq 1$$

Region S is represented by common shaded area

$$= \text{ar}\triangle FBG + \text{ar}\triangle DHI = 2 \times \text{ar}\triangle FBG$$

$$= 2 \times \frac{1}{2} \times GF \times BE \quad [\because BE = 1 \text{ unit, } GF = 2 \text{ unit}]$$

$$= 2 \times 1 = 2 \text{ sq units}$$

4. If $a_1 + a_2 + a_3 + \dots + a_n = 3(2^{n+1} - 2)$, for every $n \geq 1$, then a_{11} equals

→ Sol. $a_1 + a_2 + a_3 + \dots + a_n = 3(2^{n+1} - 2)$

$$\text{Put } n = 1, a_1 = 3(2^{1+1} - 2)$$

$$= 3 \times 2 = 6$$

$$\text{Put } n = 2, a_1 + a_2 = 3(2^{2+1} - 2) = 18$$

$$\Rightarrow 6 + a_2 = 18$$

$$\therefore a_2 = 12$$

$$\text{Put } n = 3, a_1 + a_2 + a_3 = 3(2^{3+1} - 2)$$

$$\Rightarrow 6 + 12 + a_3 = 42$$

$$\therefore a_3 = 24$$

Put $n = 4$, $a_1 + a_2 + a_3 + a_4 = 3(2^{4+1} - 2)$
 $\Rightarrow 6 + 12 + 24 + a_4 = 90$
 $\therefore a_4 = 48$
 $a_1 = 6 = 3 \times 2^1$
 $a_2 = 12 = 3 \times 2^2$
 $a_3 = 24 = 3 \times 2^3$
 $a_4 = 48 = 3 \times 2^4$
 $\therefore a_{11} = 3 \times 2^{11} = 6144$

5. If $a_1, a_2, \dots$ are in AP, then

$\frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \dots + \frac{1}{\sqrt{a_n} + \sqrt{a_{n+1}}}$ is equal

to

(a) $\frac{n-1}{\sqrt{a_1} + \sqrt{a_{n-1}}}$

(b) $\frac{n-1}{\sqrt{a_1} + \sqrt{a_n}}$

(c) $\frac{n}{\sqrt{a_1} - \sqrt{a_{n+1}}}$

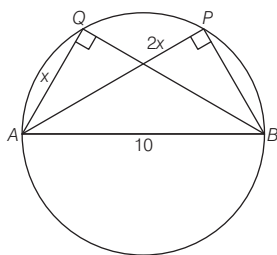
(d) $\frac{n}{\sqrt{a_n} + \sqrt{a_{n+1}}}$

$\Rightarrow$ (d) $\frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \dots + \frac{1}{\sqrt{a_n} + \sqrt{a_{n+1}}}$
 $= \frac{\sqrt{a_1} - \sqrt{a_2}}{a_1 - a_2} + \frac{\sqrt{a_2} - \sqrt{a_3}}{a_2 - a_3} + \dots + \frac{\sqrt{a_n} - \sqrt{a_{n+1}}}{a_n - a_{n+1}}$
 $= \frac{1}{-d} [\sqrt{a_1} - \sqrt{a_{n+1}}]$
 $[\because a_2 - a_1 = a_3 - a_2 = \dots = a_{n+1} - a_n = d \text{ (common difference)}]$
 $= -\frac{1}{d} \frac{[a_1 - a_{n+1}]}{[\sqrt{a_1} + \sqrt{a_{n+1}}]}$
 $= -\frac{1}{d} \frac{[a_1 - a_1 - (n+1-1)d]}{[\sqrt{a_1} + \sqrt{a_{n+1}}]} \quad [\because T_n = a_1 + (n-1)d]$
 $= -\frac{1}{d} \times \frac{-nd}{[\sqrt{a_1} + \sqrt{a_{n+1}}]}$
 $= \frac{n}{\sqrt{a_1} + \sqrt{a_{n+1}}}$

6. AB is a diameter of a circle of radius 5 cm. Let P and Q be two points on the circle so that the length of PB is 6 cm and the length of AP is twice that of AQ . Then, the length (in cm) of QB is nearest to

- (a) 9.1 (b) 7.8
 (c) 9.3 (d) 8.5

$\Rightarrow$ (a)



$\angle APB = \angle AQB = 90^\circ$ (angle in a semi-circle is always a right angle)

Let $AQ = x$, so $AP = 2x$

In right $\triangle APB$,

$$AP^2 = AB^2 - BP^2$$

$$\Rightarrow AP^2 = 10^2 - 6^2 = 8^2$$

$$\Rightarrow AP = 8$$

$$\Rightarrow 2x = 8$$

$$\Rightarrow x = 4$$

Similarly, in right $\triangle AQB$,

$$BQ^2 = AB^2 - AQ^2$$

$$\Rightarrow BQ^2 = 10^2 - 4^2 = 84$$

$$\Rightarrow BQ = \sqrt{84} \approx 9.1$$

7. Ramesh and Gautam are among 22 students who write an examination. Ramesh scores 82.5. The average score of the 21 students other than Gautam is 62. The average score of all the 22 students is one more than the average score of the 21 students other than Ramesh. The score of Gautam is

- (a) 49 (b) 51
 (c) 48 (d) 53

$\Rightarrow$ (b) Let Gautam's score be g and x be the average of all 22 students.

$$\therefore \text{Total score of 22 students} = 22x$$

According to the question,

$$22x - g = 21 \times 62 \quad \dots(i)$$

$$\left[\because \text{Average} = \frac{\text{Sum of terms}}{\text{Number of terms}} \right]$$

$$\text{and } 22x - 82.5 = 21(x - 1)$$

$$\Rightarrow 22x - 21x = 82.5 - 21$$

$$\Rightarrow x = 61.5$$

Put $x = 61.5$ in Eq. (i),

$$22 \times 61.5 - g = 21 \times 62$$

$$\therefore g = 51$$

8. One can use three different transports which move at 10, 20, and 30 km/h, respectively. To reach from A to B , Amal took each mode of transport $1/3$ of his total journey time, while Bimal took each mode of transport $1/3$ of the total distance. The percentage by which Bimal's travel time exceeds Amal's travel time is nearest to

- (a) 22 (b) 20
 (c) 19 (d) 21

$\Rightarrow$ (a) Let the total distance between A and $B = 180$ km

Given, speeds of three different transports are 10 km/h, 20 km/h and 30 km/h respectively.

Since, Bimal took each mode of transport $\frac{1}{3}$ of the total distance.

Therefore, total time taken by Bimal = $\left(\frac{60}{10} + \frac{60}{20} + \frac{60}{30}\right)h$
 $= (6 + 3 + 2)h = 11h$

Let the distances travelled by Amal for $\frac{1}{3}$ of his total time be a km, b km and c km respectively.

Therefore, time takes for each distance is equal to

$$\frac{a}{10} = \frac{b}{20} = \frac{c}{30} \Rightarrow a : b : c = 1 : 2 : 3$$

$$\therefore a = \frac{1}{(1+2+3)} \times 180 = 30 \text{ km}$$

$$b = \frac{2}{(1+2+3)} \times 180 = 60 \text{ km}$$

$$c = \frac{3}{(1+2+3)} \times 180 = 90 \text{ km}$$

$$\therefore \text{Total time taken by Amal} = \frac{30}{10} + \frac{60}{20} + \frac{90}{30}$$

$$= 3 + 3 + 3 = 9h$$

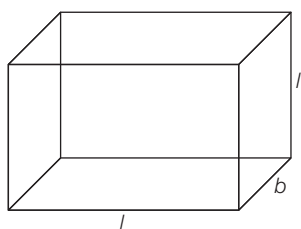
$$\text{Now, required percentage} = \frac{11-9}{9} \times 100$$

$$= \frac{2}{9} \times 100 \approx 22.22\% \approx 22\%$$

9. If the rectangular faces of a brick have their diagonals in the ratio $3 : 2\sqrt{3} : \sqrt{15}$, then the ratio of the length of the shortest edge of the brick to that of its longest edge is

- (a) $1 : \sqrt{3}$
 (b) $\sqrt{3} : 2$
 (c) $\sqrt{2} : \sqrt{3}$
 (d) $2 : \sqrt{5}$

→ (a)



The three diagonals will be $\sqrt{l^2 + b^2}$, $\sqrt{b^2 + l^2}$ and $\sqrt{h^2 + l^2}$ respectively.

$$\therefore \sqrt{l^2 + b^2} : \sqrt{b^2 + h^2} : \sqrt{h^2 + l^2} = 3 : 2\sqrt{3} : \sqrt{15}$$

$$\sqrt{l^2 + b^2} = 3x$$

$$\Rightarrow l^2 + b^2 = 9x^2 \quad \dots(i)$$

$$\sqrt{b^2 + h^2} = 2\sqrt{3}x$$

$$\Rightarrow b^2 + h^2 = 12x^2 \quad \dots(ii)$$

$$\sqrt{h^2 + l^2} = \sqrt{15}x$$

$$\Rightarrow h^2 + l^2 = 15x^2 \quad \dots(iii)$$

Adding Eqs. (i), (ii) and (iii),

$$l^2 + b^2 + h^2 = 18x^2 \quad \dots(iv)$$

From Eqs. (i) and (iv), $h = 3x$

From Eqs. (ii) and (iv), $l = \sqrt{6}x$

From Eqs. (iii) and (iv), $b = \sqrt{3}x$

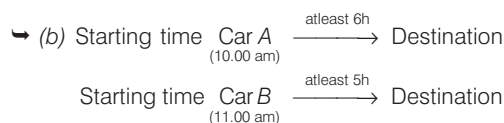
$\therefore$ Shortest edge, $b = \sqrt{3}x$

Longest edge, $h = 3x$

$$\therefore \text{Required ratio} = \frac{b}{h} = \frac{\sqrt{3}x}{3x} = \frac{1}{\sqrt{3}} = 1 : \sqrt{3}$$

10. Two cars travel the same distance starting at 10:00 am and 11:00 am, respectively, on the same day. They reach their common destination at the same point of time. If the first car travelled for atleast 6 h, then the highest possible value of the percentage by which the speed of the second car could exceed that of the first car is

- (a) 10
 (b) 20
 (c) 30
 (d) 25



If car A takes atleast 6 h to reach the destination, then car B will take atleast 5 h to reach the destination, ratio of time = 6:5.

$\therefore$ The ratio of speeds of car A and car B will be 5 : 6.

Highest possible value of the percentage by which speed of the second car exceeds that of the first car = $\frac{6-5}{5} \times 100$
 $= 20\%$

11. Amala, Bina and Gouri invest money in the ratio 3:4:5 in fixed deposits having respective annual interest rates in the ratio 6 : 5 : 4. What is their total interest income (in ₹) after a year, if Bina's interest income exceeds Amala's by ₹ 250?

- (a) 6000
 (b) 7250
 (c) 6350
 (d) 7000

→ (b) Ratio of incomes = 3 : 4 : 5

Ratio of interest = 6 : 5 : 4

Therefore, ratio of interest income

$$= (3 \times 6) : (4 \times 5) : (5 \times 4)$$

$$= 18 : 20 : 20$$

Let the interest incomes of Amala, Bina and Gouri be $18x$, $20x$ and $20x$ respectively.

Now, Bina's interest income exceeds Amala's by ₹ 250.

$$\therefore 20x - 18x = 250$$

$$\Rightarrow 2x = 250$$

$$\therefore x = 125$$

$$\therefore \text{Total interest income} = 18x + 20x + 20x$$

$$= 58x$$

$$= 58 \times 125$$

$$= 7250$$

- 12.** In a race of three horses, the first beat the second by 11 m and the third by 90 m. If the second beat the third by 80 m, what was the length, (in metres), of the racecourse?

→ **Sol.** Let the length of the racecourse = x m

∴ If Horse I runs x m, then Horse II will run $(x - 11)$ m, and Horse III will run $(x - 90)$ m.

Now, Horse II beats the Horse III by 80 m.

∴ If Horse II runs x m, then Horse III will run $(x - 80)$ m.

$$\begin{aligned} \text{Ratio of speeds of Horse II and Horse III} &= \frac{x - 11 - x}{x - 90 - (x - 80)} \\ &= \frac{11}{10} \end{aligned}$$

According to the question,

$$\frac{x - 11}{x - 90} = \frac{11}{10}$$

$$\Rightarrow 10x - 110 = 11x - 990$$

$$\therefore x = 880 \text{ m}$$

∴ Length of the racecourse = 880 m

- 13.** Meena scores 40% in an examination and after review, even though her score is increased by 50%, she fails by 35 marks. If her post-review score is increased by 20%, she will have 7 marks more than the passing score. The percentage score needed for passing the examination is

- (a) 75
(b) 60
(c) 80
(d) 70

→ (d) Let the score of the exam be $100x$.

Heena's score before review = 40% of $100x = 40x$

Her score after review = $40x + 50\%$ of $40x = 60x$

Passing marks = $60x + 35$... (i)

Her score after increasing it by 20% of post review score
= $60x + 20\%$ of $60x = 72x$

Passing marks = $72x - 7$... (ii)

Equating Eqs. (i) and (ii), $72x - 7 = 60x + 35 \Rightarrow x = 3.5$

Hence, total marks = $100x = 350$

and passing marks = $60x + 35 = 245$

∴ Passing percentage = $\frac{245}{350} \times 100 = 70$

- 14.** The wheels of bicycles A and B have radii 30 cm and 40 cm, respectively. While travelling a certain distance, each wheel of A required 5000 more revolutions than each wheel of B. If bicycle B travelled this distance in 45 min, then its speeds (in km per hour), was

- (a) 16π
(b) 12π
(c) 18π
(d) 14π

→ (a) The distance travelled by bicycle A in one revolution

$$= 2\pi r_a = 2\pi \times 30 = 60\pi \text{ cm}$$

The distance travelled by bicycle B in one revolution

$$= 2\pi r_b = 2\pi \times 40 = 80\pi \text{ cm}$$

Let B makes 'n' revolutions to cover the distance.

Then, A would make $(n + 5000)$ to cover the same distance.

$$\therefore n \times 80\pi = (n + 5000) \times 60\pi \Rightarrow n = 15000$$

$$\text{Distance travelled by B} = n \times 80\pi \text{ cm} = \frac{15000 \times 80\pi}{10^5} \text{ km}$$

$$= 12\pi \text{ km}$$

$$\text{Time taken by B} = 45 \text{ min} = \frac{45}{60} = \frac{3}{4} \text{ h}$$

$$\text{Hence, the speed of B} = \frac{12\pi}{3/4} = 16\pi \text{ km/h}$$

- 15.** A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800g. If half litre of the mixture weighs 480 g, then the percentage of liquid 1 in the mixture, in terms of volume, is

- (a) 75
(b) 85
(c) 80
(d) 70

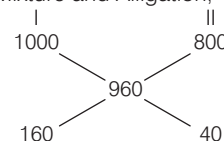
→ (c) $\frac{1}{2}$ L of the mixture weighs = 480 g

∴ 1 L of the mixture weighs = $480 \times 2 = 960$ g

Weight of 1 L of liquid I = 1 kg = 1000 g

Weight of 1 L of liquid II = 800 g

Applying the law of Mixture and Alligation,



$$\therefore \text{I} : \text{II} = 4 : 1$$

$$\therefore \text{Required percentage} = \frac{4}{5} \times 100 = 80\%$$

- 16.** Let x and y be positive real numbers such that $\log_5(x + y) + \log_5(x - y) = 3$ and $\log_2 y - \log_2 x = 1 - \log_2 3$. Then, xy equals

- (a) 150
(b) 100
(c) 250
(d) 25

→ (a) Given, $\log_5(x + y) + \log_5(x - y) = 3$

$$\Rightarrow \log_5(x + y)(x - y) = 3 \quad [\because \log_a m + \log_a n = \log_a mn]$$

$$\Rightarrow \log_5(x^2 - y^2) = 3$$

$$\Rightarrow x^2 - y^2 = 5^3$$

$$x^2 - y^2 = 125 \quad \dots (i)$$

$$\text{and} \quad \log_2 y - \log_2 x = 1 - \log_2 3 \quad [\because \log_2 2 = 1]$$

$$\Rightarrow \log_2 y - \log_2 x + \log_2 3 = 1$$

$$\Rightarrow \log_2 \frac{3y}{x} = 1$$

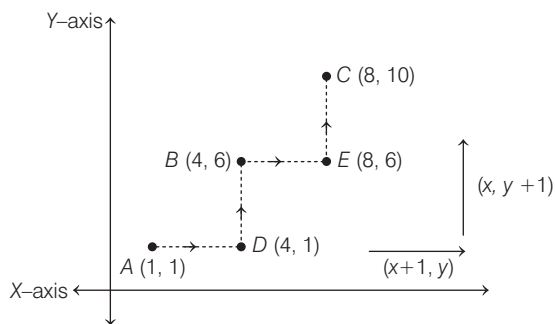
$$\Rightarrow \frac{3y}{x} = 2^1$$

$$\Rightarrow \frac{y}{x} = \frac{2}{3}$$

Let $y = 2m, x = 3m$,
 Put these values in Eq. (i), we get
 $(3m)^2 - (2m)^2 = 125$
 $\Rightarrow 9m^2 - 4m^2 = 125$
 $\Rightarrow 5m^2 = 125$
 $\Rightarrow m^2 = 25$
 $\therefore m = 5$
 $\therefore xy = 3m \times 2m$
 $= 6m^2 = 6 \times 5^2 = 150$

17. With rectangular axes of coordinates, the number of paths from (1, 1) to (8, 10) via (4, 6), where each step from any point (x, y) is either to (x, y + 1) or to (x + 1, y), is

→ Sol.



Moving from A to B, through D,

A to D = 3 steps

D to B = 5 steps

$$\text{Possible ways} = \frac{8!}{3! 5!}$$

Similarly, moving from B to C, through E

B to E = 4 steps

E to C = 4 steps

$$\text{Possible ways} = \frac{8!}{4! 4!}$$

$$\therefore \text{Total possible ways for going from A to C} \\ = \frac{8!}{3! 5!} \times \frac{8!}{4! 4!} = 3920$$

18. The number of solutions to the equation

$$|x|(6x^2 + 1) = 5x^2 \text{ is}$$

→ Sol. $|x|(6x^2 + 1) = 5x^2$

$|x|$ can take two values which are $-x$ and x

$\therefore$ For $|x| = x$

The equation will be

$$x(6x^2 + 1) = 5x^2$$

$$6x^3 + x - 5x^2 = 0$$

$$x(6x^2 + 1 - 5x) = 0$$

$x = 0$ and $6x^2 - 5x + 1 = 0$ can have two solutions

For $|x| = -x$,

The equation will be

$$-x(6x^2 + 1) = 5x^2$$

$$\Rightarrow 6x^3 + x + 5x^2 = 0$$

$$\Rightarrow x(6x^2 + 1 + 5x) = 0$$

$x = 0$ and $6x^2 + 5x + 1 = 0$ can have two solutions since $x = 0$ is a common solution for both of the equations.

Hence, total number of solutions are 5.

19. At their usual efficiency levels, A and B together finish a task in 12 days. If A had worked half as efficiently as she usually does, and B had worked thrice as efficiently as he usually does, the task would have been completed in 9 days. How many days would A take to finish the task, if she works alone at her usual efficiency?

- (a) 18 (b) 36
(c) 24 (d) 12

→ (a) Let the efficiencies of A and B are a and b respectively.

Time taken to complete the work at their usual efficiency
 $= 12$ days

$$\therefore 12a + 12b = \text{Total work}$$

If A works at half efficiency and B works at thrice efficiency, then

$$9\left(\frac{a}{2} + 3b\right) = \text{Total work}$$

$$\Rightarrow 12a + 12b = 9\left(\frac{a}{2} + 3b\right)$$

$$\therefore a = 2b \quad \dots (i)$$

Now, total work

$$= 12a + 12b$$

$$= 12a + 2b \times 6$$

$$= 12a + 6a$$

$$= 18a$$

[from Eq. (i)]

$\therefore$ Time taken by A to complete the work at usual efficiency

$$= \frac{18a}{a} = 18 \text{ days}$$

20. The product of the distinct roots of $|x^2 - x - 6| = x + 2$ is

- (a) -24
(b) -16
(c) -8
(d) -4

→ (b) Given, $|x^2 - x - 6| = (x + 2)(x - 3)$

Case I.

$$x^2 - x - 6 < 0$$

$$\Rightarrow (x + 2)(x - 3) < 0$$

$$\Rightarrow -2 < x < 3$$

$$\text{and } |x^2 - x - 6| = -(x^2 - x - 6)$$

$$\text{Therefore, } |x^2 - x - 6| = x + 2$$

$$\Rightarrow -(x + 2)(x - 3) = x + 2$$

$$\Rightarrow (x - 3) = -1$$

$$\Rightarrow x = 2$$

Case II.

$$x^2 - x - 6 \geq 0$$

$$\Rightarrow (x+2)(x-3) \geq 0$$

$$\Rightarrow x \leq -2 \text{ and } x \geq 3$$

Checking for boundary conditions

for $x = -2$ is also the root, but for $x = 3$,

$$|x^2 - x - 6| \neq x + 2$$

Hence, $x = 3$ is not the root and for the intervals $x < -2$ or $x > 3$, the expression

$$|x^2 - x - 6| = x^2 - x - 6$$

$$\text{Therefore, } |x^2 - x - 6| = x + 2$$

$$\Rightarrow (x+2)(x-3) = x+2$$

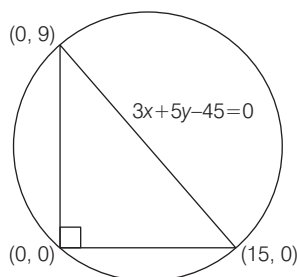
$$\Rightarrow x - 3 = 1$$

$$\Rightarrow x = 4$$

$\therefore$ The roots are $-2, 2$ and 4 . So, the required product
 $= (2)(-2)(4) = -16$

- 21.** Let T be the triangle formed by the straight line $3x + 5y - 45 = 0$ and the coordinate axes. Let the circumcircle of T have radius of length L , measured in the same unit as the coordinate axes. Then, the integer closest to L is

→ Sol.



Equation of straight line is $3x + 5y = 45$

Put $x = 0$, $y = 9$

Put $y = 0$, $x = 15$

Clearly, the triangle will be a right angled triangle and the hypotenuse would be the diameter of the circumcircle.

$$\text{Hypotenuse} = \sqrt{9^2 + 15^2} = \sqrt{306} \approx 17.5$$

$$\text{Therefore, radius} = \frac{17.5}{2} \approx 8.7$$

Hence, the closest integer = 9

- 22.** Three men and eight machines can finish a job in half the time taken by three machines and eight men to finish the same job. If two machines can finish the job in 13 days, then how many men can finish the job in 13 days?

→ (a) Let the time taken by 1 machine be x and time taken by man be m .

$$\therefore \text{Total work} = 3m + 8x$$

$\therefore$ According to the question,

$$3m + 8x = 2(3x + 8m)$$

$$\therefore 2x = 13m$$

... (i)

Now, two machines can finish the job in 13 days.

$$\therefore \text{Total work} = 2x \times 13$$

$$= 13m \times 13$$

[from Eq. (i)]

$\therefore$ Number of men required to finish the job in 13 days

$$= \frac{13m \times 13}{13} = 13 \text{ men}$$

- 23.** A person invested a total amount of ₹15 lakh. A part of it was invested in a fixed deposit earning 6% annual interest, and the remaining amount was invested in two other deposits in the ratio 2 : 1, earning annual interest at the rates of 4% and 3%, respectively. If the total annual interest income is ₹ 76000, then the amount (in ₹ lakh) invested in the fixed deposit was

→ (a) Total invested amount = ₹ 15 lakh

Part 'x' is invested at fixed deposit with 6% per annum interest.

Part 'y' is invested in the ratio 2 : 1 with annual interest 4% and 3% respectively.

$$\therefore \text{Weighted average of interest rates} = \frac{2 \times 4 + 3 \times 1}{3} = \frac{11}{3} \%$$

$$\therefore \text{Overall interest \%} = \frac{76000}{1500000} \times 100 = \frac{76}{15} \%$$

Applying Alligation rule,

$$\begin{array}{ccc} \frac{x}{6\%} = \frac{90}{15} \% & & \frac{y}{\frac{11}{3}\%} = \frac{55}{15} \% \\ & \searrow \quad \nearrow & \\ & 76\% & \\ & \nearrow \quad \searrow & \\ 21\% & & 14\% \end{array}$$

$$\therefore x : y = 21 : 14 = 3 : 2$$

$$\therefore \text{Amount invested in fixed deposit} = \frac{3}{5} \times 1500000 = ₹ 9 \text{ lakh}$$

- 24.** In a class, 60% of the students are girls and the rest are boys. There are 30 more girls than boys. If 68% of the students, including 30 boys, pass an examination, the percentage of the girls who do not pass is

→ (b) Let the total number of students in the class be x .

$$\therefore \text{Number of girls in the class} = \frac{60}{100}x = \frac{3}{5}x$$

$$\text{Number of boys in the class} = \frac{2}{5}x$$

$$\text{According to the question, } \frac{3}{5}x - \frac{2}{5}x = 30$$

$$\Rightarrow x = 150$$

$$\therefore \text{Total number of students in the class} = 150$$

$$\text{Total students who passed the examination} = \frac{68}{100} \times 150 = 102$$

$$\text{Total number of boys who passed the examination} = 30$$

∴ Total number of girls who passed the examination

$$= 102 - 30$$

$$= 72$$

$$\text{Total number of girls in the class} = \frac{3}{5} \times 150 = 90$$

$$\text{Number of girls who do not pass in the examination} = 90 - 72 = 18$$

$$\therefore \text{Required percentage} = \frac{18}{90} \times 100 = 20\%$$

25. The number of the real roots of the equation $2\cos(x(x+1)) = 2^x + 2^{-x}$ is

- (a) 0 (b) 1
(c) 2 (d) infinite

→ (b) For any real values of x , the expression

$$2\cos(x(x+1)) = 2^x + 2^{-x} \text{ would always be positive.}$$

$$\text{Let find the maximum value of } 2\cos(x(x+1)) = 2^x + 2^{-x}$$

Applying AM – GM inequality, we have

$$\frac{2^x + 2^{-x}}{2} \geq \sqrt{2^x \times 2^{-x}}$$

$$\Rightarrow 2^x + 2^{-x} \geq 2\sqrt{2^0}$$

$$\Rightarrow 2^x + 2^{-x} \geq 2$$

$$\text{Therefore, } 2\cos(x(x+1)) \geq 2$$

$$\text{It is known that } -1 \leq \cos\theta \leq 1$$

$$\Rightarrow 2\cos[x(x+1)] = 2$$

$$\text{Hence, the expression is valid only if } 2^x + 2^{-x} = 2$$

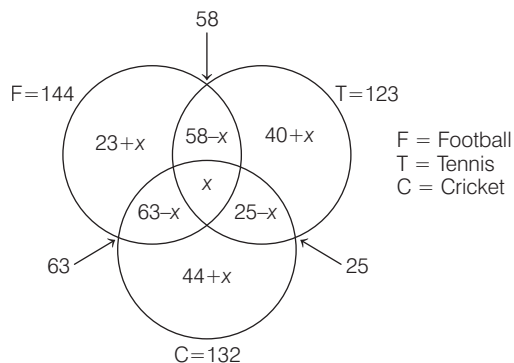
$$\text{Which is true for only one value of } x, \text{ i.e. } 0.$$

∴ The expression has only one real solution.

26. A club has 256 members of whom 144 can play football, 123 can play tennis and 132 can play cricket. Moreover, 58 members can play both football and tennis, 25 can play both cricket and tennis, while 63 can play both football and cricket. If every member can play atleast one game, then the number of members who can play only tennis is

- (a) 45
(b) 32
(c) 38
(d) 43

→ (d)



Now, on analysing the above diagram,

$$40 + x + 25 - x + 44 + x + 144 = \text{Total members}$$

$$\Rightarrow 253 + x = 256$$

$$\therefore x = 3$$

$$\therefore \text{Number of members who play only Tennis} = 40 + x = 40 + 3 = 43$$

27. For any positive integer n let $f(n) = n(n+1)$ if n is even, and $f(n) = n+3$ if n is odd. If m is a positive integer such that $8f(m+1) - f(m) = 2$, then m equals

$$\rightarrow (a) f(n) = \begin{cases} n(n+1) & \text{if } n \text{ is even} \\ n+3 & \text{if } n \text{ is odd} \end{cases}$$

Given equation

$$8f(m+1) - f(m) = 2 \quad \dots (i)$$

Now, if m is even then, $f(m) = m(m+1)$

If m is even, then $(m+1)$ will be odd.

$$\text{Then, } f(m+1) = m+3+1 = m+4$$

Putting these values in Eq. (i), we get

$$8 \times (m+4) - m(m+1) = 2$$

$$\Rightarrow 8m + 32 - m^2 - m = 2$$

$$\Rightarrow m^2 - 7m - 30 = 0$$

$$\Rightarrow m^2 - 10m + 3m - 30 = 0$$

$$\Rightarrow m(m-10) + 3(m-10) = 0$$

$$\Rightarrow (m+3)(m-10) = 0$$

$$\therefore m = -3, 10$$

∴ $m = 10$ is the answer because m is positive.

28. The product of two positive numbers is 616. If the ratio of the difference of their cubes to the cube of their difference is 157:3, then the sum of the two numbers is

- (a) 58
(b) 95
(c) 85
(d) 50

→ (d) Let the two numbers be x and y

$$\text{Given, } xy = 616$$

$$\text{Also, } \frac{x^3 - y^3}{(x - y)^3} = \frac{157}{3}$$

$$\text{Let, } x^3 - y^3 = 157k$$

$$\text{and } (x - y)^3 = 3k$$

We know that,

$$(x - y)^3 = x^3 - y^3 - 3xy(x - y)$$

$$\Rightarrow (3k) = 157k - 3 \times 616(3k)^{1/3}$$

$$\Rightarrow 154k = 3 \times 616 \times (3k)^{1/3}$$

$$\Rightarrow k = 12 \times (3k)^{1/3}$$

$$\Rightarrow k^3 = 12^3 \times 3 \times k$$

$$\Rightarrow k^2 = 3 \times 12^3$$

$$\Rightarrow k = 72$$

Therefore,

$$x - y = (3k)^{1/3} = (3 \times 72)^{1/3} = 6$$

Also, $(x + y)^2 = (x - y)^2 + 4xy$

$$\Rightarrow (x + y)^2 = 6^2 + 4 \times 616 = 2500$$

$$\Rightarrow (x + y) = 50$$

29. Consider a function f satisfying $f(x + y) = f(x) f(y)$ where x, y are positive integers, and $f(1) = 2$. If $f(a + 1) + f(a + 2) + \dots + f(a + n) = 16(2^n - 1)$, then a is equal to

→ Sol. $f(a + 1) + f(a + 2) + \dots + f(a + n) = 16(2^n - 1)$

$$\Rightarrow f(a)f(1) + f(a)f(2) + \dots + f(a)f(n) = 16(2^n - 1)$$

$$\Rightarrow f(a)\{f(1) + f(2) + \dots + f(n)\} = 16(2^n - 1)$$

Take, $n = 1$

$$\Rightarrow f(a)f(1) = 16(2^1 - 1) = 16$$

$$\Rightarrow f(a) \times 2 = 16 \Rightarrow f(a) = 8$$

Therefore,

$$f(a)\{f(1) + f(2) + \dots + f(n)\} = 16(2^n - 1)$$

$$\Rightarrow f(1) + f(2) + \dots + f(n) = 2(2^n - 1)$$

If $n = 2$, then $f(1) + f(2) = 2(2^2 - 1) = 6$

$$\Rightarrow f(2) = 6 - f(1) = 6 - 2 = 4$$

If $n = 3$, then

$$f(1) + f(2) + f(3) = 2(2^3 - 1) = 14$$

$$\Rightarrow f(3) = 14 - f(1) - f(2)$$

$$= 14 - 2 - 4 = 8 = f(a)$$

Hence, $a = 3$

30. The income of Amala is 20% more than that of Bimala and 20% less than that of Kamala. If Kamala's income goes down by 4% and Bimala's goes up by 10%, then the percentage by which Kamala's income would exceed Bimala's is nearest to

- (a) 29 (b) 28
(c) 32 (d) 31

→ (d) Let the income of Bimala be ₹ 100 then, the income of Amala be ₹ 120,

and income of Kamala = $120 \times \frac{100}{(100 - 20)}$

$$= 120 \times \frac{100}{80} = ₹ 150$$

Kamala's new income = $150 - \frac{4}{100} \times 150$

$$= 150 - 6 = ₹ 144$$

Bimala's new income = $100 + \frac{10}{100} \times 100$

$$= ₹ 110$$

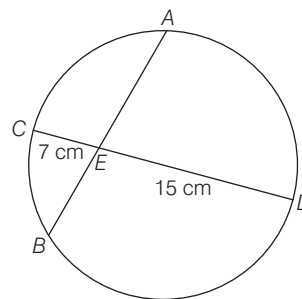
$$\therefore \text{Required percentage} = \frac{144 - 110}{110} \times 100$$

$$= \frac{34}{110} \times 100 = 30.9\% \approx 31\%$$

31. In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE (in cm), is

- (a) 1.5
(b) 2.5
(c) 3.5
(d) 0.5

→ (d)



∴ CD is the diameter

$$\therefore CE = 7 \text{ cm,}$$

$$ED = 15 \text{ cm}$$

Applying chord power theorem,

$$AE \times BE = CE \times DE$$

$$\Rightarrow AE \times BE = 7 \times 15 = 105$$

... (i)

Also, it is given that $AE + BE = 20.5$

... (ii)

$$(AE - BE)^2 = (AE + BE)^2 - 4 \times AE \times BE$$

$$\Rightarrow (AE - BE)^2 = (20.5)^2 - 4 \times 105$$

$$\Rightarrow (AE - BE)^2 = 420.25 - 420 = 0.25$$

$$\Rightarrow AE - BE = 0.5$$

32. On selling a pen at 5% loss and a book at 15% gain, Karim gains ₹ 7. If he sells the pen at 5% gain and the book at 10% gain, he gains ₹ 13. What is the cost price of the book in Rupees?

- (a) 85
(b) 95
(c) 80
(d) 100

→ (c) Let the CP of the pen be ₹ p and CP of the book be ₹ b .

Condition I

$$5\% \text{ loss on pen} + 15\% \text{ gain on book} = 7$$

$$\Rightarrow -0.05p + 0.15b = 7$$

... (i)

[− ve value for loss, + ve value for gain]

Condition II

$$5\% \text{ gain on pen} + 10\% \text{ gain on book} = 13$$

$$0.05p + 0.10b = 13 \quad \dots (ii)$$

On solving Eq. (i) and Eq. (ii), we get

$$b = 80$$

∴ CP of book is ₹ 80.

33. If the population of a town is P in the beginning of any year, then it becomes $3 + 2P$ in the beginning of the next year. If the population in the beginning of 2019 is 1000, then the population in the beginning of 2034 will be

- (a) $(997)2^{14} + 3$
 (b) $(997)^{15} - 3$
 (c) $(1003)^{15} + 6$
 (d) $(1003)2^{15} - 3$

→ (d) According to the question,

$$\begin{aligned} \text{Population of town in beginning 1st year} &= P = P + 3 - 3 \\ &= (P + 3)2^0 - 3 \end{aligned}$$

Population of town in beginning IInd year

$$\begin{aligned} &= 3 + 2P = 2P + 6 - 3 \\ &= (P + 3)2^1 - 3 \end{aligned}$$

Population of town in beginning IIIrd year = $3 + 2(3 + 2P)$

$$\begin{aligned} &= 4P + 9 \\ &= 4P + 12 - 3 = (P + 3)2^2 - 3 \end{aligned}$$

Similarly, population of town in beginning n th year

$$= (P + 3)2^{n-1} - 3$$

Number of years beginning of 2019 to 2034,

$$n = 16 \text{ and } P = 1000$$

Population of town beginning of 2034 year

$$\begin{aligned} &= (1000 + 3)2^{15} - 3 \\ &= (1003)2^{15} - 3 \end{aligned}$$

34. If m and n are integers such that

$$(\sqrt{2})^{19} 3^4 4^2 9^m 8^n = 3^n 16^m (\sqrt[4]{64}), \text{ then } m \text{ is}$$

- (a) -16 (b) -20
 (c) -12 (d) -24

→ (c) $(\sqrt{2})^{19} 3^4 4^2 9^m 8^n = 3^n 16^m (\sqrt[4]{64})$

$$\Rightarrow 2^{19/2} \times 3^4 \times 2^4 \times 3^{2m} \times 2^{3n} = 3^n \times 2^{4m} \times 2^{3/2}$$

$$\Rightarrow 2^{(19/2) + 4 + 3n} \times 3^{(4 + 2m)} = 2^{(4m + 3/2)} \times 3^n$$

Comparing the powers of same bases, we get

$$\frac{19}{2} + 4 + 3n = 4m + \frac{3}{2} \quad \dots (i)$$

$$4 + 2m = n \quad \dots (ii)$$

Substituting the value of n from Eq. (ii) in Eq. (i) and solving, we get

$$m = -12$$

CAT

Common Admission Test

Solved Paper 2018*

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carries equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

SECTION I Verbal Ability and Reading Comprehension

Passage 1

Directions (Q. Nos. 1-5) *Read the following passage carefully and answer the questions given below it.*

“Everybody pretty much agrees that the relationship between elephants and people has dramatically changed,” says psychologist Gay Bradshaw.... “Where for centuries humans and elephants lived in relatively peaceful coexistence, there is not hostility and violence. Now, I use the term ‘violence’ because of the intentionality associated with it, both in the aggression of humans and, at times, the recently observed behaviour of elephants.”.....

Typically, elephant researchers have cited, as a cause of aggression, the high levels of testosterone in newly matured male elephants or the competition for land and resources between elephants and humans. But Bradshaw and several colleagues argue ... that today’s elephant populations are suffering from a form of chronic stress, a kind of species-wide trauma. Decades of poaching and culling and habitat loss, they claim, have so disrupted the intricate web of familial and societal relations by which young elephants have traditionally been raised in the wild, and by which established elephant herds are governed, that what we are now witnessing is nothing less than a precipitous collapse of elephant culture....

Elephant, when left to their own devices, are profoundly social creatures ... Young elephants are raised within an extended, multitiered network of doting female caregivers that includes the birth mother, grandmothers, aunts and friends. These relations are maintained over a life span as long as 70 years. Studies of established herds have shown that young elephants stay within 15 feet of their mothers for nearly all of their first eight years of life, after which young females are socialised into the matriarchal network, while young go off for a time into an all-male social group before coming back into the fold as mature adults.

This fabric of elephant society, Bradshaw and her colleagues demonstrate had effectively been frayed by years of habitat loss and poaching, along with systematic culling by government agencies to control elephant numbers and translocations of herds to different habitats ... As a result of such social upheaval, calves are now being born to and raised by ever younger and inexperienced mothers. Young orphaned elephants, meanwhile, that have witnessed the death of a parent at the hands of poachers are coming of age in the absence of the support system that defines traditional elephant life. “The loss of elephant elders,” says Bradshaw ... “and the traumatic experience of witnessing the massacres of their family, impairs normal brain and behaviour development in young elephants.”

What Bradshaw and her colleagues describe would seem to be an extreme form of anthropocentric conjecture if the evidence that they've compiled from various elephant researchers ... weren't so compelling. The elephants of decimated herds, especially orphans who've watched the death of their parents and elders from poaching and culling, exhibit behaviour typically associated with post-traumatic stress disorder and other trauma-related disorders in humans: abnormal startle response, unpredictable asocial behaviour, inattentive mothering and hyper aggression.

According to Bradshaw, "Elephants are suffering and behaving in the same ways that we recognise in ourselves as a result of violence ... Except perhaps for a few specific features, brain organisation and early development of elephants and humans are extremely similar."

1. Which of the following statements best expresses the overall arguments of this passage?
 - (a) Elephants, like the humans they are in conflict with, are profoundly social creatures
 - (b) The relationship between elephants and humans has changed from one of coexistence to one of hostility
 - (c) Recent elephant behaviour could be understood as a form of species-wide trauma-related response
 - (d) The brain organisation and early development of elephants and humans are extremely similar

→ (c) Statement best expresses the overall argument of the passage. Elephants' behaviour is quite aggressive and unsocial due to trauma of losing their parents either due to poaching or due to change of habitat.
2. In the first paragraph, Bradshaw uses the term "violence" to describe the recent change in the human-elephant relationship because, according to him
 - (a) both humans and elephants have killed members of each other's species
 - (b) there is a purposefulness in human and elephant aggression towards each other
 - (c) human-elephant interactions have changed their character over time
 - (d) elephant herds and their habitat have been systematically destroyed by humans

→ (b) Bradshaw has used the term 'violence' to describe the recent changes in the human elephant relationship because there is a purposefulness in human and elephant aggression towards each other. Last line of para 1 states "... because of intentionality associated with it".
3. The passage makes all of the following claims EXCEPT
 - (a) elephant mothers are evolving newer ways of rearing their calves to adapt to emerging threats
 - (b) the elephant response to deeply disturbing experiences is similar to that of humans
 - (c) elephants establish extended and enduring familial relationships as do humans
 - (d) human actions such as poaching and culling have created stressful conditions for elephant communities

→ (a) The passage does not talk about elephants' mothers who are new and the experienced trying to evolve new ways of bringing up their children so that they could face the upcoming challenges of their survival.
4. Which of the following measures is Bradshaw most likely to support to address the problem of elephant aggression?
 - (a) The development of treatment programmes for elephants drawing on insights gained from treating post-traumatic stress disorder in humans
 - (b) Funding of more studies to better understand the impact of testosterone on male elephant aggression
 - (c) Studying the impact of isolating elephant calves on their early brain development, behaviour and aggression
 - (d) Increased funding for research into the similarity of humans and other animals drawing on insights gained from human-elephant similarities

→ (a) As per the passage, "the elephants are suffering and behaving in the same ways that we recognise in ourselves as a result of violence." So, the development and treatment of treatment programmes for elephants drawing on insights gained from treating post-traumatic stress disorder in humans is correct.
5. In paragraph 4, the phrase, "The fabric of elephant society ... has effectively been frayed by ..." is
 - (a) an exaggeration aimed at bolstering Bradshaw's claims
 - (b) an accurate description of the condition of elephant herds today
 - (c) an ode to the fragility of elephant society today
 - (d) a metaphor for the effect of human activity on elephant communities

→ (b) As per the passage, the given phrase very correctly describes the social disturbance and upheavals faced by young generation of elephants due to human activities in elephant communities.

Passage 2

The Indian Government has announced an international competition to design a National War Memorial in New Delhi, to honour all of the Indian soldiers who served in the various wars and counter-insurgency campaigns from 1947 onwards. The terms of the competition also specified that the new structure would be built adjacent to the India Gate - a memorial to the Indian soldiers who died in the First World War. Between the old imperialist memorial and the proposed nationalist one, India's contribution to the Second World War is airbrushed out of existence.

The Indian Government's conception of the war memorial was not merely absent-minded. Rather, it accurately reflected the fact that both academic history and popular memory have yet to come to terms with India's Second World War, which continues to be seen as little more than mood music in the drama of India's advance towards independence and partition in 1947. Further, the political trajectory of the postwar subcontinent has militated against popular remembrance of the war. With partition and the onset of the India-Pakistan rivalry, both of the new nations needed fresh stories for self-legitimation rather than focusing on shared wartime experiences.

However, the Second World War played a crucial role in both the independence and partition of India The Indian army recruited, trained and deployed some 2.5 million men, almost 90,000 of which were killed and many more injured. Even at the time, it was recognised as the largest volunteer force in the war....

India's material and financial contribution to the war was equally significant. India emerged as a major military-industrial and logistical base for Allied operations in South-East Asia and the middle East. This led the United States to take considerable interest in the country's future and ensured that this was no longer the preserve of the British Government.

Other wartime developments pointed in the direction of India's independence. In a stunning reversal of its long-standing financial relationship with Britain, India finished the war as one of the largest creditors to the imperial power.

Such extraordinary mobilisation for war was achieved at great human cost, with the Bengal famine the most extreme manifestation of widespread wartime deprivation. The costs on India's home front must be counted in millions of lives.

Indians signed up to serve on the war and home fronts for a variety of reasons Many were convinced that their contribution would open the doors to India's freedom The political and social churn triggered by the war was evident in the massive waves of popular protest and unrest that washed over rural and urban India in the aftermath of the conflict. This turmoil was crucial in persuading the Attlee government to rid itself of the incubus of ruling India...

Seventy years on, it is time that India engaged with the complex legacies of the Second World War. Bringing the war into the ambit of the new national memorial would be a fitting - if not overdue - recognition that this was India's War.

6. In the first paragraph, the author laments the fact that

- (a) the new war memorial will be built right next to India Gate
- (b) there is no recognition of the Indian soldiers who served in the Second World War
- (c) funds will be wasted on another war memorial when we already have the Indian Gate memorial
- (d) India lost thousands of human lives during the Second World War.

→ (b) In the first para, the author laments the fact that there is no recognition of Indian soldiers who served in the Second world War. There is a memorial for those who had served in I world war. Government also plan to build a memorial in memory of those soldiers who served in various wars or died in anti insurgency campaigns from 1947 onwards. But there is no memorial to remember those who served and laid down their lives during second world war.

7. The author lists all of the following as outcomes of the Second World War EXCEPT

- (a) US recognition of India's strategic location and role in the war
- (b) large-scale deaths in Bengal as a result of deprivation and famine
- (c) Independence of the subcontinent and its partition into two countries
- (d) the large financial debt India owed to Britain after the war

→ (d) "The large financial debt India owed to Britain" is not listed as outcomes of the Second World War in the passage. The author has listed all of the following outcomes of 2nd world war except the large financial debt India owed to Britain after the war.

8. The phrase 'mood music' is used in the second paragraph to indicate that the Second World War is viewed as

- (a) setting the stage for the emergence of the India-Pakistan rivalry in the subcontinent
- (b) a backdrop to the subsequent independence and partition of the region
- (c) a part of the narrative on the ill-effects of colonial rule of India
- (d) a tragic period in terms of loss of lives and national wealth

→ (b) The phrase 'mood music' means a prevailing atmosphere or feeling. It is used in second para to indicate that the Second World War is viewed as a backdrop to the subsequent independence and partition of India.

9. The author suggests that a major reason why India has not so far acknowledged its role in the Second World War is that it

- (a) wants to forget the human and financial toll of the War on the country
- (b) has been focused on building an independent, non-colonial political identity
- (c) views the war as a predominantly Allied effort, with India playing only a supporting role
- (d) blames the war for leading to the momentous partition of the country

→ (b) The major reason for India not acknowledging its role in Second World War is that it has been focused on building an independent, non-colonial political identity. The nation does not want to remember something related to equal contribution of India and Pakistan due to onset of Indo-Pakistan rivalry after partition.

10. The author claims that omitting mention of Indians who served in the Second World War from the new National War memorial is

- (a) a reflection of misplaced priorities of the post-independence Indian Governments
- (b) a reflection of the academic and popular view of India's role in the war
- (c) appropriate as their names can always be included in the India Gate memorial
- (d) is something which can be rectified in future by constructing a separate memorial

- (a) The omitting of motion of Indians who served in the Second World War from the National War memorial is a reflection of misplaced priorities of the post-independence Indian Governments.

Passage 3

The only thing worse than being lied to is not knowing you're being lied to. It's true that plastic pollution is a huge problem, of planetary proportions. And it's true we could all do more to reduce our plastic footprint. The lie is that blame for the plastic problem is wasteful consumers and that changing our individual habits will fix it.

Recycling plastic is to saving the Earth what hammering a nail is to halting a falling skyscraper. You struggle to find a place to do it and feel pleased when you succeed. But your effort is wholly inadequate and distracts from the real problem of why the building is collapsing in the first place. The real problem is that single-use plastic-the very idea of producing plastic items like grocery bags, which we use for an average of 12 minutes but can persist in the environment for half a millennium-is an incredibly reckless abuse of technology. Encouraging individuals to recycle more will never solve the problem of a massive production of single-use plastic that should have been avoided in the first place.

As an ecologist and evolutionary biologist, I have had a disturbing window into the accumulating literature on the hazards of plastic pollution. Scientists have long recognised that plastics biodegrade slowly, if at all, and pose multiple threats to wildlife through entanglement and consumption. More recent reports highlight dangers posed by absorption of toxic chemicals in the water and by plastic odors that mimic some species' natural food. Plastics also accumulate up the food chain and studies now show that we are likely ingesting it ourselves in seafood. . .

Beginning in the 1950s, big beverage companies like Coca-Cola and Anheuser-Busch, along with Phillip Morris and others, formed a non-profit called Keep America Beautiful. Its mission is/was to educate and encourage environmental stewardship the public. ... At face value, these efforts seem benevolent, but they obscure the real problem, which is the role that corporate polluters play in the plastic problem. This clever misdirection has led journalist and author Heather Rogers to describe Keep America Beautiful as the first corporate greenwashing front, as it has helped shift the public focus to consumer recycling behaviour and actively thwarted legislation that would increase extended producer responsibility for waste management....

The greatest success of Keep America Beautiful has been to shift the onus of environmental responsibility onto the public while simultaneously becoming a trusted name in the environmental movement.

So what can we do to make responsible use of plastic a reality? First: reject the lie. Litterbugs are not responsible for the global ecological disaster of plastic. Humans can only function to the best of their abilities, given time, mental bandwidth and systemic constraints.

Our huge problem with plastic is the result of a permissive legal framework that has allowed the uncontrolled rise of plastic pollution, despite clear evidence of the harm it causes to local communities and the world's oceans. Recycling is also too hard in most parts of the U.S. and lacks the proper incentives to make it work well.

11. Which of the following interventions would the author most strongly support?
 - (a) Recycling all plastic debris in the seabed
 - (b) Having all consumers change their plastic consumption habits
 - (c) Completely banning all single-use plastic bags
 - (d) Passing regulations targeted at producers that generate plastic products

→ (d) The author most strongly supports passing regulations targeted at producers that generate plastic products, rather than accusing the human being of using plastics.
12. The author lists all of the following as negative effects of the use of plastic EXCEPT the
 - (a) slow pace of degradation or non-degradation of plastics in the environment
 - (b) air pollution caused during the process of recycling plastics
 - (c) poisonous chemicals released into the water and the food we consume
 - (d) adverse impact on the digestive of animals exposed to plastic

→ (b) "Air pollution caused during the process of recycling plastics" is not listed in the passage as the negative effect of the use of plastics.
13. In the first paragraph, the author uses 'lie' to refer to the
 - (a) blame assigned to consumers for indiscriminate use of plastics
 - (b) understatement of the enormity of the plastics pollution problem
 - (c) fact that people do not know have been lied to
 - (d) understatement of the effects of recycling plastics

→ (c) The author says that it is a lie that human beings are wasteful consumers of plastic and changing this habit can improve the situation. The truth is plastic pollution is there due to plastic production.
14. In the second paragraph, the phrase "what hammering a nail is to halting a falling skyscraper" means
 - (a) relying on emerging technologies to mitigate the ill-effects to plastic pollution
 - (b) encouraging the responsible production of plastics by firms
 - (c) focusing on consumer behaviour to tackle the problem of plastics pollution
 - (d) focusing on single-use plastics bags to reduce the plastics footprint

→ (c) The phrase means focusing on consumer behaviour to tackle the problem of plastic pollution. It means not finding the correct reason of the problem.

15. It can be inferred that the author considers the Keep America Beautiful organisation
- (a) a 'greenwash' because it was a benevolent attempt to improve public recycling habits
 - (b) a Sham as it diverted attention away from the role of corporates in plastics pollution
 - (c) an important step in sensitising producers to the need to tackle plastics pollution
 - (d) an innovative example of a collaborative corporate social responsibility initiative
- (b) 'The Keep America beautiful' campaign is a Sham as it diverted attention away from the role of corporates in plastic pollution. The campaign just tried to shift the responsibility of plastic pollution to public in place of corporates.

Passage 4

Economists have spent most of the 20th century ignoring psychology, positive or otherwise. But today there is 'a great deal of emphasis on how happiness can shape global economies, or—on a smaller scale—successful business practice. This is driven, in part, by a trend in 'measuring' positive emotions, mostly so they can be optimised. Neuroscientists, for example, claim to be able to locate specific emotions, such as happiness or disappointment, in particular areas of the brain. Wearable technologies, such as Spire, offer data-driven advice on how to reduce stress.

We are no longer just dealing with 'happiness' in a philosophical or romantic sense – it has become something that can be monitored and measured, including by our behaviour, use of social media and bodily indicators such as pulse rate and facial expressions.

There is nothing automatically sinister about this trend. But it is disquieting that the businesses and experts driving the quantification of happiness claim to have our best interests at heart, often concealing their own agendas in the process. In the workplace, happy workers are viewed as a 'win-win'. Work becomes more pleasant, and employees, more productive. But this is now being pursued through the use of performance evaluating wearable technology, such as Humanyze or Virgin Pulse, both of which monitor physical signs of stress and activity toward the goal of increasing productivity.

Cities such as Dubai, which has pledged to become the 'happiest city in the world,' dream up ever-more elaborate and intrusive ways of collecting data on well-being - to the point where there is now talk of using CCTV cameras to monitor facial expressions in public spaces. New ways of detecting emotions are hitting the market all the time: One company, Beyond Verbal, aims to calculate moods conveyed in a phone conversation, potentially without the knowledge of at least one of the participants. And Facebook [has] demonstrated ... that it could influence our emotions through tweaking our news feeds - opening the door to ever-more targeted manipulation in advertising and influence.

As the science grows more sophisticated and technologies become more intimate with our thoughts and bodies, a clear trend is emerging. Where happiness indicators were once used as a basis to reform society, challenging the obsession with money that G.D.P. measurement entrenches, they are increasingly used as a basis to transform or discipline individuals.

Happiness becomes a personal project, that each of us must now work on, like going to the gym. Since the 1970s, depression has come to be viewed as a cognitive or neurological defect in the individual, and never a consequence of circumstances. All of this simply escalates the sense of responsibility each of us feels for our own feelings, and with it, the sense of failure when things go badly. A society that deliberately removed certain sources of misery, such as precarious and exploitative employment, may well be a happier one. But we won't get there by making this single, often fleeting emotion, the over-arching goal.

16. According to the author, wearable technologies and social media are contributing most to
- (a) happiness as a "personal project"
 - (b) depression as a thing of the past
 - (c) disciplining individuals to be happy
 - (d) making individuals aware of stress in their lives
- (c) As per the author, wearable technologies and social media are contributing most to disciplining individuals to be happy. by giving advice on how to reduce stress.
17. The author's view would be undermined by which of the following research findings?
- (a) There is a definitive move towards the adoption of wearable technology that taps into emotions
 - (b) Stakeholders globally are moving away from collecting data on the well-being of individuals
 - (c) A proliferation of gyms that are collecting data on customer well-being
 - (d) Individuals worldwide are utilising technologies to monitor and increase their well-being.
- (b) Undermines the author's new as stake holders are shifting their focus from collecturs data on well being of individuals and emphasezing more on how to work upon to remain happy.
18. In the author's opinion, the shift in thinking in the 1970s
- (a) was a welcome change from the earlier view that depression could be cured by changing circumstances
 - (b) introduced greater stress into people's lives as they were expected to be responsible for their own happiness
 - (c) put people in touch with their own feelings rather than depending on psychologists
 - (d) reflected the emergence of neuroscience as the authority on human emotions
- (b) The shift in thinking in the 1970s introduced greater stress into people's lives as they were responsible for their own happiness. (last para)

19. From the passage we can infer that the author would like economists to
- incorporate psychological findings into their research cautiously
 - correlate measurements of happiness with economic indicators
 - measure the effectiveness of Facebook and social media advertising
 - work closely with neuroscientists to understand human behaviour
- (a) The author urges economists to incorporate psychological findings into their research cautiously. (see last line of the passage)
20. According to the author, Dubai
- is on its way to becoming one of the world's happiest cities
 - collaborates with Facebook to selectively influence its inhabitants' moods
 - develops sophisticated technologies to monitor its inhabitants' states of mind
 - incentivises companies that prioritise worker welfare
- (c) Dubai has developed sophisticated technologies to monitor its inhabitants states of mind. (see para by using CCTV cameras to monitor facial expression in public spaces).

Passage 5

When researchers at Emory University in Atlanta trained mice to fear the smell of almonds (by pairing it with 'electric shocks'), they found, to their consternation, that both the children and grandchildren of these mice were spontaneously afraid of the same smell. That is not supposed to happen. Generations of schoolchildren have been taught that the inheritance of acquired characteristics is impossible. A mouse should not be born with something its parents have learned during their lifetimes, any more than a mouse that loses its tail in an accident should give birth to tailless mice

Modern evolutionary biology dates back to a synthesis that emerged around the 1940s-60s, which married Charles Darwin's mechanism of natural selection with Gregor Mendel's discoveries of how genes are inherited. The traditional, and still dominant, view is that adaptations - from the human brain to the peacock's tail - are fully and satisfactorily explained by natural selection (and subsequent inheritance). Yet new evidence from genomics, epigenetics and developmental biology indicates that evolution is more complex than we once assumed

In his book *On Human Nature* (1978), the evolutionary biologist Edward O Wilson claimed that human culture is held on a genetic leash. The metaphor needs revision. ... Imagine a dog-walker (the genes) struggling to retain control of a brawny mastiff (human culture). The pair's trajectory (the pathway of evolution) reflects the outcome of the struggle. Now imagine the same dog-walker struggling with multiple dogs, on leashes of varied lengths, with each dog tugging in different directions. All these tugs represent the influence of developmental factors, including epigenetics, antibodies and hormones passed on by parents, as well as the ecological legacies and culture they bequeath. .

...

The received wisdom is that parental experiences cannot affect the characters of their offspring. Except they do. The way that genes are expressed to produce an organism's phenotype - the actual characteristics it ends up with - is affected by chemicals that attach to them. Everything from diet to air pollution to parental behaviour can influence the addition or removal of these chemical marks, which switches genes on or off. Usually these so-called 'epigenetic' attachments are removed during the production of sperm and eggs cells, but it turns out that some escape the resetting process and are passed on to the next generation, along with the genes. This is known as 'epigenetic inheritance', and more and more studies are confirming that it really happens. Let's return to the almond-fearing mice. The inheritance of an epigenetic mark transmitted in the sperm is what led the mice's offspring to acquire an inherited fear.

Epigenetics is only part of the story. Through culture and society, humans and other animals inherit knowledge and skills acquired by their parents All this complexity ... points to an evolutionary process in which genomes (over hundreds to thousands of generations), epigenetic modifications and inherited cultural factors (over several, perhaps tens or hundreds of generations), and parental effects (over single-generation timespans) collectively inform how organisms adapt. These extra-genetic kinds of inheritance give organisms the flexibility to make rapid adjustments to environmental challenges, dragging genetic change in their wake - much like a rowdy pack of dogs.

21. The passage uses the metaphor of a dog walker to argue that evolutionary adaptation is most comprehensively understood as being determined by
- genetic, epigenetic, developmental factors and ecological legacies
 - socio-cultural, genetic, epigenetic and genomic legacies
 - ecological, hormonal, extra genetic and genetic legacies
 - extra genetic, genetic, epigenetic and genomic legacies
- (a) Option (a) gives the correct understanding of the metaphor as it covers genetics, epigenetic, developmental factors and ecological legacies.
22. Which of the following option best describes the author's arguments?
- Darwin's theory of natural selection cannot fully explain evolution
 - Mendel's theory of inheritance is unfairly underestimated in explaining evolution
 - Darwin's and Mendel's theories together best explain evolution
 - Wilson's theory of evolution is scientifically superior to either Darwin's or Mendel's
- (a) Option (a) which states that "Darwin's theory of natural selection cannot fully explain evolution" but describes the author's argument.

23. The Emory University experiment with mice points to the inheritance of

- (a) acquired characteristics (b) psychological markers
- (c) personality traits (d) acquired parental fears

→ (a) The Emory University experiment with mice points to the inheritance of acquired characteristics. Which was considered impossible.

24. Which of the following, if found to be true, would negate the main message of the passage?

- (a) A study indicating the primacy of ecological impact on human adaptation
- (b) A study highlighting the criticality of epigenetic inheritance to evolution
- (c) A study affirming the sole influence of natural selection and inheritance on evolution
- (d) A study affirming the influence of socio-cultural markers on evolutionary processes

→ (c) A study affirming the sole influence selection and inheritance on evolution. If found to be true, would negate the main message of the passage.

25. The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Artificial embryo twinning is a relatively low-tech way to make clones. As the name suggests, this technique mimics the natural process that creates identical twins. In nature, twins form very early in development when the embryo splits in two. Twinning happens in the first days after egg and sperm join, while the embryo is made of just a small number of unspecialised cells. Each half of the embryo continues dividing on its own, ultimately developing into separate, complete individuals. Since they developed from the same fertilized egg, the resulting individuals are genetically identical.

- (a) Artificial embryo twinning is just like the natural development of twins, where during fertilization twins are formed
- (b) Artificial embryo twinning is low-tech and is close to the natural development of twins where the embryo splits into two identical twins
- (c) Artificial embryo twinning is low tech unlike the natural development of identical twins from the embryo after fertilization.
- (d) Artificial embryo twinning is low-tech and mimetic of the natural development of genetically identical twins from the embryo after fertilization.

→ (d) Option (d) best captures the author's position. The word 'mimetic' means representing or imitating something.

26. The passage given below is followed by four summaries. Choose the option that best captures the author's position.

Production and legitimation of scientific knowledge can be approached from a number of perspectives. To study knowledge production from the sociology of professions

perspective would mean a focus on the institutionalisation of a body of knowledge. The professions—approach informed earlier research on managerial occupation, business schools and management knowledge. It however tends to reify institutional power structures in its understanding of the links between knowledge and authority. Knowledge production is restricted in the perspective to the selected members of the professional community, most notably to the university faculties and professional colleges. Power is understood as a negative mechanism, which prevents the non-professional actors from offering their ideas and information as legitimate knowledge.

- (a) The study of knowledge production can be done through many perspectives
- (b) The professions approach has been one of the most relied upon perspective in the study of management knowledge production
- (c) Professions approach aims at the institutionalisation of knowledge but restricts knowledge production as a function of a select few
- (d) Professions approach focuses on the creation of institutions of higher education and disciplines to promote knowledge production

→ (c) Here option (c) best captures the author's position with regard to professions-approach.

27. The passage given below is followed by four summaries. Choose the option that best captures the author's position.

The conceptualisation of landscape as a geometric object first occurred in Europe and is historically related to the European conceptualisation of the organism, particularly the human body, as a geometric object with parts having a rational, three-dimensional organisation and integration. The European idea of landscape appeared before the science of landscape emerged, and it is no coincidence that Renaissance artists such as Leonardo da Vinci, who studied the structure of the human body, also facilitated an understanding of the structure of landscape. Landscape which had been a subordinate background to religious or historical narratives, became an independent genre or subject of art by the end of sixteenth century or the beginning of the seventeenth century.

- (a) The study of landscape as an independent genre was aided by the Renaissance artists
- (b) The three-dimensional understanding of the organism in Europe led to a similar approach towards the understanding of landscape
- (c) The Renaissance artists were responsible for the study of landscape as a subject of art
- (d) Landscape became a major subject of art at the turn of the sixteenth century

→ (a) The study of landscape as an independent genre was aided by the Renaissance artists. Who facilitated the understanding of the structure of landscape.

- 28.** The four sentences (labelled a, b, c and d) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.
- The eventual diagnosis was skin cancer and after treatment all seemed well
 - The viola player didn't know what it was; nor did her GP
 - Then a routine scan showed it had come back and spread to her lungs
 - It started with a lump on Cathy Perkins' index finger
- The correct sequence is d-b-a-c.
- 29.** The four sentences (labelled a, b, c and d) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentences and key in this sequence of four numbers as your answer.
- The woodland's canopy receives most of the sunlight that falls on the trees
 - Swifts do not confine themselves to woodlands, but hunt wherever there are insects in the air
 - With their streamlined bodies, swifts are agile flyers, ideally adapted to twisting and turning through the air as they chase flying insects - the creatures that form their staple diet
 - Hundreds of thousands of insects fly in the sunshine up above the canopy, some falling prey to swifts and swallows
- a-d-c-b is the correct sequence to make the sentence form a coherent paragraph.
- 30.** The four sentences (labelled a,b,c and d) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper sequence of order of the sentences and key in this sequence of four numbers as your answer:
- But now we have another group: the unwitting enablers
 - Democracy and high levels of inequality of the kind that have come to characterise the United States are simply incompatible
 - Believing these people are working for a better world, they are actually, at most, chipping away at the margins, making slight course corrections, ensuring the system goes on as it is, uninterrupted
 - Very rich people will always use money to maintain their political and economic power
- b-d-a-c is the correct sequence.
- 31.** The four sentences (labelled a,b,c and d) given in this question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Decide on the proper sequence of order of the sentences and key in this sequence of four numbers as your answer.
- Impartiality and objectivity are fiendishly difficult concepts that can cause all sorts of injustices even if transparently implemented
 - It encourages us into bubbles of people we know and like, while blinding us to different perspectives, but the deeper problem of 'transparency' lies in the words " ...and much more"
 - Twitter's website says that "tweets you are likely to care about most will show up first in your timeline ...based on accounts you interact with most, tweets you engage with, and much more"
 - We are only told some of the basic principles, and we can't see the algorithm itself, making it hard for citizens to analyse the system sensibly or fairly or be convinced of its impartiality and objectivity
- a-c-b-d is the correct sequence to make the sentences form a coherent paragraph.
- 32.** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.
- Displacement in Bengal is thus not very significant in view of its magnitude
 - A factor of displacement in Bengal is the shifting course of the Ganges leading to erosion of river banks
 - The nature of displacement in Bengal makes it an interesting case study
 - Since displacement due to erosion is well spread over a long period of time, it remains invisible
 - Rapid displacement would have helped sensitise the public to its human costs
- (e) Sentence (e) is the odd one out here as it talks about the "Rapid Displacement" whereas the rest of the sentences talk about displacement of Bengal and soil erosion.
- 33.** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.
- In many cases time inconsistency is what prevents our going from intention to action.
 - For people to continuously postpone getting their children immunised, they would need to be constantly fooled by themselves
 - In the specific case of immunisation, however, it is hard to believe that time inconsistency by itself would be sufficient to make people permanently postpone the decision if they were fully cognizant of its benefits
 - In most cases, even a small cost of immunisation was large enough to discourage most people
 - Not only do they have to think that they prefer to spend time going to the camp next month rather than today, they also have to believe that they will indeed go next month
- (d) Sentence (d) is the odd one out here. It talks about the cost of immunisation as a discouragement for people to avoid getting their babies immunised. The other sentences talk about time inconsistency and delaying immunisation.
- 34.** Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

- (a) Translators are like bumblebees
- (b) Though long since scientifically disproved, this factoid is still routinely trotted out
- (c) Similar pronouncements about the impossibility of translation have dogged practitioners since Leonardo Bruni's *De interpretatione recta*, published in 1424
- (d) Bees, unaware of these deliberations, have continued to flit from flower to flower, and translators continue to translate

- (e) In 1934, the French entomologist August Magnan pronounced the flight of the bumblebee to be aerodynamically impossible

→ (e) The sentence (e) is the odd one out here. The other sentences talk about translators and bumblebees and make a comparison between them. However, sentence number (e) talks about the flight of bumblebee.

Section II Data Interpretation and Logical Reasoning

Directions (Q.Nos. 35-38) *The passage given below is followed by four facts. Choose the option that best captures the authors's position.*

1600 satellites were sent up by a country for several purposes. The purposes are classified as Broadcasting (B), Communication (C), Surveillance (S), and Others (O). A satellite can serve multiple purposes, however a satellite serving either B, or C, or S does not serve O.

The following facts are known about the satellites

- The numbers of satellites serving B, C and S (though may be not exclusively) are in the ratio 2 : 1 : 1.
- The number of satellites serving all three of B, C and S is 100.
- The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B.
- The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

35. What best can be said about the number of satellites serving C?

- (a) Cannot be more than 800
- (b) Must be at least 100
- (c) Must be between 450 and 725
- (d) Must be between 400 and 800

36. What is the minimum possible number of satellites serving B exclusively?

- (a) 100
- (b) 200
- (c) 250
- (d) 500

37. If at least 100 of the 1600 satellites were serving O, what can be said about the number of satellites serving S?

- (a) Exactly 475
- (b) At most 475
- (c) At least 475
- (d) No conclusion is possible based on the given information

38. If the number of satellites serving at least two among B, C, and S is 1200, which of the following MUST be FALSE?

- (a) All 1600 satellites serve B or C or S
- (b) The number of satellites serving B is more than 1000

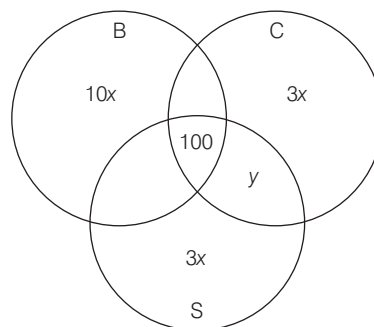
- (c) The number of satellites serving C cannot be uniquely determined
- (d) The number of satellites serving B exclusively is exactly 250

→ **Solutions (Q. Nos. 35-38)** From the information given in the question, we have satellites serving exclusively C and satellites serving exclusively S are equal, and each of these numbers is 30% of exclusively B.

Let number of satellites serving exclusively B = $10x$.

∴ Number of satellites serving exclusively S and C each = $3x$

We know that common number of satellites serving all three of B, C and S = 100. Number of satellites serving O = Number of satellites serving both C and S but not B = y (let)



From fact 1, the number of satellites serving B and C but not S = Number of satellites serving B and S but not C = z (let) and number of satellites serving B = $2 \times$ total number of satellites serving C (or S).

$$\therefore 10x + 2z + 100 = 6x + 2y + 2z + 200$$

$$\Rightarrow 4x = 2y + 100$$

$$\Rightarrow 2y = 4x - 100$$

$$\Rightarrow y = 2x - 50$$

... (i)

Now,

∴ Number of satellites serving

$$O = 2x - 50$$

Given, total number of satellites = 1600

$$\therefore 10x + z + z + 100 + 3x + 2x - 50 + 3x + 2x - 50 = 1600$$

$$\Rightarrow 20x + 2z = 1600$$

$$\Rightarrow 10x + z = 800 \quad \dots(ii)$$

From Eq. (i), we can conclude that value of x will be 25, so $y = 0$

From Eq. (ii), we can conclude that value of x will be 80, so $z = 0$

Therefore, we get minimum and maximum values of x as 25 and 80, respectively.

Consequently, the minimum and maximum value of z becomes 0 and 550.

35. (c) Number of satellites serving $C = 3x + 2x - 50 + 100 + z$

So, number of satellites serving $C = 5x + 50 + z$

As we know that minimum and maximum values are x and z .

The number of satellites serving C must be between 450 and 725.

36. (c) From the Venn diagram, number of satellites serving exclusively $B = 10x$.

As we know that minimum possible value of x is 25.

∴ Required minimum number of satellites serving B exclusively = $10 \times 25 = 250$.

37. (b) Satellites serving $O = 2x - 50$

From the question, number of satellites serving O at least = 100

$$\therefore 2x - 50 = 100$$

Therefore, minimum value of $x = 75$

$$\therefore 10x + z = 800$$

∴ Maximum value of $z = 50$

and Maximum value of $x = 80$

∴ Minimum value of $z = 0$

and number of satellites serving $S = 3x + 2x + z - 50 + 100$

As, we know that minimum and maximum values are x and z .

Hence, minimum and maximum number of satellites serving S would be 450 and 475.

∴ At most number of satellites serving $S = 475$

38. (c) According to the question and Venn diagram,

we have, $10x + z = 800 \quad \dots(i)$

Now, $2x - 50 + 100 + z + z = 1200$

$$\Rightarrow x + z = 575 \quad \dots(ii)$$

By solving these equations, we get

$$x = 25 \text{ and } z = 550$$

Therefore, statement given in option (c) must be false.

Directions (Q. Nos. 39-42)

Twenty four people are part of three committees which are to look at research, teaching, and administration respectively. No two committees have any member in common. No two committees are of the same size. Each committee has three types of people : bureaucrats, educationalists, and politicians, with at least one from each of the three types in each committee. The following facts are also known about the committees.

1. The numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee.
2. The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees.
3. 60% of the politicians are in the administration committee, and 20% are in the teaching committee.

39. Based on the given information, which of the following statements MUST be FALSE?

- (a) The size of the research committee is less than the size of the administration committee
- (b) In the teaching committee the number of educationalists is equal to the number of politicians
- (c) The size of the research committee is less than the size of the teaching committee
- (d) In the administration committee the number of bureaucrats is equal to the number of educationalists solutions

40. What is the number of bureaucrats in the administration committee?

41. What is the number of educationalists in the research committee?

42. Which of the following CANNOT be determined uniquely based on the given information?

- (a) The size of the Teaching committee
- (b) The size of the Research committee
- (c) The total number of Educationalists in the three committees
- (d) The total number of Bureaucrats in the three committees

➔ Solutions (Q. Nos. 39-42)

Let the number of bureaucrats in Administration

∴ Number of bureaucrats in Research and Teaching be '3a' and '3a' respectively. Also, let number of politicians in Administration be 3c.

∴ Number of politicians in Research and training be 'c' and 'c' respectively.

Let, number of educationalist in Teaching and Administration be '2x' and '2y' respectively.

$$\therefore \text{Number of educationalist in Research} = \frac{2x + 2y}{2} = x + y$$

Also, $2x < x + y$

So, we get

	Research	Teaching	Administration	Total
Bureaucrats	3a	3a	4a	10a
Educationalist	$x + y$	2x	2y	$3(x + y) = 3b$
Politicians	c	c	3c	5c

$$\text{Now, } 10a + 3b + 5c = 24$$

It is only possible when $a = 1, b = 3$ and $c = 1$

$$\text{So, } x + y = b = 3$$

$\therefore 2x < x + y$
 $\therefore 2x = 1$ or 2 and $2y = 5$ or 4 [$\therefore \text{total} = 3b = 9$]
 Now, we get

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalist	3	1 or 2	5 or 4	9
Politicians	1	1	3	5

39. (c) Clearly, the size of research committee is more than the size of teaching committee.
40. There are 4 bureaucrats in Administration committee.
41. There are 3 educationalist in Research committee.
42. Clearly, we cannot determine the size of Teaching committee.

Directions (Q. Nos. 43-46)

A company administers written a test comprising of three sections of 20 marks each—Data Interpretation (DI), Written English (WE) and General Awareness (GA), for recruitment. A composite score for a candidate (out of 80) is calculated by doubling her marks in DI and adding it to the sum of her marks in the other two sections. Candidates who score less than 70% marks in two or more sections are disqualified. From among the rest, four with the highest composite scores are recruited. If four or less candidates qualify, all who qualify are recruited.

Ten candidates appeared for the written test. Their marks in the test are given in the table below. Some marks in the table are missing, but the following facts are known

- No two candidates had the same composite score.
- Ajay was the unique highest scorer in WE.
- Among the four recruited, Geeta had the lowest composite score.
- Indu was recruited.
- Danish, Harini, and Indu had scored the same marks in GA.
- Indu and Jatin both scored 100% in exactly one section and Jatin's composite score was 10 more than Indu's.

Marks out of 20			
Candidate	DI	WE	GA
Ajay	8	—	16
Bala	—	9	11
Chetna	19	4	12
Danish	8	15	—
Ester	12	18	16
Falak	15	7	10
Geeta	14	—	6
Harini	5	—	—
Indu	—	8	—
Jatin	—	16	14

43. Which of the following statements MUST be TRUE?

- Jatin's composite score was more than that of Danish.
 - Indu scored less than Chetna in DI.
 - Jatin scored more than Indu in GA.
- (a) Both 1 and 2 (b) Both 2 and 3
(c) Only 1 (d) Only 2

44. Which of the following statements MUST be FALSE?

- Harini's composite score was less than of Falak.
- Bala scored same as Jatin in DI
- Bala's composite score was less than that of Ester
- Chetna scored more than Bala in DI

45. If all the candidates except Ajay and Danish had different marks in DI, and Bala's composite score was less than Chetna's composite score, then what is the maximum marks that Bala could have scored in DI?

46. If all the candidates scored different marks in WE, then what is the maximum marks that Harini could have scored in WE?

→ **Solutions (Q. Nos. 43-46)** From the given information,

Candidate	Marks out of 20			Composite score (Out of 80)
	DI	WE	GA	
Ajay	8	20	16	52
Bala	—	9	11	—
Chetna	19	4	12	54
Danish	8	15	20	51
Ester	12	18	16	58
Falak	15	7	10	47
Geeta	14	(19)	6	53
Harini	5	—	20	—
Indu	16	8	20	60
Jatin	20	16	14	70

Total composite score = 80

$$\Rightarrow (2 \times \text{DI}) + \text{WE} + \text{GA}$$

No two candidates had the same composite score.

Now, Indu's score in DI = x (let)

$$\therefore 2x + 8 + 20 = 60$$

$$\Rightarrow 2x = 60 - 28 = 32$$

$$\Rightarrow x = 16$$

If Ajay was the unique highest scorer (i.e. 20 marks) in WE and Geeta had the lowest composite score among the four recruited, she must have 19 marks in WE.

$\therefore$ Four recruited candidates are Jatin, Indu, Ester and Geeta.

43. (a) Jatin's composite score was more than that of Danish. (True)

Indu scored less than Chetna in DI. (True)

Jatin Scored more than Indu in GA. (False)

44. (b)

(a) As per the given options, Harini's composite score was less than that of Falk, this statement may be true since we don't know the marks of Harini in WE.

- (b) Bala scored same as Jatin in DI, This statement must be false because if Bala has score as same as Jatin (that is 20 marks), his composite score will be $(2 \times 20) + 9 + 11 = 60$ (which is not possible because it is given that no two candidates had same composite score).
- (c) Bala's composite score was less than that of Ester, This statement may be true since we don't know Bala's marks in DI.
- (d) Chetna scored more than Bala in DI, this statement may be true since we don't know Bala's marks in DI.

45. From all the given information, we can conclude that Bala can get any marks in DI upto 20 except 5, 8, 12, 14, 15, 16, 19 and 20 and Bala's composite score must be less than Chetna's composite score (i.e. less than 54).

From trial and error,

- (i) Let Bala's maximum score in DI = 10
 $\therefore$ Bala's composite score = $(2 \times 10) + 9 + 11 = 40$ (possible)
- (ii) Let Bala's maximum score in DI = 11
 $\therefore$ Bala's composite score = $(2 \times 11) + 9 + 11 = 42$ (possible)
- (iii) Let Bala's maximum score in DI = 13
 $\therefore$ Bala's composite score = $(2 \times 13) + 9 + 11 = 46$ (possible)
- (iv) Let Bala's maximum score in DI = 17
 $\therefore$ Bala's composite score

$$= (2 \times 17) + 9 + 11$$

$$= 54 \text{ (not possible)}$$

Therefore, Bala's maximum score in DI is 13.

46. From the given information, we can conclude that Harini could have scored any marks upto 20 in WE except 4, 7, 8, 9, 15, 16, 18, 19 and 20.

From trial and Error,

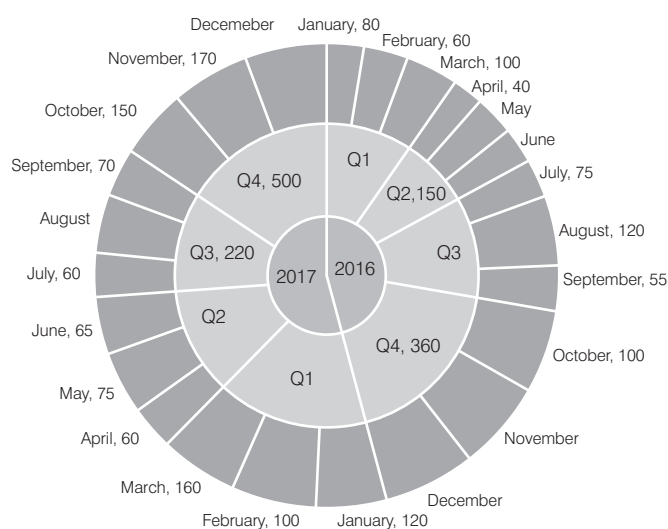
- (i) Let Harini's maximum score in WE = 10
 $\therefore$ Harini's composite score = $(2 \times 5) + 10 + 20 = 40$ (possible)
- (ii) Let Harini's maximum score in WE = 11
 $\therefore$ Harini's composite score = $(2 \times 5) + 11 + 20 = 41$ (possible)
- (iii) Let Harini's maximum score in WE = 14
 $\therefore$ Harini's composite score = $(2 \times 5) + 14 + 20 = 44$ (possible)
- (iv) Let Harini's maximum score in WE = 17
 $\therefore$ Harini's composite score = $(2 \times 5) + 17 + 20 = 47$

(not possible)

Therefore, Harini's maximum score in WE is 14.

Directions (Q. Nos. 47-50)

The multi-layered pie-chart shows the sales of LED television sets for a big retail electronics outlet during 2016 and 2017. The outer layer shows the monthly sales during this period, with each label showing the month followed by sales figure of that month. For some months, the sales figures are not given in the chart. The middle-layer shows quarter-wise aggregate sales figures (in some cases, aggregate quarter-wise sales numbers are not given next to the quarter). The innermost layer shows annual sales. It is known that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression, as do the three monthly sales figures in the fourth quarter (October, November, December) of that year.



47. What is the percentage increase in sales in December 2017 as compared to the sales in December 2016?

- (a) 22.22 (b) 28.57 (c) 38.46 (d) 50.00

48. In which quarter of 2017 was the percentage increase in sales from the same quarter of 2016 the highest?

- (a) Q1 (b) Q2 (c) Q3 (d) Q4

49. During which quarter was the percentage decrease in sales from the previous quarter's sales the highest?

- (a) Q2 of 2016 (b) Q1 of 2017
 (c) Q2 of 2017 (d) Q4 of 2017

50. During which month was the percentage increase in sales from the previous month's sales the highest?

- (a) March of 2016 (b) October of 2016
 (c) March of 2017 (d) October of 2017

→ Solutions (Q. Nos. 47-50)

Given, sales figures in October, November, December in 2016 form an AP.

$$\therefore a_1 = 100 \text{ (October)} = a$$

$$\text{and } a_1 + a_2 + a_3 = 360$$

$$\Rightarrow a + a + d + a + 2d = 360$$

$$\Rightarrow 100 + 100 + d + 100 + 2d = 360$$

$$\Rightarrow 3d = 60 \Rightarrow d = 20$$

$$\therefore \text{Sales figures in November, 2016} = a + d = 100 + 20 = 120$$

$$\therefore \text{Sales figures in December, 2016} = a + 2d = 100 + 40 = 140$$

$$\text{Similarly, } a_1 = 40 \text{ (April)} = a$$

$$\text{and } a_1 + a_2 + a_3 = 150$$

$$\Rightarrow a + a + d + a + 2d = 150$$

$$\Rightarrow 40 + 40 + d + 40 + 2d = 150$$

$$\Rightarrow 3d = 30 \Rightarrow d = 10$$

$$\therefore \text{Sales figures in May, 2016} = a + d = 40 + 10 = 50$$

$$\therefore \text{Sales figures in June, 2016} = a + 2d = 40 + 20 = 60$$

$$\text{and sales figures in December, 2017} = 500 - (150 - 170) = 180$$

$$47. (b) \text{ Required percentage} = \frac{(180 - 140)}{140} \times 100 = 28.57\%$$

48. (a) Percentage increase in Q1 from 2016 to 2017

$$= \frac{(380 - 240)}{240} \times 100 = 58.33\%$$

Percentage increase in Q2 from 2016 to 2017

$$= \frac{(200 - 150)}{150} \times 100 = 33.33\%$$

Percentage change in Q3 from 2016 to 2017

$$= \frac{(220 - 250)}{250} \times 100$$

$$= -12\% \text{ (Decrement)}$$

Percentage increase in Q4 from 2016 to 2017

$$= \frac{(500 - 360)}{360} \times 100 = 38.88\%$$

Therefore, the percentage increase is highest in Q1 from 2016 to 2017.

49. (c) In 2016;

Percentage change from Q1 to Q2

$$= \frac{150 - 240}{240} \times 100 = -37.5\%$$

Percentage change from Q2 to Q3

$$= \frac{250 - 150}{150} \times 100 = 66.66\%$$

Percentage change from Q3 to Q4

$$= \frac{360 - 250}{250} \times 100 = 44\%$$

In 2017; Percentage change from Q1 to Q2

$$= \frac{200 - 380}{380} \times 100 = -47.4\%$$

Percentage change from Q2 to Q3

$$= \frac{220 - 200}{200} \times 100 = 10\%$$

Percentage change from Q3 to Q4

$$= \frac{500 - 220}{220} \times 100 = 127.27\%$$

Therefore, in quarter Q2 of 2017 the percentage decrease in sales from the previous quarter's sales is highest.

50. (d) Percentage increase in sales from previous month in

March of 2016 = $\left(\frac{100 - 60}{60} \right) \times 100 = 66.67\%$

October of 2016 = $\left(\frac{100 - 55}{55} \right) \times 100 = 81.82\%$

March of 2017 = $\left(\frac{160 - 100}{100} \right) \times 100 = 60\%$

October of 2017 = $\left(\frac{150 - 70}{70} \right) \times 100 = 114.28\%$

Clearly, the percentage increase in sales is maximum in October of 2017.

Directions (Q. Nos. 51 - 54)

You are given an $n \times n$ square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Two cells are called adjacent if they touch each other horizontally, vertically or diagonally. So a cell in one of the four corners has three cells adjacent to it, and a cell in the first or last row or column which is not in the corner has five cells adjacent to it. Any other cell has eight cells adjacent to it.

51. What is the minimum number of different numerals needed to fill a 3×3 square matrix?

52. What is the minimum number of different numerals needed to fill a 5×5 square matrix?

53. Suppose you are allowed to make one mistake, i.e. one pair of adjacent cells can have the same numeral. What is the minimum number of different numerals required to fill a 5×5 matrix?

- (a) 9 (b) 16 (c) 25 (d) 4

54. Suppose that all the cells adjacent to any particular cell must have different numerals. What is the minimum number of different numerals needed to fill a 5×5 square matrix?

- (a) 25 (b) 16 (c) 9 (d) 4

→ **Solutions** (Q. Nos. 51-54) Given, a ' $n \times n$ ' square matrix to be filled with numerals so that no two adjacent cells have the same numerals.

51. Minimum 4 number of different numerals are needed to fill a 3×3 square matrix so that no two adjacent cells have the same numeral.

e.g.

2	3	5
5	7	2
2	3	5

The four different numbers are 2, 3, 5 and 7.

52. Minimum 4 number of different numerals are needed to fill a 5×5 square matrix so that no two adjacent cells have the same numeral.

e.g.

2	3	5	7	2
5	7	2	3	5
2	3	5	7	2
5	7	2	3	5
2	3	5	7	2

There are four different numbers viz. 2, 3, 5 and 7.

53. (d) If only one pair of adjacent cells is allowed to have same numerals, there will be no change in minimum number of different numerals required to fill a 5×5 matrix. So, minimum 4 numbers are required.

Note If we use only 3 different numbers to fill a 5×5 matrix, there will be 3 pair of adjacent cells having same numerals.

54. (c) There is minimum 9 number of different numerals needed to fill a 5×5 square matrix so that all the cells adjacent to any particular cells must have different numerals.

e.g.

4	3	7	4	3
1	2	8	1	2
5	6	9	5	6
4	3	7	4	3
1	2	8	1	2

There are 9 different numbers viz. 1, 2, 3, 4, 5, 6, 7, 8 and 9.

Directions (Q. Nos. 55 - 58)

An ATM dispenses exactly ₹ 5000 per withdrawal using 100, 200 and 500 rupee notes. The ATM requires every customer to give her preference for one of the three denominations of notes. It then dispenses notes such that the number of notes of the customer's preferred denomination exceeds the total number of notes of other denominations dispensed to her.

55. In how many different ways can the ATM serve a customer who gives 500 rupee notes as her preference?
56. If the ATM could serve only 10 customers with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, what is the maximum number of customers among these 10 who could have given 500 rupee notes as their preferences?
57. What is the maximum number of customers that the ATM can serve with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, if all the customers are to be served with at most 20 notes per withdrawal?
- (a) 13 (b) 12 (c) 16 (d) 10

58. What is the number of 500 rupee notes required to serve 50 customers with 500 rupee notes as their preferences and another 50 customers with 100 rupee notes as their preferences, if the total number of notes to be dispensed is the smallest possible?
- (a) 750 (b) 800 (c) 900 (d) 1400

→ **Solutions** (Q. Nos. 55-58) Given, dispencc per withdrawal = ₹ 5000

Number of denomination of notes = 3 (500, 200, 100)

Number of notes of the customer's preferred denomination > total number of notes of other denominations dispensed to her.

55. Denomination's preference = ₹ 500

Different ways to serve;

$$\begin{aligned}
 &500 \times 10 = ₹ 5000 \\
 &(500 \times 9) + (200 \times 2) + 100 = ₹ 5000 \\
 &(500 \times 9) + (100 \times 5) = ₹ 5000 \\
 &(500 \times 9) + (200 \times 1) + (100 \times 3) = ₹ 5000 \\
 &(500 \times 8) + (200 \times 5) = ₹ 5000 \\
 &(500 \times 8) + (200 \times 4) + (100 \times 2) = ₹ 5000 \\
 &(500 \times 8) + (200 \times 3) + (100 \times 4) = ₹ 5000 \\
 &\therefore \text{There are 7 different ways.}
 \end{aligned}$$

56. Stock of 500 rupee notes = 50

∴ Minimum 8 notes of ₹ 500 are require to fulfill the preference of ₹ 500 notes.

∴ Minimum number of people who can get ₹ 500 as preference = $\frac{50}{8} = 6.25$

Hence, maximum number of people who give ₹ 500 as preference = 6

57. (b) Stock of ₹ 500 notes = 50

Notes served at most per withdrawal = 20

We know that, $(500 \times 4) + (200 \times 15) = ₹ 5000$

Therefore, minimum number of 500 rupee notes will be 4 per withdrawal.

Now, if 12 customers withdraw money then $12 \times 4 = 48$ notes of ₹ 500 are served and after that no combination of notes can be formed with atmost 20 notes per withdrawal.

So, the maximum number of customer served is 12.

58. (c) For number of notes to be minimum, we must maximise the use of ₹ 500 notes.

For customers having ₹ 500 notes as preference, we can given them 10 notes of ₹ 500 each.

So, number of ₹ 500 notes used = $10 \times 50 = 500$

For customers having ₹ 100 notes as preference, we can give them 8 notes of ₹ 500 and 10 notes of ₹ 100.

So, number of ₹ 500 notes used = $8 \times 50 = 400$

∴ Total number of ₹ 500 notes used = $500 + 400 = 900$

Directions (Q. Nos. 59-62)

Adriana, Bandita, Chitra, and Daisy are four female students, and Amit, Barun, Chetan, and Deb are four male students. Each of them studies in one of three institutes - X, Y, and Z. Each student majors in one subject among Marketing, Operations, and Finance, and minors in a different one among these three subjects. The following facts are known about the eight students

- Three students are from X, three are from Y, and the remaining two students, both female, are from Z.
- Both the male students from Y minor in Finance, while the female student from Y majors in Operations.
- Only one male student majors in Operations, while three female students minor in Marketing.
- One female and two male students major in Finance.
- Adriana and Deb are from the same institute. Daisy and Amit are from the same institute.
- Barun is from Y and majors in Operations. Chetan is from X and majors in Finance.
- Daisy minors in Operations.

59. Who are the students from the institute Z?

- (a) Adriana and Bandita
(b) Bandita and Chitra
(c) Chitra and Daisy
(d) Adriana and Daisy

60. Which subject does Deb minor in?

- (a) Finance
(b) Marketing
(c) Operations
(d) Cannot be determined uniquely from the given information

61. Which subject does Amit major in?

- (a) Finance
(b) Marketing
(c) Operations
(d) Cannot be determined uniquely from the given information

62. If Chitra majors in Finance, which subject does Bandita major in?

(a) Finance (b) Marketing
(c) Operations
(d) Cannot be determined uniquely from the given information

→ **Solutions** (Q. Nos. 59-62) From the given information in the question, we can draw a table as follows

Females	Institute	Subjects (Major)	Subjects (Minor)
Adriana	Y	Operations	Marketing
Bandita	Z		Marketing
Chitra	Z		Marketing
Daisy	X		Operations
Males			
Amit	X	Finance	
Barun	Y	Operations	Finance
Chetan	X	Finance	
Deb	Y		Finance

59. (b) Bandita and Chitra are the students from the institute Z.
60. (a) Deb minors in Finance.
61. (a) Amit majors in Finance.
62. (c) If Chitra majors in finance, then Bandita majors in operations because she minors in marketing.

Directions (Q. Nos. 63 - 66)

Fuel contamination levels at each of 20 petrol pumps P1, P2, ..., P20 were recorded as either high, medium, or low.

- Contamination levels at three pumps among P1-P5 were recorded as high
- P6 was the only pump among P1-P10 where the contamination level was recorded as low
- P7 and P8 were the only two consecutively numbered pumps, where the same levels of contamination were recorded
- High contamination levels were not recorded at any of the pumps P16-P20
- The number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded

63. Which of the following MUST be true?
- (a) The contamination level at P10 was recorded as high.
(b) The contamination level at P12 was recorded as high.
(c) The contamination level at P13 was recorded as low.
(d) The contamination level at P20 was recorded as medium.
64. What best can be said about the number of pumps at which the contamination levels were recorded as medium?
- (a) More than 4 (b) At most 9 (c) Exactly 8 (d) At least 8

65. If the contamination level at P11 was recorded as low, then which of the following MUST be true?

(a) The contamination level at P18 was recorded as low
(b) The contamination level at P12 was recorded as high
(c) The contamination level at P14 was recorded as medium
(d) The contamination level at P15 was recorded as medium

66. If contamination level at P15 was recorded as medium, then which of the following MUST be FALSE?

(a) Contamination level as P11 and P16 were recorded as the same
(b) Contamination levels at P10 and P14 were recorded as the same
(c) Contamination levels at P13 and P17 were recorded as the same
(d) Contamination level at P14 was recorded to be higher than that at P15

→ **Solutions** (Q. Nos. 63-66) Following table is drawn for the best possible case from all the information given in question.

Petrol Pump	Fuel Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium/Low
P12	High/Medium/Low
P13	Medium/High/Low
P14	High/Medium/Low
P15	Medium/Low/High
P16	Low/Medium
P17	Medium/Low
P18	Low/Medium
P19	Medium/Low
P20	Low/Medium

63. (a) "The contamination level at P10 was recorded as high", this statement must be true. We can not say about other statements of this question because nothing exactly given in the table about these statements.
64. (c) As, the number of high rated pumps is twice the number of low rated pumps, So, their sum must be a multiple of 3.
So, there can only be 8 medium rated pumps 8 high rated and 4 low rated pumps.

65. (c) If contamination level at P11 was recorded as low, the table was changed by some exact figures as following

Petrol Pump	Fuel contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Low
P12	Medium
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

So, from the above table statement, "The contamination level at P14 was recorded as medium", must be true.

66. (a) If contamination level at P15 was recorded as medium, the following table changed as;

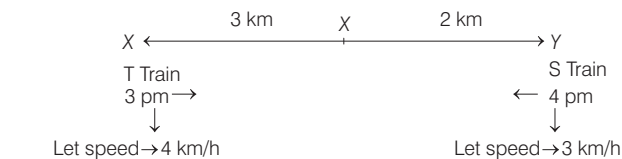
Petrol Pump	Fuel contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Medium
P16	Low
P17	Medium
P18	Low
P19	Medium
P20	Low

So, from the above table, it is clear that contamination level at P11 and P16 were not recorded as the same.

Section III Quantitative Aptitude

67. Train T leaves station X for station Y at 3 pm. Train S, traveling at three quarters of the speed of T, leaves Y for X at 4 pm. The two trains pass each other at a station Z, where the distance between X and Z is three-fifths of that between X and Y. How many hours does train T taken for its journey from X to Y?

➤ According to the question,



Distance between X and Z = $\frac{3}{5}$ th of X and Y.

$$\therefore \text{Time of train T} = \frac{3}{4} \text{ hr and Time of Train S} = \frac{2}{3} \text{ hr}$$

$$\therefore \text{Required ratio} = \frac{3}{4} : \frac{2}{3} = 9 : 8$$

When difference of timing is 1 h, because T leaves at 3 pm and S leaves at 4 pm.

$$\text{Difference} = \frac{9}{1} : \frac{8}{1} = 9 : 8$$

Actual time = 9 h and 8 h.

So, 9 hr taken by T to cover X to Z.

So, to cover 1 km train T takes 3 h.

Finally to cover 5 km, train T takes $5 \times 3 = 15$ h.

68. Point P lies between points A and B such that the length of BP is thrice that of AP. Car 1 starts from A and moves towards B. Simultaneously, car 2 starts from B and moves towards A. Car 2 reaches P one hour after car 1 reaches P. If the speed of car 2 is half that of car 1, then the time, in minutes, taken by car 1 in reaching P from A is

➤ $\therefore$ Length of BP is thrice of AP.



$$\therefore \text{Speed of } C_1 = S_1 \text{ and Speed of } C_2 = S_2 = \frac{S_1}{2}$$

When distance is thrice and speed is half. Then, time taken by car 2 = $3 \times 2 = 6$ times

$$\text{So, Ratio of time} = T_1 : T_2 = 1 : 6$$

Now, car 2 reaches 1 hour later car 1 that means

$$10x - z = 3x \Rightarrow 7x = z$$

$$5 \text{ units} = 100 \Rightarrow 5 \text{ units} = 60 \text{ min}$$

$$1 \text{ unit} = 12 \text{ min}$$

$$y = 2x - 50$$

$\Rightarrow$ Hence, car 1 takes 12 min to reach P from A.

69. John borrowed ₹ 210000 from a bank at an interest rate of 10% per annum, compounded annually. The loan was repaid in two equal instalments, the first after one year and the second after another year. The first instalment was interest of one year plus part of the principal amount, while the second was the rest of the principle amount plus due interest thereon. Then each instalment, in ₹, is

Principal = ₹ 210000

Rate = 10%

Instalments = 2

According to the question,

$$I \Rightarrow \text{Principal} = \left[\frac{x}{\left(1 + \frac{r}{100}\right)} + \frac{x}{\left(1 + \frac{r}{100}\right)^2} \right]$$

$$\Rightarrow 210000 = \left[\frac{x}{\left(1 + \frac{10}{100}\right)} + \frac{x}{\left(1 + \frac{10}{100}\right)^2} \right]$$

$$\Rightarrow 210000 = \frac{10x}{11} + \frac{100x}{121}$$

$$\Rightarrow 210000 = \frac{110x + 100x}{121}$$

$$\Rightarrow 210000 \times 121 = 210x$$

$$\Rightarrow x = 121000$$

So, each instalment = ₹ 121000

70. A tank is filled with pipes, some filling it and the rate draining it. All filling pipes fill at the same rate, and all draining pipes drain at the same rate. The empty tank gets completely filled in 6 hrs when 6 filling and 5 draining pipes are on, but this time becomes 60 hrs when 5 filling and 6 draining pipes are on. In how many hours will the empty tank get completely filled when one draining and two filling pipes are on?

Case I

Filling pipes = 6

Draining pipes = 5

Time taken by all to fill the tank = 6 hrs

$$\Rightarrow 6F - 5D = \frac{1}{6} \quad \dots(i)$$

Case II

Filling Pipes = 5

Draining Pipes = 6

Time taken by all to fill the tank = 60 hrs

$$\Rightarrow 5F - 6D = \frac{1}{60} \quad \dots(ii)$$

By solving Eqs. (i) and (ii), we get

$$6F - 5D = \frac{1}{6}$$

$$5F - 6D = \frac{1}{60}$$

$$11F - 11D = \frac{11}{60}$$

$$\Rightarrow 11(F - D) = \frac{11}{60}$$

$$F - D = \frac{1}{60}$$

Put $F - D = \frac{1}{60}$ in Eq. (i), we get

$$6F - 5D = \frac{1}{6} \Rightarrow F + 5F - 5D = \frac{1}{6}$$

$$\Rightarrow F + 5(F - D) = \frac{1}{6} \Rightarrow F + 5\left(\frac{1}{60}\right) = \frac{1}{6}$$

$$\Rightarrow F = \frac{1}{6} - \frac{5}{60} \Rightarrow F = \frac{5}{60}$$

According to the question,

$$2F - 1D = ?$$

$$\Rightarrow F + F - D = \frac{5}{60} + \frac{1}{60} = \frac{6}{60} = \frac{1}{10}$$

So, time taken by one draining and two filling pipes = 10 hrs

71. A CAT aspirant appears for a certain number of tests. His average score increases by 1 if the first 10 tests are not considered, and decreases by 1 if the last 10 tests are not considered. If his average scores for the first 10 and the last 10 tests are 20 and 30, respectively, then the total number of tests taken by him is

In case of first 10 tests

Total number of tests = 10

Average of these tests = 20

When these are not considered, average increases = + 1

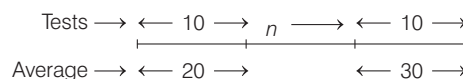
In case of last 10 tests

Total number of tests = 10

Average of these tests = 30

When these are not considered, average decreases = - 1

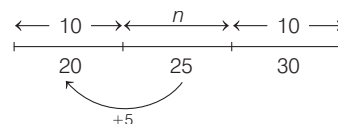
According to the question,



Total tests = $n + 10 + 10 = n + 20$

When 1st 10 eliminates = Average increases

Here, the average must be between 20 and 30 and that means the number should be 25.



So, according to both cases = $n = 10 \times 5 = 50$

Here, total number of test taken by him

$$= n + 10 = 50 + 10 = 60$$

72. In an apartment complex, the number of people aged 51 yr and above is 30 and there are at most 39 people whose ages are below 51 yr. The average age of all the people in the apartment complex is 38 yr. What is the largest possible average age, in yr, of the people whose ages are below 51 yr?

(a) 25 (b) 26 (c) 27 (d) 28

→ (d) Number of people aged 51 yr and above = 30

Number of people aged below 51 yr = 39

Total number of people = 30 + 39 = 69

Average age of 69 people = 38 yr

Sum of ages of 69 people = 69 × 38 = 2622 yr

Let the age of all people of age 51 yr and above = 51 yr

Sum of average of those people = 51 × 30 = 1530 yr

Sum of average age of 39 people of below 51 yr

$$2622 - 1530 = 1092$$

$$\text{Average age of 39 people} = \frac{1092}{39} = 28 \text{ yr}$$

- 73.** In an examination, the maximum possible score is N while the pass mark is 45% of N . A candidate obtains 36 marks, but falls short of the pass mark by 68%. Which one of the following is then correct?

- (a) $N \leq 200$ (b) $201 \leq N \leq 242$
(c) $243 \leq N \leq 252$ (d) $N \leq 253$

→ (c) Let total score = 100

Passing marks = 45%

When candidate fails, he falls short of passing marks = 68%

$$\text{So, he got marks} = \frac{45 \times 32}{100} = 14.40$$

In actual case,

Candidate got marks = 36

$$14.40 \text{ marks} = 36 \text{ marks}$$

$$\text{So, } 100 \text{ marks} = \frac{36}{14.40} \times 100 = 250 \text{ marks}$$

Hence, the score will lie between

$$243 \leq N \leq 252$$

- 74.** A wholesaler bought walnuts and peanuts, the price of walnut per kg being thrice that of peanut per kg. He then sold 8 kg of peanuts at a profit of 10% and 16 kg of walnuts at a profit of 20% to a shopkeeper. However, the shopkeeper lost 5 kg of walnuts and 3 kg of peanuts in transit. He then mixed the remaining nuts and sold the mixture at ₹ 166 per kg, thus making an overall profit of 25%. At what price, in ₹ per kg, did the wholesaler buy the walnuts?

- (a) 96 (b) 86
(c) 98 (d) 84

→ Walnuts : Peanuts

Price 3 : 1

Quantity sold 16 kg : 8 kg

Final Price 48 : 8

6 : 1

Let price of walnuts and peanuts = k

So, price of walnuts and peanuts = $6k : k$

$$\text{When walnuts sold at 20\% profit} = 6k \times \frac{120}{100} = 7.2k$$

$$\text{When peanuts sold at 10\% profit} = k \times \frac{110}{100} = 1.1k$$

$$\text{Total price} = 7.2k + 1.1k = 8.3k$$

In Case II

When 5 kg walnuts and 3 kg peanuts lost,
the amount remaining = 8 + 16 - 5 - 3

$$= 24 - 8 = 16 \text{ kg}$$

Remaining amount sold at 25% profit

According to the question,

Price of mixture = ₹ 166/kg

$$\Rightarrow \frac{(100 + 25)}{100} \times 8.3k = 16 \times 166$$

$$\Rightarrow k = 256$$

So, cost of 16 kg walnuts = 6 × 256

$$\text{Cost of 1 kg walnut} = \frac{6 \times 256}{16} = 96 \text{ per kg}$$

- 75.** Two types of tea A and B, are mixed and then sold at ₹ 40 per kg. The profit is 10% if A and B are mixed in the ratio 3 : 2, and 5% if this ratio is 2 : 3. The cost prices, per kg, of A and B are in the ratio

- (a) 17 : 25 (b) 19 : 24
(c) 18 : 25 (d) 21 : 25

→ (b) In case I, when profit is 10%

$$\text{Tea A : Tea B} = 3 : 2$$

In case II, when profit is 5%

$$\text{Tea A : Tea B} = 2 : 3$$

Let total amount of tea = 5 kg

Cost of total tea = ₹ x per kg

Case I

$$3a + 2b = 5x \times \frac{100}{(100 + 10)}$$

$$3a + 2b = \frac{5x}{1.1} \quad \dots(i)$$

Case II

$$2a + 3b = 5x \times \frac{100}{(100 + 5)}$$

$$2a + 3b = \frac{5x}{1.05} \quad \dots(ii)$$

On dividing the Eqs. (i) and (ii), we get

$$\frac{3a + 2b}{2a + 3b} = \frac{\frac{5x}{1.1}}{\frac{5x}{1.05}}$$

$$\Rightarrow \frac{3a + 2b}{2a + 3b} = \frac{1.05}{1.1}$$

$$\Rightarrow \frac{3a + 2b}{2a + 3b} = \frac{105}{110} \Rightarrow \frac{3a + 2b}{2a + 3b} = \frac{21}{22}$$

$$\Rightarrow 66a + 44b = 42a + 63b$$

$$\Rightarrow 66a - 42a = 63b - 44b$$

$$\Rightarrow 24a = 19b \Rightarrow \frac{a}{b} = \frac{19}{24}$$

∴ CP of A : B = 19 : 24

- 76.** Humans and robots can both perform a job but at different efficiencies. Fifteen humans and five robots working together take thirty days to finish the job, whereas five humans and fifteen robots working together take sixty days to finish it.

How many days will fifteen humans working together (without any robot) take to finish it?

- (a) 32 (b) 36
(c) 40 (d) 45

→ (a) Given,

$$15 \text{ Humans} + 5 \text{ Robots} = 30 \text{ days} \quad \dots(i)$$

$$5 \text{ Humans} + 15 \text{ Robots} = 60 \text{ days} \quad \dots(ii)$$

On solving Eqs. (i) and (ii), we get

$$15 \text{ Humans} + 5 \text{ Robots} = 30 \text{ days} \times 1$$

$$5 \text{ Human} + 15 \text{ Robots} = 60 \text{ days} \times 3$$

Therefore,

$$15H + 5R = 30D$$

$$15H + 45R = 180D$$

$$\begin{array}{r} 15H + 5R = 30D \\ - 15H + 45R = 180D \\ \hline -40R = -150D \end{array}$$

$$\therefore R = \frac{150}{40}$$

From Eq. (i), we get value of $H = \frac{3}{4}$

So, efficiency of Human : Robot = 5 : 1

Now, put the values of efficiencies in any equation to get the exact value.

$$\Rightarrow 15H + 5R = 30$$

$$\Rightarrow 15(5) + 5(1) = 30$$

$$\Rightarrow 75 + 5 = 30$$

$$\text{Total work} = 80 \text{ unit/day} \times 30 \text{ days} = 2400 \text{ units}$$

$$\text{Work done by 15 Humans} = 15(5) = 75 \text{ units/day}$$

$$\text{So, time requirement} = \frac{2400}{75} = 32 \text{ days}$$

- 77.** Raju and Lalitha originally had marbles in the ratio 4 : 9. Then, Lalitha gave some of her marbles to Raju. As a result, the ratio of the number of marbles with Raju to that with Lalitha became 5 : 6. What fraction of her original number of marbles was given by Lalitha to Raju?

- (a) $\frac{7}{33}$ (b) $\frac{6}{19}$
(c) $\frac{1}{4}$ (d) $\frac{1}{5}$

→ (a) Ratio of marbles to Raju and Lalitha = 4 : 9

New ratio after Lalitha gave some of her marbles to Raju = 5 : 6

Now, make both the ratios equal, we get

$$4 : 9 = 13 \quad \dots(i)$$

$$5 : 6 = 11 \quad \dots(ii)$$

$$4 : 9 = 13 \times 11$$

$$5 : 6 = 11 \times 13$$

$$\Rightarrow 44 : 99 = 143$$

$$65 : 78 = 143$$

When, Lalitha gave marbles to Raju

Initially Lalitha have marbles = 99

Finally Lalitha have marbles = 78

Lalitha gave marbles = 21

$$\therefore \text{Required fraction} = \frac{21}{99} = \frac{7}{33}$$

- 78.** When they work along, B needs 25% more time to finish a job than A does. They two finish the job in 13 days in the following manner. A works alone till half the job is done, then A and B together for four days, and finally B works alone to complete the remaining 5% of the job. In how many days can B alone finish the entire job?

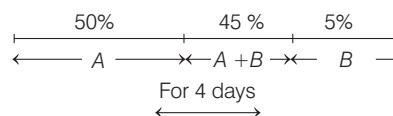
- (a) 16 (b) 18 (c) 20 (d) 22

→ (c) Let time taken by A : B = 100 : (100 + 25)

$$\begin{aligned} \text{Ratio of efficiencies of A : B} &= (100 + 25) : 100 \\ &= 125 : 100 = 5 : 4 \end{aligned}$$

Time taken by A + B to complete the work = 13 days

According to the question,



When 45% work done by A + B in 4 days.

Then, full work done by A + B = $\frac{80}{9}$ days.

So, B works 5% in 1 day.

Hence, 100% (full) work is done in 20 days.

- 79.** A trader sells 10 L of a mixture of paints A and B, where the amount of B in the mixture does not exceed that of A. The cost of paint A per litre is ₹ 8 more than that of paint B. If the trader sells the entire mixture for ₹ 264 and makes a profit of 10%, then the highest possible cost of paint B, in ₹ per litre is

- (a) 16 (b) 20 (c) 22 (d) 26

→ (b) Amount of mixture of paint A + paint B = 10 L

Selling price of mixture = ₹ 264

$$\text{Cost price of mixture} = 264 \times \frac{100}{110} = ₹ 240$$

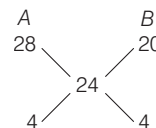
$$\text{Cost of 1 L of mixture} = \frac{240}{10} = ₹ 24$$

Now, by the rule of Alligation

Out of cost of A and B, one must be less than 24 and other one must be greater than 24.

Now, take one option from given options

Take B = 20 and A = 20 + 8 = 28



Ratio of A : B = 4 : 4 = 1 : 1

$$\text{Amount of A} = \frac{1}{2} \times 10 = 5 \text{ L}$$

$$\text{Amount of B} = \frac{1}{2} \times 10 = 5 \text{ L}$$

$$\text{Cost of amount A} = 28 \times 5 = ₹ 140$$

$$\text{Cost of amount B} = 20 \times 5 = ₹ 100$$

$$\text{Total cost} = ₹ 140 + ₹ 100 = ₹ 240$$

Given cost price = resultant cost price (proved)

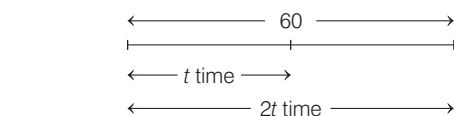
So, cost of paint = ₹ 20 L

80. The distance from A to B is 60 km. Partha and Narayan start from A at the same time and move towards B. Partha takes four hours more than Narayan to reach B. Moreover, Partha reaches the mid-point of A and B two hours before Narayan reaches B. The speed of Partha, in km per hour, is

(a) 3 (b) 4
(c) 5 (d) 6

→ (c) Total distance from A to B = 60 km.

According to the question,



$$\Rightarrow 2t - 4 - t = 2$$

$$\Rightarrow t - 4 = 2$$

$$\Rightarrow t = 6 \text{ hr}$$

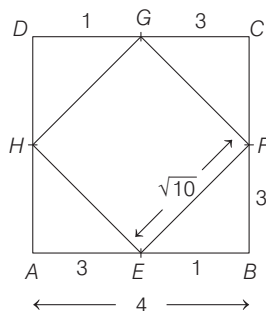
Time taken by Partha to cover 30 km = 6 hr

Hence, speed of Partha = $\frac{30}{6} = 5 \text{ km/hr}$

81. Points E, F, G, H lie on the sides AB, BC, CD, and DA, respectively, of a square ABCD. If EFGH is also a square whose area is 62.5% of that of ABCD and CG is longer than EB, then the ratio of length of EB to that of CG is

(a) 4 : 9 (b) 2 : 5
(c) 3 : 8 (d) 1 : 3

→ (d) Given, $CG > EB$



Area of square EFGH is 62.5% = Area of square ABCD

$$\text{So, } \frac{\text{Area of EFGH}}{\text{Area of ABCD}} = \frac{62.5}{100} = \frac{5}{8} \text{ or } \frac{10}{16}$$

Let the area of EFGH = 10

$$\text{Side} = \sqrt{10}$$

$$\text{Area of ABCD} = 16$$

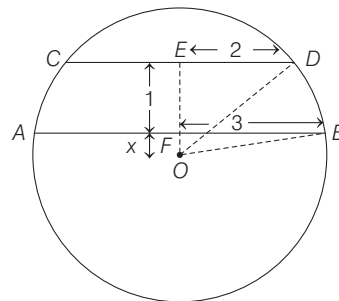
$$\text{Side} = 4$$

∴ Required ratio = $EB : CG = 1 : 3$

82. In a circle, two parallel chords on the same side of a diameter have lengths 4 cm and 6 cm. If the distance between these chords is 1 cm, then the radius of the circle, in cm, is

(a) $\sqrt{13}$ (b) $\sqrt{11}$
(c) $\sqrt{12}$ (d) $\sqrt{14}$

→ (a)



From $\triangle EOD$ and $\triangle FOB$, we get

value of $x = 3$

By Pythagoras theorem,

$$(\text{radius})^2 = (3)^2 + (2)^2$$

$$\Rightarrow (\text{radius})^2 = 9 + 4$$

$$\Rightarrow \text{Radius} = \sqrt{13} \text{ cm}$$

$$\Rightarrow \text{Radius of circle} = \sqrt{13} \text{ cm}$$

83. In a circle with center O and radius 1 cm, an arc AB makes an $\angle 60^\circ$ at O. Let R be the region bounded by the radii OA, OE and the arc AB. If C and D are two points on OA and OB, respectively, such that $OC = OD$ and the area of $\triangle OCD$ is half that of R, then the length of OC, in cm, is

(a) $\left(\frac{\pi}{3\sqrt{3}}\right)^{\frac{1}{2}}$ (b) $\left(\frac{\pi}{4}\right)^{\frac{1}{2}}$ (c) $\left(\frac{\pi}{4\sqrt{3}}\right)^{\frac{1}{2}}$ (d) $\left(\frac{\pi}{6}\right)^{\frac{1}{2}}$

→ (a) Given,

Radius of circle = 1 cm

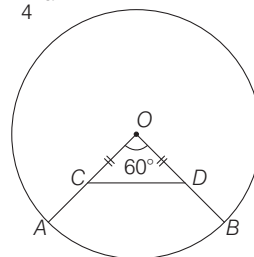
Hence, given angle = 60°

So, area of circle = $\frac{\pi}{6} \text{ cm}^2$

$\triangle OCD$ is an equilateral triangle because all angles are of 60° .

So, let the side of triangle = a

$$\text{Area of } \triangle OCD = \frac{\sqrt{3}}{4} a^2$$



According to the question,

$$\frac{1}{2} \left(\frac{\pi}{6} \right) = \frac{\sqrt{3}}{4} a^2 \Rightarrow \frac{\pi}{3} = \sqrt{3} a^2 \Rightarrow a^2 = \frac{\pi}{3\sqrt{3}}$$

$$\Rightarrow a = OC = \left(\frac{\pi}{3\sqrt{3}} \right)^{1/2} \text{ cm}$$

84. In a parallelogram ABCD of area 72 sq cm, the sides CD and AD have lengths 9 cm and 16 cm, respectively. Let P be a point on CD such that AP is perpendicular to CD. Then, the area, in sq cm, of $\triangle APD$ is

(a) $24\sqrt{3}$ (b) $18\sqrt{3}$ (c) $32\sqrt{3}$ (d) $12\sqrt{3}$

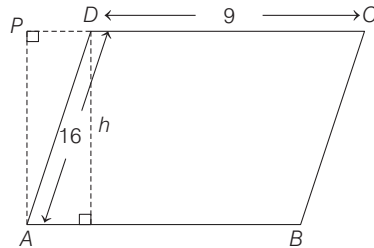
→ (c) Given,

$$\text{Area of parallelogram} = 72 \text{ cm}^2$$

$$\text{Area of parallelogram} = b \times h$$

$$\Rightarrow 72 = 9 \times h$$

$$\Rightarrow h = 8 \text{ cm}$$



Hence, $\triangle APD$ is a right angled triangle.

So, $AP = 8 \text{ cm}$, $AD = 16 \text{ cm}$

$$\Rightarrow DP = AD^2 - AP^2$$

$$\Rightarrow DP = (16)^2 - (8)^2$$

$$\Rightarrow DP = 8\sqrt{3} \text{ cm}$$

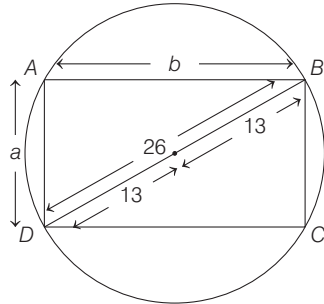
$$\text{Hence, area of } \triangle APD = \frac{1}{2} \times b \times h = \frac{1}{2} \times 8\sqrt{3} \times 8 = 32\sqrt{3} \text{ cm}^2$$

85. $ABCD$ be a rectangle inscribed in a circle of radius 13 cm. Which one of the following pairs can represent in cm, the possible length and breadth of $ABCD$?

(a) 24, 10 (b) 24, 12 (c) 25, 9 (d) 25, 10

→ (a) Given,

Radius of circle = 13 cm.



By the rule of Pythagorean triplets,

$$a^2 + b^2 = c^2$$

$$\Rightarrow (10)^2 + (24)^2 = (26)^2$$

$$\Rightarrow 100 + 567 = 676$$

$$\Rightarrow 676 = 676 \text{ (proved)}$$

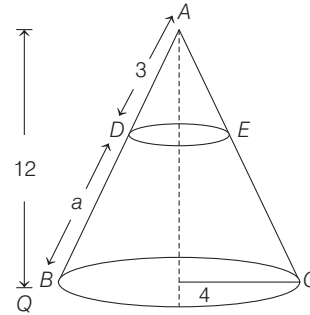
So, length of rectangle = 24 cm

Breadth of rectangle = 10 cm

86. A right circular cone, of height 12ft, stands on its base which has diameter 8 ft. The tip of the cone is cut off with a plane which is parallel to the base and 9 ft from the base. With $\pi = 22/7$, the volume, in cubic ft, of the remaining part of the cone is

→ Volume of cone $ABC = \frac{1}{3} \times \pi \times r^2 \times h$

$$= \frac{1}{3} \times 4 \times 4 \times 12 = 64\pi \text{ ft}^3$$



$$\text{Volume of cone } ADE = \frac{1}{3} \pi r^2 h$$

$$\text{In case of } ADE = \text{Ratio of height of } ABC : ADE \\ = 12 : 3 = 4 : 1$$

So, ratio of radius is also = 4 : 1

$$\text{Hence, radius of cone } ADE = \frac{4}{4} = 1 \text{ ft}$$

$$\text{Volume} = \frac{1}{3} \times \pi \times 1 \times 1 \times 3 = \pi \text{ ft}^3$$

$$\text{Volume of remaining portion} = 64\pi - \pi \\ = 63\pi = 63 \times \frac{22}{7} = 198 \text{ ft}^3$$

87. Given that $x^{2018} y^{2017} = 1/2$ and $x^{2016} y^{2019} = 8$, the value of $x^2 + y^3$ is

(a) 31/4 (b) 33/4 (c) 35/4 (d) 37/4

→ (b) Given, $x^{2018} \cdot y^{2017} = \frac{1}{2}$... (i)

$$\text{and } x^{2016} \cdot y^{2019} = 8 \quad \dots (ii)$$

In Eq. (i), the difference between the powers of x and $y = 1$

$$\text{that means } x = \frac{1}{2}$$

In Eq (ii), the difference between the powers of x and $y = 3$

that means $y = 2$

$$\text{Hence, } x^2 + y^3 = \left(\frac{1}{2}\right)^2 + (2)^3 = \frac{1}{4} + 8 = \frac{33}{4}$$

88. If x is positive quantity such that $2^x = 3^{\log_5 2}$, then x is equal to

(a) $\log_5 8$ (b) $1 + \log_5 \frac{3}{5}$ (c) $1 + \log_3 \frac{5}{3}$ (d) $\log_5 9$

→ (b) Given, $2^x = 3^{\log_5 2}$

Take log on both sides, we get

$$\log 2^x = \log 3^{\log_5 2} \Rightarrow x \log 2 = \log_5 2 \cdot \log 3$$

$$\Rightarrow x = \frac{\log_5 2 \cdot \log 3}{\log 2}$$

By dividing and multiplying $\log 5$, we get

$$x = \frac{\log_5 2 \cdot \log_5 3}{\log_5 2}$$

$$x = \log_5 3, \text{ The option does not match.}$$

Now, take option (b) and add and subtract by $\log_5 5$, we get

$$x = \log_5 5 - \log_5 5 + \log_5 3$$

$$\Rightarrow x = 1 + \log_5 \frac{3}{5} \quad \left[\text{using : } \log_a b - \log_a c = \log_a \frac{b}{c} \right]$$

89. If $\log_{12} 81 = p$, then $3\left(\frac{4-p}{4+p}\right)$ is equal to

(a) $\log_6 8$ (b) $\log_6 16$ (c) $\log_2 8$ (d) $\log_4 16$

→ (a)

$$\begin{aligned} \because \log_{12} 81 &= p && \text{[given]} \\ \Rightarrow \frac{\log 3^4}{\log 12} &= p && \left[\because \log_a x = \frac{\log \text{base } (b)^x}{\log \text{base } (b)^a} \right] \\ \Rightarrow p &= \frac{4 \log 3^3}{\log_3 2^2 + \log_3 3} && [\log ab = \log a + \log b] \\ \Rightarrow p &= \frac{4}{2 \log_3 2 + 1} \\ \Rightarrow \frac{4}{p} &= 2 \log_3 2 + 1 && [\log_3 3 = 1] \end{aligned}$$

By componendo and dividendo rule

$$\begin{aligned} \frac{4-p}{4+p} &= \frac{2 \log_3 2}{2 (\log_3 2 + 1)} \\ \Rightarrow \frac{4-p}{4+p} &= \frac{\log_3 2}{\log_3 6} = \log_3 3 = \log_6 2 \\ \Rightarrow 3\left(\frac{4-p}{4+p}\right) &= 3 (\log 6^2) = \log_6 2^3 = \log_6 8 \end{aligned}$$

90. If $\log_2 (5 + \log_3 a) = 3$ and $\log_5 (4a + 12 + \log_2 b) = 3$, then $a + b$ is equal to

(a) 32 (b) 40 (c) 59 (d) 67

→ (c)

$$\begin{aligned} \log_2 (5 + \log_3 a) &= 3 \\ \text{and } \log_5 (4a + 12 + \log_2 b) &= 3 && \text{[given]} \\ \text{We apply basic rule, } \log_a x &= t, x = a^t \\ \Rightarrow 5 + \log_3 a &= 2^3 \Rightarrow 5 + \log_3 a = 8 \\ \Rightarrow \log_3 a &= 8 - 5 = 3 \Rightarrow a = 3^3 = 27 \\ \text{Similarly, } 4a + 12 + \log_2 b &= (5)^3 \\ \Rightarrow 4(27) + 12 + \log_2 b &= 125 \Rightarrow \log_2 b = 125 - 120 \\ \Rightarrow \log_2 b &= 5 \Rightarrow b = 2^5 = 32 \\ \text{Hence, } a + b &= 27 + 32 = 59 \end{aligned}$$

91. If $u^2 + (u - 2v - 1)^2 = -4v(u + v)$, then what is the value of $u + 3v$?

(a) 0 (b) $1/4$ (c) $1/2$ (d) $-1/4$

→ (d) $\because u^2 + (u - 2v - 1)^2 = -4v(u + v)$

In case of real numbers, $a^2 + b^2 = 0 \Rightarrow a = b = 0$ [given]

So, $a = b = 0$

$$\begin{aligned} \Rightarrow u^2 + 4v(u + v) + (u - 2v - 1)^2 &= 0 \\ \Rightarrow u^2 + 4uv + 4v^2 + (u - 2v - 1)^2 &= 0 \\ \Rightarrow (u + 2v)^2 + (u - 2v - 1)^2 &= 0 \\ (u + 2v)^2 &= 0 \\ u + 2v &= 0 \\ u &= -2v && \dots(i) \end{aligned}$$

and $(u - 2v - 1)^2 = 0$

From Eq. (i), $-2v - 2v - 1 = 0$

$\therefore v = -1/4$

$$\begin{aligned} \text{Now, } u + 3v &= \frac{1}{2} + 3\left(\frac{-1}{4}\right) \\ &= \frac{1}{2} - \frac{3}{4} = \frac{2-3}{4} = \frac{-1}{4} \end{aligned}$$

92. If $f(x + 2) = f(x) + f(x + 1)$ for all positive integers x , and $f(11) = 91$, $f(15) = 617$, then $f(10)$ equals

→ Given, $f(x + 2) = f(x) + f(x + 1)$

$$\begin{aligned} \text{Here, } f(11) &= 91 \\ f(15) &= 617 \\ f(10 + 2) &= f(10) + f(10 + 1) \\ f(12) &= f(10) + f(11) \Rightarrow f(10) = f(12) - 91 \\ f(13) &= f(11) + f(12) \\ f(14) &= f(12) + f(13) \\ f(15) &= f(13) + f(14) \end{aligned}$$

So, take $f(12) = x$

$$\begin{aligned} f(13) &= 91 + x \\ f(14) &= x + 91 + x \\ f(15) &= 91 + x + x + 91 + x \end{aligned}$$

$$\Rightarrow 617 = 182 + 3x$$

$$\Rightarrow 3x = 617 - 182$$

$$\Rightarrow 3x = 435 \Rightarrow x = \frac{435}{3} \Rightarrow x = 145$$

$$\begin{aligned} \therefore f(10) &= f(12) - 91 \\ &= x - 91 = 145 - 91 = 54 \end{aligned}$$

93. The number of integers x such that $0.25 \leq 2x \leq 200$, and $2x + 2$ is perfectly divisible by either 3 or 4, is

→ $0.25 \leq 2^x \leq 200$ and $2^x + 2$ is perfectly divisible by 3 or 4.

We can take $2^x \Rightarrow 2^7$ maximum because it gives the value less than 200.

$$\text{When } x = 0, 2^x + 2 \Rightarrow 2^0 + 2 \Rightarrow 1 + 2 = 3 \quad (\checkmark)$$

$$x = 1, 2^x + 2 \Rightarrow 2^{(1)} + 2 \Rightarrow 4 \quad (\checkmark)$$

$$x = 2, 2^x + 2 \Rightarrow (2)^2 + 2 \Rightarrow 6 \quad (\checkmark)$$

$$x = 3, 2^x + 2 \Rightarrow 8 + 2 \Rightarrow 10 \quad (\times)$$

$$x = 4, 2^x + 2 \Rightarrow 16 + 2 \Rightarrow 18 \quad (\checkmark)$$

$$x = 5, 2^x + 2 \Rightarrow 32 + 2 \Rightarrow 34 \quad (\checkmark)$$

$$x = 6, 2^x + 2 \Rightarrow 64 + 2 \Rightarrow 66 \quad (\checkmark)$$

$$x = 7, 2^x + 2 \Rightarrow 128 + 2 \Rightarrow 130 \quad (\times)$$

Hence, there are 5 integers.

94. While multiplying three real numbers, Ashok took one of the numbers as 73 instead of 37. As a result, the product went up by 720. Then, the minimum possible value of the sum of squares of the other two numbers is

→ According to the question,

$$a \times b \Rightarrow (73 - 37) \times x = 720$$

$$\Rightarrow ab = 36 \times x = 720$$

$$\Rightarrow x = \frac{720}{36} = 20$$

$$\text{So, } ab = 20$$

$$\text{Now, } (a + b)^2 = a^2 + b^2 + 2ab$$

$$(a + b) \text{ minimum, when } a = b$$

$$\text{Here, } ab = 20 \quad \text{[given]}$$

$$\text{So, } a = b = \sqrt{20}$$

$$\Rightarrow \sqrt{20} \cdot \sqrt{20} = 20$$

$$\begin{aligned} \text{So, } a^2 + b^2 &= (\sqrt{20})^2 + (\sqrt{20})^2 \\ &= 20 + 20 = 40 \end{aligned}$$

$$\therefore a^2 + b^2 = 40$$

95. How many numbers with two or more digits can be formed with the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, so that in every such number, each digit is used at most once and the digits appear in the ascending order?

→ Given digits are 1, 2, 3, 4, 5, 6, 7, 8, 9.

Two digits number (minimum) = 12

Three digits number (minimum) = 123

Four digits number (minimum) = 1234 and so on.

Here, by the rule of permutation and combination

$${}^9C_2 + {}^9C_3 + {}^9C_4 + \dots + {}^9C_9 = x$$

$$[{}^nC_0 + {}^nC_1 + {}^nC_2 + \dots + {}^nC_n = 2^n]$$

$$\text{So, } {}^9C_0 + {}^9C_1 + x = 2^9$$

$$\Rightarrow 2 + 8 + x = 512$$

$$\Rightarrow x = 512 - 2 - 8$$

$$x = 502$$

There are the total 502 numbers.

96. Let $f(x) = \min\{2x^2, 52 - 5x\}$, where x is any positive real number. Then, the maximum possible value of $f(x)$ is

→ Given, $f(x) = \min\{2x^2, 52 - 5x\}$

Here, x is any positive real number,

$$f(1) = \{2(1)^2, 52 - 5(1)\}$$

$$= \{2, 47\}$$

$$f(2) = \{2(2)^2, 52 - 5(2)\} = \{8, 42\}$$

$$f(3) = \{2(3)^2, 52 - 5(3)\} = \{18, 37\}$$

$$f(4) = \{2(4)^2, 52 - 5(4)\} = \{32, 32\}$$

So, here maximum possible value of $f(x)$ is $f(4) = 32$

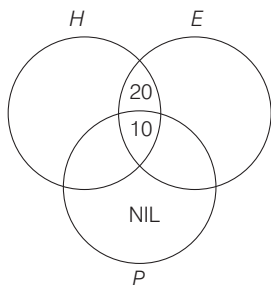
97. Each of 74 students in a class studies at least one of the three subjects. H , E and P . Ten students study all three subjects, while twenty study H and E , but not P .

Every student who studies P also studies H or E or both. If the number of student studying H equals that studying E . Then, the number of students studying H is

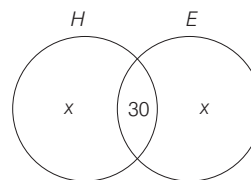
→ Total number of students = 74

Total subjects = 3 (H, E, P)

According to the question,



When $P = \text{NIL}$, then



Here,

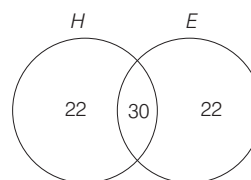
$$2x + 30 = 74$$

$$\Rightarrow 2x = 74 - 30$$

$$\Rightarrow 2x = 44$$

$$\Rightarrow x = 22$$

So,



So, the number of students studying H

$$= 22 + 30 = 52$$

98. When an equilateral triangle T_1 with side 24 cm, a second triangle T_2 is formed by joining the mid-points of the sides of T_1 . Then, a third triangle T_3 is formed by joining the mid-points of the sides of T_2 . If this process of forming triangles is continued, the sum of the areas, in sq cm, of infinitely many such triangles $T_1, T_2, T_3, \dots$ will be

(a) $192\sqrt{3}$

(b) $164\sqrt{3}$

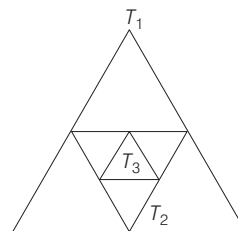
(c) $248\sqrt{3}$

(d) $188\sqrt{3}$

→ (a) Side of equilateral triangle $T_1 = 24$ cm

$$\text{Area of } T_1 = \frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} \times 24 \times 24$$

$$= 144\sqrt{3} \text{ cm}^2$$



The pattern follows geometric progression

$$\text{Here, } A_1 \text{ (Area of triangle } T_1) \left[1 + \frac{1}{4} + \frac{1}{16} + \dots + \infty \right]$$

$$\Rightarrow A_1 \times \left[\frac{a}{1-r} \right]$$

[here, a = First term r = common ratio]

$$\begin{aligned}
 &= 144\sqrt{3} \times \left[\frac{1}{1 - \frac{1}{4}} \right] \\
 &= 144\sqrt{3} \times \frac{4}{3} \\
 &= 192\sqrt{3} \text{ cm}^2
 \end{aligned}$$

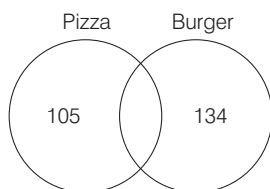
99. If among 200 students, 105 like pizza and 134 like burger, then the number of students who like only burger can possible be

- (a) 93 (b) 96
(c) 23 (d) 26

→ (a) ∵ Total number of students = 200

Students those like Pizza = 105

Students those like Burger = 134

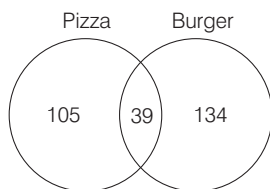


According to Venn Diagram,

Total students = 105 + 134 = 239

Extra students = 239 – 200 = 39

Here,



The persons who like Burger only

$$= 134 - 39 = 95 \text{ and } 134 - 105 = 29$$

So, $29 \leq (\text{Burgers}) \leq 95$

So, 93 students like Burgers only.

100. Let x, y, z be three positive real numbers in a geometric progression such that $x < y < z$. If $5x, 16y$ and $12z$ are in an arithmetic progression, then the common ratio of the geometric progression is

- (a) $\frac{5}{2}$ (b) $\frac{1}{6}$
(c) $\frac{3}{2}$ (d) $\frac{3}{6}$

→ (a) Given three positive real numbers = x, y, z

⇒ The given numbers are in geometric progression that means in the form of a, ar, ar^2

Now, solve the given numbers by the help of options : Take

option (i) ⇒ $\frac{5}{2}$

$5x, 16y, 12z$

Put = $(x = 1), 5(1) = 5$

$$\Rightarrow 16y = 16\left(\frac{5}{2}\right) = 40$$

$$\Rightarrow 12z = 12\left(\frac{25}{4}\right) = 75$$

So, the numbers are

$$\begin{array}{ccccc}
 5 & , & 40 & , & 75 \\
 & \underbrace{\hspace{1cm}} & & \underbrace{\hspace{1cm}} & \\
 & +35 & & +35 &
 \end{array}$$

Hence, the common ratio of GP is $\left(\frac{5}{2}\right)$.

CAT

Common Admission Test

Solved Paper 2017*

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carries equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

Section I Verbal Ability and Reading Comprehension

Directions (Q. Nos. 1-24) Read the following passage carefully and answer the questions given below it.

Passage 1

India's ambitious plans to meet its climate targets under the Paris Agreement on climate change offer a \$3.1 trillion investment opportunity by 2030 in renewable energy, green buildings, transport, infrastructure, electric vehicles and climate smart agriculture, a new report by the International Finance Corporation has said.

While green buildings represent the largest chunk, \$1.4 trillion, Alzbeta Kleiun, IFC director and global head, climate business, said it was not only the government's renewables policy but the sector's competitiveness that was driving deployment both at the utility scale and on rooftops.

Bangladesh, India, Bhutan, Maldives, Nepal and Sri Lanka together have an investment potential of \$411.4 billion in renewables. India's share is \$403.7 billion.

The IFC study examined climate investment opportunities in the six countries, which together generate 7.4 percent of global carbon dioxide emissions.

The IFC, the private investment arm of the World Bank, has since 2005 invested \$2.6 billion of its own funds in long term financing for climate smart projects in South Asia. It has also mobilised almost \$ 1 from other investors.

According to Kleiun, the IFC started doing climate business 10 years ago, beginning with the development of renewable energy mainly in Asia and Latin America and green bonds both on the IFC balance sheet and in companies where it was an investors. "Today, the climate business accounts for 25 percent of what we do. In India, the emphasis has been on renewables for six to seven years. We finance companies in India that account for 20 percent of the renewable market in the country", she said in an interview to Business Standard.

Kleiun said the IFC saw as a concrete development the willingness of the government to implement renewable energy targets, enabling policies and a regulatory environment that supported renewables. With declining prices, however it takes longer for developers to repay. So, IFC is increasing financing tenors.

Aditi Maheshwari, climate change policy specialist at the IFC, said, "Creation of green building schemes and the green building code have provided signals to property developers to enter the green building market. Financiers are increasingly aware of this. We see a \$1.4 billion opportunity during 2018-30 in this because half the buildings stock that will exist in 2030 is yet to be constructed".

Kleiun said green bonds (a tax-exempt bond issued by federally qualified organisations or by municipalities) were still a small part of the overall bond market, despite growing in double digit. This year, green bonds are expected to reach \$120 billion globally. "We're seeing investors who want green bonds in their portfolios", she added.

Maheshwari said \$3.2 billion worth of green bonds were issued till April on the basis of a framework by the Securities and Exchange Board of India and 68 percent of green bonds issued in India were for renewable energy followed by 20 percent for transport and 10 percent for green buildings. "As you see the implementation of targets and greater delivery, there will be greater issuance of green bonds," she said.

Maheshwari said the government was taking measures to address concerns surrounding contractual issues. At the same time, other components need to be addressed. For instance, clarity on withdrawal of incentives will provide certainty to investors and allow staged progression to the market. There have been signals that incentives like the renewables purchase obligation and tax holiday will be withdrawn.

"In other markets, we have seen changes to power purchase agreements have stymied growth, so they (the government) would have something to be worried about".

On the issue of tariffs, Kleiun said the cost of power generated from renewables was lower than the cost of power generated from coal in 30 emerging markets.

"When it comes to blips like the exchange rate or shortage of components, there may be some volatility. Solar and wind tariffs are extremely competitive".

1. The plans to meet climate targets have been termed ambitious. Which of the following doesn't justify the ambitious aspect of the stated target?
 - (a) It offers a bulk opportunity for investment in the years to come in the sectors of green ventures.
 - (b) Infrastructure, transport and agricultural innovations will foster in a way or the other.
 - (c) Govt. has extraordinary environmental policy to meet the stated target which is coupled with the competitiveness of the sector.
 - (d) The global head of IFC has witnessed a boom in the sectors similar to the stated one and therefore it has a high success rate.

→ (d) The statement that doesn't justify the ambitious aspect of the target is the global head of IFC has witnessed a boom in the sectors similar to the stated one and therefore it has a high success rate.
2. From the point of view of investment opportunities, how is Asia a major investment bucket?
 - (a) The investment potential in the Asian countries is high specially in renewable energy sector.
 - (b) Global carbon emission has a large share in Asian countries therefore the chances are bright for investment.
 - (c) IFC is investing in South Asia and therefore a favourable data for opportunities is reflected so that more investors can be attracted.
 - (d) Investors must be given a new venture to invest so that navity of the Purpose can be fulfilled and there remains no threat of handsome return.

→ (a) From the point of view of investment opportunities, Asia is a major investment bucket because the investment potential in the Asian countries is high specially in renewable energy sector.
3. How is Kleiun assured of a good climate business in South Asia and Latin America?
 - (a) The Climate business was started 10 years ago and it has paid on well till now.
 - (b) The relative proportion of investment in the climate business is growing each day which is expected to rise in future.
 - (c) The govt is willing to expand its policy on renewable energy targets and that gives a boost to the opportunity.
 - (d) All of the above

→ (d) Kleiun is assured of a good climate business in South Asia and Latin America. All the given statements are correct.
4. The market has responded well to the policy of green ventures. Which one of the following is not encouraging as per the passage.
 - (a) A lot of interest can be seen among the property and estate developers in the green ventures.
 - (b) Green bonds, despite having a double digit growth, were just a small fraction of the total bond market.
 - (c) The intention of investors to have green bonds in their portfolio is indicative of the prospect.
 - (d) A large number of green bonds issued by SEBI comes under the renewable energy market.

→ (b) Green bonds, despite a double digit growth, were just a small fraction of the total bond market. This statement is not encouraging as per the passage.

5. What impact can be anticipated on the issuance of green bonds with the onset of change in infrastructure?
- (a) Road transport and green vehicles will be sold more for they are the in the core of the target and more bonds will be sold.
 - (b) Green bonds will be sold rapidly initially for there is a huge demand in the beginning but with the passage of time they will see a decline in its sale.
 - (c) With the target around the corner, the bonds will be sold in plenty but with cost involved in it, a decline is on the cards later on.
 - (d) Govt. will buy more bonds than the private buyers because vulnerability of returns is a major concern for the individual and corporate investors.
- (a) With the onset of change in infrastructure, the anticipation on the issuance of green bonds will be that road transport and green vehicles will be sold more for they are in the core of the target and more bonds will be sold.
6. Green bonds have some serious flaws with them which may hinder its purchasing. Out of the given options, choose the one that is not a hindrance.
- (a) There are contractual issues and a few other components that needs to be addressed seriously.
 - (b) Govt is worried about the changes that can power the purchase agreement and it has an effect on the purchasing of the green bonds.
 - (c) The energy tariffs from the renewable sources are highly competitive which is fair enough to attract the investors.
 - (d) Concerning the energy markets in thirty countries it is evident that the output in renewable sources of energy is lower than that of from conventional sources.
- (c) It is not a hindrance with the green bonds that the energy tariffs from the renewable sources are highly competitive, which is fair enough to attract the investors.

Passage 2

Many firms fail because when they begin exporting, they have not researched the target markets or have not developed an international marketing plan to be successful. A firm must clearly define goals, objectives and potential problems. Secondly, it must develop a definite plan to accomplish its objective regardless of problems involved. Unless the firm is fortunate enough to possess a staff with considerable expertise, it may not be able to take this crucial first step without qualified outside guidance.

Often top management is not committed enough to overcome the initial difficulties and financial requirements of exporting. It can often take more time and effort to establish a firm in a foreign market than in domestic one.

Although, the early delays and costs involved in exporting may seem difficult to justify when compared to established domestic trade, the exporter should take a more objective view of this process and carefully monitor international marketing efforts through these early difficulties. If a good foundation is laid for export business, the benefits derived should eventually out-weigh the investment. Another problem area is in the selection of foreign distributor.

The complications involved in overseas communications and transportation require international distributors to act with greater independence than their domestic counterparts also since a new exporter's trademarks and reputation is usually unknown in the foreign market. Foreign customers may buy on the strength of distributing agent's reputation. A firm should, therefore, conduct a thorough evaluation of the distributor's facilities, the personnel handling, its account and managements methods employed.

Another common difficulty for new exporter is the neglect of the export market once the domestic one booms : too many companies only concentrate on exporting when there is recession. Others may refuse to modify products to, meet the regulations or cultural preferences of other countries, local safety regulations cannot be ignored by exporters. If necessary, modifications are not made at the factory, the distributor must make them, this is usually at a greater cost and probably not as satisfactory as it should be. It should also be noted that the resulting smaller profit margin makes the account less attractive.

If exporters expect distributing agents to actively promote their accounts, they must be trained and their performance must be continually monitored. This requires a company's marketing executive to be located permanently in the distributor's geographical areas until there is sufficient business to support the representative.

The distributor should also be treated on an equal basis with domestic counterparts, for example, special discount offers, sales incentive programmes and special credit terms should be available.

Considering a joint venture or licensing agreement is another option for new exporters. However, many companies still dismiss international marketing as unviable. There are a number of reasons for this. There may be import restrictions in the target market. The company may lack sufficient financial resources or its product line may be too limited. Yet many products that can compete on a national basis can be successful in the majority of world markets.

In general, all that is needed for success is flexibility in using the proper combinations of marketing techniques.

7. New exporters often make the mistake of ignoring the export market, when
- (a) distribution costs are too high
 - (b) their product is selling well at home
 - (c) there is a global economic recession
 - (d) distributors cannot make safety modifications
- (b) New exporters often make the mistake of ignoring the export market when their product is selling well at home.
8. For a distributor to be successful, the exporter, must
- (a) focus on one particular region
 - (b) finance local advertising campaigns
 - (c) give the same support as to domestic agents
 - (d) make sure there are sufficient marketing staff locally
- (c) For a distributor to be successful, the exporter must give the same support as to domestic agents.
9. The writer states that some companies are reluctant to export because
- (a) there is little demand for their products
 - (b) the importation of certain goods is controlled
 - (c) they do not have good marketing techniques
 - (d) they are not able to compete with local business
- (c) The writer states that some companies are reluctant to export because they don't have good marketing techniques.
10. In the first paragraph, the writer suggests that firms thinking about exporting should
- (a) get professional advice
 - (b) study international marketing
 - (c) identify the most profitable markets
 - (d) have different objectives to other exporters
- (b) The firms that are thinking about the exporting business must study and research the international marketing.
11. The writer believes that if sufficient preparation is undertaken
- (a) initial difficulties can be easily avoided
 - (b) the costs can be recovered quite quickly
 - (c) management will become more committed
 - (d) the exporter will be successful in the long term
- (d) The writer believes if sufficient preparation is undertaken then the exporter will be successful in the long run.
12. An exporter should choose a distributor who
- (a) has experienced personnel
 - (b) has good communication skills
 - (c) is well established in the target market
 - (d) is not financially dependent on import business
- (c) An exporter should choose a distributor who is well established in the target market.

Passage 3

A majority of Indians prefer to use the internet for accessing banking and other financial services than shopping online, shows a new survey. Almost 57% of Indian respondents using the internet prefer to bank online and use other financial services due to hassle-free access and time saving feature of online banking according to the survey.

Checking information on products and services online comes a close second at 53% while 50% shop for products online. The fourth on the list-around 42%, of respondents in India surfed online to look for jobs, the survey said.

Online banking has made things much easier for the people and it saves a lot of time.

It has eliminated the problems associated with traditional way of banking where one had to stand in a queue and fill up several forms. Most of the banks in India have introduced customer-friendly online banking facility with advanced security features to protect customers against cybercrime. The easy registration process for net banking has improved customers access to several banking products increased customer loyalty, facilitated money transfer to any bank across India and has helped banks attract new customers.

The Indian results closely track the global trends as well conducted among 19216 people from 24 countries. The survey showed that banking and keeping track of finances and searching for jobs are the main tasks of internet user around the globe.

Overall, 60% of people surveyed used the web to check their bank account and other financial assets in the past 90 days, making it the most popular use of the internet globally shopping was not too far behind at 48%, the survey showed and 41% went online in search of a job in terms of country preferences, almost 90% of respondents in Sweden use e-banking. Online banking has also caught on in a big way in nations, like France, Canada, Australia, Poland South Africa and Belgium, the survey showed.

The Germans and British come on top for using online shopping with 74% of respondents in both countries having bought something online in the past 3 months. They are followed by 68% of respondents in Sweden, 65% in US and 62% in South Korea.

- 13.** If the given sentences were to be arranged in their order of their popularity (from most popular to least popular), which one of the following would represent the correct sequence as given in the passage?
- A. Use internet to gain information about products and services.
 B. Use internet to search for jobs.
 C. Use internet for online banking.
- (a) B, A, C (b) C, B, A
 (c) C, A, B (d) A, B, C
- (c) C, A, B is the correct sequence.
- 14.** Which of the following is not true in the context of the passage?
- (a) Internet users across the globe are mainly interested in looking for jobs and keeping track of finances
 (b) Germany and Great Britain are the top countries where online shopping is quite popular
 (c) Many people in Sweden use e-banking to maintain their finances
 (d) A majority of Indians prefer shopping online as compared to other online activities
- (d) In the context of the passage, it is not true that a majority of Indians, prefer shopping online as compared to other online activities.
- 15.** According to the passage, banks are successful in attracting more customers due to
- A. better training to sales staff.
 B. opening more branches at various locations.
 C. easy registration process for net banking .
- (a) Only C (b) B and C
 (c) A and B (d) A and C
- (a) According to the passage, banks are successful in attracting more customers due to easy registration process for net banking.
- 16.** Which of the following can be the appropriate title for the passage?
- (a) The Growing Utility of the Internet
 (b) Internet and Its Drawbacks
 (c) The Traditional versus Modem Ways of Shopping
 (d) Use of the Internet in Different Countries
- (a) Appropriate title for the passage could be "The Growing Utility of the Internet."
- 17.** How many of the Indians are using the internet to shop online?
- (a) Between 40% and 50% (b) One-fourth of them
 (c) One-third of them (d) Half of them
- (d) Half of the Indians are using the Internet to shop online.
- 18.** Based on the passage, what can be said about the internet in a nutshell?
- (a) It has increased the number of cybercrimes
 (b) It is useful only for the rich
 (c) It has been hyped for no reason
 (d) It has made lives easier than before
- (d) Based on the passage, it can be said that internet has made lives easier than before.

Passage 4

The understanding that the brain has areas of specialisation has brought with it the tendency to teach in ways that reflect these specialised functions. For example, research concerning the specialised functions of the left and right hemispheres has led to left and right hemisphere teaching. Recent research suggests that such an approach neither reflects how the brain learns, nor how it functions once learning has occurred.

To the contrary, in most higher vertebrates brain systems interact together as a whole brain with the external world. Learning is about making connections within the brain and between the brain and the outside world.

What does this mean? Until recently, the idea that the neural basis for learning resided in connections between neurons remained a speculation. Now, there is direct evidence that when learning occurs, neuro-chemical communication between neurons is facilitated and less input is required to activate established connections over time.

This evidence also indicates that learning creates connections between not only adjacent neurons but also between distant neurons and that connections are made from simple circuits to complex ones and from complex circuits to simple ones.

As connections are formed among adjacent neurons to form circuits, connections also begin to form with neurons in other regions of the brain that are associated with visual, tactile and even olfactory information related to the sound of the word. Meaning is attributed to sounds of words because of these connections.

Some of the brain sites for these other neurons are far from the neural circuits that correspond to the component sounds of the words; they include sites in other areas of the left hemisphere and even sites in the right hemisphere. The whole complex of interconnected neurons that are activated by the word is called a neural network. In early stages of learning, neural circuits are activated piecemeal, incompletely and weakly. It is like getting a glimpse of a partially exposed and blurry picture. With more experience, practice and exposure, the picture becomes clearer and more detailed.

As the exposure is repeated, less input is needed to activate the entire network. With time; activation and recognition become relatively automatic and the learner can direct her attention to other parts of the task. This also explains why learning takes time.

Time is needed to establish new neural networks and connections between networks. This suggests that the neural mechanism for learning is essentially the same as the products of learning. Learning is a process that establishes new connections among networks. The newly acquired skills or knowledge are nothing but formation of neural circuits and networks.

- 19.** It can be inferred that for a nursery student, learning will
- comprise piecemeal ideas and disconnected concepts
 - be a pleasant experience due to the formation of improved connections among neurons
 - lead to complex behaviour due to formation of new connections among neurons
 - be better if discrete subjects are taught rather than a mix of subjects

→ (a) Option (b) is not talked about anywhere in the passage. Option (c) is wrong as new connections make reality more intelligible. Option (d) is also wrong because learning would be tedious had the subjects are not related to each other. Hence, option (a) is appropriate.

- 20.** Read the following statements and answer the question that follows.

- The two hemispheres of the brain are responsible for learning autonomously.
- Simultaneous activation of circuits can take place in different areas of the brain.
- There are specific regions of the brain associated with sight, touch and smell.

- The brain receives inputs from multiple external sources.
- Learning is not the result of connections between neurons.

Which of the above statements are consistent with ideas expressed in the passage?

(a) 1, 5	(b) 2, 3
(c) 3, 5	(d) 4, 5

→ (b) Statements 2, 3 are consistent with the ideas expressed in the passage.

- 21.** Which of the following proverbs best describes the passage?

- When student is ready, the master appears
- Child is the father of the man
- All's well that ends well
- Many a mickle makes a muckle

→ (d) Option (a) is not correct truly because it doesn't capture that learning is cumulative and connected. There has no mention of learning which is an interaction between master and pupil. Option (c) is irrelevant as there is no ultimate objective of learning. Option (d) contradicts the idea. Option (b) is also out of context.

Passage 5

Rising inflation, coupled with a new packaging legislation, will make price hikes of packaged foods inevitable, says the Divisional Chief Executive of ITC's foods division. On one hand, the costs of inputs such as raw material, furnace oil and packaging material and even logistics have gone up, while on the other, the new packaging law that bans producers from reducing the quantity inside the packet; will leave them with no choice but to raise prices.

This new Legal Metrology Act is likely to come into force shortly. At present, FMCG companies rely on reduced quantity to tackle rising inflationary pressure on input costs rather changing the price points owing mainly to coinage issues. The new Act will make the price-point concept impossible, he said, On the demand supply side he said the company had to make a lot of efforts to meet the spurt in demand for its cream biscuits.

Giving an example, he said the company's premium range offerings such as Dark Fantasy and Dream Cream Bourbon have witnessed a growth of 118% in the second quarter over the first. Even other Sunfeast premium creams have shown a growth 72 percent in Q2 over Q1. Responding to a question on competition from global brands such as Oreo (from Kraft Foods), McVitie's from (United Biscuits), and domestic brands such as Parle and Britannia, he said international competition is a reality.

It is good as it aids 'premiumisation' of the category. He said this has actually enriched Sunfeast portfolio last year.

On the domestic front, given the emerging trends in consumption patterns, the biscuit market offers enormous opportunities, scope for improvement both in terms of new products and segments and also in terms operational excellence. The fields of play is large and we are encouraged and really excited about the years ahead, he said. At present, ITC's Sunfeast is the third largest national player after Parle and Britannia. The brand has 10% share of the ₹ 15000 crore biscuit market. And, within this, in the creams segment (which accounts for over ₹ 3500 crore) Sunfeast commands 15% share.

22. How has competition from foreign brands affected the Indian biscuit market?
- A. Only the three largest manufacturers survived; while the smaller ones withered away.
 - B. The range of categories available to the Indian consumers has expanded.
 - C. The foreign brands got restricted to premium categories only; leaving the field open to domestic brands in non-premium categories.
- (a) A and B
 - (b) B and C
 - (c) Only B
 - (d) A, B and C
- (c) Only option (b) can be inferred from the passage. It is implied in the lines, on the domestic front, given the emerging trends in consumption patterns, the biscuit market offers enormous opportunities, scope for improvement both in terms of new products and segments.
23. The price-point concept discussed in the passage is referring to
- (a) fixing prices of packaged foods in round figures for earlier of payment at the point of purchase
 - (b) prices to be fixed by the government
 - (c) variations of prices from point-to-point in any city
 - (d) None of the above
- (a) The price point concept discussed in the passage is referring to fixing prices of packaged foods in round figures for ease of payment at the point of purchase.
24. It can be accurately inferred from the passage that
- (a) Parle is the largest selling brand of biscuits in India
 - (b) Sunfeast is the third largest selling brand of cream biscuits in the country
 - (c) competition from foreign brands has adversely affected the sales of Sunfeast
 - (d) All of the above
- (a) It can be accurately inferred from the passage that Parle is the largest selling brand of biscuits in India.

Passage 6

Directions (Q.Nos. 25-27) The Passage given below is followed by four summaries. Choose the option that best captures the authors's position.

In the world today, we make health and end in ourselves. We have forgotten that health is really means to enable a person to do his work and does it well. A lot of modern medicine and this includes many patients as well as many physicians pays very little attention to health but very much attention to those who imagine that they are ill. Our great concern with health is shown by the medical columns in newspapers. The health articles in popular magazines and the popularity of television programmes and all those books on medicine. We talk about health all the time. Yet for the most part, the only result is more people with imaginary illness. The healthy man should not be wasting time talking about health. He should be using health for work. The work does the work that good health possible.

25. (a) People should pay attention to their health and make sure how they can achieve it. Just being interested in the different types of medical stories and journals won't do any good.
- (b) People show concerns about their health but they avoid paying attention to it and later on, they repent over it as the time gets passed away.
- (c) Mere watching of the TV shows on health issues and reading of the health magazines are not the steps to ensure the good health but a mere false reality.
- (d) People are in general imaginary about their illness and don't pay much attention to it, thereby, putting an undue stress on their health which results in their increased attention towards health.
- (a) The passage is a critical analysis of the different aspects of health. It also deals with the mindset of the people towards keeping themselves fit and fine. Considering all these points, we can say that the theme of the passage lies in the statement. "People should pay attention to their health and make sure how they can achieve it. Just being interested in the different types of medical stories and journals won't do any good".

Passage 7

A Delhi court sent Unitech Ltd promoters Ajay Chandra and Sanjay Chandra to police custody in an alleged fraud case related to a Gurugram-based real estate project. Metropolitan Magistrate sent the accused persons to two-day police custody after the probe agency said their custodial interrogation was required to find out the alleged money trail and the beneficiaries of the transactions. The agency had sought three days remand of both the accused claiming they were not cooperating in the investigation.

The counsel for the accused, however, opposed the remand plea, saying the police have already searched the premises of the accused and they cannot be forced to give any incriminating evidence against them. He urged the court to send the accused persons to judicial custody, saying the arrest was not required.

"The accused were arrested for not developing a project, Anthea Floors, at Gurugram" a probe officer said, adding 91 people have invested Rs35 crore in the project.

26. (a) The Chandras are accused of not developing the real estate project worth 35 crores as there are suspicions of the money being laundered in other ways to make it a huge profit for them.
- (b) The court sent the two promoters- The Chandras, to a police -custody of two days for being accused of not developing a real estate project worth 35 crores at Gurugram involving around hundred persons.
- (c) The court found the Chandras guilty of not developing the real estate project that has investment from more investors who seek relief from the court and thus custody is granted to the police.
- (d) The court is in a fix about the Chandras being guilty of an alleged involvement in the hidden profit worth 35 crores in a real estate project at Gurugram.
- (b) The passage describes the case of a possible cheat by the Chandras regarding a project based at Gurugram in which they are supposed to have some monetary gains and the court is in the process to find out the truth. Theme of the passage lies in the statement. "The court sent the two promoters - The Chandras, to a police custody of two days for being accused of not developing a real estate project worth 35 crores at Gurugram involving around hundred persons".

Passage 8

Over 90 stalls were put up at the German Christmas market at the Indo-German Chamber of Commerce this year and the buyers had plenty to choose from. This fair has plenty of options, unlike shops. The attendees told us that the fair at the market changes every year. Mira Sachdeva, who works for an event management company, said, "I was looking for huge candles for ceremonial lighting, but, this year their designs are different, so I have placed orders for them." Julianne, a French national who was shopping for gifts, told that plants could be the best gifts this Christmas. She said, "This is not a proper Christmas fair but quite close. I liked the bonsai collection a lot and considering the pollution in Delhi, I think plants are the best gifts to give on Christmas." Another shopper Maia, from the US, told, "You can find decorative items in any market but the wooden Santa and the woollen dolls are unique here."

27. (a) The fair has a lot of things to offer ranging from bonsai to the beautiful candles and trees. Also the fair is a matter of great joy for those who are to shop here, as they have got a length of articles to choose from and the prices are never dear to them.
- (b) The fair at the German Christmas market is an attraction to the people who come here to shop because the fair offers a range of articles and it also considers the element of pollution level in Delhi- a good initiative on the go.
- (c) The German Christmas market has to offer much more things than a traditional shop and all those who are shopping there admit the same and they consider that the trees are the best gift to present, for the pollution level in Delhi is damn high.
- (d) The pollution level in Delhi has forced the organisers of the fair to go for the articles that are environment friendly and that also meet the budget of the shoppers so that they can come in a large numbers and making it a huge success.

→ (c) The passage describes the German Christmas market and the things it offers for sale on the occasion of Christmas. The theme of the passage can best be understood by the Statement (c) that is "The German Christmas market has to offer much more things than a traditional shop and all those who are shopping there admit the same and they consider that the trees are the best gift to present for the pollution level in Delhi is damn high."

Direction (Q. No. 28) The five sentences labelled as 1,2,3,4,5 are given in this question. When these are sequenced properly, these form a meaningful paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

28. (1) Let us take a look at the manner in which the traditional bank adds value to the customer.
- (2) The ability to retain deposits, in itself, is not enough to ensure long-term survival and growth.
- (3) The ability to deploy invested funds into productive economic activity at a higher rate of return, hence contributing to the prosperity of both the economy and the institution, is the other loop in the banking cycle.
- (4) Further, as only a small portion of the actual deposit base is retained with the bank in a liquid form, the very survival of the bank lies in building enough trust with its clientele so as to prevent the occurrence of a sizeable chunk of simultaneous customer withdrawal (a run on the bank).
- (5) The bank's basic job is risk absorption- it takes money, which has a lot of attached risk, and provides the customer an assured rate of return.

→ 15423

Direction The five sentences labelled as 1,2,3,4,5 are given in this question. When these are sequenced properly, these form a meaningful paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

29. (1) Over the years, I have had the opportunities to observe and understand the thought processes behind the ads that have been flooding both the print and the TV media.
 (2) Although there is a huge shift in the quality of ads that we come across on a daily basis thanks essentially to improvement in technology, I somehow can't help but feel that the quality of communication of the message has become diluted.
 (3) Proportionally, the number of ads that lack in quality, have gone up exponentially as well !!
 (4) There is an increasing attempt by most companies to be seen as cool and funky.
 (5) Another reason could be the burgeoning number of companies, which means an exponential increase in the number of ads that are being made.

→ 12453

Direction The five sentences labelled as 1,2,3,4,5 are given in this question. When these are sequenced properly, these form a meaningful paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

30. (1) They argue that it is this, which has led to the bankruptcy in many states.
 (2) Here was a commission whose members worked very hard, did exemplary research and homework, before coming up with a list of recommendations that balanced economic efficiency with safety nets for disadvantaged labour.
 (3) It reminds us of the political shenanigans during the implementation of the Fifth pay Commission.
 (4) How many times have you heard experts, politicians and the finance minister refer to the implementation of the pay hikes following the commission's report as the singular cause for the increase in government expenditure?
 (5) Barring P. Chidambaram, who was then the finance minister, every single political party and politician opposed the implementation of the recommendations and are directly responsible for the current fiscal crises in the Centre and the states.

→ 34125

Direction The five sentences labelled as 1,2,3,4,5 are given in this question. When these are sequenced properly, these form a meaningful paragraph. Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

31. (1) The general impressions that skilled negotiators seem to convey is they are people who keep their cards close to their chest and do not reveal their feelings.
 (2) Hence, they used a surrogate method they countered the number of times that the negotiators talked about their feelings or motives.

- (3) This contrasts sharply with the amount of information given about external events such as facts, clarifications and general expressions of opinion.
 (4) The results showed that contrary to the general impressions, skilled negotiators are more likely to give information about internal events than are average negotiators.
 (5) Feelings are in themselves not observable and Huthwaite's researchers could not measure them directly.

→ 15243

Direction Five sentences related to a topic are given below. Four of them form a meaningful and coherent short paragraph. Identify the odd one out.

32. (1) Even the enormous, impregnable stupidity of our High Command on all matters of psychology was penetrated by a vague notion that a few "writing fellows" might be sent out with permission to follow the armies in the field, under the strictest censorship, in order to silence the popular clamour for more news.
 (2) We want to know more about their heroism, so that it shall be remembered by their people and known by the world.
 (3) Lord Kitchener, prejudiced against them, was being broken down a little by the pressure of public opinion, which demanded more news of their men in the field than was given by bald communiques.
 (4) Dimly and nervously they apprehended that in order to stimulate the recruiting of the New Army now being called to the colours by vulgar appeals to sentiment and passion, it might be well to "write up" the glorious side of war as it could be seen at the base and in the organization of transport, without, of course, any allusion to dead or dying men, to the ghastly failures of distinguished generals, or to the filth and horror of the battlefields
 (5) In 1915, the War Office at last moved in the matter of war correspondents.

→ Sentence (2) is the odd one out.

Direction Five sentences related to a topic are given below. Four of them form a meaningful and coherent short paragraph. Identify the odd one out.

33. (1) Since our economy is heavily dependent on cash, demonetisation has caused a lot of problems and imbalance in the functioning of the nation.
 (2) The effects are more severe as only less than half the population uses banking system for monetary transactions.
 (3) The aim of demonetisation was to free the society of black money and make the terrorists powerless who had entered our country.
 (4) Demonetisation has hit trade and consumption hard and has severely affected the wages and income of huge masses of people.
 (5) With people scrambling for cash to pay for goods and services, the move is likely to take a big toll on the country's growth and output during the current fiscal.

→ Sentence (3) is the odd one out.

Direction Five sentences related to a topic are given below. Four of them form a meaningful and coherent short paragraph. Identify the odd one out.

- 34.** (1) The 11 Principles of Effective Character Education are the cornerstone of philosophy on effective character education.
 (2) Each principle outlines vital aspects of character education initiatives that should not be overlooked in program implementation.
 (3) A principal needs to possess a leadership quality in order to enhance the education quality at school.

- (4) From curriculum integration to extra-curricular activities, from parent and community partnerships to staff development, the 11 Principles of Effective Character Education offer fundamental guidance for educators and community leaders to maximize their character education outcomes.
 (5) This document serves as an excellent outline for program planning and can easily be integrated into staff development and self-evaluation.

→ Sentence (3) is odd one out.

Section II Data Interpretation and Logical Reasoning

Directions (Q. Nos. 35-38) Five colleagues pooled their efforts during the office lunch-hour to solve the crossword in the daily paper.

Colleagues : Mr. Vinay, Mr. Eric, Ms. Ally, Ms. Shelly, Ms. Bela

Answer : Burden, Barely, Baadshah, Rosebud, Silence.

Numbers : 4 down, 8 across, 15 across, 15 down, 21 across.

Order: First, second, third, fourth, fifth.

- Bela produced the answer to 8 across, which had the same number of letters as the previous answer to be inserted and more than the subsequent answer which was produced by one of the men.
- It was not Vinay who solved the clue of 'Burden', and Eric did not solve 4 down.
- The answers to 15 across and 15 down did not have the same number of letters.
- 'Silence', which was not the third word to be inserted, was the answer to an across clue
- 'Barely' was the first word to be entered in the grid, but 'Baadshah' was not the second answer to be found.
- Ally's word was longer than Vinay's, Shelly was neither the first nor the last to come up with an answer.
- Fifth one to be worked out was an answer to an across clue.

Solutions. (Q. Nos. 35-38)

First	Vinay	Barely	4 down
Second	Shelly	Silence	15 across
Third	Bela	Rosebud	8 across
Fourth	Eric	Burden	15 down
Fifth	Ally	Baadshah	21 across

35. What was Shelly's word?

→ Shelly's word was 'Silence'.

36. What could be Bela's answer?

→ Bela's answer could be 'Rosebud'.

37. What was Bela's order?

→ Bela's order was third.

38. What was Eric's number?

→ Eric's number was '15 down'.

Directions (Q. Nos. 39-42) Refer to the following data and the given table to answer the questions that follow.

The G8 is an association of South East Asian countries to resolve their trade disputes. Every year, 24 countries elect their chairperson. For this, several rounds of voting are done, the details of which is given below

- For the post of chairperson, only member countries of the G8 can nominate at the most one candidate per country.
- For the post of chairperson for the year 2007-2008, four people, Audi, Boxer, Coffee and Dimply are contending.
- In each round of voting the candidate with the minimum number of votes is eliminated such that the person with the maximum votes at the last of the voting process is designated the chairperson of G8.
- While voting, the member countries whose members are in the contention can cast a vote and for only one member in contention.
- A member country is eligible to vote for at the most two candidates in the entire voting process.
- Candidates Audi and Boxer retain their votes from all the previous rounds as long as they were in contentions for the post of the chairperson.
- 25% of those who voted for Coffee in round I voted for Boxer in round 2.
- Those who voted for Dimply in round I voted for either Boxer or Coffee in round 2.
- Half of those who voted for Coffee in round 1 voted for Boxer in round 3.

- (x) All countries whose candidates are in contention voted for their own candidates as long as they were in contention.

The following table gives some more information regarding the voting pattern in different rounds of voting that happened.

Round	Total Votes	Minimum votes for		Maximum votes for	
		Candidate	Votes	Candidate	Votes
1		D	24	A	60
2	163	C	39	B	64
3	147				

39. Which of the following statements is necessarily true?

- (i) 16 candidates who voted for Dimply in round 1 voted for Coffee in round 2
 (ii) Audi won the election in round 3 by a margin of 3 votes
 (a) Only (i) (b) Only (ii)
 (c) Both (i) and (ii) (d) None of these

→ (b) The total number of votes in round 1 is 164 as the country of Dimply is also allowed to vote. Audi gets 60 votes and Dimply gets 24 votes. Hence total votes obtained by Boxer and Coffee is $164 - (60 + 24) = 80$ votes

Since in round 3, the total number of votes is 147. Hence the 15 countries that are ineligible to vote + the country that voted for dimply in round and for coffee in round 2 were ineligible to vote in round 3.

The remaining $24 - 15 - 1 = 8$ countries who voted for Dimply in round 1 voted for Boxer in round 2. Since 15 countries who voted for Dimply in round 1, voted for Coffee in round 2 and the number of members who voted for coffee in both the rounds 1 and 2 should be 24 ($24 + 15 = 39$). As 25% of those who voted for Coffee in round 1 voted for Boxer in round 2, $24 = 75\%$ of those who voted for Coffee in round 1 which is 32.

Obviously, number of voted for Boxer in round 1 would be $80 - 32 = 48$. In the third round, half of those who voted for Coffee in round 1 voted for Boxer. Hence, total votes for Boxer = $48 + 16 + 8 = 72$. Hence, total votes in round 3 are 147. So, votes for Audi in round 3 = 75

Hence, Statement (ii) is true.

40. How many countries who voted for Dimply in round 1 voted for Boxer in round 2?

- (a) 8 (b) 7
 (c) 9 (d) None of these

→ (a) From the above discussion, it is clear that the answer is 8.

41. What is the number of votes casted for candidate Coffee in round 1?

- (a) 28 (b) 29
 (c) 30 (d) None of these

→ (d) From the above discussion it is clear that the answer is 32.

42. Among the members who voted for Coffee in round 2 and were still eligible to vote in round 3, what percentage voted for Audi in round 3?

- (a) 64.8% (b) 66.7% (c) 65.9% (d) 65.2%

→ (d) Members who voted for Coffee in round 2 = 39 out of which members eligible to vote in round 3 were $39 - 15 - 1 = 23$. Also those who voted for candidate Audi = 15. Hence required percentage = $\frac{15}{23} \times 100 = 65.2\%$.

Directions (Q. Nos. 43-46) Read the given information and answer the questions that follow.

In a bar, there are seven frequent visitors who visit the bar daily. On being asked about their visit to the bar last Sunday, the following were the answers

Jai Chand : I came in first and the next two persons to enter were Sohan Singh and Shail Munshi. When I left the bar, Jai Prakash and Vinod Rai were present in the bar. Deepak Garg left with me.

Jai Prakash : When I entered the bar with Vinod Rai, Jai Chand was sitting there. There was someone else also, but I was not in a position to recognise him.

Shail Munshi : I went to the bar for a short while last Sunday and met jai Chand, Sohan Singh and Deepak Garg there.

Sohan Singh : I left immediately after Shail Munshi left.

Deepak Garg : I met Jai Chand, Sohan Singh, Shail Munshi, Jai Prakash and Vinod Rai during my first visit to the bar. But I got an urgent call and came out of the bar with Jai chand. When I went to the bar a second time, Jai Prakash and Vinod Rai were there.

Pradeep Kumar : I had some urget work, so I did not sit in the bar for a long time. Jai Prakash and Deepak Garg were the only people in the bar while I was there.

Vinod Rai : I was drunk and I don't remember anything.

43. Who among Jai Prakash and Deepak Garg, entered the bar first?

- (a) Jai Praksh
 (b) Deepak Garg
 (c) Both entered together
 (d) Cannot be determined

44. Who was sitting with Jai Chand when Jai Prakash entered the bar?

- (a) Sohan Singh (b) Shail Munshi
 (c) Deepak Garg (d) Pradeep Kumar

45. How many of the seven members did Vinod Rai meet on Sunday in the bar?

- (a) 2 (b) 3 (c) 4 (d) 5

46. Who were the last two persons to leave the bar?

- (a) Jai Chand & Deepak Garg
 (b) Pradeep Kumar & Deepak Garg
 (c) Jai Praksh & Pradeep Kumar
 (d) Jai Prakash & Deepak Garg

Solutions. (Q. Nos. 43-46)

This question looks extremely complicated due to the multiple statements, but the main issue required to be resolved while solving this question is the structure of the diagram. (A very similar question had been asked in CAT and was preaztically left by everybody since solvers could not make heads or tails of the situation.) While solving this question concentrate mainly on who is present in the bar at different times of the day and correlate this information to the statements. Also try to number the events so as to order the various going ins and coming outs of the people.

Statement of	Reactions
Jaichand (JC)	Event 1 : JC comes in Event 2 : Sohan Singh (SS) comes in. Event 3 : Shail munshi (SM) comes in. Constraints : JC leaves with Deepak Garg (DG) leaving Jai Prakash (JP) and Vinod Rai (VR)
Jai Prakash (JP)	Event (Number not known) : JP and VR enter. Constraint : JC and Someone else was there.
Shail Munshi (SM)	Event : SM enters Constraint : Meets JC, SS and DG
Sohan Singh (SS)	Event x : SM leaves Event (x + 1) : SS leaves
DG	Event : DG enters. constraints : Meets JC, SS, SM, JP and VR during his first visit. Event : DG enters for second time. Constraint : JP and VR are there when DG enters again. (No one else present).
PK	Event : PK enters Constratin : Only JP and DG present at this time
VR	No info. Deductions : When JP and VR enter only 2 people are there. We also know the first 3 events JC enters, SS enters and SM enters. Also, DG meets JC, SS, SM, JR & VR in his first visit. This gives us that : Event 4 : DG enters Event 5 : SM leaves Event 6 : SS leaves Event 7 : JP and VR enter (at this time only JC and DG will be there) Event 8 : JC and DG leave (Now only JP and VR will be present) Event 9 : DG comes back again (now JP, VR and DG are inside) Event 10 : VR leaves (since when PK enters only JP and DG are there) Event 11 : PK enters. Event 12 : PK leaves

43. (b) DG enters before JP.

44. (c) DG was sitting there (Event 7).

45. (b) NR meets JC, DG and JP. He comes in after SM and SS have left and leaves before PK enters. Hence, he meets only 3 people.

46. (d) JP and DG must be leaving last since they are there when PK leaves.

Directions (Q. Nos. 47-50)

The table below shows the number of goals scored by the top four International footballers in all International matches played for each year from 2013-2016.

The goals scored by the four top goal scorers for each year between 2013 and 2016 have been represented as P, Q, R and S in no particular order. It was the same set of four footballers- Lionel Messi, Neymar Jr., Wayne Rooney & Cristiano Ronaldo. (in no particular order) who were the top goal scorers in each year.

	P	Q	R	S
2013	51	53	61	55
2014	57	58	55	49
2015	61	62	65	66
2016	60	47	48	50

The following additional information is provided too :

Lionel Messi was the highest goal scorer in either 2015 or 2016

The total number of goals scored in the four years by Neymar Jr. and Cristiano Ronaldo differ by 9

The letter representing Wayne Rooney, was neither P nor S

47. If the difference in the number of goals scored by Cristiano Ronaldo and Lionel Messi is 3, in 2016, then in how many years did Wayne Rooney score more than 60 goals?

- (a) 0 (b) 1
(c) 2 (d) Cannot be Determined

48. The highest possible number of goals scored by Wayne Rooney and Neymar Jr. together in any of these four years is?

- (a) 128 (b) 130
(c) 126 (d) 127

49. Given the two statements. What can be definitely said regarding the goals scored by the footballers?

Statement 1 The number of goals scored by Neymar Jr. in 2015 was a prime number.

Statement 2 Wayne Rooney scored the least number of goals in 2016 amongst the four

- (a) If statement 1 is false, statement 2 is true
(b) If statement 1 is true, statement 2 is false
(c) If statement 2 is false, statement 1 is true
(d) If statement 2 is true, statement 1 is false

50. Given the following two statements, what can be said regarding the goals scored by the footballers?

Statement 1 At least one of the other three footballers scored more goals than Cristiano Ronaldo, across the four years combined

Statement 2 Wayne Rooney scored less goals than Lionel Messi in 2015.

- (a) If statement 1 is false, statement 2 is false
 (b) If statement 2 is true, statement 1 is false
 (c) If statement 2 is false, statement 1 is true
 (d) None of the above

Solutions (Q. Nos. 47-50)

Case I				
	NJ/CR	CR/NJ	WR	LM
2013	51	53	61	55
2014	57	58	55	49
2015	61	62	65	66
2016	60	47	48	50
Total	229	220	229	220

Case II				
	LM	WR	NJ/CR	CR/NJ
2013	51	53	61	55
2014	57	58	55	49
2015	61	62	65	66
2016	60	47	48	50
Total	229	220	229	220

47. (c) Wayne Rooney scored more than 60 goals in 2 years.
 48. (a) The highest number of goals scored by Wayne Rooney and Neymar Jr. is 128. [In case II in 2015]
 49. (d) **Statement 1** : Case I holds, if true. No conclusion possible.
Statement 2 : Only Case II holds. If true, then Case I is false.
 50. (d) **Statement 1** Either case holds. No conclusion possible.
Statement 2 Only Case I holds, if True and Case II, If false. No conclusion possible.

Direction (Q. Nos. 51-54) Read the passage given below and solved the questions based on it.

During their Stint at IIM Shillong, ten students have opted for various electives named from A to F. In these electives students are given the points on a scale of 1 to 5 points. Points obtained by the students can be integral point only.

It is also known that not all the electives are taken by all the students and not all the students are taking atleast an elective.

The range of scores indicates the maximum and minimum scores in that elective by the students who have chosen that elective. However, if the range of the scores is 1-4, then atleast one of students must have got 1 point and atleast one student must have got 4 points in that elective.

The number of elective takers out of the 10 students is given in the last column.

Elective	Range of scores of all the elective takers (minimum and maximum scored)	Average score of the elective takers	Number of elective takers
A	1-4	3.5	6
B	2-4	3	3
C	1-5	4	7
D	1-2	4/3	3
E	2-5	4	4
F	3-5	11/3	6

51. How many students have scored more than 4 points in atleast 2 electives?
 52. What is the minimum number of students who must have scored less than 2 points in atleast one elective?
 53. What is the minimum number of students who have scored more than 3 points in atleast one elective?
 54. Elective A and elective B are merged to form a new elective H. This new elective H will be having all those students who have opted elective A and elective B and the scores of each of these elective have been taken into consideration while finding the average of elective H. If none of the students of elective A and elective B are common, then what will be the average score of elective H?

Solutions (Q. Nos. 51-54)

51. We cannot find a definitive answer to this question because the solution given rise to multiple over-lapping.
 52. Looking at the elective D, total number of points scored = 4 points and the number of students = 3. Since, the range of the points obtained is 1-2, hence maximum 2 points can be obtained by only one student and remaining two students are getting one mark each.
 53. To find the minimum number of students with more than 3 points, we should try to accommodate as much students as possible at 3 points each. And after we have accommodated enough students at 3 points each, remaining students will be accommodated at more than 3 points.

In case of elective A, maximum number of students who can get 3 points = 3. Hence, remaining 3 students are getting a total of 12 points. And in no way these 3 students are getting 3 points or less than 3 points to satisfy the conditions given.

In case of elective C, the minimum number of students that can be accommodated at 3 points each = 3. Hence, total points = 9. Now, remaining 19 points are to be accommodated among 4 students and none of these to year students can get 3 points or less than 3 points [Otherwise then 16 points will be required to be accommodated among 3 students and in that case atleast one student will get more than 5 points and that is a contradiction].

We can further see that each of these students will get more than 3 points now to satisfy the given conditions.

Hence, minimum number of the students who have scored more than 3 points in atleast one elective = 4.

54. Total points obtained by the students of elective A = 21.
 Total points obtained by the students of elective B = 9.
 Total points obtained by the students of elective A + B = 30.
 Total number of students = 9
 Hence, average = $\frac{30}{9} = \frac{10}{3}$

Directions (Q. Nos. 55-58) Read the following passage and solve the questions based on it.

A chess tournament is taking place at the college club and the players on all the four tables are engaged in their fourth game against their respective opponents. The players with the white pieces are: Sharukh, Sanjay, Saif and Shakti. The players with the black pieces are : Salman, Sunny, Sunil and Sohail. The scores are 3:0, 2.5:0.5, 2 : 1 and 1.5 : 1.5

(Note Tied games result in a score of 0.5 for each player).

- (i) The player using the white pieces at table 4 is Shakti; however, the current score at the table is not 2:1.
 - (ii) Saif is playing at the table on the right hand side of Sohail, who has lost all his games upto now.
 - (iii) Sunil, who is not in the lead against his opponent, has not been in a tied game.
 - (iv) Salman is leading his match after his last three games.
 - (v) Sanjay is playing against Sunny.
- (One win gets point for the winner whereas a player gets no point for losing the game).

White :	Sanjay	Shahrukh	Saif	Shakti
	1.5	3	2	0.5
Black :	Sunny	Sohail	Sunil	Salman
	1.5	0	1	2.5

55. What table is Sohail playing at, and what is the score at that table?

- (a) table 1:2.5-1.5
- (b) table 2:3-0
- (c) table 2:2.5-1.5
- (d) table 3:2-1

→ (b) Condition (ii) says Sohail lost all 3 games, hence his score should be 3-0.

56. Which player has the higher score?

- (a) Salman
- (b) Saif
- (c) Sunny
- (d) Sunil

→ (a) The highest score could be that of Shahrukh or Salman. However, Salman is at the winning table 4, hence option (a) is the correct answer.

57. Which player had the black pieces alongwith and the lowest score?

- (a) Salman
- (b) Sunny
- (c) Sunil
- (d) Sohail

→ (d) Sohail had the black pieces alongwith and the lowest score, i.e. 0.

58. Who is the winning player at table 4?

- (a) Salman
- (b) Shakti
- (c) Sharukh
- (d) Sanjay

→ (a) Salman is the winning player at table 4.

Directions (Q. Nos. 59-62) Read the following passage and solve the questions based on it.

To make the non-technical background new joiners understand the process of manufacturing color TVs better, LG has hired the services of Due North Inc. consultants. Due North is a consultancy firm which provides technical training of all the household equipment to the non-tech background new joiners at LG. To facilitate the training process, it has been decided that there will be six groups of new joiners namely A, B, C, D, E and F and each of the groups is scheduled at least once a week. All the groups will start their training on the same day and will also end their training on the same day.

Following points are to be taken into consideration while making the training schedule :

- (i) Sunday is a holiday.
- (ii) B group is scheduled all days except Friday and Saturday.
- (iii) C group meets four days in succession.
- (iv) F group meets only from Monday to Thursday.
- (v) E group is scheduled everyday, but not on Thursday and Saturday.
- (vi) A group is scheduled on alternate days.
- (vii) C group does not meet on Monday and Tuesday.
- (viii) A and D groups never meet on the same days.
- (ix) D group is scheduled only once a week on either Wednesday or Friday.

59. Which groups are scheduled for the same number of classes during the week?

- (a) B, A and F
- (b) E, B and C
- (c) E, F and A
- (d) None of these

60. If a certain class of D is scheduled on the same day as that of the B group, then how many groups are scheduled on Friday.

- (a) 2
- (b) 3
- (c) 4
- (d) 5

61. For how many groups, do we have a definite training schedule, for the whole week?

- (a) 1
- (b) 2
- (c) 3
- (d) 5

62. Which two groups can never be scheduled on the same day?

- (a) C and D
- (b) C and E
- (c) A and D
- (d) None of these

Solutions (Q. Nos. 59-62)

Using the statements given above, we have the following diagram for the training schedule :

Group	Mon	Tue	Wed	Thu	Fri	Sat
A	X	✓	X	✓	X	✓
B	✓	✓	✓	✓	X	X
C	X	X	✓	✓	✓	✓
D	X	X		X		X
E	✓	✓	✓	X	✓	X
F	✓	✓	✓	✓	X	X

Here, group D meets either on Wednesday or on Friday.

59. (d) B, C, E and F have same number of classes.

60. (a) 2 groups are scheduled on Friday.

61. (d) Five groups have definite training schedule.

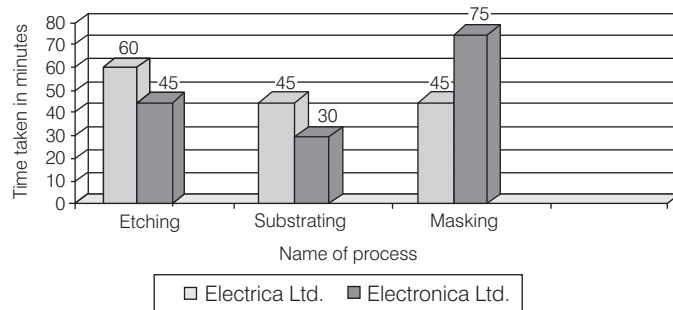
62. (c) A and D can never be scheduled on the same day.

Directions (Q. Nos. 63-66) From the data given below, derive the appropriate answers.

Mr. Sharma, a graduate in electronics engineering and an MBA from IIM Bangalore, decided to open an entrepreneurial venture. He decide to run an electronics workshop and manufacture field effect transistors. The manufacturing required three simultaneous processes : Substrating, Masking and Etching. Electronica Ltd and Electrica Ltd. gave orders of 15 units and 10 units per day respectively.

The profit made by Mr. Sharma on 1 unit for Electronica Ltd. is Rs. 75 and for 1 unit of Electrica Ltd. Rs. 100. The working hours were 0900 hours to 1700 hours. The workshop has two machines for substrating, four for Masking and three for Etching.

The following bar chart gives the time required for each machine per unit (in minutes).



63. After supplying both the companies, Mr. Sharma might conclude that :

- Mr. Sharma can make one more unit for Electrica Ltd.
- Out of the two machines of process substrating, one has an idle time of 30 min and the other has an idle time of 15 min
- Machines of process Masking have no idle time left
- Mr. Sharma can make two more units for Electronica Ltd.

64. If Mr. Sharma has the flexibility to manufacture anyone of the two products, what is the maximum profit that he can make on any given day and for which product?

- ₹ 2400, Electrica Ltd.
- ₹ 2100, Electronica Ltd.
- ₹ 1800, Electronica Ltd.
- ₹ 2000, Electrica Ltd.

65. Mr. Sharma decided to install one more machine for each process. With the existing commitments, in order to maximise his profits, what should he produce so that he gets the best deal (Both the companies will levy no extra production)

- 6 more units for Electronica Ltd and 7 more units for Electrica Ltd
- 7 more units for Electronica Ltd and 6 more units for Electrica Ltd.
- 5 more units for Electronica Ltd
- 10 more units of Electrica Ltd

66. Ignoring Mr. Sharma's commitments to Electrica Ltd., the maximum number of units that Mr. Sharma can make for Electronica Ltd. is

- 24
- 25
- 26
- 27

Solutions (Q. Nos. 63-66)

	Machine 1	Machine 2	Machine 3	Machine 4
Process : Substrating	30 minutes (15 units for Electronica Ltd.)	30 minutes (10 units for Electrica Ltd)	—	—
Process : Masking	30 minutes (6 units for Electronica Ltd.)	30 minutes (6 units for Electronica Ltd.)	4 hours 15 minutes (3 unit for Electronica Ltd.)	30 minutes (10 units for Electrica Ltd.)
Process : Etching	30 minutes (10 units for Electronica Ltd.)	2 hours 15 minutes (5 units for Electronica Ltd and 2 units for Electrica Ltd.)	No spare time (8 units for Electrica Ltd.)	—

63. (d) Using the above given table, options (a) and (b) are obviously ruled out. Option (c) is not possible as 1 unit for Electrica Lrd. needs 45 min for process Substrating and both the machines have an idle time of only 30 min each.

64. (a) Profit made by manufacturing only for Electronica Ltd. = $24 \times 75 = ₹1800$

Profit made by manufacturing only for Electrica Ltd = $20 \times 100 = ₹2000$

65. (d) From the given options, the most profitable one is (d) as it generates ₹ 1000 in profits. Hence, (d) is the correct option.

66. (a) The bottle neck for Electronica Ltd is obviously process masking as can be observed from the table. The maximum can make is 6. Hence, the maximum possible number of units of Electronica Ltd. are 24; the other two processes not being any constraint.

Section III Quantitative Aptitude

67. A milkman purchases 10 litres of milk at Rs. 7 per litre and forms a mixture by adding freely available water which constitutes 16.66% of the mixture. Later on he replaced the mixture by some freely available water and thus the ratio of milk is to water is 2 : 1. He then sold the new mixture at cost price of milk and replaced amount of mixture at twice the cost of milk then what is the profit percentage?

- (a) 68% (b) 34%
(c) 40% (d) None of these

→ (a) Given, quantity of milk is 10 l Since, water is 16.66% of the mixture. Therefore, quantity of water added is 2l.

Now, after replacement,

$$\frac{10 - 5x/6}{2 - x/6 + x} = \frac{2}{1}$$

$$\Rightarrow \frac{60 - 5x}{12 - x + 6x} = 2$$

$$\Rightarrow 60 - 5x = 24 + 10x$$

$$\Rightarrow x = 2.4 \text{ l}$$

$$\therefore \text{SP} = 12 \times 7 + 2.4 \times 14$$

$$= 84 + 33.6$$

$$= ₹ 117.6$$

$$\text{CP} = 10 \times 7 = ₹ 70$$

$$\text{Hence, profit} = \frac{117.6 - 70}{70} \times 100 = 68\%$$

68. If x, y, z are real numbers such that $x + y + z = 4$ and $x^2 + y^2 + z^2 = 6$, then x, y, z lie in

- (a) $\left[\frac{3}{2}, 2\right]$ (b) $\left[\frac{2}{3}, 2\right]$
(c) $\left[0, \frac{2}{3}\right]$ (d) None of these

→ (b) $x + y + z = 4$ and $x^2 + y^2 + z^2 = 6$

$$\therefore y + z = 4 - x$$

$$yz = \frac{1}{2}\{(y + z)^2 - (y^2 + z^2)\}$$

$$= \frac{1}{2}\{(4 - x)^2 - (6 - x^2)\}$$

$$\Rightarrow yz = x^2 - 4x + 5$$

Hence, y and z are the roots of

$$t^2 - (4 - x)t + (x^2 - 4x + 5) \geq 0$$

Since the roots y and z are real.

$$(4 - x)^2 - 4(x^2 - 4x + 5) \geq 0$$

$$\Rightarrow 3x^2 - 8x + 4 \leq 0$$

$$\Rightarrow (3x - 2)(x - 2) \leq 0$$

$$\Rightarrow x \in \left[\frac{2}{3}, 2\right]$$

$$\text{By symmetry } y, z \in \left[\frac{2}{3}, 2\right]$$

Direction Raghupati goes at a speed of 60 km/h.

Raghav goes at a speed of 36 km/h. Raja Ram can go from Azamgarh to Barelley in 2 hours. The distance between Azamgarh to Barelley is equal to the distance between Azamgarh to Chandoli. Raghav takes the same time travelling from Barelley to Azamgarh as from Barelley to Chandoli at his regular speed which is twice the speed of Raja Ram.

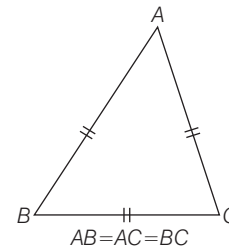
69. If Raghupati and Raja Ram travel towards each other from Barelley and Chandoli respectively, how far from Barelley will they meet each other?

- (a) $\frac{60}{13}$ (b) $27\frac{9}{13}$ (c) $37\frac{9}{13}$ (d) $\frac{360}{9}$

→ (b) Speed of Raghupati (R_p) = 60 km/h

Speed of Raghav (R_v) = 36 km/h

Speed of Raja Ram (R_R) = 18 km/h



Time taken to cover AB by (R_R) is 2 hours

$\therefore$ Time taken to cover AB by Raghav is 1 hour

$\therefore$ Time taken to cover AB by Raghupati = 36 min

$$\left(t_{RP} : t_{RV} : t_{RR} = \frac{1}{S_{RP}} : \frac{1}{S_{RV}} : \frac{1}{S_{RR}}\right)$$

$t \rightarrow$ Time, $S \rightarrow$ Speed

$$AB = 2 \times 18 = 36 \text{ km}$$

$$\text{Distance from Barelley} = \frac{60}{(60 + 18)} \times 36 = \frac{360}{13}$$

$$= 27\frac{9}{13} \text{ km}$$

70. Let $f(x, y) = |x + y|$ and $g(x, y) = |x - y|$, then how many ordered pairs of the form (x, y) would satisfy $f(x, y) = g(x, y)$

- (a) 1 (b) 2
(c) 4 (d) Infinitely many

→ (d) $|x + y| = |x - y|$

$$\Rightarrow (x + y)^2 = (x - y)^2$$

$$\Rightarrow 4xy = 0$$

$$\Rightarrow \text{either } x = 0 \text{ or } y = 0$$

If $x = 0$ and y is any real number, we have infinite possible values of y as

$$|0 + y| = |0 - y| \Rightarrow |y| = |-y|$$

Similarly, $(x, 0)$ where x can be any real number also satisfies

$$|x + 0| = |x - 0|$$

So, there are infinite number of solutions.

71. a, b, c, d and e are 5 distinct numbers that are from an arithmetic progression. They are not necessarily consecutive terms but from the first 5 terms of the AP. It is known that c is the arithmetic mean of a and b , d is the arithmetic mean of b and c . Which of the following statements are true?

- A. Average of all 5 terms put together is c .
 B. Average of d and e is not greater than average of a and b .
 C. Average of b and c is greater than average of a and d .
 (a) A and B (b) B and C
 (c) A, B and C (d) A and C

→ (a) I. c is the arithmetic mean of a and $b \Rightarrow c$ lies in between a and b . And it lies exactly in between the two terms. As in the number of terms between a and c should be equal to number of terms between b and c . a, c, b could be the 1st, 2nd and 3rd terms respectively, or the 1st, 3rd and 5th, respectively, or the 2nd, 3rd, 4th respectively, or the 3rd, 4th, 5th, respectively. The terms could also be the other way around. As in, b, c, a could be the 1st 2nd and 3rd terms respectively, or the 1st, 3rd and 5th respectively and so on. This is a very simple but very powerful idea.

II. Now, d is the arithmetic mean of b and $c \Rightarrow d$ lies between b and c . Using statements I and II we can say that a, c, b have to be 1st, 3rd and 5th or 5th, 3rd and 1st as there is an element between b and c also.

So, c is the third term. a and b are 1st and 5th in some order.

Statement I : The average of all 5 terms put together is c . c is the middle term. So this is true.

Statement II : The average of d and e is not greater than average of a and b . Average of a, b is c . d and e are the 2nd and 4th terms of this sequence (in some order). So, their average should also be equal to c . So, both these are equal. So, this statement is also true.

Statement III : The average of b and c is greater than average of a and d . The average of b and c is d . The average of a and d could be greater than or less than d . So, this need not be true.

72. In a village three people contested for the post of village Pradhan. Due to their own interest, all the voters voted and no one vote was invalid. The losing candidate got 30% votes. What could be the minimum absolute margin of votes by which the winning candidate led by the nearest rival, if each candidate got an integral per cent of votes?

- (a) 4 (b) 2
 (c) 1 (d) None of these

→ (c) Losing candidate = $0.3x$

$\therefore$ Other two candidates = $0.7x$

The share of winning candidates = $0.36x$
 and the second ranker = $0.34x$

$\therefore$ Margin (min. possible) = $0.02x$

$\Rightarrow$ 2% of x

Let the minimum possible voters be 50 then

$$\frac{2 \times 50}{100} = 1$$

Hence, the minimum possible margin of votes = 1

73. A merchant buys 80 articles, each at ₹ 40. He sells n of them at a profit of $n\%$ and the remaining at a profit of $(100 - n)\%$. What is the minimum profit the merchant could have made on this trade?

→ CP = 80×40

Profit from the n objects = $n\% \times 40 \times n$.

Profit from the remaining objects

$$= (100 - n)\% \times 40 \times (80 - n)$$

We need to find the minimum possible value of n

$$n\% \times 40 \times n + (100 - n)\% \times 40 \times (80 - n)$$

Or, we need to find the minimum possible value of

$$n^2 + (100 - n)(80 - n).$$

$$\Rightarrow \text{Minimum of } n^2 + n^2 - 180n + 8000$$

$$\Rightarrow \text{Minimum of } n^2 - 90n + 4000$$

$$\Rightarrow \text{Minimum of } n^2 - 90n + 2025 - 2025 + 4000$$

We add and subtract 2025 to this expression in order to create an expression that can be expressed as a perfect square. This approach is termed as the "Completion of Squares" approach.

$$\Rightarrow \text{Minimum of } n^2 - 90n + 2025 + 1975$$

$$= (n - 45)^2 + 1975$$

This reaches minimum, when $n = 45$.

When $n = 45$, the minimum profit made

$$= 45\% \times 40 \times 45 + 55\% \times 40 \times 35$$

$$= 810 + 770 = ₹ 1580$$

74. Number of real values of x for which $\log_9(x - 3) = \log_3(x - 7)$ is ?

$$\rightarrow \frac{\log(x - 3)}{\log 9} = \frac{\log(x - 7)}{\log 3}$$

$$\Rightarrow \frac{\log(x - 3)}{\log 3^2} = \frac{\log(x - 7)}{\log 3}$$

$$\Rightarrow \frac{\log(x - 3)}{2 \log 3} = \frac{\log(x - 7)}{\log 3}$$

$$\Rightarrow \log(x - 3) = 2 \log(x - 7)$$

$$\Rightarrow (x - 3) = (x - 7)^2$$

$$\Rightarrow x - 3 = x^2 - 14x + 49$$

$$x^2 - 15x + 52 = 0$$

$$\text{Discriminant} = 15^2 - 4 \times 52 = 225 - 208 = 17 > 0,$$

Two distinct values of x exists

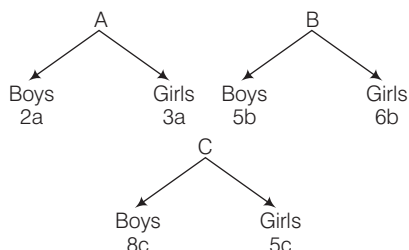
However, since we have the log function involved here, we will have to verify the solutions. Log is defined only for positive terms. So, if $\log(x - 3)$ and $\log(x - 7)$ are defined, x has to be greater than 7.

For the equation $x^2 - 15x + 52 = 0$, one of the values $\frac{1}{2}(15 - \sqrt{17})$. This is less than 7. Since x cannot be less than 7, there is only one possible solution.

75. The ratios of boys to girls in three Classes A, B and C are 2:3, 5:6 and 8:5, respectively. The ratio of boys to girls when Classes A and B are taken together is 7:9 and when B and C are taken together is 3:2. Which of the following could be the total number of students in the three classes?

- (a) 400 (b) 180 (c) 360 (d) 540

→ (c) Let us try to represent the data in the question.



The ratio of boys to girls when Classes A and B are taken together is 7 : 9. Therefore,

$$\frac{2a + 5b}{3a + 6b} = \frac{7}{9}$$

Hence,

$$\frac{a}{b} = 1.$$

$$a > b \quad \dots(i)$$

The ratio of boys to girls when B and C are taken together is 3 : 2. Therefore,

$$\frac{5b + 8c}{6b + 5c} = \frac{3}{2}$$

$$\frac{b}{c} = \frac{1}{8} \Rightarrow 8b = c \quad \dots(ii)$$

From Eqs. (i) and (ii), we get $a = b$ and $8a = c$

Total students in A = $2a + 3a = 5a$

Total students in B = $5b + 6b = 11b$

Total students in C = $8c + 5c = 13c$

Total students in all the classes = $5a + 11b + 13c = 120a$

Hence, the total number of students is some multiple of 120. 360 is the correct answer among the answer among the answer choices.

- 76.** A bus travels from City A to City B at a constant speed. If the speed of the bus increases by 8 km/h, it will reach its destination 3 hours earlier. On the contrary, if the speed decreases by 4 km/h, then the bus will reach the destination 8 hours later than the scheduled time. Approximately, how long does the bus usually take?

→ Let the normal speed be S and normal time taken by T hours.

$$\text{Then, } (S + 8)(T - 3) = ST \quad \dots(i)$$

$$\text{and } (S - 4)(T + 8) = ST \quad \dots(ii)$$

Solving equation (i) and (ii),

$$\text{we get } 8T - 3S = 24$$

$$\text{and } 8S - 4T = 32$$

$$\text{Solving for } T, \text{ we get } T = \frac{72}{13} \text{ hr} = 5\frac{7}{13} \text{ hr.}$$

- 77.** Sequence P is defined by $p_n = p_{n-1} + 3$, $p_1 = 11$, Sequence Q is defined as $q_n = q_{n-1} - 4$, $q_3 = 103$. If $p_k > q_{k+2}$, what is the smallest value k can take?

→ Sequence P is an A.P. with $a = 11$, and common difference 3. So,

$$p_k = 11 + (k - 1)3.$$

Sequence Q is an A.P. with third term 103 and common difference -4 .

$$t_3 = a + 2d$$

$$103 = a + 2(-4) \text{ or } a = 111$$

$$q_{k+2} = 111 + (k + 1)(-4)$$

$$q_{k+2} = 111 - 4k - 4 = 107 - 4k$$

$$p_k > q_{k+2}$$

$$11 + (k - 1)3 > 107 - 4k$$

$$8 + 3k > 107 - 4k$$

$$7k > 99$$

$$k > \frac{99}{7}$$

k has to be an integer, so smallest value k can take is 15.

- 78.** $f(x) = 1 - h(x)$, $g(x) = 1 - k(x)$, $h(x) = f(x) + 1$, $f(x) = g(x) + 1$, $k(x) = f(x) + 1$.

Find the value of $\frac{j(f(x)) + k(h(x))}{h(k(x)) + f(j(x))}$.

(a) $1/2$

(b) $3/2$

(c) $2/3$

(d) $1/9$

→ (b)

$$f(x) = 1 - h(x)$$

... (i)

$$g(x) = 1 - k(x)$$

... (ii)

$$h(x) = f(x) + 1$$

... (iii)

$$j(x) = g(x) + 1$$

... (iv)

$$k(x) = j(x) + 1$$

... (v)

From Eqs. (i) and (iii), we get

$$f(x) + h(x) = 1 - h(x) + f(x) + 1$$

⇒

$$h(x) = 1$$

... (vi)

⇒

$$f(x) = 0$$

... (vii)

From Eqs. (ii) and (iv), we get

$$g(x) = 1 - k(x) = 1 - (j(x) + 1)$$

$$g(x) = -j(x)$$

... (viii)

From Eqs. (iv) and (viii), we get

$$j(x) - g(x) = 1$$

and

$$g(x) = -j(x)$$

⇒

$$j(x) = \frac{1}{2}$$

... (ix)

∴

$$g(x) = -\frac{1}{2}$$

... (x)

∴

$$k(x) = j(x) + 1 = \frac{3}{2}$$

... (xi)

Hence,

$$f(x) = 0$$

$$g(x) = -\frac{1}{2}$$

$$h(x) = 1$$

$$j(x) = \frac{1}{2}$$

$$k(x) = \frac{3}{2}$$

Thus all the functions are constant.

- 79.** Two straight lines intersect at a point O . Points $A_1, A_2, A_3, A_4, A_5, \dots, A_m$ are taken on one line and points $B_1, B_2, B_3, \dots, B_n$ on the other. If the point O is not included, the number of triangles that can be drawn using these points as vertices, is

(a) ${}^nC_2 + {}^mC_2$

(b) $2^n C_2$

(c) ${}^{m+n}C_2$

(d) None of these

→ (d) Required number of triangles

$$= {}^{m+n}C_3 - {}^mC_3 - {}^nC_3$$

80. Find the number of ways of putting five distinct rings on four fingers of the left hand. (Ignore the difference of size of rings and the fingers).

(a) 1250 (b) 6720
(c) 5260 (d) None of these

→ (b) Since rings are distinct, hence they can be named as R_1, R_2, R_3, R_4 and R_5 .
The ring R_1 can be placed on any of the four fingers in 4 ways. The ring R_2 can be placed on any of the four fingers in 5 ways since the finger in which R_1 is placed now has 2 choices, one above the R_1 and one below the ring R_1 .
Similarly R_3, R_4 and R_5 can be arranged in 6, 7 and 8 ways respectively.
Hence, the required number of ways
 $= 4 \times 5 \times 6 \times 7 \times 8 = 6720$

81. A group of workers was put on a job. From the second day onwards, one worker was withdrawn each day. The job was finished when the last worker was withdrawn. Had no worker been withdrawn at any stage, the group would have finished the job in 55% of the time. How many workers were there in the group?

(a) 55 (b) 40
(c) 45 (d) 10

→ (a) It can be solved easily through option.
 $(10 + 9 + 8 + \dots + 1) = 10 \times \left(10 \times \frac{55}{100}\right)$
 $55 = 55$

Hence, option (a) is correct.

Alternate Method

$$\frac{n(n+1)}{2} = n \times \frac{55n}{100}$$

$$\Rightarrow n = 10$$

In both cases total work is 55 man-days.

82. A line described by the equation $y = \sqrt{16x^2 + 5x + 16}$ on a cartesian plane. What is the shortest distance between coordinate (2, 0) and this line?

→ Start by finding the distance from some point on the curve to (2, 0) in terms of x . Using the distance formula, we get

$$D = \sqrt{(x-2)^2 + (\sqrt{16x^2 + 5x + 16} - 0)^2}$$

$$D = \sqrt{x^2 - 4x + 4 + 16x^2 + 5x + 16}$$

$$D = \sqrt{17x^2 + x + 20}$$

This will end up being a messy derivative. However, since the distance D will never be negative, we can minimize D^2 instead of D and still get the same answer. So, now we get

$$D^2 = 17x^2 + x + 20$$

$$\frac{dD^2}{dx} = 34x + 1$$

Now we set this equal to 0 and solve for x

$$34x + 1 = 0$$

$$x = -\frac{1}{34}$$

So, the distance is minimized at $x = -\frac{1}{34}$ and to find the minimum distance, simply evaluate D when $x = -\frac{1}{34}$.

$$\begin{aligned} \therefore D &= \sqrt{\frac{17}{(34)^2} - \frac{1}{34} + 20} \\ &= \frac{1}{34} \sqrt{17 - 34 + 20 \times (34)^2} \\ &= \frac{1}{34} \sqrt{23103} \\ &\approx 4.4 \text{ units} \end{aligned}$$

83. Consider triangle ABC with $AB = 8$ cms and areas 24 sq cm. If AB is greater than the other two sides and the triangle's centroid, incenter, circumcenter and orthocenter are collinear, find its perimeter.

(a) $16 + 4\sqrt{13}$ (b) $8 + 4\sqrt{13}$
(c) $8 + 8\sqrt{13}$ (d) $8 + 6\sqrt{13}$

→ (b) Centroid, incenter, circumcenter and orthocenter are collinear $\Rightarrow$ Triangle is isosceles $\Rightarrow$ two sides must be equal, AB is the longest side $\Rightarrow$ the other two sides must be equal
Sides should be 8, y and y .

$$\text{Perimeter} = 8 + 2y, s = 4 + y$$

$$\text{Area} = \sqrt{(4+y)(y-4)(4)(4)}$$

$$24 = \sqrt{4^2(y^2 - 16)}$$

$$24 = 4\sqrt{y^2 - 16}$$

$$6 = \sqrt{y^2 - 16}$$

$$y^2 = 52$$

$$\Rightarrow y = \sqrt{52}$$

$$y = 2\sqrt{13}$$

$$\text{Perimeter} = 8 + 2y = 8 + 4\sqrt{13}$$

84. $3x + 4|y| = 33$. How many integer values of (x, y) are possible?

→ Let us rearrange the equation

$$3x = 33 - 4|y|$$

Since x and y are integers, and since $|y|$ is always positive regardless of the sign of y , this means that when you subtract a multiple of 4 from 33, you should get a multiple of 3.

Since 33 is already a multiple of 3, in order to obtain another multiple of 3, you will have to subtract a multiple of 3 from it. So, y has to be a positive or a negative multiple of 3.

$$y = 3, -3, 6, -6, 9, -9, 12, -12 \dots \text{etc.}$$

For every value of y , x will have a corresponding integer value.

So there are infinite integer values possible for x and y .

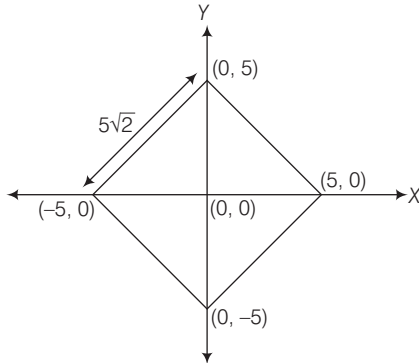
85. What is the area enclosed by the region $|x-2| + |y+4| < 5$?

(a) $\frac{25}{2}$ sq units (b) 25 sq units
(c) 50 sq units (d) $\frac{25}{4}$ sq units

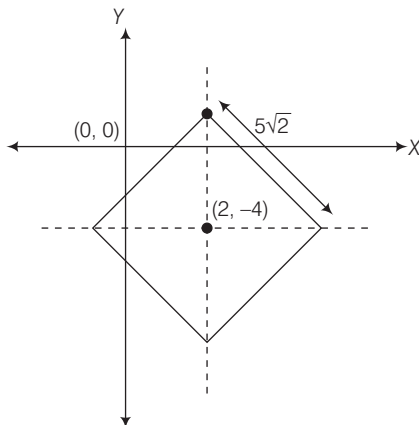
→ (c) Let us take $X = x - 2$ and $Y = y + 4$. Now, let us draw $|x| + |y| < 5$.

When $Y = 0$, $|X| < 5$ i.e., $-5 < X < 5$.

When $X = 0$, $|Y| < 5$ i.e., $-5 < Y < 5$



Now, try to think of how the graph of $|x - 2| + |y + 4| < 5$ would look. ' $x - 2$ ' indicates a shift along the X-axis, 2 unit to the right and ' $y + 4$ ' indicates a shift along the Y-axis, 4 units to the bottom.



We can observe that shifting the origin has no impact on the area of the figure. This essentially means that area computed using $|x - 2| + |y + 4| < 5$ has to be same as the area computed using $|x| + |y| < 5$.

Required Area = $4 \times \frac{1}{2} \times 5 \times 5 = 50$ sq units

- 86.** A box is built vertically upwards from a base that is a regular hexagon of side ' a '. The height of the shapes is ' h '. If the height of this shape is doubled, the total surface area increases by 50%, find the ratio $a : h$.

- (a) 2 : 1 (b) $2 : \sqrt{3}$
(c) $3 : \sqrt{2}$ (d) $\sqrt{2} : 1$

→ (b) Area of the box = area (2 hexagons) + area (6 rectangles).

$$= 6 \times \frac{\sqrt{3}}{4} a^2 \times 2 + 6 \times ah$$

$$= 3\sqrt{3}a^2 + 6ah$$

In the revised box, the height becomes = $2h$

$$\text{New area} = 6 \times \frac{\sqrt{3}}{4} a^2 \times 2 + 6 \times a \times 2h$$

$$= 3\sqrt{3}a^2 + 12ah$$

Area has increased by 50%.

⇒ New area = $1.5 \times$ (old area)

$$\Rightarrow (3\sqrt{3}a^2 + 6ah) 1.5 = 3\sqrt{3}a^2 + 12ah$$

$$\Rightarrow 3\sqrt{3}a^2 \times 1.5 + 9ah = 3\sqrt{3}a^2 + 12ah$$

$$\Rightarrow 3\sqrt{3}a^2 \times 0.5 = 3ah$$

$$\Rightarrow \frac{\sqrt{3}}{2} a = h$$

$$\Rightarrow \frac{a}{h} = \frac{2}{\sqrt{3}}$$

$$\Rightarrow a : h = 2 : \sqrt{3}$$

- 87.** $(x - y + z) : (y - z + 2w) : (2x + z - w) = 2 : 3 : 5$, find the values of S , where S is $(3x + 3z - 2w) : w$.

- (a) 7 : 1 (b) 6 : 1
(c) 13 : 2 (d) None of these

→ (a) Let $(x - y + z) = 2k$, $(y - z + 2w) = 3k$

and $(2x + z - w) = 5k$

Then, $(x - y + z) + (y - z + 2w)$

$$= 2k + 3k$$

$$= 5k = 2x + z - w$$

$$\text{or } x + z = 3w$$

$$\therefore S = (3x + 3z - 2w) : w = 7 : 1$$

- 88.** Each family in a locality has at most two adults, and no family has fewer than 3 children. Considering all the families together, there are more adults than boys, more boys than girls, and more girls than families. Then the minimum possible number of families in the locality is :

- (a) 4 (b) 5
(c) 2 (d) 3

→ (a) Given, Number of adults > Number of boys > Number of girls > Number of families.

Going back from the choices, let us start with the least value given in the choices.

Since the minimum possible number of families has been asked.

In choice (c) Number of families = 2

⇒ Number of girls ≥ 3 , Number of boys ≥ 4 and Number of adults ≥ 5

But two families together can have a maximum of 4 adults ≥ 5

But two families together can have a maximum of 4 adults.

Therefore, the number of families is not equal to 2.

In choice (d). Number of families = 3.

Therefore, the Number of (girls) ≥ 4 . Number of (boys) ≥ 5 and

Number of (adults) ≥ 6 .

- 89.** A boat travels upstream from Point A to point B 20 km apart. If the speed of the boat in still water is 10 kmph, then the trip from A to B takes 2 hours and 40 minutes more than the return trip from B to A. What should be the still water speed of the boat, if the onward trip were to take 2 hours more than the return trip?

→ Let the speed of the stream be ' r ' kmph.

The onward journey, A to B, is an upstream one and the effective speed = $10 - r$.

The return journey, B to A, is a downstream one and the effective speed = $10 + r$.

The trip from A to B takes 2 hours and 40 minutes more than the return trip from B to A. 2 hours and 40 minutes is equal to $\frac{8}{3}$ hours. Or, we have

$$\frac{20}{10-r} = \frac{20}{10+r} + \frac{8}{3}$$

Solving for r , we get $r = 5$ kmph.

For the second case let us assume the still water speed of the boat to be ' b ' kmph.

The onward journey, A to B, is an upstream one and the effective speed = $b - 5$.

The return journey, B to A, is a downstream one and the effective speed = $b + 5$.

We also know that the onward trip takes 2 hours more than the return trip.

$$\frac{20}{b-5} = \frac{20}{b+5} + 2$$

Solving for b , we get $b = 5\sqrt{5}$ kmph.

90. If $p^q - q^r = (p+q)^{r-q}$; $p > r > q \in$ Prime numbers less than 11, then $p+q$ is equal to

- (a) $r(r-q)$ (b) $r(q-p)$
(c) $r(p+q)$ (d) pq

→ (a) $p^q - q^r = (p+q)^{r-q}$;

$11 > p > r > q \in$ Prime numbers.

$$7^3 - 3^5 = (7+3)^{5-3}$$

$$100 = 100$$

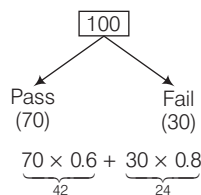
$$\therefore (p+q) = 7+3 = 10$$

$$= 5(5-3) = r(r-q)$$

91. In the half yearly exam only 70% of the students were passed. Out of these (passed in half yearly) only 60% students are passed in annual exam, out of remaining students (who fail in half yearly exam) 80% passed in annual exam. What per cent of the students passed the annual exam?

- (a) 42% (b) 56%
(c) 66% (d) None of the above

→ (c) Let the total number of students be 100.



$\therefore$ Total pass in annual exam

$$= 42 + 24 = 66$$

92. x, y, z are 3 integers in a geometric sequence such that $y-x$ is a perfect cube. Given, $\log_{36} x^2 + \log_6 \sqrt{y} + 3 \log_{216} y^{1/2} z = 6$. Find the value of $x+y+z$.

$$\rightarrow \log_{36} x^2 + \log_6 y^{1/2} + 3 \log_{36} y^{1/2} z = 6$$

$$\Rightarrow \frac{2 \log x}{\log 6} + \frac{1 \log y}{2 \log 6} + \frac{\log y^{1/2} z}{\log 6} = 6$$

$$\begin{aligned} 2 \log x + \log y + 2 \log (y^{1/2} z) &= 6 \log 6^2 \\ \Rightarrow \log x^2 + \log y + \log yz^2 &= \log 6^{12} \\ \Rightarrow \log (x^2 y \cdot y \cdot z^2) &= \log 6^{12} \\ \Rightarrow (x y z)^2 &= (6^6)^2 \\ \Rightarrow xyz &= 6^6 \end{aligned}$$

Given x, y, z is in G.P. Let $x = a, y = ab, z = ab^2$

$$\Rightarrow xyz = a^3 b^3 = (ab)^3$$

$$\Rightarrow (ab)^3 = (6^2)^3$$

Possible values of (a, b) satisfying the equation :

$(1, 36), (2, 18), (3, 12), (4, 9), (9, 4), (12, 3), (18, 2), (36, 1)$

Given, $y-x$ is a perfect cube

$\Rightarrow ab - a$ is perfect cube

$\Rightarrow a(b-1)$ is perfect cube

Only possible when $(a, b) = (9, 4)$

$$\therefore x = 9, y = 36, z = 144$$

$$\therefore x + y + z = 9 + 36 + 144 = 189$$

93. A company instead of raising the mark-up by 20% discounted the cost price by 20% while stitching the price tag on its product. Further the company offer a discount of 6.25% to its customer. In this process company incurs a loss of Rs. 37.5 on a single article. What is the selling price of that article?

- (a) 417.5 (b) 112.5
(c) 365.5 (d) None of these

→ (b) CP = 100, then

tag price = 80

SP, after discount = 75

Total loss = 25

$\therefore$ ₹ 25 are being less at CP of ₹ 100

$$\therefore \text{₹ } 37.5 \text{ are being less at CP of } \frac{100}{25} \times 37.5 = 150$$

$$\text{Hence, SP} = 150 - 37.5 = 112.5$$

94. Consider a class of 40 students whose average weight is 40 kg. ' m ' students join this class and then average weight become ' n ' kg. If it is known that $m+n=50$, what is the maximum possible average weight of the class now?

→ If the overall average weight has to increase after the new people are added, the average weight of the new entrants has to be higher than 40.

So, $n > 40$

Consequently, m has to be < 10 (as $n+m=50$).

Working with the "differences" approach, we know that the total additional weight added by ' m ' students would be $(n-40)$ each, above the already existing average of 40. $m(n-40)$ is the total extra additional weight added, which is shared amongst $40+m$ students. So, $\frac{m(n-40)}{m+40}$ has to be maximum for the overall

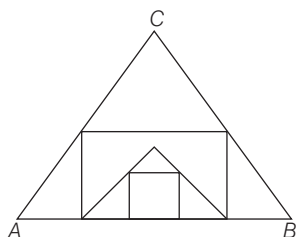
average to be maximum.

At this point, use the trial and error approach to arrive at the answer.

The maximum average occurs when $m=5$ and $n=45$ And the average is

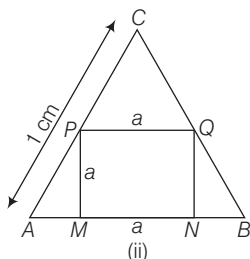
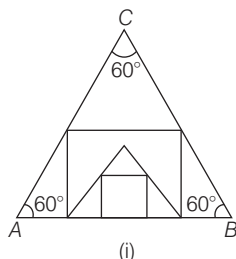
$$\begin{aligned} &= 40 + \frac{5 \times 5}{45} \left\{ \frac{\text{extra weight} \times \text{extra number of people}}{\text{total number of people}} \right\} \\ &= 40 + \frac{5}{9} = 40.56 \end{aligned}$$

95. In the adjoining figure ABC is an equilateral triangle inscribing a square of maximum possible area. Again in this square there is an equilateral triangle whose side is same as that of the square. Further the smaller equilateral triangle inscribes a square of maximum possible area. What is the area of the innermost square if the each side of the outermost triangle be 0.01 m?



- (a) $(873 - 504\sqrt{3}) \text{ cm}^2$ (b) $(738 - 504\sqrt{3}) \text{ cm}^2$
 (c) $(873 - 405\sqrt{2}) \text{ cm}^2$ (d) None of these

→ (a) As per given figure,



PCQ is also an equilateral triangle

$$\therefore PC = PQ = PM = a$$

$$\therefore \frac{a}{PA} = \frac{\sqrt{3}}{2}$$

$$\therefore PA = \frac{2a}{\sqrt{3}}$$

$$\therefore AC = AP + PC = \frac{2a}{\sqrt{3}} + a = 1 \text{ cm}$$

$$\Rightarrow a = \frac{\sqrt{3}}{(2 + \sqrt{3})} = \sqrt{3}(2 - \sqrt{3})$$

Now, in figure (iii)

$$PM = MT = a$$

Let the each side of square $RSYX$ be K , then $RT = K$ also (since RTS is an equilateral triangle)

$$\therefore \frac{K}{RM} = \frac{\sqrt{3}}{2}$$

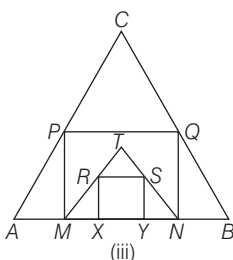
$$\therefore RM = \frac{2K}{\sqrt{3}}$$

$$\therefore MT = RT + RM = K + \frac{2K}{\sqrt{3}}$$

$$MT = \frac{(\sqrt{3} + 2)}{\sqrt{3}} K$$

but $MT = a$

$$\therefore a = \left(\frac{\sqrt{3} + 2}{\sqrt{3}} \right) K$$



$$\therefore K = \frac{\sqrt{3}a}{(\sqrt{3} + 2)}$$

$$\text{But } a = \sqrt{3}(2 - \sqrt{3})$$

$$\therefore K = \frac{\sqrt{3}}{(\sqrt{3} + 2)} [\sqrt{3}(2 - \sqrt{3})]$$

$$= \frac{3(2 - \sqrt{3})}{(2 + \sqrt{3})} \times \frac{(2 - \sqrt{3})}{(2 - \sqrt{3})}$$

$$\Rightarrow K = \frac{3(2 - \sqrt{3})^2}{1} = 3(7 - 4\sqrt{3})$$

$\therefore$ Area of square,

$$RSYX = K^2 = [3(7 - 4\sqrt{3})]^2$$

$$K^2 = 9(49 + 48 - 56\sqrt{3})$$

$$K^2 = (873 - 504\sqrt{3}) \text{ cm}^2$$

96. My salary is ₹ 12,345 per month. The salary of my brother is 10% greater than that of mine. The salary of my only sister is 9.09% greater than my only brother. The salary of my wife is $56\frac{12}{23}\%$ less than the total salary of my brother

and sister together, then the salary of my wife is

(a) greater than my sister's salary

(b) $33\frac{11}{23}\%$ less than my sister's salary

(c) equal to my salary

(d) $44\frac{11}{23}\%$ greater than my own salary

→ (c) My salary = 100

Salary of my brother = 110

Salary of my sister = 120

$$\text{Salary of my wife} = 230 - \left(230 \times \frac{1300}{23 \times 100} \right) = 100$$

97. If a, b, c and d are four positive number such that $a + d + c + d = 4$, then what is the maximum value of $(a + 1)(b + 1)(c + 1)(d + 1)$?

→ If $a + b + c + d$ is constant, then the product $abcd$ is maximum when $a = b = c = d$,

$$(a + 1) = (b + 1) = (c + 1) = (d + 1)$$

Given that

$$(a + 1) + (b + 1) + (c + 1) + (d + 1) = 8$$

$$\therefore 4(a + 1) = 8$$

$$\Rightarrow (a + 1) = 2$$

$$\therefore \text{Maximum value} = 2 \times 2 \times 2 \times 2 = 16$$

98. In the Garbar Jhala, Aminabad a shopkeeper first raises the price of a Jewellery by $x\%$ then he decreases the new price by $x\%$. After one such up down cycle, the price of a Jewellery decreased by ₹ 21025. After a second updown cycle the jewellery was sold for ₹ 484416. What was the original price of the jewellery.

(a) ₹ 500000

(b) ₹ 600625

(c) ₹ 525625

(d) ₹ 526000

- (c) Let the original price P , then the decrease in value of P after one cycle.

$$= P \left(\frac{x}{100} \right)^2 = 21025 \quad \dots(i)$$

Again the final value after second cycle

$$\Rightarrow P \left(1 + \frac{x}{100} \right) \left(1 - \frac{x}{100} \right) \left(1 + \frac{x}{100} \right) \left(1 - \frac{x}{100} \right) = 484416$$

$$\Rightarrow P \left[1 - \left(\frac{x}{100} \right)^2 \right] = 484416 \quad \dots(ii)$$

Dividing Eq. (ii) by Eq. (i), we get

$$\frac{\left[1 - \left(\frac{x}{100} \right)^2 \right]^2}{\left(\frac{x}{100} \right)^2} = \frac{484416}{21025} = \frac{2304}{100}$$

$$\Rightarrow \frac{1 - \left(\frac{x}{100} \right)^2}{\left(\frac{x}{100} \right)^2} = \sqrt{\frac{2304}{100}} = \frac{48}{10}$$

Let $\frac{x}{100} = k$, then $\frac{1 - k^2}{k} = \frac{48}{10}$

$$\Rightarrow 10k^2 + 48k - 10 = 0$$

$$\Rightarrow 5k^2 - 24k - 5 = 0$$

$$\Rightarrow k = 5 \text{ or } k = -\frac{1}{5} \quad (\text{inadmissible value})$$

So $x = 20\%$

Hence, $P \left(\frac{x}{100} \right)^2 = 21025$

$$\Rightarrow P = 525625$$

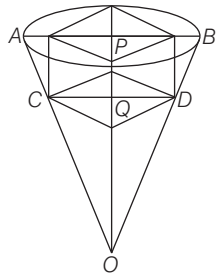
- 99.** The radius of a cone is $\sqrt{2}$ times the height of the cone. A cube of maximum possible volume is cut from the same cone. What is the ratio of the volume of the cone to the volume of the cube?

- (a) 3.18π (b) 2.25π
(c) 2.35 (d) can't be determined

- (b) Let the each side of cube be a , then

$$CD = \sqrt{2}a$$

$$\therefore CQ = \frac{a}{\sqrt{2}}$$



Let the radius of cone be r and height be h , then
 $r = h\sqrt{2}$

$\therefore$ In ΔAPO and ΔCQO (Similar triangles)

$$\frac{AP}{PO} = \frac{CQ}{OQ}$$

$$= \frac{r}{h} = \frac{\frac{a}{\sqrt{2}}}{(h-a)}$$

$$\Rightarrow \frac{\frac{a}{\sqrt{2}}}{(h-a)} = \sqrt{2}$$

$$\Rightarrow a = 2(h-a)$$

$$\Rightarrow h = \frac{3a}{2}$$

$$\therefore r = \frac{3a}{2} \times \sqrt{2}$$

and $h = \frac{3a}{2}$

$$\therefore \text{Volume of cone} = \frac{1}{3} \pi \times \left(\frac{3a\sqrt{2}}{2} \right)^2 \times \frac{3a}{2} = \frac{9}{4} a^3 \pi$$

and Volume of cube = a^3

$$\therefore \text{Required ratio} = \frac{\frac{9}{4} \pi a^3}{a^3} = \frac{9}{4} \pi = 2.25 \pi$$

- 100.** The ratio of selling price of 3 articles A, B and C is $8 : 9 : 5$ and the ratio of percentage profit is $8 : 7 : 14$ respectively. If the profit percentage of A is 14.28% and the cost price of B is ₹ 400, What is the overall percentage gain?

- (a) 14.28% (b) 14.87%
(c) 16.66% (d) None of these

→ (d)

$$\text{SP } \frac{1}{7} \left(\frac{8}{7} \right) \frac{1}{8} : \frac{1}{8} \left(\frac{9}{8} \right) \frac{1}{9} : \frac{1}{4} \left(\frac{5}{4} \right) \frac{1}{5}$$

Since $14.28\% = \frac{1}{7}$

So, the ratio of profit percentage of

A	B	C
8	7	14 (Given)
↓	↓	↓
$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{4}$

Thus the ratio of CP of $A : B : C$
 $7 : 8 : 4$

Therefore % profit

$$= \frac{(8 + 9 + 5) - (7 + 8 + 4)}{(7 + 8 + 4)} \times 100$$

$$= \frac{3}{19} \times 100 = 15.78\%$$

NUMBER SYSTEM

- 1) What is the greatest power of 5 which can divide 80! exactly? (2016)
(a) 15 (b) 16 (c) 19 (d) 13
- 2) p, q and r are three non-negative integers such that $p + q + r = 10$. The maximum value of $pq + qr + pr + pqr$. (2016)
(a) ≥ 40 and < 50 (b) ≥ 50 and < 60
(c) ≥ 60 and < 70 (d) ≥ 70 and < 80
- 3) N , the set of natural number is partitioned into subsets $s_1 = (1)$, $s_2 = (2, 3)$, $s_3 = (4, 5, 6)$, $s_4 = (7, 8, 9, 10)$ and so on. What is the sum of the elements of the subset s_{50} ? (2016)
- 4) If x, y and z are three positive integers such that $x > y > z$. Which of the following is closest to the product xyz ? (2016)
(a) $(x-1)yz$ (b) $x(y-1)z$ (c) $xy(z-1)$ (d) $x(y+1)z$
- 5) A sequence of 4-digits, when considered as a number in base 10 is four times the number, it represents in base 6. What is the sum of the digits of the sequence? (2016)
- 6) Find n , if $2^{200} - 2^{192} \cdot 31 + 2^n$ is a perfect square. (2016)
(a) 199 (b) 200 (c) 198 (d) 197
- 7) Consider the expression (2016)

$$\frac{(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)(d^2 + d + 1)(e^2 + e + 1)}{abcde},$$
 where a, b, c, d and e are positive numbers. What is the minimum value of the expression?
 8) How many pairs of integers (a, b) are possible such that $a^2 - b^2 = 288$? (2016)
 9) If a, b and c are distinct natural numbers less than 25. What is the maximum possible value of (2016)
 $|a - b| + |b - c| + |c - a|?$
 (a) 44 (b) 46 (c) 23 (d) 21
- 10) The unit's digit of $34563^{20359} + 2358^{784}$ is ... (2015)
- 11) What is the value of
 $1*1! + 2*2! + 3*3! + \dots + n*n!$,
 where $n!$ means n factorial or $n(n-1)(n-2)\dots$? (2015)
 (a) $n(n-1)(n-1)!$ (b) $(n+1)!/n(n-1)$
 (c) $(n+1)! - n!$ (d) $(n+1)! - 1!$
- 12) Find the sum of

$$\sqrt{1 + \frac{1}{1^2} + \frac{1}{2^2}} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \dots + \sqrt{1 + \frac{1}{2007^2} + \frac{1}{2008^2}}.$$
 (2015)
 (a) $2008 - \frac{1}{2008}$ (b) $2007 - \frac{1}{2007}$
 (c) $2007 - \frac{1}{2008}$ (d) $2008 - \frac{1}{2007}$
- 13) If $x + \frac{1}{x} = 1$ and $p = x^{4000} + \frac{1}{x^{4000}}$ and q is the digit at unit's place in the number $2^{2n} + 1$, n being a natural number greater than 1, then $(p+q)$ is equal to (2015)
- 14) For a positive integer n , let P_n denote the product of the digits of n and S_n denote the sum of the digits of n . The number of integers between 10 and 1000 for which $P_n + S_n = n$ is (2014)
 (a) 81 (b) 16
 (c) 18 (d) 9
- 15) The digits of a three-digit number A are written in the reverse order to form another three-digit number B . If $B > A$ and $B - A$ is perfectly divisible by 7, then which of the following is necessarily true? (2014)
 (a) $100 < A < 299$ (b) $106 < A < 305$
 (c) $112 < A < 311$ (d) $118 < A < 317$

- 16) The total number of integer pairs (x, y) satisfying the equation $x + y = xy$ is/are (2014)
 (a) 0
 (b) 1
 (c) 2
 (d) None of the above
- 17) Suppose n is an integer such that the sum of the digits of n is 2 and $10^{10} < n < 10^{11}$. The number of different values for n is (2014)
 (a) 11 (b) 10
 (c) 9 (d) 8
- 18) A real number x satisfying $1 - \frac{1}{n} < x \leq 3 + \frac{1}{n}$ for every positive integer n , is best described by (2014)
 (a) $1 < x < 4$ (b) $1 < x \leq 3$
 (c) $0 < x \leq 4$ (d) $1 \leq x \leq 3$
- 19) Let x, y and z be distinct integers, x and y be odd positive and z is even and positive. Which one of the following statements cannot be true? (2014)
 (a) $(x - z)^2 y$ is even (b) $(x - z) y^2$ is odd
 (c) $(x - z) y$ is odd (d) $(x - y)^2 z$ is even
- 20) A quantity Q is obtained by adding three quantities. The first is a constant, the second varies directly with the square root of y and the third varies directly with the cube root of y . If $y = 1$, $Q = 60$, when $y = 64$, $Q = 230$ and when $y = 729$, $Q = 660$, then find the constant. (2014)
 (a) 10 (b) 20
 (c) 30 (d) 40
- 21) A three-digit number is eleven times the two-digit number formed by using the hundred's and the unit's digit of the three-digit number respectively, in the ten's and unit's place of the two-digit number. If the difference between the digit in ten's place and the digit in hundred's place is 1, then what is the digit in the unit's place? (2014)
 (a) 2 (b) 3
 (c) 4 (d) 1
- 22) Let w, x, y and z be four natural numbers such that their sum is $8m + 10$, where m is a natural number. Which of the following is necessarily true? (2014)
 (a) The maximum possible value of $w^2 + x^2 + y^2 + z^2$ is $6m^2 + 40m + 26$
 (b) The maximum possible value of $w^2 + x^2 + y^2 + z^2$ is $16m^2 + 40m + 28$
 (c) The minimum possible value of $w^2 + x^2 + y^2 + z^2$ is $16m^2 + 40m + 28$
 (d) The minimum possible value of $w^2 + x^2 + y^2 + z^2$ is $16m^2 + 40m + 26$
- 23) Let p, q and r be distinct positive integers that are odd. Which of the following statements cannot always be true? (2014)
 (a) $pq^2 \cdot r^3$ is odd
 (b) $(p + q)^2 r^3$ is even
 (c) $(p - q + r)^2 (q + r)$ is even
 (d) If p, q and r are consecutive odd integers, the remainder of their product when divided by 4 is 3
- 24) If p be a prime number, $p > 3$ and let x be the product of positive number $1, 2, 3, \dots, (p - 1)$, then consider the following statements
 I. x is a composite number divisible by p .
 II. x is a composite number not divisible by p but some prime number greater than p may divide x .
 III. x is not divisible by any prime number $(p - 2)$.
 IV. All prime numbers less than $(p - 1)$ divide x .
 Which of the following statement(s) is/are correct? (2013)
 (a) I and II are correct (b) II and III are correct
 (c) III and IV are correct (d) IV alone is correct
- 25) A three digit number which on being subtracted from another three-digit number consisting of the same digits in reverse order gives 594. The minimum possible sum of all the three digits of this number is (2013)
 (a) 6 (b) 7
 (c) 8 (d) Cannot be determined
- 26) If $22^3 + 23^3 + 24^3 + \dots + 87^3 + 88^3$ is divided by 110, then the remainder will be (2013)
 (a) 55 (b) 1
 (c) 0 (d) 44
- 27) If $x + \frac{1}{x} = 1$ and $p = x^{4000} + \frac{1}{x^{4000}}$ and q be the digit at units place in the number $2^{2^n} + 1$, n being a natural number greater than 1, then $(p + q)$ is equal to (2013)
 (a) 8 (b) 6
 (c) 4 (d) 2
- 28) If p, q, r and s are positive real numbers such that $p + q + r + s = 2$, then $m = (p + q)(r + s)$ satisfies the relation (2013)
 (a) $0 \leq m \leq 1$ (b) $1 \leq m \leq 2$
 (c) $2 \leq m \leq 3$ (d) $3 \leq m \leq 4$
- 29) Let $P = \{2, 3, 4, \dots, 100\}$ and $Q = \{101, 102, 103, \dots, 200\}$. How many elements of Q are there such that they do not have any element of P as a factor? (2012)
 (a) 20 (b) 24 (c) 23 (d) 21

- 30) What is the sum of all the 2-digit numbers which leave a remainder of 6 when divided by 8? (2012)
 (a) 612 (b) 594
 (c) 324 (d) 872
- 31) Find the remainder of 2^{1040} divided by 131. (2012)
 (a) 1 (b) 3
 (c) 5 (d) 7
- 32) A certain number written in a certain base is 144. Which of the following is always true?
 I. Square root of the number written in the same base is 12.
 II. If base is increased by 2, the number becomes 100. (2012)
 (a) Only I (b) Only II
 (c) Neither I nor II (d) Both I and II
- 33) S is a set given by $S = \{1, 2, 3, \dots, 4n\}$, where n is a natural number. S is partitioned into n disjoint subsets $A_1, A_2, A_3, \dots, A_n$ each containing four elements. It is given that in everyone of these subsets there is one element, which is the arithmetic mean of the other three elements of the subsets. Which of the following statements is then true? (2012)
 (a) $n \neq 1$ and $n \neq 2$
 (b) $n \neq 1$ but can be equal to 2
 (c) $n \neq 2$ but can be equal to 1
 (d) It is possible to satisfy the requirement for $n=1$ as well as for $n=2$
- 34) When asked for his taxi number, the driver replied, "If you divide the number of my taxi by 2, 3, 4, 5, 6 each time you will find a remainder of one. But, if you divide it by 11, the remainder is zero. You will also not find any other driver with a taxi having a lower number who can say the same". What is the taxi number? (2012)
 (a) 121 (b) 1001
 (c) 1881 (d) 781
- 35) The values of the numbers 2^{2004} and 5^{2004} are written one after another. How many digits are there in all? (2011)
 (a) 4008 (b) 2003
 (c) 2004 (d) None of these
- 36) Let S_n denote the sum of the squares of the first n odd natural numbers. If $S_n = 533n$, find the value of n . (2011)
 (a) 18 (b) 20
 (c) 24 (d) 30
- 37) Auto fare in Bombay is ₹ 2.40 for the first 1 km, ₹ 2.00 per km for the next 4 km and 1.20 for each additional km thereafter. Find the fare in rupees for k km ($k \geq 5$). (2011)
 (a) $2.4k + 1.2(2k - 3)$ (b) $10.4 + 12(k - 5)$
 (c) $2.4 + 2(k - 3) + 12(k - 5)$ (d) $10.4 + 12(k - 4)$
- 38) The largest number amongst the following that will perfectly divide $101^{100} - 1$ is (2010)
 (a) 100 (b) 10000 (c) 100^{100} (d) 100000
- 39) Rohan and Sohan take a vacation at their grandparents' house. During the vacation, they do any activity together. They either played Tennis in the evening or practiced Yoga in the morning, ensuring that they do not undertake both the activities on any single day. There were some days when they did nothing. Out of the days that they stayed at their grandparents' house, they involved in one of the two activities on 22 days. However, their grandmother while sending an end of vacation report to their parents stated that they did not do anything on 24 mornings and they did nothing on 12 evenings. How long was their vacation? (2010)
 (a) 36 days (b) 14 days
 (c) 29 days (d) Cannot be determined
- 40) The sum of the number of factors of the number N and N^2 is 34. How many such distinct numbers $N < 150$ exist? (2010)
 (a) 6 (b) 2 (c) 4 (d) 3
- 41) The remainder, when $(1523 + 2323)$ is divided by 19, is (2010)
 (a) 4 (b) 15 (c) 0 (d) 18
- 42) A positive whole number M less than 100 is represented in base 2 notation, base 3 notation, and 5 notation. It is found that in all three cases the last digit is 1, while in exactly two out of the three cases the leading digit is 1. Then, M equals (2010)
 (a) 31 (b) 63 (c) 75 (d) 91
- 43) What is the remainder when $7^{74} - 5^{74}$ is divided by 4? (2009)
 (a) 0 (b) 1
 (c) 2 (d) None of these
- 44) Find the remainder when $a^3 - 5a^2 + 7a - 9$ is divided by $a^2 + a - 6$. (2009)
 (a) $19a - 31$ (b) $19a - 38$
 (c) $19a - 49$ (d) $19a - 45$

- 45) Hema is fond of shopping, she took nearly ₹ 15 with her in the form of one rupee notes and 20 paise coins. When she came back, she had as many one rupee notes as she originally had 20 paise coins and as many 20 paise coins as she originally had one rupee notes. The total amount was also reduced by two-third. How much did she spend? (2009)
- (a) ₹ 4.28 (b) ₹ 9.30
(c) ₹ 9.60 (d) ₹ 10.20
- 46) A calculator has two memory buttons- P and Q . Value 1 is initially stored in both memory locations. The following, sequence of steps is carried out five times (2009)
- (i) Add 1 to Q
(ii) Multiply P and Q
(iii) Store the result in P
- What is the value stored in memory location P after this procedure?
- (a) 120 (b) 450
(c) 600 (d) 720
- 47) A manager is not used to work in the decimal system. She says that there are 100 employees in the office of which 24 are males and 32 are females. Which number system does the manager use? (2009)
- (a) 4 (b) 6
(c) 8 (d) 16
- 48) The integers 1,2, ...,40 are written on a blackboard. The following operation is then repeated 39 times. In each repetition, any two numbers, say a and b , currently on the blackboard are erased and a new number $a + b - 1$ is written. What will be the number left on the board at the end? (2008)
- (a) 820 (b) 821 (c) 781
(d) 819 (e) 780
- 49) What are the last two digits of 7^{2008} ? (2008)
- (a) 21 (b) 61 (c) 01
(d) 41 (e) 81
- 50) A shop stores x kg of rice. The first customer buys half this amount plus half a kg of rice. The second customer buys half the remaining amount plus half a kg of rice. Then, the third customer also buys half the remaining amount plus half a kg of rice. Thereafter, no rice is left in the shop. Which of the following best describes the value of x ? (2008)
- (a) $2 \leq x \leq 6$ (b) $5 \leq x \leq 8$
(c) $9 \leq x \leq 12$ (d) $11 \leq x \leq 14$
(e) $13 \leq x \leq 18$
- 51) The number of common terms in the two sequences 17, 21, 25, ...,417 and 16, 21, 26, ..., 466 is (2008)
- (a) 78 (b) 19
(c) 20 (d) 77
(e) 22
- 52) How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed? (2008)
- (a) 499 (b) 500
(c) 375 (d) 376
(e) 501
- 53) Suppose, the seed of any positive integer n is defined as follows
seed (n) = n , if $n < 10$ = seed ($s(n)$), otherwise,
where $s(n)$ indicates the sum of digits of n . For example,
seed (7) = 7, seed (248) = seed (2 + 4 + 8) = seed (14) = seed (1 + 4) = seed (5) = 5 etc.
How many positive integers n , such that $n < 500$, will have seed (n) = 9? (2008)
- (a) 39 (b) 72
(c) 81 (d) 108
(e) 55
- 54) What is the number of distinct terms in the expansion of $(a + b + c)^{20}$? (2008)
- (a) 231 (b) 253 (c) 242
(d) 210 (e) 228
- 55) Three consecutive positive integers are raised to the first, second and third powers respectively and then added. The sum so obtained is a perfect square whose square root equals the total of the three original integers. Which of the following best describes the minimum, say m , of these three integers? (2008)
- (a) $1 \leq m \leq 3$ (b) $4 \leq m \leq 6$
(c) $7 \leq m \leq 9$ (d) $10 \leq m \leq 12$
(e) $13 \leq m \leq 15$
- 56) Find the sum $\sqrt{1 + \frac{1}{1^2} + \frac{1}{2^2}} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \dots + \sqrt{1 + \frac{1}{2007^2} + \frac{1}{2008^2}}$ (2008)
- (a) $2008 - \frac{1}{2008}$ (b) $2007 - \frac{1}{2007}$
(c) $2007 - \frac{1}{2008}$ (d) $2008 - \frac{1}{2007}$
(e) $2008 - \frac{1}{2009}$

- 57) Consider four digit numbers for which the first two digits are equal and the last two digits are also equal. How many such numbers are perfect squares? (2007)
- (a) 2 (b) 4 (c) 0
(d) 1 (e) 3
- 58) In a tournament, there are n teams $T_1, T_2, \dots, T_n$, m with $n > 5$. Each team consists of k players, $k > 3$. The following pairs of teams have one player in common T_1 and T_2 , T_2 and $T_3 \dots$, T_{n-1} and T_n , and T_n and T_1 . No other pair of teams has any player in common. How many players are participating in the tournament, considering all the n teams together? (2007)
- (a) $k(n-1)$ (b) $n(k-2)$
(c) $k(n-2)$ (d) $(n-1)(k-1)$
(e) $n(k-1)$
- 59) Ten years ago, the ages of the members of a joint family of eight people added up to 231 yr. Three years later, one member died at the age of 60 yr and a child was born during the same year. After another three years, one more member died, again at 60 and a child was born during the same year. The current average age of this eight-member joint family is nearest to (2007)
- (a) 22 yr (b) 21 yr (c) 25 yr
(d) 24 yr (e) 23 yr
- 60) The price of Darjeeling tea (in rupees per kg) is $100 + 0.10n$, on the n th day of 2007 ($n = 1, 2, \dots, 100$) and then remains constant. On the other hand, the price of Ooty tea (in rupees per kg) is $89 + 0.15n$, on the n th day of 2007 ($n = 1, 2, \dots, 365$). On which date in 2007 will the prices of these two varieties of tea be equal? (2007)
- (a) April 11 (b) May 20 (c) April 10
(d) June 30 (e) May 21
- 61) Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos? (2007)
- (a) 16 (b) 18 (c) 15
(d) 19 (e) 17
- 62) A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount? (2007)
- (a) Over ₹ 7 but less than ₹ 8
(b) Over ₹ 22 but less than ₹ 23
(c) Over ₹ 18 but less than ₹ 19
(d) Over ₹ 4 but less than ₹ 5
(e) Over ₹ 13 but less than ₹ 14
- 63) How many pairs of positive integers m, n satisfy $\frac{1}{m} + \frac{4}{n} = \frac{1}{12}$, where n is an odd integer less than 60? (2007)
- (a) 4 (b) 7
(c) 5 (d) 3
- 64) Which among $2^{1/2}$, $3^{1/3}$, $4^{1/4}$, $6^{1/6}$ and $12^{1/12}$ is the largest? (2006)
- (a) $2^{1/2}$ (b) $3^{1/3}$
(c) $4^{1/4}$ (d) $6^{1/6}$
(e) $12^{1/12}$
- 65) Consider a sequence where the n th term, $t_n = \frac{n}{(n+2)}$, $n = 1, 2, \dots$. The value of $t_3 \times t_4 \times t_5 \times \dots \times t_{53}$ equals (2006)
- (a) $\frac{2}{495}$ (b) $\frac{2}{477}$ (c) $\frac{12}{55}$
(d) $\frac{1}{1485}$ (e) $\frac{1}{2970}$
- 66) If $\frac{a}{b} = \frac{1}{3}$, $\frac{b}{c} = 2$, $\frac{c}{d} = \frac{1}{2}$, $\frac{d}{e} = 3$ and $\frac{e}{f} = \frac{1}{4}$, then what is the value of $\frac{abc}{def}$? (2006)
- (a) $\frac{3}{8}$ (b) $\frac{27}{8}$ (c) $\frac{3}{7}$
(d) $\frac{27}{4}$ (e) $\frac{1}{4}$
- 67) If $x = -0.5$, then which of the following has the smallest value? (2006)
- (a) $2^{1/x}$ (b) $\frac{1}{x}$ (c) $\frac{1}{x^2}$
(d) 2^x (e) $\frac{1}{\sqrt{-x}}$
- 68) The sum of four consecutive two-digit odd numbers, when divided by 10, becomes a perfect square. Which of the following can possibly be one of these four numbers? (2006)
- (a) 21 (b) 25
(c) 41 (d) 67
(e) 73
- 69) When you reverse the digits of the number 13, the number increases by 18. How many other two digit numbers increase by 18 when their digits are reversed? (2006)
- (a) 5 (b) 6 (c) 7
(d) 8 (e) 10

- 70) The number of employees in Obelix Menhir Co. is a prime number and is less than 300. The ratio of the number of employees who are graduates and above, to that of employees who are not, can possibly be (2006)
- (a) 101 : 88 (b) 87 : 100 (c) 110 : 111
(d) 85 : 98 (e) 97 : 84
- 71) The rightmost non-zero digit of the number 30^{2720} is (2005)
- (a) 1 (b) 3 (c) 7 (d) 9
- 72) Let S be a set of positive integers such that every element n of S satisfies the conditions
- (i) $1000 \leq n \leq 1200$
(ii) every digit in n is odd
- Then, how many elements of S are divisible by 3? (2005)
- (a) 9 (b) 10 (c) 11 (d) 12
- 73) Let $x = \sqrt{4 + \sqrt{4 - \sqrt{4 + \sqrt{4 - \dots}}}}$. Then, x equals (2005)
- (a) 3 (b) $\left(\frac{\sqrt{13}-1}{2}\right)$
(c) $\left(\frac{\sqrt{13}+1}{2}\right)$ (d) $\sqrt{13}$
- 74) A rectangular floor is fully covered with square tiles of identical size. The tiles on the edges are white and the tiles in the interior are red. The number of white tiles is the same as the number of red tiles. A possible value of the number of tiles along one edge of the floor is (2005)
- (a) 10 (b) 12 (c) 14 (d) 16
- 75) Let $n! = 1 \times 2 \times 3 \times \dots \times n$ for integer $n \geq 1$. If $p = 1! + (2 \times 2!) + (3 \times 3!) + \dots + (10 \times 10!)$, then $p + 2$ when divided by $11!$ leaves a remainder of (2005)
- (a) 10 (b) 0 (c) 7 (d) 1
- 76) Let S be the set of five digit numbers formed by the digits 1, 2, 3, 4 and 5, using each digit exactly once such that exactly two odd positions are occupied by odd digits. What is the sum of the digits in the rightmost position of the numbers in S ? (2005)
- (a) 228 (b) 216
(c) 294 (d) 192
- 77) Each family in a locality has at most two adults and no family has fewer than 3 children. Considering all the families together, there are more adults than boys, more boys than girls and more girls than families. Then, the minimum possible number of families in the locality is (2004)
- (a) 4 (b) 5 (c) 2 (d) 3
- 78) If the sum of the first 11 terms of an arithmetic progression equals that of the first 19 terms, then what is the sum of the first 30 terms? (2004)
- (a) 0 (b) -1
(c) 1 (d) Not unique
- 79) On January 1, 2004 two new societies, S_1 and S_2 are formed, each with n members. On the first day of each subsequent month, S_1 adds b members while S_2 multiple its current number of members by a constant factor r . Both the societies have the same number of members on July 2, 2004. If $b = 10.5n$, what is the value of r ? (2004)
- (a) 2.0 (b) 1.9 (c) 1.8 (d) 1.7
- 80) Let $y = \frac{1}{2 + \frac{1}{3 + \frac{1}{2 + \frac{1}{3 + \dots}}}}$, what is the value of y ? (2004)
- (a) $\frac{\sqrt{13}+3}{2}$ (b) $\frac{\sqrt{13}-3}{2}$
(c) $\frac{\sqrt{15}+3}{2}$ (d) $\frac{\sqrt{15}-3}{2}$
- 81) N persons stand on the circumference of a circle at distinct points. Each possible pair of persons, not standing next to each other, sings a two-minute song one pair after the other. If the total time taken for singing is 28 min, what is N ? (2004)
- (a) 5 (b) 7
(c) 9 (d) None of these
- 82) The remainder, when $(15^{23} + 23^{23})$ is divided by 19, is (2004)
- (a) 4 (b) 15 (c) 0 (d) 18
- 83) Consider the sequence of numbers $a_1, a_2, a_3, \dots$ to infinity, where $a_1 = 81.33$ and $a_2 = -19$ and $a_j = a_{j-1} - a_{j-2}$ for $j \geq 3$. What is the sum of the first 6002 terms of this sequence? (2004)
- (a) -100.33 (b) -30.00
(c) 62.33 (d) 119.33
- 84) If $a, a+2$ and $a+4$ are prime numbers, then the number of possible solutions for a is (2003)
- (a) one (b) two
(c) three (d) more than three
- 85) Let x and y be positive integers such that x is prime and y is composite. Then, (2003)
- (a) $y-x$ cannot be an even integer
(b) xy cannot be an even integer
(c) $(x+y)/x$ cannot be an even integer
(d) None of the above

- 86) Let $n (> 1)$ be a composite integer such that $\sqrt{n}$ is not an integer. Consider the following statements
 A : n has a perfect integer – valued divisor which is greater than 1 and less than $\sqrt{n}$.
 B : n has a perfect integer – valued divisor which is greater than $\sqrt{n}$ but less than n . (2003)
 Then,
 (a) both A and B are false (b) A is true but B is false
 (c) A is false but B is true (d) both A and B are true
- 87) What is the remainder when 4^{96} is divided by 6 ? (2003)
 (a) 0 (b) 2 (c) 3 (d) 4
- 88) What is the sum of all two-digit numbers that give a remainder of 3 when they are divided by 7 ? (2003)
 (a) 666 (b) 676 (c) 683 (d) 777
- 89) $7^{6n} - 6^{6n}$, where n is an integer > 0 , is divisible by (2002)
 (a) 13 (b) 127 (c) 559 (d) None of these
- 90) After the division of a number successively by 3, 4 and 7, the remainders obtained are 2, 1 and 4 respectively. What will be the remainder if 84 divides the same number? (2002)
 (a) 80 (b) 75 (c) 41 (d) 53
- 91) When 2^{256} is divided by 17, the remainder would be (2002)
 (a) 1 (b) 16
 (c) 14 (d) None of these
- 92) A child was asked to add first few natural numbers (that is $1 + 2 + 3 + \dots$) so long his patience permitted. As he stopped, he gave the sum as 575. When the teacher declared the result wrong, the child discovered he had missed one number in the sequence during addition. The number he missed was (2002)
 (a) less than 10 (b) 10
 (c) 15 (d) more than 15
- 93) A rich merchant had collected many gold coins. He did not want any body to know about him. One day, his wife asked, "How many gold coins do we have 7" After pausing a moment, he replied, "Well! if I divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the squares of the two numbers." The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has? (2002)
 (a) 96 (b) 53
 (c) 43 (d) None of these
- 94) The owner of a local jewellery store hired 3 watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave $\frac{1}{2}$ of the diamonds he had then and 2 more besides. He escaped with one diamond. How many did he steal originally? (2002)
 (a) 40 (b) 36
 (c) 25 (d) None of these
- 95) Number S is obtained by squaring the sum of digits of a two digit number D . If difference between S and D is 27, then the two digit number D is (2002)
 (a) 24 (b) 54 (c) 34 (d) 45
- 96) If there are 10 positive real numbers $n_1 < n_2 < n_3 < \dots < n_{10} < \dots$. How many triplets of these numbers $(n_1, n_2, n_3), (n_2, n_3, n_4), \dots$ can be generated such that in each triplet the first number is always less than the second number and the second number is always less than the third number (2002)
 (a) 45 (b) 90
 (c) 120 (d) 180
- 97) A set of consecutive positive integers beginning with 1 is written on the blackboard. A student came along and erased one number. The average of the remaining numbers is $35\frac{7}{17}$. What was the number erased? (2001)
 (a) 7 (b) 8
 (c) 9 (d) None of these
- 98) If a number system, the product of 44 and 11 is 1034. The number 3111 of this system, when converted to the decimal number system becomes (2001)
 (a) 406 (b) 1086
 (c) 213 (d) 691
- 99) Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed a bowl of mints at the front counter. Sita took $\frac{1}{3}$ of the mints, but returned four because she had a monetary pang of guilt. Fatima then took $\frac{1}{4}$ of what was left but returned three for similar reasons. Eswari then took half of the remainder but threw two back into the bowl. The bowl had only 17 mints left when the raid was over. How many mints were originally in the bowl? (2001)
 (a) 38 (b) 31
 (c) 41 (d) None of these

- 100)** m is the smallest positive integer such that for any integer $n \leq m$, the quantity $n^3 - 7n^2 + 11n - 5$ is positive. What is the value of m ? (2001)
 (a) 4 (b) 5
 (c) 8 (d) None of these
- 101)** Anita had to do a multiplication. Instead of taking 35 as one of the multipliers, she took 53. As a result, the product went up by 540. What is the new product? (2001)
 (a) 1050 (b) 540 (c) 1040 (d) 1590
- 102)** In a 4-digit number, the sum of the first two digits is equal to that of the last two digits. The sum of the first and last digits is equal to the third digit. Finally, the sum of the second and fourth digits is twice the sum of the other two digits. What is the third digit of the number? (2001)
 (a) 5 (b) 8 (c) 1 (d) 4
- 103)** A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour? (2001)
 (a) 30 (b) 24 (c) 20 (d) 60
- 104)** Three pieces of cakes of weights $4\frac{1}{2}$ lbs, $6\frac{3}{4}$ lbs and $7\frac{1}{5}$ lbs respectively are to be divided into parts of equal weights. Further, each part must be as heavy as possible. If one such part is served to each guest, then what is the maximum number of guests that could be entertained? (2001)
 (a) 54 (b) 72
 (c) 20 (d) None of these
- 105)** Convert the number 1982 from base 10 to base 12. The result is (2000)
 (a) 1182 (b) 1912 (c) 1192 (d) 1292
- 106)** $ABCDEFGH$ is a regular octagon. A and E are opposite vertices of the octagon. A frog starts jumping from vertex to vertex, beginning from A . From any vertex of the octagon except E , it may jump to either of the two adjacent vertices. When it reaches E , the frog stops and stays there. Let a_n be the number of distinct paths of exactly n jumps ending in E . Then, what is the value of a_{2n-1} ? (2000)
 (a) 0 (b) 4
 (c) $2n - 1$ (d) None of these
- 107)** Let $N = 55^3 + 17^3 - 72^3$. N is divisible by (2000)
 (a) both 7 and 13 (b) both 3 and 13
 (c) both 17 and 7 (d) both 3 and 17
- 108)** Let S be the set of integers x such that
 I. $100 \leq x \leq 200$, II. x is odd,
 III. x is divisible by 3 but not by 7.
 How many elements does S contain? (2000)
 (a) 16 (b) 12
 (c) 11 (d) 13
- 109)** The integers 34041 and 32506, when divided by a three-digit integer n , leave the same remainder. What is the value of n ? (2000)
 (a) 289 (b) 367
 (c) 453 (d) 307
- 110)** $N = 1421 \times 1423 \times 1425$. What is the remainder when N is divided by 12? (2000)
 (a) 0 (b) 9
 (c) 3 (d) 6
- 111)** Consider a sequence of seven consecutive integers. The average of the first five integers is n . The average of all the seven integers is (2000)
 (a) n
 (b) $n + 1$
 (c) $k \times n$, where k is a function of n
 (d) $n + \left(\frac{2}{7}\right)$
- 112)** What is the value of the following expression?

$$\left(\frac{1}{2^2 - 1}\right) + \left(\frac{1}{4^2 - 1}\right) + \left(\frac{1}{6^2 - 1}\right) + \dots + \left(\frac{1}{20^2 - 1}\right)$$
 (2000)
 (a) $\frac{9}{19}$ (b) $\frac{10}{19}$
 (c) $\frac{10}{21}$ (d) $\frac{11}{21}$
- 113)** Let D be a recurring decimal of the form $D = 0.a_1a_2a_1a_2a_1a_2\dots$, where digits a_1 and a_2 lie between 0 and 9. Further, at most one of them is zero. Which of the following numbers necessarily produces an integer, when multiplied by D ? (2000)
 (a) 18 (b) 108 (c) 198 (d) 288
- 114)** For two positive integers a and b , define the function $h(a, b)$ as the greatest common factor (GCF) of a, b . Let A be a set of n positive integers $G(A)$ the GCF of the elements of set A is computed by repeatedly using the function h . The minimum number of times h is required to be used to compute G is (1999)
 (a) $\frac{1}{2}n$ (b) $(n - 1)$
 (c) n (d) None of these

- 115) If $n = 1 + x$, where x is the product of four consecutive positive integers, then which of the following is/are true? (1999)
- A. n is odd B. n is prime
 C. n is a perfect square
 (a) A and C (b) A and B
 (c) Only A (d) None of these
- 116) The remainder when 7^{84} is divided by 342 is (1999)
- (a) 0 (b) 1
 (c) 49 (d) 341
- 117) Let a, b, c be distinct digits. Consider a two-digit number ' ab ' and a three-digit number ' ccb ', both defined under the usual decimal number system, if $ab^2 = ccb > 300$, then the value of b is (1999)
- (a) 1 (b) 0
 (c) 5 (d) 6

Directions (Q. Nos. 118-120) Answer the questions based on the following information.

There are 50 integers $a_1, a_2, \dots, a_{50}$, not all of them necessarily different. Let the greatest integer of these 50 integers be referred to as G and the smallest integer be referred to as L . The integers a_1 through a_{24} form sequence S_1 and the rest form sequence S_2 . Each member of S_1 is less than or equal to each member of S_2 .

- 118) All values in S_1 are changed in sign, while those in S_2 remain unchanged. Which of the following statements is true? (1999)
- (a) Every member of S_1 is greater than or equal to every member of S_2 .
 (b) G is in S_1 .
 (c) If all numbers originally in S_1 and S_2 had the same sign, then after the change of sign, the largest number of S_1 and S_2 is in S_1 .
 (d) None of the above
- 119) Elements of S_1 are in ascending order and those of S_2 are in descending order. a_{24} and a_{25} are interchanged, then which of the following statements is true? (1999)
- (a) S_1 continues to be in ascending order.
 (b) S_2 continues to be in descending order.
 (c) S_1 continues to be in ascending order and S_2 in descending order.
 (d) None of the above
- 120) Every element of S_1 is made greater than or equal to every element of S_2 by adding to each element of S_1 a integer x . Then, x cannot be less than (1999)
- (a) 2^{10}
 (b) the smallest value of S_2
 (c) the largest value of S_2
 (d) $(G - L)$

Directions (Q.Nos. 121-123) Answer the questions based on the following information.

A young girl Roopa leaves home with x flowers, goes to the bank of a nearby river. On the bank of the river, there are four places of worship, standing in a row. She dips all the x flowers into the river, the number of flowers doubles. Then, she enters the first place of worship, offers y flowers to the deity. She dips the remaining flowers into the river and again the number of flowers doubles. She goes to the second place of worship, offers y flowers to the deity. She dips the remaining flowers into the river and again the number of flowers doubles. She goes to the third place of worship, offers y flowers to the deity. She dips the remaining flowers into the river and again the number of flowers doubles. She goes to the fourth place of worship, offers y flowers to the deity. Now, she is left with no flowers in hand.

- 121) If Roopa leaves home with 30 flowers, the number of flowers she offers to each deity is (1999)
- (a) 30 (b) 31
 (c) 32 (d) 33
- 122) The minimum number of flowers that could be offered to each deity is (1999)
- (a) 0 (b) 15
 (c) 16 (d) Cannot be determined
- 123) The minimum number of flowers with which Roopa leaves home is (1999)
- (a) 16 (b) 15
 (c) 0 (d) Cannot be determined
- 124) If $n^2 = 12345678987654321$, what is n ? (1999)
- (a) 12344321 (b) 1235789
 (c) 11111111 (d) 11111111
- 125) $A, B, C, D, \dots, X, Y, Z$ are the players who participated in a tournament. Everyone played with every other player exactly once. A win scores 2 points, a draw scores 1 point and a lose scores 0 point. None of the matches ended in a draw. No two players scored the same score. At the end of the tournament, a ranking list is published which is in accordance with the alphabetical order. Then, (1998)
- (a) M wins over N
 (b) N wins over M
 (c) M does not play with M
 (d) None of the above
- 126) A hundred digit number is formed by writing first 54 natural numbers in front of each other as 12345678910111213 Find the remainder when this number is divided by 8. (1998)
- (a) 1 (b) 7
 (c) 2 (d) 0

- 127)** A is set of positive integers such that when divided by 2, 3, 4, 5, 6 leaves the remainders 1, 2, 3, 4, 5 respectively. How many integers between 0 and 100 belong to set A ? (1998)
 (a) 0 (b) 1
 (c) 2 (d) None of these
- 128)** A certain number when divided by 899 leaves the remainder 63. Find the remainder when the same number is divided by 29. (1998)
 (a) 5 (b) 4
 (c) 1 (d) Cannot be determined
- 129)** Three wheels can complete 60, 36, 24 revolutions per minute respectively. There is a red spot on each wheel that touches the ground at time zero. After how much time, all these spots will simultaneously touch the ground again (1998)
 (a) $\frac{5}{2}$ s (b) $\frac{5}{3}$ s
 (c) 6 s (d) 7.5 s
- 130)** What is the digit in the unit's place of 2^{51} ? (1998)
 (a) 2 (b) 8 (c) 1 (d) 4
- 131)** Number of students who have opted for the subjects A , B and C are 60, 84 and 108 respectively. The examination is to be conducted for these students such that only the students of the same subject are allowed in one room. Also, the number of students in each room must be same. What is the minimum number of rooms that should be arranged to meet all these conditions? (1998)
 (a) 28 (b) 60
 (c) 12 (d) None of these
- 132)** $(BE)^2 = MPB$, where B , E , M and P are distinct integers, then $M = ?$ (1998)
 (a) 2 (b) 3
 (c) 9 (d) None of these
- 133)** n^3 is odd. Which of the following statement(s) is (are) true? (1998)
 A. n is odd B. n^2 is odd
 C. n^2 is even
 (a) Only A (b) Only B
 (c) A and B (d) A and C
- 134)** A , B and C are defined as follows
 $A = (2000004) \div [(2000004)^2 + (4.000008)]$,
 $B = (3.000003) \div [(3.000003)^2 + (9.000009)]$,
 $C = (4.000002) \div [(4.000002)^2 + (8.000004)]$.
 Which of the following is true about the values of the above three expression? (1997)
 (a) All of them lie between 0.18 and 0.2
 (b) A is twice of C
 (c) C is the smallest
 (d) B is the smallest
- 135)** ABC is a three-digit number in which $A > 0$. The value of ABC is equal to the sum of the factorials of its three digits. What is the value of B ? (1997)
 (a) 9 (b) 7 (c) 4 (d) 2
- 136)** P , Q and R are three consecutive odd numbers in ascending order. If the value of three times P is 3 less than two times R , find the value of R . (1997)
 (a) 5 (b) 7 (c) 9 (d) 11
- 137)** Which of the following is true? (1997)
 (a) $7^{3^2} = (7^3)^2$ (b) $7^{3^2} > (7^3)^2$
 (c) $7^{3^2} < (7^3)^2$ (d) None of these
- 138)** If m and n are integers divisible by 5, which of the following is not necessarily true? (1997)
 (a) $(m - n)$ is divisible by 5
 (b) $(m^2 - n^2)$ is divisible by 25
 (c) $(m + n)$ is divisible by 10
 (d) None of the above
- 139)** $\log_2[\log_7(x^2 - x + 37)] = 1$, then what could be the value of ' x '? (1997)
 (a) 3 (b) 5 (c) 4 (d) None of these
- 140)** P and Q are two positive integers such that $PQ = 64$. Which of the following cannot be the value of $P + Q$? (1997)
 (a) 20 (b) 65 (c) 16 (d) 35
- 141)** A student instead of finding the value of $\frac{7}{8}$ of the number, found the value of $\frac{7}{18}$ of the number. If his answer differed from the actual one by 770, find the number. (1997)
 (a) 1584 (b) 2520 (c) 1728 (d) 1656
- 142)** If n is an integer, how many values of n will give an integral value of $\frac{(16n^2 + 7n + 6)}{n}$? (1997)
 (a) 2 (b) 3
 (c) 4 (d) None of these
- 143)** Find the value of $\frac{1}{1 + \frac{1}{3 - \frac{1}{2 + \frac{1}{3 - \frac{1}{2}}}}} + \frac{3}{3 - \frac{4}{3 + \frac{1}{2 - \frac{1}{2}}}}$. (1996)
 (a) $\frac{13}{7}$ (b) $\frac{15}{7}$ (c) $\frac{11}{21}$ (d) $\frac{17}{28}$

- 144)** If n is any odd number greater than 1, then $n(n^2 - 1)$ is (1996)
 (a) divisible by 96 always (b) divisible by 48 always
 (c) divisible by 24 always (d) None of these
- 145)** If a number 774958A96B is to be divisible by 8 and 9, the respective values of A and B will be (1996)
 (a) 7 and 8 (b) 8 and 0
 (c) 5 and 8 (d) None of these
- 146)** Three consecutive positive even numbers are such that thrice the first number exceeds double the third by 2, the third number is (1995)
 (a) 10 (b) 14 (c) 16 (d) 12
- 147)** Three bells chime at intervals of 18 min, 24 min and 32 min, respectively. At a certain time, they begin to together. What length of time will elapse before they chime together again? (1995)
 (a) 2 h and 24 min (b) 4 h and 48 min
 (c) 1 h and 36 min (d) 5 h
- 148)** Two positive integers differ by 4 and sum of their reciprocals is $\frac{10}{21}$. Then, one of the numbers is (1995)
 (a) 3 (b) 1 (c) 5 (d) 21
- 149)** $5^6 - 1$ is divisible by (1995)
 (a) 13 (b) 31
 (c) 5 (d) None of these
- 150)** The remainder obtained when a prime number greater than 6 is divided by 6 is (1995)
 (a) 1 or 3 (b) 1 or 5
 (c) 3 or 5 (d) 4 or 5
- 151)** For the product $n(n+1)(2n+1)$, $n \in N$, which one of the following is not necessarily true? (1995)
 (a) It is even
 (b) Divisible by 3
 (c) Divisible by the sum of the squares of first n natural numbers
 (d) Never divisible by 237
- 152)** The value of $\frac{55^3 + 45^3}{55^2 - 55 \times 45 + 45^2}$ is (1995)
 (a) 100 (b) 105 (c) 125 (d) 75
- 153)** 72 hens cost ₹ ...96.7.... Then, what does each hen cost, where two digits in place of '...' are not visible written in illegible hand-writing? (1995)
 (a) ₹ 3.23 (b) ₹ 5.11 (c) ₹ 5.51 (d) ₹ 7.22
- 154)** Which is the least number that must be subtracted from 1856, so that the remainder when divided by 7, 12, 16 is 4? (1994)
 (a) 137 (b) 1361
 (c) 140 (d) 172
- 155)** $\log_6 216\sqrt{6}$ is (1994)
 (a) 3 (b) $\frac{3}{2}$ (c) $\frac{7}{2}$ (d) None of these
- 156)** What is the smallest number which when increased by 5 is completely divisible by 8, 11 and 24? (1994)
 (a) 264 (b) 259
 (c) 269 (d) None of these
- 157)** If $\log_7 \log_5 (\sqrt{x} + 5 + \sqrt{x}) = 0$, find the value of x . (1994)
 (a) 1 (b) 0 (c) 2 (d) None of these
- 158)** The smallest number which, when divided by 4, 6 or 7 leaves a remainder of 2, is (1993)
 (a) 44 (b) 62 (c) 80 (d) 86
- 159)** The number of positive integers not greater than 100, which are not divisible by 2, 3 or 5, is (1993)
 (a) 26 (b) 18
 (c) 31 (d) None of these
- 160)** Let $x < 0.50$, $0 < y < 1$, $z > 1$. Given a set of numbers; the middle number, when they are arranged in ascending order, is called the median. So, the median of the numbers x , y and z would be (1993)
 (a) less than one (b) between 0 and 1
 (c) greater than one (d) cannot say
- 161)** The product of all integers from 1 to 100 will have the following numbers of zeros at the end (1993)
 (a) 20 (b) 24 (c) 19 (d) 22
- 162)** Let $u_{n+1} = 2u_n + 1$, ($n = 0, 1, 2, \dots$) and $u_0 = 0$. Then, u_{10} would be nearest to (1993)
 (a) 1023 (b) 2047 (c) 4095 (d) 8195
- 163)** A young girl counted in the following way on the fingers of her left hand. She started calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5, then reversed direction, calling the ring finger 6, middle finger 7, index finger 8, thumb 9 and then back to the index finger for 10, middle finger for 11 and so on. She counted up to 1994. She ended on her (1993)
 (a) thumb (b) index finger
 (c) middle finger (d) ring finger
- 164)** An intelligence agency decides on a code of 2 digits selected from 0, 1, 2, ..., 9. But the slip on which the code is hand written allows confusion between top and bottom, because these are indistinguishable. Thus, for example, the code 91 could be confused with 16. How many codes are there such that there is no possibility of any confusion? (1993)
 (a) 25 (b) 75 (c) 80 (d) None of these

HINTS & SOLUTIONS

- 1) (c) Number of powers of 5 in 80!

$$= \left(\frac{80}{5} = 16 \right) + \left(\frac{80}{5^2} \approx 3 \right) = 19$$

- 2) (c) Value of $pq + qr + pr + pqr$ will be maximum, if consider the possible greatest values of p, q and r .

Such that $p + q + r = 10$

Consider $p = 3, q = 3, r = 4$

$$pq + qr + pr + pqr = 9 + 12 + 12 + 36 = 69$$

Consider, $p = 2, q = 3, r = 5$

$$pq + qr + pr + pqr = 6 + 15 + 10 + 30 = 61$$

Thus, we can say that the maximum value of given expression is ≥ 60 and < 70 .

- 3) First element of each set = 1, 2, 4, 7, 11, 16, ... This series is neither an AP nor a GP but the difference between the terms viz. 1, 2, 3, 4, 5, ... is in AP with both first term and common difference as 1.

Hence, to find the 50th term of the original series we have to add the sum of 49th terms of the second series to the first term of the original series.

$$\text{The sum of first 49th terms} = \frac{49 \times 50}{2} = 1225$$

$$\text{Therefore, the 50th term of the original series} \\ = (1225 + 1) = 1226$$

This will be the first element of the set s_{50} , which will have 50 elements.

The last element of s_{50} will be $1226 + 49 = 1275$

$$\text{So, the sum of the elements in this set} \\ = \frac{50 \times (1226 + 1275)}{2} = 62525$$

- 4) (a) Going by the options

$$(a) (x-1)yz = xyz - yz \quad (b) x(y-1)z = xyz - xz$$

$$(c) xy(z-1) = xyz - xy \quad (d) x(y+1)z = xyz + xz$$

Here, yz will be minimum out of yz, xz, xy as $x > y > z$.

Hence, the correct answer is option (a).

- 5) Let the 4-digits sequence be $abcd$.

In base 6, this represents $216a + 36b + 6c + d$ and each of a, b, c, d is less than 6.

In base 10, it represents $1000a + 100b + 10c + d$.

$$\text{Given } 4(216a + 36b + 6c + d) \\ = 1000a + 100b + 10c + d$$

$$\Rightarrow 136a = 44b + 14c + 3d \quad \dots(i)$$

By trial $a = 1, b = 2, c = 3, d = 2$

If $a = 2$, LHS = 272

If we consider $b = 5$, we need $272 - 220$ or 52 from $14c + 3d$ (c, d) = (2, 8) but 8 is not a proper digit in base 6.

If $a = 3$, LHS = 408, while $44b + 14c + 3d$ can at the most be $(44 + 14 + 3)5$ or 305.

$\therefore$ There are no other possible values that satisfy (i).

$$\therefore abcd = 1232 \text{ and } a + b + c + d = 8$$

$$6) (c) 2^{200} - 2^{192} \cdot 31 + 2^n = 2^{192} (2^8 - 31) + 2^n \\ = 2^{192} (256 - 31) + 2^n = 2^{192} \cdot 225 + 2^n$$

$\therefore$ For some $m \in n$,

$$2^n = m^2 - 2^{192} \cdot 225 = m^2 - (2^{96} \cdot 15)^2 \\ = (m - 2^{96} \cdot 15)(m + 2^{96} \cdot 15)$$

$$\text{So, } m - 2^{96} \cdot 15 = 2^\alpha \quad (\text{say})$$

$$\text{and } m + 2^{96} \cdot 15 = 2^{\alpha+\beta} \quad (\text{say})$$

For some negative integers α, β .

$$\therefore 2^{97} \cdot 15 = 2^{\alpha+\beta} - 2^\alpha$$

$$\Rightarrow 2^{97} \cdot 15 = 2^\alpha (2^\beta - 1)$$

$$\Rightarrow 2^{97} = 2^\alpha \text{ and } 2^\beta - 1 = 15$$

$$\Rightarrow \alpha = 97 \text{ and } \beta = 4$$

$$\therefore n = 2\alpha + \beta = 2 \times 97 + 4 = 198$$

- 7) We have, the minimum value of the expression

$$\frac{(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)(d^2 + d + 1)(e^2 + e + 1)}{abcde}$$

Only when $a = b = c = d = e = 1$ and at this value, the minimum value of the expression

$$= \frac{3 \times 3 \times 3 \times 3 \times 3}{1} = 243$$

At any other values of a, b, c, d and e , we get the value of the expression greater than 243.

Alternate Method

For any positive value x , the minimum value of $x + \frac{1}{x}$ is 2.

$$\text{Therefore, } \frac{x^2 + x + 1}{x} = x + 1 + \frac{1}{x} = \left(x + \frac{1}{x} \right) + 1 \geq 3$$

$$(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)$$

$$\text{Therefore, } \frac{(d^2 + d + 1)(e^2 + e + 1)}{abcde}$$

$$\left(\frac{a^2 + a + 1}{a} \right) \left(\frac{b^2 + b + 1}{b} \right)$$

$$\times \dots \times \left(\frac{e^2 + e + 1}{e} \right) \geq (3)(3)(3)(3)(3)$$

$$(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)$$

$$\frac{(d^2 + d + 1)(e^2 + e + 1)}{abcde} \geq 243$$

- 8) $(a + b)(a - b) = 288$

$288 = 2^5 \times 3^2$. So, it has $6 \times 3 = 18$ factors. Or there are 9 ways of writing this number as a product of two positive integers.

Let us list down these $1 \times 288, 2 \times 144, 3 \times 96, 4 \times 72, 6 \times 48, 8 \times 36, 9 \times 32, 12 \times 24$ and 16×18 .

If a, b are integers either $a + b$ and $a - b$ have to be both odd or $a + b$ and $a - b$ have to be both even. So, within this set of possibilities $1 \times 288, 3 \times 96$ and 9×32 will not result in integer values of a, b . So, there are 6 sets of numbers that work for us.

Let us consider the set 2×144 .

When a, b are natural numbers $a + b > a - b$

So, $a + b = 144, a - b = 2; a = 73$ and $b = 71$.

Now, if $a = 73, b = 71$ holds good. We can see that $a = 73, b = -71$ also holds good. $a = -73, b = 71$ works and so does $a = -73, b = -71$.

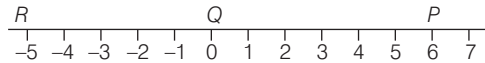
There are 4 possibilities

$$a = 73, b = 71; a = 73, b = -71$$

$$a = -73, b = 71; a = -73, b = -71$$

So, for each of the 6 products remaining, we will have 4 possibilities each. Total number of (a, b) that will satisfy this equation $= 6 \times 4 = 24$.

- 9) (a)



For any two points M, N on the number line representing numbers m, n the distance $MN = |m - n|$.

So, for three points P, Q and R on the number line $|p - q|, |q - r|, |r - p|$ are distances between three pairs of points on the number line.

In this case, we are trying to find maximum value of $|a - b| + |b - c|, |c - a|$. If b lies between a and c , the above value would be zero. So, b should not be between a and c .

The best case scenario would be if a, c were very close to each other and far from b .

Let us try $b = 24, a = 1, c = 2$

In this case $|a - b| + |b - c| - |c - a|$

$$= 23 + 22 - 1 = 44$$

This is the maximum possible value

We could also have $b = 1, a = 24, c = 23$,

$$|a - b| + |b - c| - |c - a| = 23 + 22 - 1 = 44$$

- 10) Last digit of $34563^{20359} = \text{Last digit of } 3^{20359} = \text{Last digit of } 3^3 = 7$ (as 20359 is of the form $4k + 3$)

Also, last digit of $2358^{784} = \text{Last digit of } 8^{784} = \text{Last digit of } 8^4 = 6$ (784 is of the form $4k + 4$)

$$\therefore \text{Last digit of } (34563^{20359} + 2358^{784}) = \text{Last digit of } (7 + 6) = 3$$

- 11) (c) We have,

$$1*1! = (2-1)*1! = 2*1! - 1*1! = 2! - 1!$$

$$2*2! = (3-1)*2! = 3*2! - 2! = 3! - 2!$$

$$3*3! = (4-1)*3! = 4*3! - 3! = 4! - 3!$$

.....

.....

$$n*n! = (n+1-1)*n! = (n+1)n! - n! = (n+1)! - n!$$

- 12) (a) First term is $\sqrt{1 + 1 + \frac{1}{4}} = \frac{3}{2} = 2 - \frac{1}{2}$

$$\begin{aligned} \text{Sum of first two terms is } & \frac{3}{2} + \sqrt{1 + \frac{1}{4} + \frac{1}{9}} \\ &= \frac{3}{2} + \sqrt{\frac{36+9+4}{36}} = \frac{3}{2} + \frac{7}{6} = \frac{16}{6} = \frac{8}{3} = 3 - \frac{1}{3} \end{aligned}$$

Sum of first three terms is

$$\frac{8}{3} + \sqrt{1 + \frac{1}{9} + \frac{1}{16}} = \frac{8}{3} + \sqrt{\frac{169}{144}} = \frac{8}{3} + \frac{13}{12} = \frac{45}{12} = \frac{15}{4} = 4 - \frac{1}{4}$$

Similarly, sum of the given terms is $2008 - \frac{1}{2008}$.

- 13) Given, $x + \frac{1}{x} = 1 \Rightarrow x^2 - x + 1 = 0$

Now, as $x \neq -1$

$$\Rightarrow (x+1)(x^2 - x + 1) = 0 \Rightarrow x^3 + 1 = 0$$

$$\therefore x^3 = -1$$

$$\Rightarrow (x^3)^{1333} x = -x \Rightarrow x^{4000} = -x$$

$$\begin{aligned} \text{and } p &= x^{4000} + \frac{1}{x^{4000}} \\ &= -x + \frac{1}{-x} = -\left(x + \frac{1}{x}\right) = -1 \end{aligned}$$

Let $x = 2$, then $q = (2)^{2 \times 2} + 1 = 16 + 1 = 17$

Here, unit's place digit = 7

$$\text{Hence, } p + q = -1 + 7 = 6$$

- 14) (d) Here, $10 < n < 1000$

Let n be the two-digit number.

$$\text{Then, } n = 10a + b, P_n = ab, S_n = a + b$$

$$\therefore ab + a + b = 10a + b$$

$$\Rightarrow ab = 9a$$

$$\therefore b = 9$$

So, there are $\boxed{9}$ two digit numbers, i.e. 19, 29, 39, ..., 99.

Again, let n be the three-digit number.

$$\text{Then, } n = 100a + 10b + c,$$

$$P_n = abc, S_n = a + b + c$$

$$\therefore abc + a + b + c = 100a + 10b + c$$

$$\Rightarrow abc = 99a + 9b \Rightarrow bc = 99 + 9\frac{b}{a}$$

But the maximum value for $bc = 81$

and RHS is more than 99.

So, no three-digit number is possible.

Hence, required number of integers is 9.

- 15) (b) Let $A = 100x + 10y + z \Rightarrow B = 100z + 10y + x$

$$\therefore B - A = 99(z - x)$$

For $B - A$ to be divided by 7, $(z - x)$ has to be divisible by 7. Only possibility is $z = 9, x = 2$ and y can be any number.

So, A can be 299 and B can be 992, when $y = 9$.

Here, $B - A = 693$, which is divisible by 7.

Hence, option (b) is correct.

- 16) (c) Given, $xy - x - y = 0$

Adding 1 to both sides of the equation, we get

$$xy - x - y + 1 = +1$$

$$\Rightarrow y(x-1) - 1(x-1) = 1$$

$$\Rightarrow (y-1)(x-1) = 1 \quad \dots(i)$$

As x and y are integers, $(x-1)$ and $(y-1)$ are integers.

So, both $(x-1)$ and $(y-1)$ must be 1 or -1 to satisfy

Eq. (i), i.e. $x = 2, y = 2$ or $x = 0, y = 0$. Hence, only two

integer pairs satisfy the equation $x + y = xy$.

- 17) (a) We have, $10^{10} = 10000000000$

If anyone of the zeroes is replaced by 1, the value of the result is between 10^{10} and 10^{11} . There are 10 zeroes, which can be replaced by 1.2×10^{10} .

2 followed by 10 zeroes also lies between 10^{10} and 10^{11} . Moreover, the sum of digits of each of the 11 numbers is two. Hence, n is equal to 11.

- 18) (c) Here, $0 < \frac{1}{n} \leq 1$

$$\text{For positive } n, 0 \leq 1 - \frac{1}{n} < 1 \Rightarrow 3 < 3 + \frac{1}{n} \leq 4$$

$$\Rightarrow 0 \leq 1 - \frac{1}{n} < x \leq 4 \Rightarrow 0 < x \leq 4$$

- 19) (a) $x, y, z > 0$; x and y are odd, z is even.

$\therefore$ [odd - even is odd], [odd - odd is even] and [odd $\times$ odd is odd].

Since, $(x - z)$ is odd.

So, $(x - z)^2$ is odd and $(x - z)^2 y$ is also odd.

Hence, except option (a) is true.

- 20) (c) Let $Q = A + B\sqrt{y} + C(\sqrt[3]{y})$

where A, B and C are constants.

$$60 = A + B + C \Rightarrow B + C = 60 - A \quad \dots(i)$$

$$230 = A + 8B + 4C \Rightarrow 2B + C = \frac{230 - A}{4} \quad \dots(ii)$$

$$660 = A + 27B + 9C \Rightarrow 3B + C = \frac{660 - A}{9} \quad \dots(iii)$$

On subtracting Eq. (i) from Eq. (ii), we get

$$B = \left(\frac{230 - A}{4} \right) - (60 - A) \quad \dots(iv)$$

On subtracting Eq. (ii) from Eq. (iii), we get

$$B = \left(\frac{660 - A}{9} \right) - \left(\frac{230 - A}{4} \right) \quad \dots(v)$$

From Eqs. (iv) and (v), we get

$$\left(\frac{230 - A}{4} \right) - (60 - A) = \left(\frac{660 - A}{9} \right) - \left(\frac{230 - A}{4} \right)$$

$$\Rightarrow 2 \left(\frac{230 - A}{4} \right) = \left(\frac{660 - A}{9} \right) + (60 - A)$$

$$\Rightarrow \frac{230 - A}{2} = \frac{660 - A + 540 - 9A}{9}$$

$$\Rightarrow 2070 - 9A = 2400 - 20A \Rightarrow 11A = 330$$

$$\therefore A = 30$$

- 21) (d) Let the hundred's, ten's and unit's digits be x, y and z , respectively.

Then, $(100x + 10y + z)$ is the three-digit number

$$= 11(10x + z)$$

$$= (100x + z) + (10x + 10z)$$

$$\therefore y = x + z$$

$$\text{Given, } y - x = 1$$

$$\therefore z = 1$$

Note If $(x - y)$ is taken as 1, $z = -1$ which is inadmissible.

- 22) (d) Given, $w + x + y + z = 8m + 10$

$$\text{If } m = 1, w + x + y + z = 8m + 10 = 18$$

If the sum of natural numbers is constant, then the sum of their squares is minimum when the numbers are as close as possible.

So, the four numbers must be

$$(2m + 2), (2m + 2), (2m + 3) \text{ and } (2m + 3).$$

$$\therefore \text{Minimum value of } w^2 + x^2 + y^2 + z^2$$

$$= (2m + 2)^2 + (2m + 2)^2 + (2m + 3)^2 + (2m + 3)^2$$

$$= 16m^2 + 40m + 26$$

- 23) (d) **Option (a)**

As q and r are odds, q^2 and r^2 are odds.

So, pq^2r^3 is odd.

Hence, option (a) is always true.

Option (b)

$(p + q)^2$ is even.

So, $(p + q)^2 r^3$ is even.

Hence, option (b) is always true.

Option (c)

Here, $(q + r)$ is even.

So, $(p - q + r)^2 (q + r)$ is even.

Hence, option (c) is always true.

Option (d)

If $p = 1, q = 3$ and $r = 5, pqr$ leaves a remainder of 3 when divided by 4.

If $p = 3, q = 5$ and $r = 7, pqr$ leaves a remainder of 1 when divided by 4.

Hence, option (d) is not always true.

- 24) (d) Statements I and II are wrong, since when p is prime number, so it does not have any factor. So, when all factors (or numbers) before p do not involve in the product, so it is not divisible by p or any prime number greater than p . Statement III is wrong, since $1 \times 2 \times 3 \times 4 \times 5 \times 6$ is divisible by 5. Since, x in values prime number less than $(p - 1)$, hence Statement IV is correct.

- 25) (c) Let x , y and z be the hundredth, tens and unit digits of the original number.

According to the question,

$$(100z + 10y + x) - (100x + 10y + z) = 594$$

$$\Rightarrow 99(z - x) = 594 \Rightarrow (z - x) = 6$$

So, the possible values of (x, z) are $(1, 7)$, $(2, 8)$ and $(3, 9)$.

Again, the tens digit can have any values from 0, 1, 2, ..., 9.

$$\therefore \text{Minimum value for their sum} = x + y + z = 1 + 0 + 7 = 8$$

- 26) (a) $22^3 + 23^3 + 24^3 + 25^3 + \dots + 87^3 + 88^3$

On rearranging

$$= (22^3 + 88^3) + (23^3 + 87^3) + (24^3 + 86^3) + \dots + (54^3 + 56^3) + 55^3$$

Now, we know that $a^n + b^n$ is divisible by $(a + b)$ when n is odd number. Therefore, all the terms except 55^3 , is divisible by 110. Now, the remainder when 55^3 is divided by 110 is 55.

Hence, the required remainder when whole expression is divided by 110 is 55.

- 27) (b) $x + \frac{1}{x} = 1 \Rightarrow x^2 - x + 1 = 0$
Now, as $x \neq -1$

$$\Rightarrow (x + 1)(x^2 - x + 1) = 0$$

$$\Rightarrow x^3 + 1 = 0$$

$$\therefore x^3 = -1$$

$$\Rightarrow (x^3)^{1333} x = -x$$

$$\Rightarrow x^{4000} = -x$$

$$\text{and } p = x^{4000} + \frac{1}{x^{4000}}$$

$$= -x + \frac{1}{-x} = -\left(x + \frac{1}{x}\right) = -1$$

Now, let $n = 2$

$$\text{Then, } q = 2^{2^2} + 1$$

$$= 16 + 1 = 17$$

Unit's place digit = 7

$$\therefore p + q = -1 + 7 = 6$$

- 28) (a) Let $p + q = A$ and $r + s = B$

$$\text{Now, } p + q + r + s = 2 \quad (\text{given})$$

$$\text{So, } A + B = 2 \text{ and } AB > 0$$

(since, A and B are positive real numbers)

We know that,

$$AM \geq GM \Rightarrow \frac{p+q}{2} \geq \sqrt{pq}$$

$$\Rightarrow 1 \geq \sqrt{pq}$$

On squaring both sides, we get

$$1 \geq pq$$

$$pq = m \leq 1$$

$$\therefore 0 \leq m \leq 1$$

- 29) (d) We have to find the number of prime numbers from 101 to 200, which is 21.

- 30) (b) The numbers are of the form $8k + 6$.

$$\therefore \text{Sum} = \sum_{k=1}^{11} 8k + 6$$

$$= 6(11) + 8(11/2)(12) = 66 + 66(8) = 66(9) = 594$$

- 31) (a) $(2)^{1040} / 131 = (2^8)^{130} / 131 = (256)^{130} / 131$

The remainder of a number of the form a^n , divided by $n + 1$ (where $n + 1$ is prime and is relatively prime to a) is always 1.

Hence, the remainder of 2^{1040} divided by 131 is 1.

- 32) (d) Since, the number has 4 in the expression.

The base must be ≥ 5 .

If the original base is y , then the number in base 10 is $y^2 + 4y + 4 = (y + 2)^2$

So, square root $= y + 2$ which is greater than the base and hence will be presented by 2 (2 can be used as base ≥ 5).

Then, the number $(144)_y = (y + 2)_{10}^2$ can be represented in base $(y + 2)$ as

$y + 2$	$(y + 2)^2$	0
	$y + 2$	0
	1	1

$$\therefore (144)_y = (100)_{y+2}$$

$\therefore$ Both Statements I and II are true.

- 33) (b) Clearly, the requirement cannot be satisfied for $n = 1$ but it is possible. For $n = 2$, the partitioned subsets are $\{2, 3, 4, 7\}$ and $\{1, 5, 6, 8\}$, where 4 and 5 are the arithmetic means, respectively.

Alternatively

Let a, b, c and d be the elements of subset of A , where a is arithmetic mean of a, b, c and d .

$$\therefore a = \frac{a + b + c + d}{4}$$

$$\Rightarrow 4a = a + b + c + d$$

$\therefore$ The sum of all elements in any subset A_i and in turn sum of all elements S is multiple of 4, which is possible only for even value of n .

- 34) (a) The smallest number divisible by 2, 3, 4, 5 and 6 is their LCM $(2, 3, 4, 5, 6) = 60$

∴ The Taxi number is of the form $(60x + 1)$. The only option that satisfies the condition is option (a) and option (d). But as no other driver can say the same about his taxi number the number has to be the smallest.

- 35) (d) The given numbers are 2^{2004} and 5^{2004} .

Let $a = 2004$

Total number of digits when 2^1 and 5^1 are written side by side $(25) = (1 + 1)$

Total number of digits when 2^2 and 5^2 are written one after another $(425) = (2 + 1)$

Similarly for 2^3 and $5^3 = (3 + 1)$ and so on.

∴ Total number of digits when 2^{2004} and 5^{2004} are written one after another is $2004 + 1 = 2005$

∴ Hence, option (d) is correct.

- 36) (b) The sum of the squares of the first n odd natural numbers = sum of the squares of the first $2n - 1$ natural numbers $- 4 \times$ sum of the squares of the first $n - 1$ even natural numbers

Hence,

$$S_n = \frac{(2n-1)(2n)(4n-1)}{6} - 4 \left[\frac{(n-1)(n)(2n-1)}{6} \right]$$

$$= \frac{n(2n-1)}{3} (2n+1)$$

As, $S_n = 533n$

$$\therefore n(2n-1)(2n+1) = 1599n$$

$$\Rightarrow 4n^2 = 1600 \Rightarrow n = 20$$

- 37) (b) We get for $k \geq 5$, $2.4 + 4 \times 2 + 1.2(k - 5)$

$$= 10.4 + 1.2(k - 5)$$

- 38) (b) The easiest way to solve such problems for CAT purposes is trail and error or by back substituting answers in the choices given.

$$101^2 = 10201$$

$$101^2 - 1 = 10200$$

This is divisible by 100.

Similarly try for

$$101^3 - 1 = 1030301 - 1 = 1030300$$

So, you can safely conclude that $(101^1 - 1)$ to

$(101^9 - 1)$ will be divisible by 100.

$(101^{10} - 1)$ to $(101^{99} - 1)$ will be divisible by 1000.

Therefore, $(101^{100} - 1)$ will be divisible by 10000.

- 39) (c) Let the number of days that they holidayed be equal to T .

Then, they practiced Yoga on $(T - 24)$ mornings.

They played tennis on $(T - 12)$ evenings.

As they did not do both the activities together on any single day,

Days on which they had any activity

= Number of days they practiced Yoga

+ Number of days they played tennis

$$\text{i.e., } 22 = T - 24 + T - 12$$

$$\Rightarrow 22 + 24 + 12 = 2T \Rightarrow 58 = 2T$$

Hence, $T = 29$

- 40) (b) We know that number of factors in a perfect square is always even. So, factors in N^2 is an even number.

Now, factors of $N = 34$ – an even number

= even number

So, N is a perfect square too.

Now to find out the actual values of N , we consider that if the factors of N are of form $a^x \times b^y$, then factors of N^2 will be $a^{2x} \times b^{2y}$.

So, sum of factors will be

$$(x+1)(y+1) + (2x+1)(2y+1) = 34$$

Only value which satisfies this equation is $x=2, y=2$

(x, y are obviously positive integers)

For $N < 150$, we have only $N = 36$ and $N = 100$ (check for perfect squares)

So, the answer is 2.

- 41) (c) We can rewrite the numerator as $(-4)23 + 423$.

Hence, we get remainder = 0

Hence, answer option is (c).

- 42) (d) Since, the last digit in base 2, 3 and 5 is 1, the number should be such that on dividing by either 2, 3 or 5 we should get a remainder 1. The smallest such number is 31. The next set of numbers are 61, 91.

Among these only 31 and 91 are a part of the answer choices.

Among these, $(31)^{10}, (11111)^2, (1011)^3, (111)^5$

Thus, all three forms have leading digit 1.

Hence, the answer is 91.

- 43) (d) $a^n - b^n$ is divisible by $(a + b)$ and $(a - b)$, if n is even.

∴ $7^{74} - 5^{74}$ is divisible by 12 and 2, and consequently by 4.

- 44) (d) By direct division method,

$$a^2 + a - 6 \mid a^3 - 5a^2 + 7a - 9(a - 6)$$

$$\underline{(-)a^3 + a^2 - 6a}$$

$$-6a^2 + 13a - 9$$

$$\underline{(-) -6a^2 - 6a + 36}$$

$$19a - 45$$

$$\therefore \text{Remainder} = 19a - 45$$

- 45) (c) Let number of one rupee notes = A

Number of 20 paise coins = B

Hema started with $(100A + 20B)$ paise and came back with $(100B + 20A)$ paise.

$$\text{Also, } 100B + 20A = \frac{1}{3}(100A + 20B)$$

$$A = 7B$$

Thus, now check by hit and trial method

Put $B = 1 \rightarrow A = 7 \rightarrow$ total ₹ 7.2 is too less.

Put $B = 2 \rightarrow A = 14 \rightarrow$ total ₹ 14.4

This is correct. Hence, she spent $= \frac{2}{3} \times 14.4 = ₹ 9.60$

- 46) (d) The different values are

Step	P	Q	New Q	P × new Q	New P
1	1	1	2	2	2
2	2	2	3	6	6
3	6	3	4	24	24
4	24	4	5	120	120
5	120	5	6	720	720

- 47) (b) Let the required number system = N , then

$$(100)_N = (24)_N + (32)_N$$

$$N^2 = 2N + 4 + 3N + 2 = 5N + 6$$

$$N^2 - 5N - 6 = 0$$

$$\Rightarrow (N + 1)(N - 6) = 0$$

So, $N = 6$ as -1 is not possible.

- 48) (c) According to the question, if two numbers say a and b are erased and replaced by a new number $a + b - 1$, then in every repetition, the number of integers gets reduced by 1 and consequently at the last repetition there will be only one number left.
Note Whatever may be our selection of two numbers a and b . In any and every repetition, the final number so arrived will not change.

$$\begin{aligned} \text{Now, the sum of integers from 1 to 40} &= \frac{n(n+1)}{2} \\ &= \frac{40 \times 41}{2} = 820 \end{aligned}$$

As discussed above the sum of integers of the first, second, third ... repetitions will be 819, 818, 817, ... so on respectively. Therefore, after 39 operations there will be only 1 number left and that will be $820 - 39 = 781$.

- 49) (c) The last two digits of number the expansion of $(7)^4 = 01(2401)$ and if the power of 7 is any multiple of 4 the last two digits will not change,
 i.e., $(7)^4 = 2401 \Rightarrow 01$
 $(7)^8 = 5764801 \Rightarrow 01$
 Since, power of 7, i.e. 2008 is a multiple of 4, the last two digits of $(7)^{2008}$ will be 01.

- 50) (b) Quantity of rice left after first transaction

$$= x - \left(\frac{x}{2} + \frac{1}{2} \right) = \frac{x}{2} - \frac{1}{2}$$

Quantity of rice left after second transaction

$$= \left(\frac{x}{2} - \frac{1}{2} \right) - \left(\frac{x}{4} - \frac{1}{4} + \frac{1}{2} \right) = \frac{x}{4} - \frac{3}{4}$$

Quantity of rice left after third transaction

$$= \left(\frac{x}{4} - \frac{3}{4} \right) - \left(\frac{x}{8} - \frac{3}{8} + \frac{1}{2} \right) = \frac{x}{8} - \frac{7}{8}$$

$$\text{Given, } \frac{x}{8} - \frac{7}{8} = 0 \Rightarrow x = 7$$

- 51) (c) Both the sequences (17, 21, 25, ...) and (16, 21, 26, ...) are arithmetic progression with a common difference of 4 and 5, respectively.

In both the sequences first common term is 21. Hence, a new arithmetic sequence containing the common terms of both the series can be formed with a common difference of LCM of (4, 5), i.e. 20.

$\therefore$ New sequence will be 21, 41, 61, ..., 401.

$$nth \text{ term} = a + (n-1)d$$

$$401 = 21 + (n-1)20$$

$$\therefore (n-1) = \frac{401-21}{20} \Rightarrow 19$$

$$\therefore n = 20$$

- 52) (d) The number required is greater than 999 and less than and equal to 4000. Now out off four digits 0, 1, 2, 3 and 4. To form a number greater than 999 and less than 4000.

The digit at thousands place can be selected in 3 ways. ($\therefore$ 0 and 4 can not be taken)

The digit at hundreds place can be selected in 5 ways.

The digit at tens place can be selected in 5 ways.

The digit at unit place can be selected in 5 ways.

$\therefore$ Total required number of ways $= 3 \times 5 \times 5 \times 5 = 375$

Since, 4000 is also one of the required number.

Therefore, total number of ways $= 375 + 1 = 376$

- 53) (e) Seed (n) is defined as sum of the digits of n . From the given definition $S(n) = 9$ will be satisfied for all the multiples of 9. In the first 499 natural numbers, we have 495 as the last multiple of 9, which is 55th multiple of 9.

$$\begin{aligned} 54) (a) (a+b+c)^{20} &= \{(a+b)+c\}^{20} \\ &= {}^{20}C_0(a+b)^{20} \cdot C^0 + {}^{20}C_1(a+b)^{19} \cdot C^1 \\ &\quad + \dots + {}^{20}C_{20}(a+b)^0 \cdot C^{20} \end{aligned}$$

$$\text{Number of terms} = 21 + 20 + 19 + \dots + 1 = 231$$

Hence, option (a) is the correct answer.

- 55) (a) Let the three consecutive positive integers be $(n-1)$, n and $(n+1)$.

$$\Rightarrow n-1 + n^2 + (n+1)^3 = (3n)^2$$

$$\Rightarrow n^3 + 4n^2 + 4n = 9n^2 \Rightarrow n^2 - 5n + 4 = 0$$

$$\Rightarrow n = 1 \text{ or } n = 4$$

Since, the three integers are positive, the value of ' n ' cannot be equal to 1, therefore the value of $n = 4$ or $m = n - 1 = 3$. Hence, three consecutive integers are 3, 4 and 5. Hence, option (a) is the correct choice.

56) (a) First term is $\sqrt{1+1+\frac{1}{4}} = \frac{3}{2} = 2 - \frac{1}{2}$

Sum of first two terms is $\frac{3}{2} + \sqrt{1+\frac{1}{4}+\frac{1}{9}}$
 $= \frac{3}{2} + \sqrt{\frac{36+9+4}{36}} = \frac{3}{2} + \frac{7}{6} = \frac{16}{6} = \frac{8}{3} = 3 - \frac{1}{3}$

Sum of first three terms is $\frac{8}{3} + \sqrt{1+\frac{1}{9}+\frac{1}{16}}$
 $= \frac{8}{3} + \sqrt{\frac{169}{144}} = \frac{8}{3} + \frac{13}{12} = \frac{45}{12} = \frac{15}{4} = 4 - \frac{1}{4}$

Similarly, sum of the given terms is $2008 - \frac{1}{2008}$.

57) (d) Any four digit number in which first two digits are equal and last two digits are also equal will be of the form $11 \times (100a + b)$, i.e. it will be multiple of 11 like 1122, 3366, 2244, ... Now, let the required number be $aabb$. Since, $aabb$ is a perfect square, the only pairs of values of a and b that satisfy the above mentioned condition is $a = 7$ and $b = 4$. Hence, 7744 is a perfect square.

58) (e) In each team there are two players which share with other two teams T_{n-1} and T_{n+1} (Team T_3 shares with T_4 and T_2 and so on) other $(k-2)$ players share with no other team, so total players which play for only one team = $n(k-2)$ one player is common in T_1 and T_2 , T_2 and T_3 and so on

Number of such players = Number of pairs = n

So, total players = $n(k-2) + n = n(k-1)$

59) (d) Total age of eight people 10 yr ago = 231yr

Total age of eight people 7 yr ago
 $= 231 + 8 \times 3 - 60 + 0 = 195$

Total age of eight people 4 yr ago
 $= 195 + 3 \times 8 - 60 + 0 = 159$

Current total age of eight people
 $= 159 + 4 \times 8 = 191$ yr

$\therefore$ Average age = $\frac{191}{8} = 24$ yr (approximately).

60) (b) Price of Darjeeling tea (in rupees per kg) is $100 + 0.10n$.

Price of Ooty tea (in rupees per kg) is $89 + 0.15n$.

Price of Darjeeling tea on the 100th day
 $= 100 + 0.1 \times 100 = 110$

$\Rightarrow 89 + 0.15n = 110$

$\Rightarrow n = 140$

Number of days in the months of Jan, Feb, March, April in the year 2007 = $31 + 28 + 31 + 30 = 120$

Therefore, the price of both the tea will be equal on 20th May.

61) (b) Let the number of currency of 1 miso, 10 misos and 50 misos be x , y and z , respectively.

Then, $x + 10y + 50z = 107$.

Now, possible values of $z = 0, 1, 2$. If $z = 0$, then $x + 10y = 107$. Now, number of pairs of values of x and y that satisfy the above equation are 11. These pairs (7,10), (17, 9), ..., (107, 0). If $z = 1$, then $x + 10y = 57$.

For this number of pairs of values of x and y is 6. (7, 5), (17, 4), (27, 3), ..., (57, 0) if $z = 2$, then $x + 10y = 7$. There is only one such pair of x and y , (7, 0) which satisfy the equation. Therefore, total number of ways = $11 + 6 + 1 = 18$

62) (c) Suppose the cheque for Shailaja is of ₹ X and Y paise. According to the information given in the question.

$$3 \times (100X + Y) = (100Y + X) - 50$$

$$300X + 3Y = 100Y + X - 50$$

$$299X = 97Y - 50$$

$$Y = \frac{299X + 50}{97}$$

Now, value of Y should be an integer. For $X = 18$, Y is an integer 56. Hence, option (c) is the correct choice.

63) (d) $\frac{1}{m} + \frac{4}{n} = \frac{1}{12}$, $n < 60$

$$\Rightarrow \frac{1}{m} = \frac{1}{12} - \frac{4}{n} = \frac{n-48}{12n}$$

$$\Rightarrow m = \frac{12n}{n-48}$$

Positive integral values of m for odd integral values of n are for $n = 49, 51$ and 37 . Therefore, there are 3 integral pairs of values of m and n that satisfy the given equation.

64) (b) LCM of 2, 3, 4, 6, 12 = 12

$$(2^{1/2})^{12}, (3^{1/3})^{12}, (4^{1/4})^{12}, (6^{1/6})^{12}, (12^{1/12})^{12}$$

$$(2)^6, (3)^4, (4)^3, (6)^2, (12)^1$$

$$64, 81, 64, 36, 12$$

Hence, $3^{1/3}$ is the largest.

65) (a) Given, $t_n = \frac{n}{(n+2)}$, $n = 1, 2, \dots$

$$\text{Therefore, } t_3 = \frac{3}{5}, t_4 = \frac{4}{6}, t_5 = \frac{5}{7}, \dots, t_{53} = \frac{53}{55}$$

$$\begin{aligned} \therefore t_3 \times t_4 \times t_5 \times \dots \times t_{53} \\ &= \frac{3}{5} \times \frac{4}{6} \times \frac{5}{7} \times \frac{6}{8} \times \dots \times \frac{51}{53} \times \frac{52}{54} \times \frac{53}{55} \\ &= \frac{3 \times 4}{54 \times 55} = \frac{2}{495} \end{aligned}$$

66) (a) Given that $\frac{a}{b} = \frac{1}{3}$, $\frac{b}{c} = 2$, $\frac{c}{d} = \frac{1}{2}$, $\frac{d}{e} = 3$ and $\frac{e}{f} = \frac{1}{4}$

$$\therefore \frac{a}{b} \times \frac{b}{c} \times \frac{c}{d} = \frac{1}{3} \times 2 \times \frac{1}{2} = \frac{1}{3}$$

$$\Rightarrow \frac{a}{d} = \frac{1}{3} \text{ and } \frac{c}{d} \times \frac{d}{e} = \frac{1}{2} \times 3 = \frac{3}{2}$$

$$\Rightarrow \frac{c}{e} = \frac{3}{2}$$

$$\text{and } \frac{e}{f} \times \frac{d}{e} \times \frac{b}{c} \times \frac{c}{d} = \frac{1}{4} \times 3 \times 2 \times \frac{1}{2} = \frac{3}{4}$$

$$\Rightarrow \frac{b}{f} = \frac{3}{4}$$

$$\therefore \frac{abc}{def} = \frac{a}{d} \times \frac{c}{e} \times \frac{b}{f} = \frac{1}{3} \times \frac{3}{2} \times \frac{3}{4} = \frac{3}{8}$$

- 67) (b) Using options, we can solve the question easily.

$$\text{Put } x = -\frac{1}{2}$$

$$(a) 2^{-2} = \frac{1}{4} \quad (b) \frac{1}{\left(-\frac{1}{2}\right)} = -2 \quad (c) \frac{1}{\left(-\frac{1}{2}\right)^2} = 4$$

$$(d) 2^{-1/2} = \frac{1}{\sqrt{2}} \quad (e) \frac{1}{\sqrt{-\left(\frac{1}{2}\right)}} = \sqrt{2}$$

- 68) (c) Using options, we find that four consecutive odd numbers are 37, 39, 41 and 43. The sum of these 4 numbers is 160, when divided by 10, we get 16 which is a perfect square.

$\therefore$ 41 is one of the odd numbers.

- 69) (b) Let the number be $(10x + y)$, so when the digits of number are reversed the number becomes $(10y + x)$. According the question, $(10y + x) - (10x + y) = 18$
- $$\Rightarrow 9(y - x) = 18$$
- $$\Rightarrow y - x = 2$$
- So, the possible pairs of (x, y) are $(1, 3), (2, 4), (3, 5), (4, 6), (5, 7), (6, 8)$ and $(7, 9)$. But we want the number other than 13. Thus, there are 6 possible numbers, i.e. 24, 35, 46, 57, 68, 79. So, total number of possible numbers are 6.

- 70) (e) Using options, we find that sum of numerator and denominator of $97 : 84$ is $(97 + 84) = 181$, which is a prime number. Hence, it is the appropriate answer.

- 71) (a) $[(30)^4]^{680}$, hence the rightmost non-zero digit is 1.

- 72) (a) The 100th and 1000th position value will be only 1. Now, the possibility of unit and tens digits are $(1, 3), (1, 9), (3, 1), (3, 7), (5, 5), (7, 3), (7, 9), (9, 1), (9, 7)$.

- 73) (c) $x = \sqrt{4 + \sqrt{4 - x}} \Rightarrow x^2 = 4 + \sqrt{4 - x}$

Now, put the values from only option (c) satisfies the condition.

- 74) (b) Let the rectangle has m and n tiles along its length and breadth, respectively.

The number of white tiles

$$W = 2m + 2(n - 2) = 2(m + n - 2)$$

And the number of red tiles $= R = mn - 2(m + n - 2)$

Given, $W = R \Rightarrow 4(m + n - 2) = mn$

$$\Rightarrow mn - 4m - 4n = -8 \Rightarrow (m - 4)(n - 4) = 8$$

$$\Rightarrow m - 4 = 8 \text{ or } 4 \Rightarrow m = 12 \text{ or } 8$$

$\therefore$ 12 suits the option.

- 75) (d) If $P = 1! = 1$

Then, $P + 2 = 3$ when divided by $2!$ remainder will be 1.

$$\text{If } P = 1! + 2 \times 2! = 5$$

Then, $P + 2 = 7$ when divided by $3!$ remainder is still 1.

$$\text{Hence, } P = 1! + (2 \times 2!) + (3 \times 3!) + \dots + (10 \times 10!)$$

When divided by $11!$ leaves remainder 1.

Alternative method

$$P = 1 + 2 \cdot 2! + 3 \cdot 3! + \dots + 10 \cdot 10!$$

$$= (2 - 1)1! + (3 - 1)2! + (4 - 1)3! + \dots + (11 - 1)10!$$

$$= 2! - 1! + 3! - 2! + \dots + 11! - 10! = 1 + 11!$$

Hence, the remainder is 1.

- 76) (b) We would be first considering the case when 1 is coming at unit place and 3 or 5 is coming at 100th position and even number will be at 10000 position. The possible number of cases are $2 \times 2 \times 2 = 8$.

So, when 1 is coming at the unit position and 1 odd number is coming at 100th position, then there are 8 cases similarly when odd number is coming at 10000 position, then also there will be 8 cases, so total number of cases when 1 is coming at unit position is 16. Therefore, summation of all cases is $16(1 + 3 + 5) = 144$.

Now, when even number is coming at the 1 position. Then, the number of possible cases $3 \times 2 \times 2 \times 1 \times 1 = 12$. Therefore, the summation of these numbers at unit position will be $12(2 + 4) = 72$. So, the total sum of all these numbers will be $144 + 72 = 216$ at unit position.

- 77) (d) Given, Number of adults > Number of boys > Number of girls > Number of families.

Going back from the choices, let us start with the least value given in the choices. Since the minimum possible number of families has been asked.

In choice (c), Number of families = 2

$\Rightarrow$ Number of girls ≥ 3 , Number of boys ≥ 4 and Number of adults ≥ 5 . But two families together can have a maximum of 4 adults.

$\therefore$ Number of families $\neq 2$.

In choice (d), Number of families = 3

$\therefore$ Number of girls ≥ 4 , Number of boys ≥ 5 and Number of adults ≥ 6

3 families can have a maximum of 9 children and 6 adults. Hence, the minimum number of families = 3

- 78) (a) Let the first term and the common difference of the progression be a and d , respectively.

$$\text{Given, } S_{11} = S_{19}, \text{ i.e. } \frac{11}{2} [2a + 10d] = \frac{19}{2} [2a + 18d]$$

$$\Rightarrow 16a + 232d = 0 \Rightarrow 2a + 29d = 0$$

$$\therefore S_{30} = \frac{30}{2} [2a + 29d] = 15(0) = 0$$

- 79) (a) Let the number of members as on January 1, 2004 in S_1 and S_2 be n each. At the beginning of every month, members of society S_1 are in arithmetic progression while those of S_2 are in geometric progression. Hence, on July 1, 2004 the number of members in S_1 and S_2 are $n + (7-1)b$ and nr^{7-1} , i.e. $n + 6b$ and nr^6 , respectively.

Hence, $n + 6b = n + 6(10.5n) = 64n = nr^6$
 $\Rightarrow r^6 = 64 \Rightarrow r = 2$. Hence the value of $r = 2$.

80) (d) Since, $y = \frac{1}{2 + \frac{1}{3 + \frac{1}{2 + \frac{1}{3 + \dots}}}}$
 $y = \frac{1}{2 + \frac{1}{3 + y}} \Rightarrow y = \frac{3 + y}{6 + 2y + 1}$

$\Rightarrow 2y^2 + 7y = 3 + y \Rightarrow 2y^2 + 6y - 3 = 0$

$\therefore y = \frac{-6 \pm \sqrt{36 + 24}}{4} = \frac{-3 \pm \sqrt{15}}{2}$

As the contained fraction is positive $y = \frac{\sqrt{15} - 3}{2}$.

- 81) (b) Each of the N persons from a pair with $(N-3)$ persons (i.e. excluding the person himself and the adjacent two). So, the total number of pairs that can be formed = $\frac{N(N-3)}{2}$

$\therefore$ The total time they sing = $\frac{N(N-3)}{2} \times 2 = 28$ (given)

$\Rightarrow N(N-3) = 28$
 $N^2 - 3N - 28 = 0$

$\therefore N = 7$ or $-4 \Rightarrow N = 7$ (as $N > 0$).

- 82) (c) $a^n + b^n$ is always divisible by $a + b$ when n is odd.
 $\therefore 15^{23} + 23^{23}$ is always divisible by $15 + 23 = 38$. As, 38 is a multiple of 19, $15^{23} + 23^{23}$ is divisible by 19.
 $\therefore$ We get a remainder of 0.

- 83) (c) The terms of the given sequence are as follows

$$\begin{array}{ll} a_1 = 81.33 & a_7 = a_1 \\ a_2 = -19 & a_8 = a_2 \\ a_3 = a_2 - a_1 & a_9 = a_3 \\ a_4 = -a_1 & a_{10} = a_4 = -a_1 \\ a_5 = -a_2 & a_{11} = a_4 = -a_2 \\ a_6 = -a_2 + a_1 & a_{12} = a_6 = -a_3 \text{ and so on.} \end{array}$$

The sum of the first six terms, the next six terms and so on is 0.

The sum of the first 6002 terms can be written as the sum of first 6000 terms + 6001st term + 6002nd term. From the above explanation, the sum of the first 6000 terms is zero, 6001st term will be a_1 and 6002nd term will be a_2 .

$\therefore$ The sum of the first 6002nd terms will be
 $a_1 + a_2 = 81.33 + (-19) = 62.33$.

- 84) (a) $a, a+2, a+4$ are prime numbers.
 Put value of " a " starting from 3.
 We will have 3, 5, 7 as the only set of prime numbers satisfying the given relationship.

- 85) (d) Put $x = 2$ and $y = 6$ and check for the options.

- 86) (d) Consider a number $n = 6$

$$\sqrt{n} = 245$$

A : We have a divisor 2 which is greater than 1 and less than $\sqrt{6}$.

B : We have a divisor 3 which is greater than $\sqrt{6}$ but less than 6.

Thus, both statements are true.

- 87) (d) $4^3 \equiv 4 \pmod{6}$

$$4^4 \equiv 4 \pmod{6}$$

$$4^6 \equiv 4 \pmod{6}$$

and so on ... the answer will remain the same.

- 88) (b) First of all, we have to identify such 2 digit numbers.

Obviously, they are 10, 17, 24, ...

The required sum = $10 + 17 + \dots + 94$. Now, this is an AP with $a = 10$, $n = 13$ and $a = 7$

$$= \frac{13}{2} [2 \times 10 + (13-1)7] = 676$$

- 89) (b) For $n = 1$, $7^6 - 6^6 = (7^3)^2 - (6^3)^2$
 $= (7^3 - 6^3)(7^3 + 6^3) = (343 - 216)(343 + 216)$
 $= 127 \times 559$. Clearly, it is divisible by 127.

- 90) (d) The number = $3\{4(7x+4)+1\} + 2 = 84x + 53$

Hence, if the number is divided by 84, the remainder is 53.

- 91) (a) 2^{256} can be written as $(2^4)^{64} = (17-1)^{64}$.

In the expansion of $(17-4)^{64}$ every term is divisible by 17 except $(-1)^{64}$. Hence, the remainder is 1.

- 92) (d) Sum of n natural numbers = $\frac{n}{2} [2a + (n-1)d]$

$$575 = \frac{n}{2} [2 + (n-1)] \Rightarrow 575 = \frac{n(n+1)}{2}$$

$$n^2 + n = 1150$$

$$\text{For } n = 33, n^2 + n = 1122$$

$$\text{For } n = 34, n^2 + n = 1190.$$

$$\text{The difference } (1190 - 1150) = 40$$

$$\text{or effective change required is } \frac{40}{2} = 20$$

Hence, number 20 was missed by the student.

- 93) (d) Let the two unequal numbers be x and y .

$$\text{Then, } 48(x-y) = (x^2 - y^2) \Rightarrow x + y = 48$$

- 94) (b) At last thief is left with one diamond. Hence, the number of diamonds before he gave some diamonds to the third watchman = $x - \left(\frac{x}{2} + 2\right) = 1$

$$\Rightarrow \frac{x-4}{2} = 1 \Rightarrow x = 6$$

Hence, he had 6 diamonds before he gave 5 to the third watchman. Similarly, number of diamonds before giving to second watchman

$$= \frac{x-4}{2} = 6 \Rightarrow x = 16$$

and number of diamonds before giving to the first watchman = $\frac{x-4}{2} = 16 \Rightarrow x = 36$

Therefore, the thief stole 36 diamonds originally.

- 95) (b) Using options we find that only option (b) satisfies the given condition $\Rightarrow (5+4)^2 - 54 = 27$.

- 96) (c) Three numbers can be selected and arranged out of 10 numbers in ${}^{10}P_3$ ways = $\frac{10!}{7!} = 10 \times 9 \times 8$. Now, this arrangement is restricted to a given condition that first number is always less than the second number and second number is always less than the third number. Hence, three numbers can be arranged among themselves in $3!$ ways.

Hence, required number of arrangements

$$= \frac{10 \times 9 \times 8}{3 \times 2} = 120 \text{ ways.}$$

- 97) (a) Let the last number of the series be n and the number erased by x , then

$$\frac{\frac{n(n+1)}{2} - x}{n-1} = \frac{602}{17} \Rightarrow \frac{n(n-1)-2x}{2(n-1)} = \frac{602}{17}$$

Using options we find that for $x = 7$, n is an integer i.e. 69.

- 98) (a) The product of 44 and 11 is 484.

Here, $3x^3 + 4x^2 + 1x^1 + 4 \times x^0 = 484$

$$\Rightarrow 3x^3 + 4x^2 + x = 480$$

This equation is satisfied only when $x = 5$.

In decimal system, the number 3111 can be written as 406.

- 99) (d) Number of mint before Eswari took

$$= \left(x - \frac{x}{2}\right) + 2 = 17 \Rightarrow x = 30$$

Number of mint before Fatima took

$$= \left(x - \frac{x}{4}\right) + 3 = 30 \Rightarrow x = 36$$

Number of mint before Sita took

$$= \left(x - \frac{x}{3}\right) + 4 = 36 \Rightarrow x = 48$$

Hence, there were 48 mints originally.

- 100) (d) Let $y = n^3 - 7n^2 + 11n - 5$

At $n = 1$, $y = 0$

$$\therefore n^3 - 7n^2 + 11n - 5 = (n-1)(n^2 - 6n + 5) \\ = (n-1)^2(n-5)$$

Now, for every value of n , $(n-1)^2$ is always +ve.

$(n-5)$ is negative for all values < 5 . Hence, for $n = 6$, $(n-1)^2(n-5)$ is positive. Therefore, the smallest value of m is 6.

- 101) (d) $53x - 35x = 540 \Rightarrow 18x = 540 \Rightarrow x = 30$

Therefore, new product = $53 \times 30 = 1590$.

- 102) (a) Let the first, second, third and fourth digits be a , b , c and d , respectively.

$$\text{Then, } a + b = c + d \quad \dots (i)$$

$$a + d = c \quad \dots (ii)$$

$$b + d = 2(a + c) \quad \dots (iii)$$

From Eqs. (i) and (ii), we get $a + b = a + 2d \Rightarrow b = 2d$

From Eq. (iii), we get $2d + d = 2(a + a + d)$

$$\Rightarrow 3d = 2(2a + d) \Rightarrow d = 4a$$

$$\Rightarrow a = \frac{d}{4}$$

Now, from Eq. (ii), we get $a + d = \frac{d}{4} + d = \frac{5d}{4} = c$

$$\Rightarrow c = \frac{5}{4}d$$

The value of d can be either 4 or 8. If $d = 4$, then $c = 5$.

If $d = 8$, then $c = 10$. But the value of c should be less than 10. Hence, value of c would be 5.

- 103) (a) First light blink, after 20 s, second light blinks after 24 s.

Now, they blink together after LCM of 20 and 24 s = 120 s = 2 min.

Hence, the number of times they blink together in an hour = 30.

- 104) (d) Total weight of three pieces

$$= \left(\frac{9}{2} + \frac{27}{4} + \frac{36}{5}\right) = \frac{369}{20} = 18.45 \text{ lb}$$

Required weight of a single piece is HCF of

$$\left(\frac{9}{2}, \frac{27}{4}, \frac{36}{5}\right) = \frac{\text{HCF of } (9, 27, 36)}{\text{LCM of } (2, 4, 5)} = \frac{9}{20} \text{ lb}$$

$$\text{Number of guests} = \frac{18.45}{\frac{9}{20}} = \frac{18.45 \times 20}{9} = 41$$

- 105) (c)

12	1982
12	165-2
12	13-9
	1-1

The required number is 1192.

- 106) (d) The frog can move either clockwise or anti-clockwise in order to reach point E . In any case, number of jumps required is 4.

For $n = 4$; $a_{2n-1} = a_{8-1} = 7$.

107) (d) $N = 55^3 + 17^3 - 72^3 = (54 + 1)^3 + (18 - 1)^3 - 72^3$
 $= (51 + 4)^3 + 17^3 - (68 + 4)^3$

These two different forms of given expression is divisible by 3 and 17 both.

108) (d) Numbers between 100 to 200, which are divisible by 3 are 102, 106, 109, ..., 198. $198 = 102 + (n - 1) \times 3 \Rightarrow n = 30$. Out of these 33 numbers 17 are even and 16 are odd. Out of these 16 odd numbers there are three numbers (= 105, 147, 189), which are divided by the LCM of (7, 3), i.e. 21. Hence, in all $(16 - 3) = 13$ numbers are contained in S .

109) (d) Let the common remainder be x . Then, numbers $(34041 - x)$ and $(32506 - x)$ would be completely divisible by n . Hence, the difference of the numbers, i.e. $(34041 - x)$ and $(32506 - x)$ will also be divisible by n or $(34041 - x - 32506 + x) = 1535$ will also be divisible by n . Now, using options we find that 1535 is divisible by 307.

110) (c) According to the remainder theorem the remainders for the following expressions will be same
 $\frac{1421 \times 1423 \times 1425}{12} \Rightarrow \frac{5 \times 7 \times 9}{12} \Rightarrow \frac{315}{12} \Rightarrow \text{Remainder} = 3$

111) (b) Average of first five integers
 $= \frac{1 + 2 + 3 + 4 + 5}{5} = \frac{15}{5} = 3 = n$ (given)

and average of first seven integers
 $= \frac{1 + 2 + 3 + 4 + 5 + 6 + 7}{7} = \frac{28}{7} = 4 = (3 + 1) = (n + 1)$

112) (c) $\frac{1}{1 \cdot 3} + \frac{1}{3 \cdot 5} + \frac{1}{5 \cdot 7} + \dots + \frac{1}{19 \cdot 21}$
 $= \frac{1}{2} \left(1 - \frac{1}{3} \right) + \frac{1}{2} \left(\frac{1}{3} - \frac{1}{5} \right) + \frac{1}{2} \left(\frac{1}{5} - \frac{1}{7} \right) + \dots + \frac{1}{2} \left(\frac{1}{19} - \frac{1}{21} \right)$
 $= \frac{1}{2} \left(1 - \frac{1}{21} \right) = \frac{1}{2} \times \frac{20}{21} = \frac{20}{42} = \frac{10}{21}$

113) (c) $D = 0 \cdot a_1 a_2, 100D = a_1 a_2 \cdot a_1 a_2$
 $\therefore 99D = a_1 a_2 \Rightarrow D = \frac{a_1 a_2}{99}$

Required number should be the multiple of 99.
Hence, 198 is the required number.

114) (b) It is clear that for n positive integers function $h(a, b)$ has to be used one time less than the number of integers, i.e. $(n - 1)$ times.

115) (a) Let us solve the question for first consecutive positive integers, then $x = 1 \times 2 \times 3 \times 4 = 24$
 $\therefore n = 1 + 24 = 25$. We find that n is odd and a perfect square. This is true for any set of four consecutive positive integers.

116) (b) According to the remainder theorem, the following expression will have the same remainder,
 $\frac{(7)^{84}}{342} = \frac{(7^3)^{28}}{342} = \frac{(343)^{28}}{(342)} \Rightarrow \text{Remainder} = 1$.

117) (a) $(ab)^2 = ccb$. The greatest possible value of 'ab' to be 31. Since, $(31)^2 = 961$ and since $ccb > 300$, $300 < ccb < 961$, so $18 < ab < 31$.

So, the possible value of ab which satisfies $(ab)^2 = ccb$ is 21.

So, $(21)^2 = 441$

$\therefore a = 2, b = 1$ and $c = 4$.

Solutions (Q. Nos. 118-120) Let the series of integers $a_1, a_2, \dots, a_{50}$ be 1, 2, 3, 4, 5, ..., 50.

$S_1 = 1, 2, 3, 4, \dots, 24, S_2 = 25, 26, 27, \dots, 50$

118) (d) None of the options (a), (b), (c) is necessarily true. Hence, option (d) is an answer.

119) (c) Let $S_1 = 1, 2, 3, 4, \dots, 24, S_2 = 50, 49, \dots, 25$
New series after interchange

$S_1 = 1, 2, 3, 4, \dots, 25, S_2 = 50, 49, \dots, 24$

It is therefore clear that, S_1 continues to be in ascending order and S_2 in descending order.

120) (d) The smallest integer of the series 1 and greatest integer is 50. If each element of S_1 is made greater or equal to every element of S_2 , then the smallest element 1 should be added to $(50 - 1) = 49$. Hence, option (G - L) is the correct answer.

Solutions (Q. Nos. 121-123) Let Roopa had x flowers with her, then

	Balance before offering	Flower offered	Balance after offering
Ist Place	$2x$	y	$2x - y$
IInd Place	$4x - 2y$	y	$4x - 3y$
IIIrd Place	$8x - 2y$	y	$8x - 7y$
IVth Place	$16x - 14y$	y	$16x - 15y$

$\therefore 16x - 15y = 0 \Rightarrow 16x - 15y \Rightarrow y = \frac{16x}{15}$

121) (c) If $x = 30, y = 16 \times 2 = 32$

122) (c) Minimum value for y is available for $x = 15$
 $y = \frac{16}{15} \times 15 \Rightarrow y = 16$

123) (b) Minimum value of x is available for $y = 16$
 $x = \frac{15}{16} \times y = \frac{15}{16} \times 16 = 15$

124) (d) Square root of 12345678987654321 is 11111111.

125) (a) It is given in the question that ranking is in accordance with the alphabetical order. It means, A occupies first, B second, C third, D fourth position and so on. In other words, A wins all the matches, B wins all the matches except with A, C wins all the matches except with A and B and so on.

In view of the above order, N wins all the matches except with A to M. Hence, M wins over N.

- 126) (a) According to the rule of divisibility for 8, any number is divisible by 8, if the number formed by the last three digits is divisible by 8. And the same rule will be applicable to find the remainder. Now, the last three digits in the hundred digit number of the form 1234567891011121314 ... is 545. Therefore, the remainder when 545 is divided by 8 is 1.

- 127) (b) Required number of the set is calculated by the LCM of (2, 3, 4, 5, 6) – (common difference)

In this case, common difference

$$= (2 - 1) = (3 - 2) = (4 - 3)$$

$$= (5 - 4) = (6 - 5) = 1$$

∴ All integers of the set will be given by $(60n - 1)$.

$$\text{If } n = 1, (60n - 1) = 59$$

$$\text{If } n = 2, (60n - 1) = 119$$

Since, range of the set A is between 0 and 100, hence there will exist only one number, i.e. 59.

- 128) (a) Dividend = Divisor $\times$ Quotient + Remainder
 $= 899Q + 63$

$$\text{Dividend} = 29 \times 31Q + 29 \times 2 + 5 = 29(31Q + 2) + 5$$

- 129) (c) Time taken by red spot on all the three wheel to touch the ground again simultaneously will be equal to the LCM of the times taken by the three wheels to complete one revolution. The first wheel completes 60 revolutions per minute. Therefore, to complete

one revolution it takes $\left(\frac{60}{60}\right) = 1$ s

Time taken by the second wheel to complete one revolution = $\frac{36}{60} = \frac{3}{5}$ s

and time taken by the third wheel to complete one revolution = $\frac{24}{60} = \frac{2}{5}$ s

$$\text{Hence, LCM of } 1, \frac{3}{5}, \frac{2}{5} = \frac{\text{LCM}(1, 3, 2)}{\text{HCF}(1, 5, 5)} = \frac{6}{1} = 6 \text{ s}$$

- 130) (b) Unit digit in $(2)^4 = 6$, $(2)^8 = 6$, $(2)^{16} = 6$. Hence, 2 has a cyclicity of four. Hence, unit digit in $(2)^{48} = 6$
 Therefore, unit digit in $(2)^{51} = (2)^{48} \times (2)^3 = 6 \times 8 \Rightarrow 8$

- 131) (d) Number of students which should be seated in each room is the HCF of 60, 84 and 108, which is 12.
 ∴ Number of rooms required for subject A , subject B and subject $C = \frac{60}{12} = 5$ rooms, $\frac{84}{12} = 7$ rooms and $\frac{108}{12} = 9$ rooms, respectively. Hence, minimum number of rooms required to satisfy our condition = $(5 + 7 + 9) = 21$.

- 132) (b) Given, $(BE)^2 = MPB$. BE is a two digit number and will be less than or equal to 31 because $(32)^2$ is a four digit number. B can take any of the three values 0, 1, 2 and 3.

But it cannot be 2 and 3 because none of the square produces the digit 2 and 3 at the unit place and it is the requirement because B (the first digit of BE) should be equal to B (the last digit of MPB). It is hence confirmed that B should be either 0 or 1. But it can not be 0 because square of none of two digit number starting with 0 produces a three digit number ending with 0. Hence, B has to be 1. Again, E should be such a number whose square ends up with 1 and such number is 9. Hence, $BE = 19$. Therefore, $(19)^2 = 361$. Hence, $M = 3$.

- 133) (c) If n^3 is odd, then n and n^2 will also be odd. It can be checked for any odd integer. If $n = 3$, $n^2 = 9$, $n^3 = 27$.

$$\begin{aligned} 134) (d) A &= \frac{2.000004}{[(2.000004)^2 + (4.000008)]} \\ &= \frac{2.000004}{[(2.000004)^2 + 2(2.000004)]} \\ &= \frac{2.000004}{(2.000004)(2.000004 + 2)} = \frac{1}{4} \text{ (approx.)} \end{aligned}$$

Similarly, $B = \frac{1}{9}$ and $C = \frac{1}{8}$. It is therefore clear that $B = \frac{1}{9}$ is the smallest.

- 135) (c) Given, $100A + 10B + C = A! + B! + C!$

We can take the help of options. Value of B will be less than 7 because $7! = 5040$ which is a four digit number. Hence, B can be either 4 or 2.

Again, values of A and C has to be any of $6! = 720$ or $5! = 144$ because any other combination will not produce a three digit number. Hence, required number will be 145 as $1! + 4! + 5! = 1 + 24 + 120 = 145$.

- 136) (c) P, Q and R are three consecutive odd numbers hence $Q = P + 2$ and $R = P + 4$. given,
 $3P = 2(P + 4) - 3 \Rightarrow P = 5$. Hence, $R = 5 + 4 = 9$.

- 137) (b) $7^3 = 7^9$ and $(7^3)^2 = 7^6$. Hence, clearly $7^9 > 7^6$.

- 138) (c) The questions can be solved for any integers, divisible by 5. Let $m = 10$ and $n = 5$, then
 $(m - n) = (10 - 5) = 5$, which is divisible by 5.
 $(m^2 - n^2) = (100 - 25) = 75$, which is divisible by 5.
 $(m + n) = (10 + 5) = 15$, which is not divisible by 10.

- 139) (c) $\log_2[\log_7(x^2 - x + 37)] = 1$
 $\Rightarrow \log_7(x^2 - x + 37) = (2)^1 \therefore \log_a x = y$
 $\Rightarrow x = (a)^y \Rightarrow (x^2 - x + 37) = (7)^2$
 $\Rightarrow x^2 - x + 37 - 49 = 0$
 $\Rightarrow x^2 - x - 12 = 0 \Rightarrow x = 4$

- 140) (d) (P, Q) may be any of the followings
 $(1, 64), (2, 32), (4, 16), (8, 8)$. Hence, $P + Q$ cannot be 35.

- 141) (a) $\frac{7}{8}x - \frac{7}{18}x = 770 \Rightarrow \left(\frac{126 - 56}{144}\right)x = 770 \Rightarrow x = 1584$

- 142) (c) $\frac{(16n^2 + 7n + 6)}{n} \Rightarrow 16n + 7 + \left(\frac{6}{n}\right)$

Since, n is an integer, hence for the entire expression to become an integer $\left(\frac{6}{n}\right)$ should be an integer. And $\left(\frac{6}{n}\right)$ can be integer for $n = 1, 2, 3, 6$. Hence, n will have four values.

143) (b) Given expression is equal to $\frac{4}{7} + \frac{11}{7} = \frac{15}{7}$

144) (c) Let us solve the question for any two odd numbers greater than 1, i.e. 3 and 5, then
 $n(n^2 - 1)$ for $n = 3 = 3 \times 8 = 24$
 $n(n^2 - 1)$ for $n = 5 = 5 \times 24 = 120$

Using options, we find that both the numbers are divisible by 24.

145) (b) The number 774958A96B is divisible by 8 if 96B is divisible by 8. And 96B is divisible by 8, if B is either 0 or 8. Now to make the same number divisible by 9 sum of all the digits should be divisible by 9. Hence, $(55 + A + B)$ is divisible by 9, if $(A + B)$ is either 0 or 8 $\Rightarrow$ either $A = 0$ or $B = 8$ or $A = 8$ or $B = 0$.

Since, the number is divisible by both A and B. Hence, A and B may take either values. i.e. 8 and 0.

146) (b) Let the three even numbers be $(x - 2)$, x $(x + 2)$.
 Then, $3(x - 2) - 2(x + 2) = 2$
 $\Rightarrow 3x - 6 - 2x - 4 = 2 \Rightarrow x = 12$
 $\therefore$ The third number $= (12 + 2) = 14$

147) (b) The bells will chime together again after a time that is equal to the LCM of 18, 24 and $32 = 288$ min $= 4$ h and 48 min.

148) (a) Let one number be x , then second number will be $(x + 4)$.

$$\therefore \frac{1}{x} + \frac{1}{(x+4)} = \frac{10}{21} \Rightarrow \frac{x+x+4}{x(x+4)} = \frac{10}{21}$$

$$\Rightarrow \frac{2x+4}{x(x+4)} = \frac{10}{21} \Rightarrow x = 3$$

149) (b) $(5^6 - 1) = (5^3)^2 - (1)^2 = (125)^2 - (1)^2$
 $= (125 + 1)(125 - 1) = 126 \times 124 = 31 \times 4 \times 126$

It is therefore clear that the expression is divisible by 31.

150) (b) Let us solve the question for some prime numbers greater than 6, i.e. 7, 11, 13 and 17. If these numbers are divided by 6, the remainder is always either 1 or 5.

151) (d) It is clear that for $n = 237$ the expression $n(n + 1)(2n + 1)$ is divisible by 237. Hence, option (d) is not necessarily true.

152) (a) $\frac{55^3 + 45^3}{55^2 - 55 \times 45 + 45^2} = \frac{(55 + 45)(55^2 - 55 \times 45 + 45^2)}{(55^2 - 55 \times 45 + 45^2)}$
 $= (55 + 45) = 100$

153) (c) Clearly, $5.51 \times 72 = 396.72$. None other option gives answer similar to it.

154) (d) LCM of (7, 12, 16) = 336

If we divide 1856 by 336, then remainder is 176. Since, it is given the remainder in this condition is 4. Hence the least number to be subtracted $= (176 - 4) = 172$.

155) (c) Let $\log_6 216\sqrt{6} = x$, then $216\sqrt{6} = (6)^x$
 $\therefore \log_a x = y \Rightarrow x = (a)^y$
 $(6)^3 \times (6)^{\frac{1}{2}} = (6)^x \Rightarrow (6)^{\frac{7}{2}} = (6)^x \Rightarrow x = \frac{7}{2}$

156) (b) Required number = LCM of (8, 11, 24) - 5
 $= (264 - 5) = 259$

157) (b) $\log_7 \log_5 (\sqrt{x} + 5 + \sqrt{x}) = 0$
 $\Rightarrow \log_5 (\sqrt{x} + 5 + \sqrt{x}) = (7)^0 = 1$ [$\therefore \log_a x = y$]
 $\Rightarrow x = (a)^y$
 $\Rightarrow (\sqrt{x} + 5 + \sqrt{x}) = (5)^1 = 5$
 $2\sqrt{x} = 0 \therefore x = 0$

158) (d) Required number = LCM of (4, 6, 7) + 2
 $\Rightarrow 84 + 2 = 86$

159) (a) There are 50 odd numbers less than 100 which are not divisible by 2. Out of these 50 there are 17 numbers which are divisible by 3. Out of remaining there are 7 numbers which are divisible by 5. Hence, numbers which are not divisible by 2, 3, 5 $= (50 - 17 - 7) = 26$

160) (b) Given $x < 0.50$, $0 < y < 1$, $z > 1$. It is therefore clear that values of x and y range between 0 and 1, hence median will also lie between 0 and 1.

161) (b) Number of zero in the product of any number is decided by the number of 2 and 5, whichever is less. Every combination of 5 and 2 will give one zero. In the product of all the numbers from 1 to 100, the number of 5 will be less than that of 2. Hence, our problem will be solved if we know the number of 5 in the product of (1 to 100).

Clearly, there are 20 members which are divisible by 5. Besides, there are four numbers 25, 50, 75 and 100 which will have one additional 5. Hence, total number 5 will be $20 + 4 = 24$. Therefore, number of zeroes in the product of all the numbers from 1 to 100 is 24.

162) (a) $U_{n+1} = 2U_n + 1 (n = 0, 1, 2, \dots)$
 Put $n = 0, U_1 = 1$ $n = 1, U_2 = 3$
 $n = 2, U_3 = 7$ $n = 3, U_4 = 15$
 $n = 4, U_5 = 31$

Seeing the pattern it is clear that $U_n = 2^n - 1$
 Hence, $U_{10} = (2)^{10} - 1 = 1023$

163) (e) If the girl counts the way as given in the question, then counting serial for the thumb will be 1, 8, 17, 25, ... Hence, number 1992 will also fall on thumb. Hence, number 1994 will end on her middle finger.

164) (c)

CHAPTER TWO

PERCENTAGE

- 1) A charity solicited P persons over the phone who agreed to an average pledge of ₹ R each. Q of these people had pledged on average of ₹ S each never sent in the pledged amount. Which of the following expressions represents the percentage of pledged money that the charity received? (2016)

- (a) $100 \times \frac{PR}{QS}$ (b) $100 \times \frac{QS}{PR}$
(c) $100(PR - QS)$ (d) $100 \left(1 - \frac{QS}{PR} \right)$

- 2) In 2001, the transportation cost of an item was 30% of its manufacturing cost. From 2001 to 2002, its manufacturing cost went up by 20%. Its transportation cost in 2002 was $33\frac{1}{3}\%$ of its manufacturing cost in that year. By what per cent should the total cost in 2002 be reduced to bring it back to that in 2001?

(Total cost = Manufacturing cost
+ Transportation cost) (2014)

- (a) 12.5% (b) 18.75%
(c) 31.25% (d) 25%
- 3) In a Public Sector Unit (PSU), there are 45600 employees. When the PSU offered a Voluntary Retirement Scheme (VRS), 40% of the employees applied for the VRS. After scrutinizing, PSU has rejected 15% of the applications. But only 9120 employees took the retirement through the scheme. What percentage of the total number of employees did not take retirement even though their applications are not rejected? (2014)
- (a) 25% (b) 14%
(c) 24% (d) 12.75%
- 4) Suppose that an equal number of persons are born on each day. What will be the percentage of persons whose birthday will fall on 29th February? (2009)
- (a) 0.741 (b) 0.273
(c) 0.068 (d) None of these

- 5) The length, breadth and height of a room are in the ratio 3 : 2 : 1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will (2006)

- (a) remain the same (b) decrease by 13.64%
(c) decrease by 15% (d) decrease by 18.75%
(e) decrease by 30%

Directions (Q.Nos. 6-7) Answer the questions based on the following information.

In an examination, there are 100 questions divided into three groups A, B and C such that each group contains at least one question. Each question in group A carries 1 mark, each question in group B carries 2 marks and each question in group C carries 3 marks. It is known that the questions in group A together carry at least 60% of the total marks. (2004)

- 6) If group B contains 23 questions, then how many questions are there in group C ?
- (a) 1 (b) 2
(c) 3 (d) Cannot be determined
- 7) If group C contains 8 questions and group B carries at least 20% of the total marks, which of the following best describes the number of questions in group B ?
- (a) 11 or 12 (b) 12 or 13
(c) 13 or 14 (d) 14 or 15
- 8) A survey on a sample of 25 new cars being sold at a local auto dealer was conducted to see which of the three popular options-air conditioning, radio and power windows-were already installed. The survey found: 15 had air conditioning, 2 had air conditioning and power windows but no radios, 12 had radio, 6 had air conditioning and radio but no power windows, 11 had power windows, 4 had radio and power windows, 3 had all three options. What is the number of cars that had none of the options? (2003)
- (a) 4 (b) 3 (c) 1 (d) 2

- 9) At the end of year 1998, Shepard bought nine dozen goats. Henceforth, every year he added $p\%$ of the goats at the beginning of the year and sold $q\%$ of the goats at the end of the year, where $p > 0$ and $q > 0$. If Shepard had nine dozen goats at the end of year 2002, after making the sales for that year, which of the following is true? (2003)
- (a) $p = q$ (b) $p < q$
(c) $p > q$ (d) $p = q/2$
- 10) The owner of an art shop conducts his business in the following manner. Every once in a while he raises his prices by $X\%$, then a while later he reduces all the new prices by $X\%$. After one such up-down cycle, the price of a painting decreased by ₹ 441. After a second up-down cycle, the painting was sold for ₹ 1944.81. What was the original prices of the painting (in ₹)? (2001)
- (a) 2756.25 (b) 2256.25
(c) 2500 (d) 2000
- 11) A student took five papers in an examination, where the full marks were the same for each paper. His marks in these papers were in the proportion of 6 : 7 : 8 : 9 : 10. In all papers together, the candidate obtained 60% of the total marks. Then, the number of papers in which he got more than 50% marks is (2001)
- (a) 1 (b) 3
(c) 4 (d) 5
- 12) A college has raised 75% of the amount it needs for a new building by receiving an average donation of ₹ 600 from the people already solicited. The people already solicited represent 60% of the people, the college will ask for donations. If the college is to raise exactly the amount needed for the new building, what should be the average donation from the remaining people to be solicited? (2001)
- (a) 300 (b) 250
(c) 400 (d) 500
- 13) Forty per cent of the employees of a certain company are men and 75% of the men earn more than ₹ 25000 per year. If 45% of the company's employees earn more than ₹ 25000 per year, what fraction of the women employed by the company earn ₹ 25000 per year? (1999)
- (a) 2/11 (b) 1/4
(c) 1/3 (d) 3/4
- 14) In a survey of political preferences, 78% of those asked were in favour of at least one of the proposals: I, II and III, 50% of those asked favoured proposal I, 30% favoured proposal II and 20% favoured proposal III. If 5% of those asked favoured all three of the proposals, what percentage of those asked favoured more than one of the three proposals? (1999)
- (a) 10 (b) 12
(c) 17 (d) 22
- 15) One bacteria splits into eight bacteria of the next generation. But due to environment, only 50% of one generation can produce the next generation. If the seventh generation number is 4096 million, what is the number in first generation? (1998)
- (a) 1 million (b) 2 million
(c) 4 million (d) 8 million
- 16) I bought 5 pens, 7 pencils and 4 erasers. Rajan bought 6 pens, 8 erasers and 14 pencils for an amount which was half more what I had paid. What per cent of the total amount paid by me was paid for the pens? (1998)
- (a) 37.5% (b) 62.5%
(c) 50% (d) None of these
- 17) A man earns $x\%$ on the first ₹ 2000 and $y\%$ on the rest of his income. If he earns ₹ 700 from ₹ 4000 and ₹ 900 from ₹ 5000 of income, find $x\%$. (1997)
- (a) 20% (b) 15%
(c) 25% (d) None of these
- 18) The price of a Maruti car rises by 30% while the sales of the car comes down by 20%. What is the percentage change in the total revenue? (1996)
- (a) -4% (b) -2%
(c) +4% (d) +2%
- 19) A person who has a certain amount with him goes to market. He can buy 50 oranges or 40 mangoes. He retains 10% of the amount for taxi fares and buys 20 mangoes and of the balance, he purchases oranges. Number of oranges he can purchase is (1995)
- (a) 36 (b) 40 (c) 15 (d) 20
- 20) $\frac{2}{5}$ of the voters promise to vote for P and the rest promised to vote for Q . Of these, on the last day 15% of the voters went back of their promise to vote for P and 25% of voters went back of their promise to vote for Q and P lost by 2 votes. Then, the total number of voters is (1995)
- (a) 100 (b) 110
(c) 90 (d) 95

- 21) The number of votes not cast for the Praja Party increased by 25% in the National General Election over those not cast for it in the previous Assembly Polls and the Praja Party lost by a majority twice as large as that by which it had won the Assembly Polls. If a total 260000 people voted each time, how many voted for the Praja Party in the previous Assembly Polls? (1994)
- (a) 110000 (b) 150000
(c) 140000 (d) 120000
- 22) The rate of increase of the price of sugar is observed to be two per cent more than the inflation rate expressed in percentage. The price of sugar, on January 1, 1994 is ₹ 20 per kg. The inflation rates of the years 1994 and 1995 are expected to be 8% each. The expected price of sugar price on January 1, 1996 would be (1993)
- (a) ₹ 23.60 (b) ₹ 24.00 (c) ₹ 24.20 (d) ₹ 24.60
- 23) A report consists of 20 sheets each of 55 lines and each such line consists of 65 characters. This report is reduced onto sheets each of 65 lines such that each line consists of 70 characters. The percentage reduction in number of sheets is closest to (1993)
- (a) 20% (b) 5% (c) 30% (d) 35%

HINTS & SOLUTIONS

- 1) (d) Total amount solicited from P persons, each of whom agreed to pledge ₹ $R = ₹ PR$ of these Q did not send the pledged amount. Average value of amount not sent = ₹ S .
Hence, total amount pledged but not received = ₹ QS
∴ Charity received = ₹ $(PR - QS)$
So, required percentage
- $$= 100 \left(\frac{PR - QS}{PR} \right)$$
- $$= 100 \left(1 - \frac{QS}{PR} \right)$$
- 2) (b) Let the manufacturing cost in 2001 be ₹ 100.
Transportation cost in 2001 = ₹ 30
Total cost in 2001 = ₹ 130
Manufacturing cost in 2002 = $100 + \frac{20}{100}(100) = ₹ 120$
Transportation cost in 2002 = $\frac{33\frac{1}{3}}{100} \times 120 = ₹ 40$
Total cost in 2002 = ₹ 160
∴ Required per cent = $\frac{160 - 130}{160} \times 100 = 18.75\%$
- 3) (b) From the given information, the percentage of employees who took retirement through the scheme
- $$= \frac{9120}{45600} \times 100 = 20\%$$
- Now, by taking 100 as the base we can calculate the answer easily.
Out of 100 employees, 40 applied for VRS.
But PSU allowed only 85% of 40, i.e. 34 employees to take VRS $(34 - 20)\% = 14\%$
- i.e. 14% of the total employees did not take retirement, although their applications are not rejected.
- 4) (c) 29th February falls in a leap year.
A leap year falls once in four years.
A normal year has 365 days while a leap year has 366 days.
∴ Required percentage = $\frac{1}{4 \times 365 + 1} \times 100$
$$= \frac{1}{1461} \times 100 = 0.068\%$$
- 5) (e) Let the length, breadth and height of the room be 3, 2 and 1 unit, respectively.
Area of the four walls of the room = $2(l + b)h$
$$= 2(3 + 2) \times 1 = 10 \text{ sq unit}$$

New length, breadth and height of the room will be 6, 1 and $\frac{1}{2}$ unit, respectively.
∴ New area of the four walls of the room
- $$= 2(6 + 1) \times \frac{1}{2} = 7 \text{ sq unit}$$
- Percentage decrease = $\frac{10 - 7}{10} \times 100\% = 30\%$
- 6) (a) Let the number of questions in A , B and C be a , b and c , respectively.
We have, $a + b + c = 100$
Total marks would be $a + 2b + 3c$
Given $b = 23$, total marks from section $B = 46$
Different possible values for c are 1, 2, 3, ...
∴ Corresponding values for a are 76, 75, 74, ... (since total questions are 100).
When $c = 1$, $a = 76$, $b = 23$

Total marks from sections A, B, C are 76, 46, 3, respectively.

Percentage marks from $A = \frac{76}{76 + 46 + 3} = \frac{76}{125} > 60\%$

When $c = 2, a = 75, b = 23$

Percentage marks from $A = \frac{75}{75 + 46 + 6} = \frac{75}{127} < 60\%$

For all other values, when c increases, a decreases and contribution of marks from A keeps decreasing.
 $\therefore$ There is only 1 possible value for questions from group C .

- 7) (c) Marks from section $C = 24$

Since, B contributes at least 20% and A contributes at least 60% to the total contribution from C is maximum of the 20%.

$\therefore$ Total marks ≥ 120 .

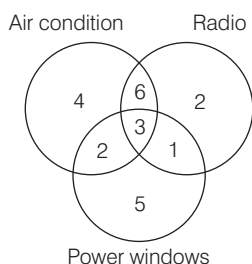
Total question are 100. So, $A + B = 72$

Minimum number questions in $A = 72$ and $B = 12$.

C	B	A	Total score ($A + 2B + 3C$)	% Contri- bution of A	% Contri- bution of B	Condition satisfied
8	12	80	128	$\frac{80}{128} > 60\%$	$\frac{24}{128} < 20\%$	×
8	13	79	129	$> 60\%$	$> 20\%$	✓
8	14	78	130	$> 60\%$	$> 20\%$	✓
8	15	77	131	$< 60\%$	$> 20\%$	×

Hence, only 2 possible values of B exist.

- 8) (d) From the given conditions, we have



When we add up all the values, we get 23 cars.

So, 2 cars don't have any option.

- 9) (c) If $p = q$, then 9 doz. $\left(\frac{1+p}{100}\right)\left(\frac{1-q}{100}\right) < 9$ doz.

Hence, for the final value to be equal to the original value, p should be greater than q . To understand the concept let $p = q = 20$ and original number be 100, then

$$100 \times 1.2 \times 0.8 = 96.$$

Hence, it is very clear that for final value to be equal to 100, p should be greater than q .

- 10) (a) Let the initial price be ₹ A .

$$\text{Then, } A - A\left(\frac{100-X}{100}\right)\left(\frac{100+X}{100}\right) = 441$$

$$\Rightarrow \left(\frac{100^2 - X^2}{100^2}\right) = \frac{A - 441}{A} \quad \dots(i)$$

$$\text{and } A\left(\frac{100^2 - X^2}{100^2}\right)^2 = 1944.81 \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$A\left(\frac{A - 441}{A}\right)^2 = 1944.81 \Rightarrow A = ₹ 2756.25$$

- 11) (c) Let the marks scored in five subjects be $6x, 7x, 8x, 9x$ and $10x$.

Total marks in all the five subjects = $40x$

$$\text{Max. marks of the five subjects} = \frac{40x}{0.6}$$

($\because 40x$ is 60% of total marks)

$$\therefore \text{Max. marks in each subject} = \frac{40x}{0.6 \times 5} = 13.33x$$

$$\text{Hence, percentage in each subject} = \frac{6x}{13.33x} \times 100,$$

$$\frac{7x}{13.33x} \times 100, \frac{8x}{13.33x} \times 100, \frac{9x}{13.33x} \times 100 \text{ and}$$

$$\frac{10x}{13.33x} \times 100 \text{ or } 45.01\%, 52.51\%, 60.01\%, 67.51\% \text{ and } 75.01\%.$$

$\therefore$ Number of papers in which he got more than 50% marks is 4.

- 12) (a) Let x be the number of people who were asked for donation.

People already solicited = $0.6x$

Remaining people = $0.4x$

Amount collected from the people solicited = $600 \times 0.6x = 360x$, which is 75% of the amount to be collected.

Remaining amount 25% = $120x$.

$\therefore$ Average donation from remaining people

$$= \frac{120x}{0.4x} = 300$$

- 13) (d) Let number of men and women be 40 and 60, respectively.

$\therefore$ Number of men earning more than ₹ 25000 = 30

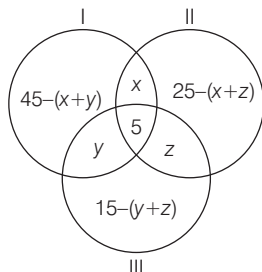
Total number of employees earning more than ₹ 25000 = 45

$\therefore$ Number of women earning more than ₹ 25000 = $(45 - 30) = ₹ 15$

Now, fraction of the women earning ₹ 25000 or less = $\frac{60 - 15}{60} = \frac{45}{60} = \frac{3}{4}$

- 14) (c) Given,

$$45 - (x + y) + 25 - (x + z) + 15 - (y + z) + (x + y + z + 5) = 78$$



$$\Rightarrow (x + y + z) = 12$$

$\therefore$ Percentage of those asked favoured more than one proposal = $12 + 5 = 17$

- 15) (a) Let number of bacteria in the first generation be
- x
- .

$\therefore$ Number of bacteria in the second, third, fourth ... generation would be $8\left(\frac{x}{2}\right), 8\left(\frac{4x}{2}\right), 8\left(\frac{16x}{2}\right) \dots$ and so on.

$\Rightarrow x, 4x, 16x, 64x, \dots$ it is a GP with common difference 4.

Hence, seventh term of GP = $x(4)^6 = 4096$

$$\Rightarrow x(2)^{12} = 4096$$

$$\Rightarrow x = 1 \text{ or } 1 \text{ million.}$$

- 16) (b) Let
- $5P + 7P_C + 4E_R = 100$
- ... (i)

$$\therefore 6P + 14P_C + 8E_R = 150 \quad \dots (ii)$$

Multiplying Eq. (i) by 2, we get

$$10P + 14P_C + 8E_R = 200 \quad \dots (iii)$$

Solving Eqs. (ii) and (iii) simultaneously, we get

$$P = 12.5$$

Hence, total amount paid for $5P = 12.5 \times 5 = 62.5$ and it is the required percentage.

- 17) (b)
- $2000 \times \frac{x}{100} + 2000 \times \frac{y}{100} = 700$
- ... (i)

$$\text{and } 2000 \times \frac{x}{100} + 3000 \times \frac{y}{100} = 900 \quad \dots (ii)$$

On simplifying these equations change to $x + y = 35$ and $2x + 3y = 90$. Solving these two equations simultaneously, we get $x = 15\%$.

- 18) (c) Let the original price and sale be 10 unit each.

Then, original revenue collection = $10 \times 10 = 100$

New price = $10 \times 1.3 = 13$, New sale = $10 \times 0.8 = 8$

New revenue collection = 104

Hence, revenue is increased by 4%.

- 19) (d) Suppose the person has ₹ 100 with him.

$\therefore$ Price per orange is ₹ 2 and that of a mango is ₹ 2.50.

After keeping ₹ 10 for taxi, he is left with ₹ 90.

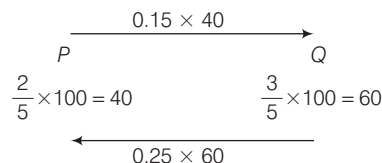
Price of 20 mangoes = ₹ 40

Remaining money = $(90 - 40) = ₹ 50$

So, he can buy $\frac{50}{2.5} = 20$ oranges for this amount.

- 20) (a) Let total number of votes polled be 100, then votes polled in favour of
- $P = 40 - 6 + 15 = 49$

Votes polled in favour of $Q = 60 - 15 + 6 = 51$



Difference = $51 - 49 = 2$. It is already given that P lost by 2 votes, hence total number of votes polled = 100.

- 21) (c) Let
- x
- voters voted against the party in the Assembly Poll. Then, votes in favour =
- $(y - x)$

{For calculation simplicity suppose $260000 = y$ }

$\therefore$ Majority of votes by which party man in previous poll = $(y - x) - x = (y - 2x)$

Now, votes against the party in general election = $1.25x$

and votes polled in favour of the party = $(y - 1.25x)$

$\therefore$ Majority of votes by which party lost is general election

$$= (1.25x) - (y - 1.25x)$$

$$= (2.5x - y)$$

It is given that,

$$(2.5x - y) = 2(y - 2x)$$

$$\Rightarrow 2.5x - y = 2y - 4x$$

$$\Rightarrow 6.5x = 3y$$

$$\Rightarrow x = \frac{3 \times 260000}{6.5}$$

$$= 120000$$

$\therefore$ Votes polled by the voters for the party in Assembly Polls

$$= (260000 - 120000)$$

$$= 140000.$$

- 22) (c) Increase in price on sugar =
- $(8 + 2) = 10\%$

$\therefore$ Price of sugar of Jan. 1, 1996

$$= 20 \times 1.1 \times 1.1$$

$$= ₹ 24.20$$

- 23) (a) Total number on characters =
- $20 \times 55 \times 65 = 71500$

Number of pages required, if the report is retyped

$$= \frac{71500}{65 \times 70} = 15.70$$

Hence, 16 pages are required. Hence, % reduction

$$= \frac{20 - 16}{20} \times 100 = 20\%$$

PROFIT, LOSS AND RATIO, PROPORTION

- 1) The total cost of 2 pencils, 5 erasers and 7 sharpeners is ₹ 30, while 3 pencils and 5 sharpeners cost ₹ 15 more than 6 erasers. By what amount (in ₹) does the cost of 39 erasers and 1 sharpener exceed the cost of 6 pencils? (2016)
- 2) Balram, the local shoe shop owner, sells four types of footwear - Slippers (S), Canvas Shoes (C), Leather Shoes (L) and Joggers (J). The following information is known regarding the cost prices and selling prices of these four types of footwear
 - (i) L sells for ₹ 500 less than J , which costs ₹ 300 more than S , which in turn, sells for ₹ 200 more than L .
 - (ii) L cost ₹ 300 less than C , which sells for ₹ 100 more than S , which in turn, costs ₹ 100 less than C .

If it is known that Balram never sells any item at a loss, then which of the following is true regarding the profit percentages earned by Balram on the items L , S , C and J represented by l , s , c and j , respectively? (2016)

(a) $l \geq c \geq s \geq j$	(b) $c \geq s \geq l \geq j$
(c) $l \geq s \geq c \geq j$	(d) $s \geq l \geq j \geq c$
- 3) For the maximum profit, the number of colour TVs and VCRs that he should respectively stocks are

(a) 80, 20	(b) 20, 80
(c) 60, 40	(d) None of these
- 4) If the dealer would have managed to get an additional space to stock 20 more items, then for maximising profit, the ratio of number of VCRs and the number of TVs that he should stock is

(a) 7 : 3	(b) 0
(c) 1 : 2	(d) None of these
- 5) The maximum profit in rupees lakh, the dealer can earn from his original stock if he can sell a colour TV at ₹ 12200 and VCR at ₹ 18300 is

(a) 2.64	(b) 2.49
(c) 2.72	(d) 2.87
- 6) Half of the volume of milk and water mixture of ratio 7 : 5 is converted into a mixture of ratio 3 : 1 by the substitution (or replacement) method. The mixture of ratio 7 : 5 was formed from the mixture 7 : 3 by adding the water in it. If 240 L milk is required in the replacement method. What is the total amount of water was added to prepare the mixture of 7 : 5? (2013)

(a) 100 L	(b) 400 L
(c) 50 L	(d) 200 L
- 7) Which of the terms $2^{1/3}$, $3^{1/4}$, $4^{1/6}$, $6^{1/8}$ and $10^{1/12}$ is the largest? (2012)

(a) $2^{1/3}$	(b) $3^{1/4}$
(c) $4^{1/6}$	(d) $10^{1/12}$

Directions (Q. Nos. 3-5) Answer the questions based on the following information.
A dealer deals only in colour TVs and VCRs. He wants to spend upto ₹12 lakhs to buy 100 pieces. He can purchase a colour TV at ₹ 10000 and a VCR at ₹ 15000. He can sell a colour TV at ₹ 12000 and a VCR at ₹ 17500. His objective is to maximise profits. Assume that he can sell all the items that he stocks. (2016)

- 8) A vessel has a milk solution in which milk and water are in the ratio 4 : 1. By addition of water to it, milk solution with milk and water in the ratio 4 : 3 was formed. On replacing 14 L of this solution with pure milk the ratio of milk and water changed to 5 : 3. What is the volume of the water added? (2012)

(a) 12 L (b) 60 L
(c) 32 L (d) 24 L

- 9) A milkman mixes 20 L of water with 80 L of milk. After selling one-fourth of this mixture, he adds water to replenish the quantity that he has sold. What is the current proportion of water to milk? (2010)

(a) 2 : 3 (b) 1 : 2
(c) 1 : 3 (d) 3 : 4

- 10) $p \propto q$, $q \propto \frac{1}{s}$, $s \propto \frac{1}{r}$. $p = 1$, when $q = 2$, $q = 3$; when $s = 4$, $s = 4$; when $r = 5$. Find r , when $p = 6$. (2009)

(a) 35 (b) 30
(c) 20 (d) 16

- 11) If $\frac{a^2 - ab + b^2}{a^2 + ab + b^2} = \frac{1}{3}$, then find $\frac{a}{b}$. (2009)

(a) 1 (b) 2
(c) 3 (d) 4

- 12) A shopkeeper gives two successive discounts of 10% and 20% on a marked price of ₹ 5000 of a bicycle. He had to give a further discount equal to 20% of his cost price on his new selling price, as a result of which he made neither a profit nor a loss. Find his cost price for the bicycle. (2009)

(a) ₹ 2000 (b) ₹ 3000
(c) ₹ 3600 (d) ₹ 4500

- 13) In a T-shirt stitching factory, the accepted pieces on Friday were 95% of the total production and rejected pieces on Saturday were 10% of the total production. The overall rejection rate for the two days combined works out to 8.33%. What was the ratio of production of Friday to production of Saturday? (2009)

(a) 1 : 2 (b) 2 : 1
(c) 1 : 3 (d) 1 : 1.75

Directions (Q.Nos. 14-15) Answer the questions based on the following information.

Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is ₹ 30. On the other hand, the cost, in rupees, of

producing x unit is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by $66\frac{2}{3}\%$. However, an increase in daily

production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit. (2007)

- 14) How many units should Mr. David produce daily?

(a) 100 (b) 70
(c) 150 (d) 130
(e) Cannot be determined

- 15) What is the maximum daily profit, in rupees, that Mr. David can realise from his business?

(a) 920 (b) 840
(c) 760 (d) 620
(e) Cannot be determined

- 16) A milkman mixes 20 L of water with 80 L of milk. After selling one-fourth of this mixture, he adds water to replenish the quantity that he has sold. What is the current proportion of water to milk? (2004)

(a) 2 : 3 (b) 1 : 2
(c) 1 : 3 (d) 3 : 4

- 17) Using only 2, 5, 10, 25 and 50 paise coins, what will be the minimum number of coins required to pay exactly 78 paise, 69 paise and ₹ 1.01 to three different persons? (2003)

(a) 19 (b) 20 (c) 17 (d) 18

- 18) Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then, the ratio of the shorter side to the longer side is (2002)

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$

- 19) Mayank, Mirza, Little and Jaspal bought a motorbike for \$60000. Mayank paid one-half of the sum of the amounts paid by the other boys, Mirza paid one-third of the sum of the amounts paid by the other boys; and Little paid one-fourth of the sum of the amounts paid by the other boys. How much did Jaspal has to pay? (2002)

(a) \$15000 (b) \$13000
(c) \$17000 (d) None of these

- 20) A piece of string is 40 cm long. It is cut into three pieces. The longest piece is 3 times as long as the middle-sized and the shortest piece is 23 cm shorter than the longest piece. Find the length of the shortest piece (in cm). (2002)
- (a) 27 (b) 5
(c) 4 (d) 9

- 21) Fresh grapes contain 90% water by weight while dried grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes? (1997, 2001)
- (a) 2 kg
(b) 2.4kg
(c) 2.5 kg
(d) None of the above

Directions (Q.Nos. 22-23) Answer the questions based on the following information.

There are blue vessels with known volumes $v_1, v_2, \dots, v_m$, arranged in ascending order of volume, $v_1 > 0.5$ L and $v_m < 1$ L. Each of these is full of water initially. The water from each of these is emptied into a minimum number of empty white vessels, each having volume 1 L. The water from a blue vessel is not emptied into a white vessel unless the white vessel has enough empty volume to hold all the water of the blue vessel. The number of white vessels required to empty all the blue vessels according to the above rules was n . (1999)

- 22) Among the four values given below, which is the least upper bound on e , where e is the total empty volume in the white vessels at the n end of the above process?
- (a) mv_m (b) $m(1 - v_m)$
(c) mv_1 (d) $m(1 - v_1)$
- 23) Let the number of white vessels needed be n_1 for the emptying process described above, if the volume of each white vessel is 2 L. Among the following values, which is the least upper bound on n_1 ?
- (a) $\frac{m}{4}$
(b) Smallest integer greater than or equal to $\left(\frac{n}{2}\right)$
(c) n
(d) Greatest integer less than or equal to $\left(\frac{n}{2}\right)$

Directions (Q.Nos. 24-25) Answer the questions based on the following information.

The following table presents the sweetness of different items relative to sucrose, whose sweetness is taken to be 1.00. (1999)

Lactose	0.16
Maltose	0.32
Glucose	0.74
Sucrose	1.00
Fructose	1.70
Saccharin	675.00

- 24) What is the minimum amount of sucrose (to the nearest gram) that must be added to one gram of saccharin to make a mixture that will be at least 100 times as sweet as glucose?
- (a) 7 (b) 8
(c) 9 (d) 10
- 25) Approximately how many times sweeter than sucrose is a mixture consisting of glucose, sucrose and fructose in the ratio of 1 : 2 : 3?
- (a) 1.3 (b) 1.0
(c) 0.6 (d) 2.3

Directions (Q.Nos. 26-27) Answer the questions based on the following information.

A company purchases components A and B from Germany and USA, respectively. A and B form 30% and 50% of the total production cost. Current gain is 20%. Due to change in the international scenario, cost of the German mark increased by 30% and that of USA dollar increased by 22%. Due to market conditions, the selling price cannot be increased beyond 10%. (1998)

- 26) What is the maximum current gain possible?
- (a) 10% (b) 12.5%
(c) 0% (d) 7.5%
- 27) If the USA dollar becomes cheap by 12% over its original cost and the cost of German mark increased by 20%, what will be the gain? (The selling price is not altered)
- (a) 10% (b) 20%
(c) 15% (d) 7.5%
- 28) There are two containers: the first contains 500 mL of alcohol, while the second contains 500 mL of water. Three cups of alcohol from the first container is taken out and is mixed well in the second container. Then, three cups of this mixture is taken out and is mixed in the first container. Let A denote the proportion of water in the first container and B denote the proportion of alcohol in the second container. Then, (1998)
- (a) $A > B$ (b) $A < B$
(c) $A = B$ (d) Cannot be determined

- 29) You can collect rubies and emeralds as many as you can. Each ruby is of ₹ 4 crore and each emerald is of ₹ 5 crore. Each ruby weighs 0.3 kg. And each emerald weighs 0.4 kg. Your bag can carry at the most 12 kg. What you should collect to get the maximum wealth? (1998)

(a) 20 rubies and 15 emeralds
(b) 40 rubies
(c) 28 rubies and 9 emeralds
(d) None of the above

- 30) I have one rupee coins, fifty paise coins and twenty five paise coins. The number of coins are in the ratio 2.5 : 3 : 4. If the total amount with me is ₹ 210, find the number of one rupee coins. (1998)

(a) 90 (b) 85
(c) 100 (d) 105

- 31) After allowing a discount of 11.11%, a trader still makes a gain of 14.28%. If how many per cent above the cost price does he mark on his goods? (1997)

(a) 28.56% (b) 35%
(c) 22.22% (d) None of these

- 32) A dealer buys dry fruits at ₹ 100, ₹ 80 and ₹ 60 per kilogram. He mixes them in the ratio 3 : 4 : 5 by weight and sells at a profit of 50%. At what price per kilogram does he sell the dry fruit? (1997)

(a) ₹ 80 (b) ₹ 100
(c) ₹ 95 (d) None of these

Directions (Q.Nos. 33-34) Answer the questions based on the following information.

A watch dealer incurs an expense of ₹ 150 for producing every watch. He also incurs an additional expenditure of ₹ 30,000, which is independent of the number of watches produced. If he is able to sell a watch during the season, he sells it for ₹ 250. If he fails to do so, he has to sell each watch for ₹ 100. (1996)

- 33) If he is able to sell only 1200 out of 1500 watches he has made in the season, then he has made a profit of

(a) ₹ 90000 (b) ₹ 75000
(c) ₹ 45000 (d) ₹ 65000

- 34) If he produces 1500 watches, what is the number of watches that he must sell during the season in order to breakeven, given that he is able to sell all the watches produced?

(a) 500 (b) 700
(c) 800 (d) 1000

- 35) Two liquids A and B are in the ratio 5 : 1 in container 1 and 1 : 3 in container 2. In what ratio should the contents of the two containers be mixed so as to obtain a mixture of A and B in the ratio 1 : 1 ? (1996)

(a) 2 : 3 (b) 4 : 3
(c) 3 : 2 (d) 3 : 4

- 36) Instead of a metre scale, a cloth merchant uses a 120 cm scale while buying, but uses an 80 cm scale while selling the same cloth. If he offers a discount of 20% on cash payment, what is his overall profit percentage? (1996)

(a) 20% (b) 25%
(c) 40% (d) 15%

- 37) I sold two watches for ₹ 300 each, one at the loss of 10% and the other at the profit of 10%. What is the percentage of loss (–) or profit (+) that resulted from the transaction? (1996)

(a) (+) 10 (b) (–) 1
(c) (+) 1 (d) (–) 10

- 38) The cost of diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ratio 1 : 2 : 3 : 4. When the pieces were sold, the merchant got ₹ 70000 less. Find the original price of the diamond. (1996)

(a) ₹ 1.4 lakh (b) ₹ 2 lakh
(c) ₹ 1 lakh (d) ₹ 2.1 lakh

- 39) A stockist wants to make some profit by selling sugar. He contemplates about various methods. Which of the following would maximise his profit?

I. Sell sugar at 10% profit.
II. Use 900 g of weight instead of 1 kg.
III. Mix 10% impurities in sugar and selling sugar at cost price.
IV. Increase the price by 5% and reduce weights by 5%. (1995)

(a) I or III (b) II
(c) II, III and IV (d) Profits are same

Directions (Q.Nos. 40-42) Answer the questions based on the following information.

Alphonso, on his death bed, keeps half his property for this wife and divides the rest equally among his three sons: Ben, Carl and Dave. Some years later, Ben dies leaving half his property to his widow and half to his brothers Carl and Dave together; sharing equally. When Carl makes his will, he keeps half his property for his widow and the rest he bequeaths to his younger brother Dave. When Dave dies some years later, he keeps half his property for his widow and the remaining for his mother. The mother now has ₹ 1575000. (1994)

- 40) What was the worth of the total property?
 (a) ₹ 30 lakh (b) ₹ 8 lakh
 (c) ₹ 18 lakh (d) ₹ 24 lakh
- 41) What was Carl's original share?
 (a) ₹ 4 lakh (b) ₹ 12 lakh
 (c) ₹ 6 lakh (d) ₹ 5 lakh
- 42) What was the ratio of the property owned by the widows of the three sons, in the end?
 (a) 7 : 9 : 13 (b) 8 : 10 : 15
 (c) 5 : 7 : 9 (d) 9 : 12 : 13
- 43) A dealer offers a cash discount of 20% and still makes a profit of 20%, when he further allows 16 articles to a dozen to a particularly sticky bargainer. How much per cent above the cost price were his wares listed? (1994)
 (a) 100% (b) 80%
 (c) 75% (d) $66\frac{2}{3}\%$
- 44) A man buys spirit at ₹ 60 per litre, adds water to it and then sells it at ₹ 75 per litre. What is the ratio of spirit to water if his profit in the deal is 37.5% ? (1994)
 (a) 9 : 1 (b) 10 : 1
 (c) 11 : 1 (d) None of these
- 45) Two oranges, three bananas and four apples cost ₹ 15. Three oranges, two bananas and one apple cost ₹ 10. I bought 3 oranges, 3 bananas and 3 apples. How much did I pay? (1993)
 (a) ₹ 10 (b) ₹ 8
 (c) ₹ 15 (d) Cannot be determined
- 46) From each of two given numbers, half the smaller number is subtracted. Of the resulting numbers the larger one is three times as large as the smaller. What is the ratio of the two numbers ? (1993)
 (a) 2 : 1 (b) 3 : 1
 (c) 3 : 2 (d) None of these

HINTS & SOLUTIONS

- 1) Let the cost of pencil, eraser and sharpener (in ₹) be p , e and s respectively.

Then, $2p + 5e + 7s = 30$... (i)

and $3p - 6e + 5s = 15$... (ii)

We need the value of the following expression

$$E = -6p + 39e + s$$

We assume that by multiplying Eq. (i) by x and Eq. (ii) by y and adding we get the equation E . By considering the coefficients of only p and e , we get

$$2x + 3y = -6$$

and $5x - 6y = 39$

This gives $x = \frac{(-6)(-6) - 3(39)}{(2)(-6) - (5)(3)}$

$$= \frac{36 - 117}{-12 - 15}$$

$$= \frac{-81}{-27} = 3$$

$\Rightarrow x = 3$ and $y = -4$

$\therefore E = 3(30) - 4(15) = 30$

Note Observe that the coefficients of s also combine in the same way to match the coefficient of s in E , i.e. $3(7) - 4(5) = 1$.

- 2) (c) Tabulating the given information

Cost price	Item	Selling price
y	S	$x - 300$
$y + 100$	C	$x - 200$
$y - 200$	L	$x - 500$
$y + 300$	J	x

To compare the profit percentages, we can compare $\frac{SP}{CP}$.

$$\frac{x - 300}{y}, \frac{x - 200}{y + 100}, \frac{x - 500}{y - 200}, \frac{x}{y + 300}$$

It can be observed that the above fractions can be written as

$$\frac{a}{b}, \frac{a + 100}{b + 100}, \frac{a - 200}{b - 200}, \frac{a + 300}{b + 300}$$

where $a = x - 300$, $b = y$

Now, no item sells at a loss and given the identity

that $\frac{m}{n} > \frac{m + k}{n + k}$, whenever $\frac{m}{n} \geq 1$ and k is a +ve

quantity, the above ratios can be rearranged as

$$\frac{a - 200}{b - 200} \geq \frac{a}{b} \geq \frac{a + 100}{b + 100} \geq \frac{a + 300}{b + 300} \Rightarrow l \geq s \geq c \geq j.$$

- 3) (c) Let the number of TVs and VCRs bought be t and v , respectively.

$$\text{Therefore, } t + v \leq 100 \quad \dots(i)$$

$$10000t + 15000v \leq 1200000$$

$$\Rightarrow 2t + 3v \leq 240 \quad \dots(ii)$$

$$\text{Profit} = 2000t + 2500v$$

To maximise profit, we have to maximise v .

From Eqs. (i) and (ii), we have

$$2(100 - v) + 3v \leq 240$$

$$\therefore v \leq 40 \text{ and } t \leq 60$$

For maximum profit, $t = 60$ and $v = 40$.

- 4) (b) Let the number of TVs and VCRs bought be t and v , respectively.

$$\text{Therefore, } t + v \leq 120 \quad \dots(i)$$

$$10000t + 15000v \leq 1200000$$

$$\Rightarrow 2t + 3v \leq 240 \quad \dots(ii)$$

$$\text{Profit} = 2000t + 2500v$$

To maximise profit, we have to maximise v .

From Eqs. (i) and (ii), we have

$$2(120 - v) + 3v \leq 240$$

$$v \leq 0 \text{ and } t \leq 120$$

For maximum profit, $t = 120$ and $v = 0$

$$\therefore \text{Required ratio} = 0$$

- 5) (a) From the above information, we have

$$2(100 - v) + 3v \leq 240$$

$$v \leq 40 \text{ and } t \leq 60.$$

For maximum profit, $t = 60$ and $v = 40$.

Required profit = $2200 \times 60 + 3300 \times 40 = ₹ 2.64$ lakh

- 6) (d) Let the milk and water be $7x$ L and $3x$ L.

Milk : Water

$$\begin{array}{lcl} 7x & : & 3x \\ & & \downarrow \\ & & + \text{Water} \\ \text{Step 1} & 7x & : 5x \\ \text{Step 2} & 3x & : x \end{array}$$

By using replacement formula,

$$\frac{1}{4} = \frac{5}{2} \left(1 - \frac{240}{12x} \right)$$

$$\Rightarrow \frac{3}{5} = \left(1 - \frac{240}{12x} \right)$$

$$\frac{2}{5} = \frac{20}{x} \Rightarrow x = 50$$

$\therefore$ Half of initial amount = $(350 + 150)$ L

$$\begin{aligned} \text{Then, required amount of water} &= 5x - 3x = 2x \\ &= 2 \times 50 = 100 \text{ L} \end{aligned}$$

But for the whole amount water required to be added
 $= 2 \times 100 = 200$ L

- 7) (d) Clearly, $2^{\frac{1}{3}} = 4^{\frac{1}{6}}$

$\therefore$ The largest is the largest among $2^{\frac{1}{3}}, 3^{\frac{1}{4}}, 6^{\frac{1}{8}}$ and $10^{\frac{1}{12}}$.

$$2^{\frac{1}{3}} = (2^8)^{\frac{1}{24}}$$

$$3^{\frac{1}{4}} = (3^6)^{\frac{1}{24}}$$

$$6^{\frac{1}{8}} = (6^3)^{\frac{1}{24}}$$

$$10^{\frac{1}{12}} = (10^2)^{\frac{1}{24}}$$

- 8) (c) The ratio of milk, water and the total volume before replacement

$$= 4 : 3 : 7 \quad \dots(i)$$

The ratio of the same after replacement

$$= 5 : 3 : 8 \quad \dots(ii)$$

In the method of replacement, total volume of the mixture remains unchanged. Hence, express Eqs. (i) and (ii) keeping the total volume same in both cases.

The ratios are $8(4:3:7) = 32:24:56$, before replacement and $7(5:3:8) = 35:21:56$ after replacement.

From the above two proportions, it can be seen that 3 parts out of an initial 24 parts of water are replaced with milk.

Hence, $(3/24)$ parts of $4 : 3$ mixture = 14 L (given)

Hence, the total volume of $4 : 3$ mixture

$$= \frac{24(14)}{3} \text{ or } 112 \text{ L} \quad \dots(iii)$$

The $4 : 3$ mixture is made from $4 : 1$ mixture by adding water.

The ratio of milk, water and the total before and after the addition of water is

Before : $4 : 1 : 5$

After : $4 : 3 : 7$

i.e., 2 parts of water are added to the $4 : 1$ solution to get the $4 : 3$ solution. The quantity of water added is $2/7$ of the final volume or $\frac{2}{7}(112)$ or 32 L.

- 9) (a) Out of total 100 L of mixture there is 20 L of water and 80 L of milk. When he sells $\frac{1}{4}$ part of

mixture that is 25 L now water will be 15 L and 60 L of milk in total 75 L of mixture. When he adds 25 L water in it now total water will be $25 + 15 = 40$ L and milk is 60 L. So, the required ratio is $40 : 60 = 2 : 3$. Hence, answer is (a).

- 10) (c) $q \propto \frac{1}{s}$ and $s \propto \frac{1}{r}$

$$\therefore q \propto r$$

$$\therefore p \propto q \text{ and } q \propto r, p \propto r$$

When $q = 3, r = 5$

$$\therefore q = 2 \Rightarrow r = \frac{10}{3}$$

$$\text{i.e. when } p = 1, r = \frac{10}{3}$$

$$\Rightarrow r = 20, \text{ when } p = 6$$

$$11) (a) \frac{a^2 - ab + b^2}{a^2 + ab + b^2} = \frac{1}{3}$$

$$\therefore \frac{2(a^2 + b^2)}{-2(ab)} = \frac{4}{-2}$$

(By componendo-dividendo)

$$\frac{a^2 + b^2}{ab} = 2$$

$$\Rightarrow a^2 + b^2 = 2ab$$

$$\Rightarrow a^2 - 2ab + b^2 = 0$$

$$\Rightarrow (a - b)^2 = 0 \Rightarrow a = b$$

$$\therefore \frac{a}{b} = 1$$

- 12) (b) The marked price of bicycle of ₹ 5000. Let the cost price be P .

Successive discounts are 10% and 20%.

$$5000 \times 0.9 \times 0.8 - 0.2P = P$$

$$\Rightarrow P = \frac{5000 \times 0.72}{1.2}$$

$$\therefore P = ₹ 3000$$

- 13) (a) Let production of Friday = X

So, accepted pieces = $0.95X$, rejected pieces = $0.05X$

Let production on Saturday = Y

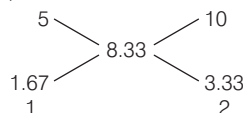
So, accepted pieces = $0.9Y$, rejected pieces = $0.1Y$

$$\therefore \frac{0.05X + 0.1Y}{X + Y} = 0.0833$$

$$\text{So, } X : Y = 1 : 2$$

Alternate solution

By alligation,



- 14) (a) Given : that, production cost increases by $\frac{200}{3}\%$ when production is increased from 20 to 40 units.

$$\therefore \frac{(240 + 40b + 40^2c) - (240 + 20b + 20^2c)}{240 + 20b + 20^2c} = \frac{200}{300} = \frac{2}{3} \dots(i)$$

$$\text{and } \frac{(240 + 60b + 60^2c) - (240 + 40b + 40^2c)}{240 + 40b + 40^2c} = \frac{1}{2} \dots(ii)$$

Solving the above equations, we get

$$c = \frac{1}{10} \text{ and } b = 10$$

$$\text{So, cost of producing } x \text{ units} = 240 + 10x + \frac{x^2}{10}.$$

Profit earned in producing x units

$$= 30x - \left(240 + 10x + \frac{x^2}{10} \right) = 20x - \frac{x^2}{10} - 240$$

Using options, we find that profit is maximum at $x = 100$.

$$15) (c) \text{ For } x = 100, \text{ Profit} = 20 \times 100 - \frac{100 \times 100}{10} - 240 = 760$$

- 16) (a) As one-fourth of the solution (milk + water = 80 L + 20 L) is sold, solution drawn out is $100 \times \frac{1}{4} = 25$ L

$$\text{Quantity of milk drawn out} = 25 \times \frac{4}{5} = 20 \text{ L}$$

$$\therefore \text{Quantity of water drawn out} = 5 \text{ L}$$

$$\text{Now adding 25 L of water, quantity of water} = 20 - 5 + 25 = 40 \text{ L}$$

$$\text{Also quantity of milk remaining} = 80 - 20 = 60 \text{ L}$$

$$\therefore \text{Required ratio} = 40 : 60 = 2 : 3$$

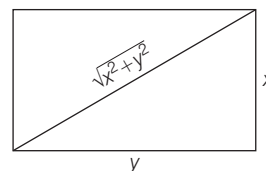
$$17) (a) 78 = 50 + 10 + 10 + 2 + 2 + 2 + 2 = 7$$

$$69 = 50 + 10 + 5 + 2 + 2 = 5$$

$$1.01 = 50 + 25 + 10 + 10 + 2 + 2 + 2 = 7$$

Hence, $7 + 5 + 7 = 19$ coins.

$$18) (d) \text{ Given, } (x + y) - \sqrt{x^2 + y^2} = \frac{y}{2}$$



$$\Rightarrow x + \frac{y}{2} = \sqrt{x^2 + y^2}$$

Now, using options we find that option (d) satisfies the above relationship

$$3 + 2 = \sqrt{9 + 16} \Rightarrow 5 = 5$$

- 19) (b) Mayank paid $\frac{1}{2}$ of the sum paid by other three. Let the other three paid ₹ x jointly, then Mayank paid $\frac{x}{2}$. So, $x + \frac{x}{2} = 60000 \Rightarrow x = 40000$. Hence, Mayank paid \$ 20000.

Likewise, Mirza and Little paid \$ 15000 and \$ 12000, respectively.

$$\text{Hence, amount paid by Jaspal } \$ (60000) - (20000 + 15000 + 12000) = 13000.$$

- 20) (c) Let the largest piece be $3x$, then middle and shortest piece would be x and $(3x - 23)$, respectively. or $3x + x + (3x - 23) = 40$
 $\Rightarrow x = 9$, therefore shortest piece = $(3 \times 9 - 23) = 4$

- 21) (c) Let x kg of dry grapes is obtained.

Then, solid part in fresh grapes = solid part in dry grapes

$$0.10 \times 20 = 0.8 \times x \Rightarrow x = 2.5 \text{ kg}$$

- 22) (d) Using options we find that if we suppose $m = 1$, option (a) will give the answer as v_m and option (c) will give the answer, as v_1 . But, both of these cannot be our answer, as v_m and v_1 are the amounts of volume filled. If $m = 2$, option (b) will give the answer as $2(1 - v_2)$ and option (d) will give the answer as $2(1 - v_2)$. But actual empty volume is greater than $2(1 - v_2)$. Therefore, for this condition $m(1 - v_1)$ is the only possible answer.

- 23) (b) Using options we find that for $m = 1$ and $n = 1$

Option (a) gives answer as $1/4$

Option (b) gives answer as $\geq 1/2$

Option (c) gives answer as 1

and Option (d) gives answer as $\leq 1/2$.

As per information given in question, the volume of vessel is 2 L, hence answer should be greater than 1. Hence, option (b) is the answer.

- 24) (c) Let x g of sucrose be added with 1 g of saccharin to obtain a mixture 100 times as sweet as glucose.

$$\text{Then, } 1.00x + 1 \times 675.00 = 0.74(x + 1) \times 100$$

$$\Rightarrow x + 675 = 74(x + 1)$$

$$\Rightarrow x = 9.26 \text{ g or } 9 \text{ g (approximately).}$$

- 25) (a) $\frac{[(0.74) + (1.00)(2) + (1.7)(3)]}{6} = 1.3$

- 26) (a) Let cost of components A and B be ₹ 30 and ₹ 50, respectively. Then, cost of production = ₹ $(30 + 50 + 20)$, where ₹ 20 contributes to the other expenses, assuming total production cost ₹ 100.

Since, profit is 20%. Hence, selling price = ₹ 120.

Now, new cost price of component A = ₹ 39

New cost price of component B = ₹ 61

New production cost (other expenses do not change)

$$= (39 + 61 + 20) = ₹ 120$$

Since, new SP = $120 \times 1.1 = 132$

$$\therefore \text{New profit\%} = \frac{132 - 120}{120} \times 100 = 10\%$$

- 27) (b) New cost of component A = $30 \times 1.2 = ₹ 36$

New cost of component B = $50 \times 0.88 = ₹ 44$

New production cost = ₹ $(36 + 44 + 20) = ₹ 100$

New selling price is same.

Hence, profit = $120 - 100 = 20$ or 20%

- 28) (c) Let capacity of each cup be 100 mL.

After first operation, first container will have 200 mL of alcohol and second container will have 300 mL alcohol and 500 mL water.

Ratio of water to alcohol in the second container
= 5 : 3.

After second operation, the quantity of water and alcohol left would be $\left(300 \times \frac{5}{8}\right) = 187.5$ mL and

$$\left(300 \times \frac{3}{8}\right) = 112.5 \text{ mL respectively and quantity of}$$

water and alcohol in the first container is 187.5 mL and $(200 + 112.5) \text{ mL} = 312.5 \text{ mL}$, hence ratio of water and alcohol = $187.5 : 312.5 = 3 : 5$

Hence, on comparing ratio of water and alcohol in both the containers we find that $A = B$.

- 29) (b) Value of 1 kg of ruby = $\frac{4}{0.3}$ crores = 13.33 crores

$$\text{Value of 1 kg of emerald} = \frac{5}{0.4} \text{ crores} = 12.5 \text{ crores}$$

To maximise wealth maximum number of ruby and minimum number of emerald should be collected as price per kg of ruby is more than that of emerald. $(40 > 28 + 9)$.

- 30) (d) Ratio of number of one rupee, fifty paise, twenty five paise coins = 2.5 : 3 : 4

$$\therefore \text{Ratio of value of coins} = 2.5 \times 1 : \frac{3}{2} : \frac{4}{4} = 5 : 3 : 2$$

Let amount of ₹ 1 coins, 50 paise coins and 25 paise coins be $5x$, $3x$ and $2x$, respectively.

$$\text{So, } 5x + 3x + 2x = 210 \text{ (given)} \Rightarrow x = 21$$

$\therefore$ Value of one rupee coins

$$= \text{number of one rupee coins} = 21 \times 5 = 105$$

- 31) (a) Let the CP be ₹ 100, then SP = ₹ 114.28
(Profit = 14.28%)

This SP is arrived after giving a discount of 11.11% on marked price, hence if marked price = x .

$$\text{Then, } x \times 0.8889 = 114.28 \Rightarrow x = ₹ 128.56$$

Which is 28.56% more than the CP.

- 32) (d) Cost price of $(3 + 4 + 5) = 12$ kg of fruits
= ₹ $(300 + 320 + 300) = ₹ 920$

SP at a profit of 50% = ₹ 1380

$$\therefore \text{SP of fruits per kg} = \frac{1380}{12} = ₹ 115$$

- 33) (b) Production cost of 1500 watches
= $(1500 \times 150 + 30000) = ₹ 255000$

Amount realised on the sale of 1500 watches

$$= (12000 \times 250 + 300 \times 12) = ₹ 3300000$$

$$\therefore \text{Profit earned} = (3300000 - 255000) = ₹ 75000$$

- 34) (b) Production cost of 1500 watches = ₹ 255000

Let he sells x watches during the season, therefore number of watches sold after the season = $(1500 - x)$

$\therefore$ Amount realised on the sale of 1500 watches

$$= 250 \times x + 100(1500 - x)$$

$$= 150x + 150000$$

Now, break-even is achieved if production cost is equal to the selling price.

$$\therefore 150x + 150000 = 255000 \Rightarrow x = 700$$

- 35) (d) Let the ratio of contents of the two containers be x and y .

Then, quantity of a liquid A in the mixture $= \frac{5}{6}x + \frac{1}{4}y$

and quantity of liquid B in the mixture $= \frac{1}{6}x + \frac{3}{4}y$

$$\text{Given, } \frac{\frac{5x}{6} + \frac{y}{4}}{\frac{x}{6} + \frac{3y}{4}} = \frac{1}{1}$$

$$\Rightarrow \frac{5x}{6} - \frac{x}{6} = \frac{3y}{4} - \frac{y}{4}$$

$$\Rightarrow \frac{4x}{6} = \frac{2y}{4}$$

$$\Rightarrow \frac{x}{y} = \frac{3}{4}$$

- 36) (a) Let the price of 100 cm of cloth be ₹ 100, but he gets 120 cm of cloth for ₹ 100. Hence, his actual cost for

$$1 \text{ cm} = \frac{100}{120} = ₹ \frac{5}{6}$$

Now, instead of selling 100 cm, by cheating he sells 80 cm of cloth for the cost price of 100 cm of cloth. To calculate his profit, the cost price of 80 cm of cloth

$$= \frac{5}{6} \times 80 = ₹ 66.66$$

Selling price of 80 cm of cloth (actually 100 cm for the buyes) at a discount of 20%

$$= 100 \times 0.8 = ₹ 80$$

$$\therefore \text{Profit percentage} = \frac{80 - 66.66}{66.66} \times 100 = 20.01\%$$

or 20% (approximately).

- 37) (b) In such case, where SP of two items is same and loss % and profit % is also same, there is always a loss on such transaction and it is given by

$$\text{loss percentage} = \frac{(10)^2}{100} = 1\%$$

- 38) (c) Let the weight of the diamond be $10x$, then price of the diamond will be $k(10x)^2 = k \cdot 100x^2$, where k is a constant.

Weight of each piece $= x, 2x, 3x$ and $4x$. Therefore, their price will be $kx^2, k4x^2, k9x^2$ and $k16x^2$.

Total price of pieces $= kx^2(1 + 4 + 9 + 16) = 30kx^2$

Given, $k100x^2 - k30x^2 = 70000$ or $kx^2 = 1000$

$\therefore$ Original price of diamond

$$= k100x^2 = 1000 \times 100 = 100000$$

- 39) (b) Let the CP of 1 kg of sugar be ₹ 100.

$$\text{Then, CP of 900 g of sugar} = \frac{100}{1000} \times 900 = ₹ 90$$

Hence, profit per cent in Case II

$$= \frac{100 - 90}{90} \times 100 = 11.11\%$$

If he adds 10% impurity then his CP for 1 kg

$$= \frac{100}{1100} \times 1000 = ₹ 90.90$$

Hence, profit per cent in Case III

$$= \frac{100 - 90.90}{90.90} \times 100 = 10.01\%$$

If he reduces weight by 5%.

Then, cost price of 950 g

$$= \frac{100}{1000} \times 950 = ₹ 95 \text{ and SP} = ₹ 105$$

Hence, profit per cent in Case IV

$$= \frac{105 - 95}{95} \times 100 = 10.52\%$$

Hence, method II maximises his profit.

- 40) (d) Let the property of the Alphonso be ₹ x .

After first distribution, money possessed by the family members would be

$$\text{wife} \left(\frac{x}{2} \right), \text{Ben} \left(\frac{x}{6} \right), \text{Carl} \left(\frac{x}{6} \right), \text{Dave} \left(\frac{x}{6} \right)$$

After second distribution, money possessed by each of them would be

$$\text{Alphonso's wife} \left(\frac{x}{2} \right), \text{Ben} (0), \text{Ben's wife} \left(\frac{x}{12} \right),$$

$$\text{Carl} \left(\frac{x}{6} + \frac{x}{24} \right), \text{Dave} \left(\frac{x}{6} + \frac{x}{24} \right)$$

After third distribution, money possessed by them

$$\text{Alphonso's wife} \left(\frac{x}{2} \right), \text{Ben} (0), \text{Ben's wife} \left(\frac{x}{12} \right),$$

$$\text{Carl} (0), \text{Carl's wife} \left(\frac{5x}{48} \right), \text{Dave} \left(\frac{x}{6} + \frac{x}{24} + \frac{5x}{48} \right) = \frac{15x}{48}$$

After last distribution, money possessed by them

$$\text{Alphonso's wife} \left(\frac{x}{2} + \frac{15x}{96} \right), \text{Ben} (0), \text{Ben's wife} \left(\frac{x}{12} \right),$$

$$\text{Carl's} (0), \text{Carl's wife} \left(\frac{5x}{48} \right), \text{Dave} (0), \text{Dave's wife}$$

$$\left(\frac{15x}{96} \right)$$

$$\text{Now, given that } \left(\frac{x}{2} + \frac{15x}{96} \right) = 1575000$$

$$\Rightarrow x = 2400000$$

- 41) (a) Carl's original share

$$= \left(\frac{x}{6} \right) = \left(\frac{24}{6} \right) = 4 \text{ lakh}$$

- 42) (b) Ratio of property owned by the widows of three sons

$$= \frac{x}{12} : \frac{5x}{48} : \frac{15x}{96} = 8 : 10 : 15$$

- 43) (a) Let the CP of the article be ₹ x , since he earns a profit of 20%, hence $SP = 1.2x$. It is given that he incurs loss by selling 16 articles at the cost of 12 articles $\left(\text{loss} = \frac{16-12}{16} \times 100 = 25\% \right)$

$\therefore$ His selling price = $SP \times 0.75$

$$\text{Now, } SP \times 0.75 = 1.2x \Rightarrow SP = \frac{1.2}{0.75} x = 1.6x$$

This SP is arrived after giving a discount of 20% on MP.

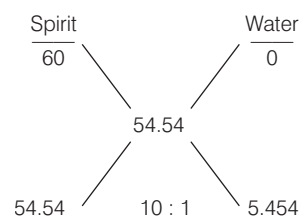
Hence, $MP = \frac{1.6x}{0.8} = 2x$. It means that article has been marked 100% above the cost price.

- 44) (b) Selling price of the mixture at a profit of 37.5% is ₹ 75.

$$\text{Hence, cost price} = \frac{75}{1.375} = ₹ 54.54$$

Assuming cost of water as 0.

By allegation rule, we get



- 45) (c) $2O + 3B + 4A = 15$... (i)
 $3O + 2B + A = 10$... (ii)

Adding Eqs. (i) and (ii), we get

$$5O + 5B + 5A = 25 \text{ or } O + B + A = 5$$

$$\therefore 3O + 3B + 3A = 3 \times 5 = 15$$

- 46) (a) Let the two numbers be x and y and $x < y$.

$$\text{Then, } \left(y - \frac{x}{2} \right) = 3 \left(x - \frac{x}{2} \right) \Rightarrow \left(y - \frac{x}{2} \right) = \frac{3x}{2}$$

$$\Rightarrow y = \frac{4x}{2} \Rightarrow y = 2x$$

$$\therefore y : x = 2 : 1$$

CHAPTER FOUR

TIME, SPEED AND DISTANCE

- 1) Ram, Shyam and Hari went out for a 100 km journey. Ram and Hari started the journey in Ram's car at the rate of 25 km/h, while Shyam walked at 5 km/h. After sometime, Hari got off and started walking at the rate of 5 km/h and Ram went back to pick up Shyam. All three reached the destination simultaneously. What was the number of hours required for the trip? (2016)
- 2) The distance through which a freely falling body drops is directly proportional to the square of the time for which it drops. If a body falls through 320 m in 8 s, then find the distance that the body falls through m in the next 2 s. (2015)
- 3) A ferry carries passengers to Rock of Vivekananda and back from Kanyakumari. The distance of Rock of Vivekananda from Kanyakumari is 100 km. One day, the ferry started for Rock of Vivekananda with passengers on board, at a speed of 20 km/h. After 90 min, the crew realised that there is a hole in the ferry and 15 gallons of sea water had already entered the ferry. Sea water is entering the ferry at the rate of 10 gallons/h. It requires 60 gallons of water to sink the ferry.
- At what speed should the driver now drive the ferry, so that it can reach the Rock of Vivekananda and return back to Kanyakumari just in time before the ferry sinks? (Given, current of the sea water from Rock of Vivekananda to Kanyakumari is 2 km/h) (2015)
- (a) 40 km/h towards the Rock and 39 km/h while returning to Kanyakumari
(b) 41 km/h towards the Rock and 38 km/h while returning to Kanyakumari
(c) 42 km/h towards the Rock and 36 km/h while returning to Kanyakumari
(d) 35 km/h towards the Rock and 39 km/h while returning to Kanyakumari
- 4) P , Q and R start from the same place X at a km/h, $(a + b)$ km/h and $(a + 2b)$ km/h, respectively. If Q starts p h after P , then how many hours after R should start, so that both Q and R overtake P at the same time, where $(a > 0, b > 0)$? (2014)
- (a) $\frac{pa}{a+b}$ (b) $\frac{a}{p(a+b)}$ (c) $\frac{p(a+b)}{a+2b}$ (d) $\frac{pa}{a+2b}$
- 5) Two cars left simultaneously from two places P and Q and headed for Q and P , respectively. They crossed each other after x h. After that, one of the cars took y h to reach its destination while the other took z h to reach its destination. Which of the following always holds true? (2014)
- (a) $x = \frac{y+z}{2}$ (b) $x = \frac{2yz}{y+z}$
(c) $x = \sqrt{yz}$ (d) $x = \frac{y^2+z^2}{y+z}$
- Directions (Q. Nos. 6-7) Answer the questions based on the following information.**
- Taj Express started at 11 am from Delhi to Jhansi with a speed of 72 km/h. After two hours, Qutub Express leaves Jhansi towards Delhi with a speed of 90 km/h. The two trains expected to cross each at 3:30 pm. But at 2 pm due to some signal problem the speed of both trains reduced by same quantity, then they cross each other 6:30 pm. (2013)
- 6) What is new speed of the Taj Express after the reduction in speed?
- (a) 18 km/h (b) 36 km/h
(c) 45 km/h (d) 54 km/h
- 7) If the signal problem had occurred at 3 : 00 pm instead of 2 : 00 pm, at what time would the two trains have crossed each other?
- (a) 5 : 00 pm (b) 4 : 00 pm
(c) 3 : 30 pm (d) 4 : 30 pm

- 8) A car A starts from a point P towards another point Q . Another car B starts (also from P) 1 h after the first car and overtakes it after covering 30% of the distance PQ . After that, the cars continue. On reaching Q , car B reverses and meets car A , after covering $23\frac{1}{3}$ of the distance QP . Find

the time taken by car B to cover the distance PQ (in hours). (2012)

- (a) 3 (b) 4 (c) 5 (d) $3\frac{1}{3}$

- 9) Two cars A and B start from two points P and Q respectively towards each other simultaneously. After travelling some distance, at a point R , car A develops engine trouble. It continues to travel at $\frac{2}{3}$ rd of its usual speed to meet car B at a point S , where $PR = QS$. If the engine trouble had occurred after car A had travelled double the distance it would have met car B at a point T , where $ST = SQ/9$. Find the ratio of speeds of A and B . (2011)

- (a) 4 : 1 (b) 2 : 1 (c) 3 : 1 (d) 3 : 2

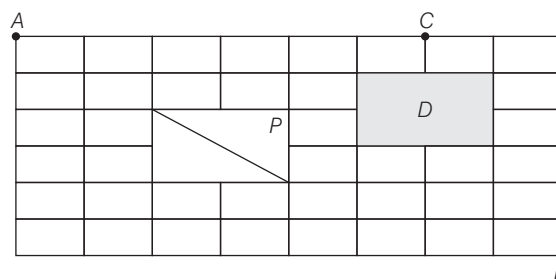
Directions (Q. Nos. 10-11) Answer the questions based on the following information.

A is standing 5 m East and 4 m North of a point P while B is standing 15 m East and 24 m North of P . A walks at a speed of 1.4 m/s while B walks at a speed of 2.1 m/s. (2011)

- 10) If A and B simultaneously start walking towards each other and finally meet at a point Q , then find the distance PQ .
 (a) 13 m (b) $12\sqrt{3}$ m (c) 15 m (d) $13\sqrt{2}$ m
- 11) If A and B simultaneously start walking East and South respectively, then which of the following is true of the distance of closest approach ' d_1 ' between them?
 (a) $d_1 > 5$ m (b) $d_1 < 5$ m
 (c) $d_1 = 5$ m (d) Cannot be determined
- 12) In a race of 200 m, A beats S by 20 m and N by 40 m. If S and N are running a race of 100 m with exactly the same speed as before, then by how many metres will S beat N ? (2010)
 (a) 11.11 m (b) 10 m (c) 12 m (d) 25 m
- 13) The difference between the time taken by two cars to travel a distance of 350 km is 2 h 20 min. If the difference between their speeds is 5 km/h, then the speed of faster car is (2009)
 (a) 30 km/h (b) 35 km/h
 (c) 40 km/h (d) 45 km/h

Directions (Q.Nos. 14-15) Answer the questions based on the following information.

The figure below shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town. (2008)



- 14) Neelam rides her bicycle from her house at A to her office at B , taking the shortest path. Then, the number of possible shortest paths that she can choose is
 (a) 60 (b) 75
 (c) 45 (d) 90
 (e) 72
- 15) Neelam rides her bicycle from her house at A to her club at C , via B taking the shortest path. Then the number of possible shortest paths that she can choose is
 (a) 1170 (b) 630 (c) 792
 (d) 1200 (e) 936
- 16) Rahim plans to drive from city A to station C , at the speed of 70 km/h, to catch a train arriving there from B . He must reach C at least 15 min before the arrival of the train. The train leaves B , located 500 km South of A , at 8:00 am and travels at a speed of 50 km/h. It is known that C is located between West and North-West of B , with BC at 60° to AB . Also, C is located between South and South-West of A with AC at 30° to AB . The latest time by which Rahim must leave A and still catch the train is closest to (2008)
 (a) 6:15 am (b) 6:30 am (c) 6:45 am
 (d) 7:00 am (e) 7:15 am

Directions (Q.Nos. 17-18) Answer the questions based on the following information.

Cities A and B are in different time zones. A is located 3000 km East of B . The table below describes the schedule of an airline operating non-stop flights between A and B . All the time indicated are local and on the same day.

Assume that planes cruise at the same speed in both directions. However; the effective speed is influenced by a steady wind blowing from East to West at 50 km/h. (2007)

Departure		Arrival	
City	Time	City	Time
B	8:00 am	A	3:00 pm
A	4:00 pm	B	8:00 pm

- 17) What is the time difference between A and B ?
 (a) 2 h (b) 2 h and 30 min
 (c) 1 h (d) 1 h and 30 min
 (e) Cannot be determined
- 18) What is the plane's cruising speed in km/h ?
 (a) 550 (b) 600 (c) 500 (d) 700
 (e) Cannot be determined
- 19) Arun, Barun and Kiranmala start from the same place and travel in the same direction at speeds of 30, 40 and 60 km/h, respectively. Barun starts two hours after Arun. If Barun and Kiranmala overtake Arun at the same instant, how many hours after Arun did Kiranmala start? (2006)
 (a) 3 (b) 3.5 (c) 4 (d) 4.5
 (e) 5

Directions (Q.Nos. 20-21) Answer the questions based on the following information.

Ram and Shyam run a race between points A and B, 5 km apart. Ram starts at 9 am from A at a speed of 5 km/h; reaches B and returns to A at the same speed. Shyam starts at 9:45 am from A at a speed of 10 km/h, reaches B and comes back to A at the same speed. (2005)

- 20) At what time do Ram and Shyam first meet each other?
 (a) 10 am (b) 10:10 am
 (c) 10:20 am (d) 10:30 am
- 21) At what time does Shyam overtake Ram?
 (a) 10:20 am (b) 10:30 am
 (c) 10:40 am (d) 10:50 am
- 22) A chemical plant has four tanks (A, B, C and D), each containing 1000 L of a chemical. The chemical is being pumped from one tank to another as follows

From A to B @ 20 L/min
 From C to A @ 90 L/min
 From A to D @ 10 L/min
 From C to D @ 50 L/min
 From B to C @ 100 L/min

From D to B @ 110 L/min

Which tank gets emptied first and how long does it take (in minutes) to get empty after pumping starts? (2005)

- (a) A, 16.66 (b) C, 20 (c) D, 20 (d) D, 25
- 23) If a man cycles at 10 km/h, then he arrives at a certain place at 1 pm. If he cycles at 15 km/h, he will arrive at the same place at 11 am. At what speed must he cycle to get there at noon ? (2004)
 (a) 11 km/h (b) 12 km/h (c) 13 km/h (d) 14 km/h
- 24) Two boats, travelling at 5 km/h and 10 km/h, head directly towards each other. They begin at a distance of 20 km from each other. How far apart are they (in km) one minute before they collide? (2004)
 (a) 1/12 (b) 1/6 (c) 1/4 (d) 1/3
- 25) Karan and Arjun run a 100 m race, where Karan beats Arjun by 10 m. To do a favour to Arjun, Karan starts 10 m behind the starting line in a second 100 m race. They both run at their earlier speeds. Which of the following is true in connection with the second race ? (2004)
 (a) Karan and Arjun reach the finishing line simultaneously
 (b) Arjun beats Karan by 1 m
 (c) Arjun beats Karan by 11 m
 (d) Karan beats Arjun by 1 m
- 26) In Nuts and Bolts factory, one machine produces only nuts at the rate of 100 nuts per minute and needs to be cleaned for 5 min after production of every 1000 nuts. Another machine produces only bolts at the rate of 75 bolts per minute and needs to be cleaned for 10 min after production of every 1500 bolts. If both the machines start production at the same time, what is the minimum duration required for producing 9000 pairs of nuts and bolts? (2004)
 (a) 130 min (b) 135 min
 (c) 170 min (d) 180 min
- 27) A father and his son are waiting at a bus stop in the evening. There is a lamp post behind them. The lamp post, the father and his son stand on the same straight line. The father observes that the shadows of his head and his son's head are incident at the same point on the ground. If the heights of the lamp post, the father and his son are 6 m, 1.8 m and 0.9 m respectively and the father is standing 2.1 m away from the post, then how far (in m) is the son standing from his father? (2004)
 (a) 0.9 (b) 0.75 (c) 0.6 (d) 0.45

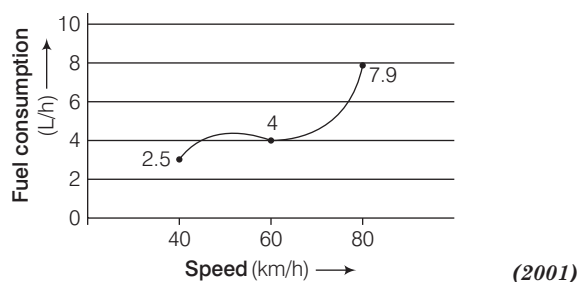
- 28) A sprinter starts running on a circular path of radius r metres. Her average speed (in metres/minute) is πr during the first 30 s, $\pi r / 2$ during next one min, $\pi r / 4$ during next 2 min, $\pi r / 8$ during next 4 min and so on. What is the ratio of the time taken for the n th round to that for the previous round? (2004)
 (a) 4 (b) 8 (c) 16 (d) 32
- 29) Two straight roads R_1 and R_2 diverge from a point A at an angle of 120° . Ram starts walking from point A along R_1 at a uniform speed of 3 km/h. Shyam starts walking at the same time from A along R_2 at a uniform speed of 2 km/h. They continue walking for 4 h along their respective roads and reach points B and C on R_1 and R_2 , respectively. There is a straight line path connecting B and C . Then, Ram returns to point A after walking along the line segments BC and CA . Shyam also returns to A after walking along line segments CB and BA . Their speeds remain unchanged. The time interval (in hours) between Ram's and Shyam's return to the point A is (2003)
 (a) $\frac{10\sqrt{19} + 26}{3}$ (b) $\frac{2\sqrt{19} + 10}{3}$
 (c) $\frac{\sqrt{19} + 26}{3}$ (d) $\frac{\sqrt{19} + 10}{3}$
- 30) Three small pumps and a large pump are filling a tank. Each small pump works at $(2/3)$ rd the rate of the large pump. If all four work at the same time, they should fill the tank in what fraction of the time it would have taken the large pump alone? (2003)
 (a) $4/7$ (b) $1/3$ (c) $2/3$ (d) $3/4$
- 31) Shyam visited Ram on vacation. In the mornings, they both would go for yoga. In the evenings, they would play tennis. To have more fun, they indulge only in one activity per day, i.e. either they went for yoga or played tennis each day. There were days when they were lazy and stayed home all day long. There were 24 mornings when they did nothing, 14 evenings when they stayed at home and a total of 22 days when they did yoga or played tennis. For how many days Shyam stayed with Ram? (2002)
 (a) 32 (b) 24
 (c) 30 (d) None of these
- 32) Six technicians working at the same rate completely work of one server in 10 h. If they start at 11:00 am and one additional technician per hour being added beginning at 5:00 pm, at what time the server will be complete? (2002)
 (a) 6 : 40 pm (b) 7 pm (c) 7 : 20 pm (d) 8 : 00 pm
- 33) A train approaches a tunnels AB . Inside the tunnel a cat located at a point that is $\frac{3}{8}$ of the distance AB measured from the entrance A . When the train whistles, the cat runs. If the cat moves to the entrance of the tunnel A , the train catches the cat exactly at the entrance. If the cat moves to the exit B , the train catches the cat at exactly the exit. The speed of the train is greater than the speed of the cat by what order? (2002)
 (a) 3 : 1 (b) 4 : 1
 (c) 5 : 1 (d) None of these
- 34) At a bookstore, "MODERN BOOK STORE" is flashed using neon lights. The words are individually flashed at intervals of $2\frac{1}{2}$, $4\frac{1}{4}$, $5\frac{1}{8}$ seconds respectively and each word is put off after a second. The least time after which the full name of the bookstore can be read again, is (2002)
 (a) 49.5 s (b) 73.5 s (c) 1744.5 s (d) 855 s
- 35) On a 20 km tunnel connecting two cities A and B , there are three gutters. The distance between gutters 1 and 2 is half the distance between gutters 2 and 3. The distance from city A to its nearest gutter, gutter 1 is equal to the distance of city B from gutter 3. On a particular day; the hospital in city A receives information that an accident has happened at the third gutter. The victim can be saved only if an operation is started within 40 min. An ambulance started from city A at 30 km/h and crossed the first gutter after 5 min. If the driver had doubled the speed after that, what is the maximum amount of time the doctor would get to attend the patient at the hospital. Assume 1 min is elapsed for taking the patient into and out of the ambulance. (2002)
 (a) 4 min (b) 2.5 min (c) 1.5 min
 (d) Patient died before reaching the hospital.
- 36) Only a single rail track exists between stations A and B on a railway line. One hour after the North bound superfast train N leaves station A for station B , a South bound passenger train S reaches station A from station B . The speed of the superfast train is twice that of a normal express train E , while the speed of a passenger train S is half that of E . On a particular day N leaves for station B from station A , 20 min behind the normal schedule. In order to maintain the schedule, both N and S increased their speeds.

If the superfast train doubles its speed, what should be the ratio (approximately) of the speed of passenger train to that of the superfast train, so that passenger train *S* reaches exactly at the scheduled time at station *A* on that day. (2002)

- (a) 1 : 3 (b) 1 : 4 (c) 1 : 5 (d) 1 : 6

Directions (Q.Nos. 37-38) Answer the questions based on the following information.

The petrol consumption rate of a new model car 'Palto' depends on its speed and may be described by the adjoining graph



- 37) Manasa makes the 200 km trip from Mumbai to Pune at a steady speed of 60 km/h. What is the amount of petrol consumed for the journey?

- (a) 12.5 L (b) 13.33 L
(c) 16 L (d) 19.75 L

- 38) Manasa would like to minimize the fuel consumption for the trip by driving at the appropriate speed. How should she change the speed?

- (a) Increase the speed
(b) Decrease the speed
(c) Maintain the speed at 60 km/h
(d) Cannot be determined

- 39) Three runners *A*, *B* and *C* run a race, with runner *A* finishing 12 m ahead of runner *B* and 18 m ahead of runner *C*, while runner *B* finishes 8 m ahead of runner *C*. Each runner travels the entire distance at a constant speed. What was the length of the race? (2001)

- (a) 36 m (b) 48 m
(c) 60 m (d) 72 m

- 40) A train *X* departs from station *A* at 11:00 am for station *B*, which is 180 km away. Another train *Y* departs from station *B* at 11:00 am for station *A*. Train *X* travels at an average speed of 70 km/h and does not stop anywhere until it arrives at station *B*. Train *Y* travels at an average speed of 50 km/h, but has to stop for 15 min at station *C*, which is 60 km away from station *B* enroute to station *A*.

Ignoring the lengths of the trains, what is the distance, to the nearest (in km), from station *A* to the point, where the trains cross each other?

(2001)

- (a) 112 (b) 118 (c) 120 (d) None of these

- 41) There's a lot of work in preparing a birthday dinner. Even after the turkey is in the oven, there's still the potatoes and gravy, yams, salad and cranberries, not to mention setting the table. Three friends, Asit, Arnold and Afzal, work together to get all of these chores done. The time it takes them to do the work together is six hours less than Asit would have taken working alone, one hour less than Arnold would have taken alone and half the time Afzal would have taken working alone. How long did it take them to do these chores working together? (2001)

- (a) 20 min (b) 30 min (c) 40 min (d) 50 min

- 42) Shyama and Vyom walk up an escalator (moving stairway). The escalator moves at a constant speed. Shyama takes three steps for every two of Vyom's steps. Shyama gets to the top of the escalator after having taken 25 steps, while Vyom (because his slower pace lets the escalator do a little more of the work) takes only 20 steps to reach the top. If the escalator were turned off, how many steps would they have to take to walk up? (2001)

- (a) 40 (b) 50 (c) 60 (d) 80

- 43) At his usual rowing rate, Rahul can travel 12 miles downstream in a certain river in six hours less than it takes him to travel the same distance upstream. But if he could double his usual rowing rate for this 24 mile round trip, the downstream 12 miles would then take only one hour less than the upstream 12 miles. What is the speed of the current in miles per hour? (2001)

- (a) $7/3$ (b) $4/3$ (c) $5/3$ (d) $8/3$

- 44) Two men *X* and *Y* started working for a certain company at similar jobs on January 1, 1950. *X* asked for an initial salary of ₹ 300 with an annual increment of ₹ 30. *Y* asked for an initial salary of ₹ 200 with a rise of ₹ 15 every six months. Assume that the arrangements remained unaltered till December 31, 1959. Salary is paid on the last day of the month. What is the total amount paid to them as salary during the period? (2001)

- (a) ₹ 93300 (b) ₹ 93200
(c) ₹ 93100 (d) None of these

- 45) A can complete a piece of work in 4 days. B takes double the time taken by A , C takes double that of B and D takes double that of C to complete the same task. They are paired in groups of two each. One pair takes two-third the time needed by the second pair to complete the work. Which is the first pair? (2001)

(a) A, B (b) A, C (c) B, C (d) A, D

- 46) Two full tanks, one shaped like a cylinder and the other like a cone, contain jet fuel. The cylindrical tank holds 500 L more than the conical tank. After 200 L of fuel has been pumped out from each tank, the cylindrical tank contains twice the amount of fuel in the conical tank. How many litres of fuel did the cylindrical tank have when it was full? (2000)

(a) 700 L (b) 1000 L
(c) 1100 L (d) 1200 L

Directions (Q.Nos. 47-48) Answer the questions based on the following information.

There are five machines— A, B, C, D and E —situated on a straight line at distances of 10 m, 20 m, 30 m, 40 m and 50 m respectively from the origin of the line. A robot is stationed at the origin of the line. The robot serves the machines with raw material whenever a machine becomes idle. All the raw materials are located at the origin. The robot is in an idle state at the origin at the beginning of a day. As soon as one or more machines become idle, they send messages to the robot-station and the robot starts and serves all the machines from which it received messages. If a message is received at the station while the robot is away from it, the robot takes notice of the message only when it returns to the station. While moving, it serves the machines in the sequence in which they are encountered and then returns to the origin. If any messages are pending at the station when it returns, it repeats the process again. Otherwise, it remains idle at the origin till the next message (s) is (are) received. (2000)

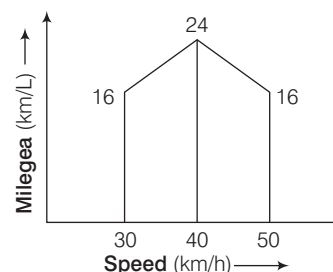
- 47) Suppose on a certain day, machines A and D have sent the first two messages to the origin at the beginning of the first second, C has sent a message at the beginning of the 5th second, B at the beginning of the 6th second and E at the beginning of the 10th second. How much distance has the robot travelled since the beginning of the day, when it notices the message of E ? Assume that the speed of movement of the robot is 10 m/s.
(a) 140 m (b) 80 m
(c) 340 m (d) 360 m

- 48) Suppose there is a second station with raw material for the robot at the other extreme of the line which is 60 m from the origin, i.e. 10 m from E . After finishing the services in a trip, the robot returns to the nearest station. If both stations are equidistant, it chooses the origin as the station to return to. Assuming that both stations receive the messages sent by the machines and that all the other data remains the same, what would be the answer to the above question?

(a) 120 m (b) 140 m
(c) 340 m (d) 70 m

Directions (Q.Nos. 49-50) Answer the questions based on the following information.

Rajiv reaches city B from city A in 4 h, driving at the speed of 35 km/h for the first two hours and at 45 km/h for the next two hours. Aditi follows the same route, but drives at three different speeds : 30, 40 and 50 km/h; covering an equal distance in each speed segment. The two cars are similar with petrol consumption characteristics (km/L) shown in the figure below

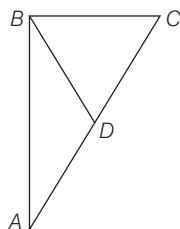


(1999)

- 49) The quantity of petrol consumed by Aditi for the journey is
(a) 8.3 L (b) 8.6 L
(c) 8.2 L (d) 9.2 L
- 50) Zoheb would like to drive Aditi's car over the same route from A to B and minimize the petrol consumption for the trip. What is the quantity of petrol required by him?
(a) 6.67 L (b) 7 L
(c) 6.33 L (d) 6 L

Directions (Q.Nos. 51-53) Answer the questions based on the following information.

A road network (shown in figure) connects cities A, B, C and D . All road segments are straight lines. D is the mid point on the road connecting A and C . Roads AB and BC are at right angles to each other with BC shorter than AB . The segment AB is 100 km long.



Mr. X and Mr. Y leave A at 8:00 am, take different routes to city C and reach at the same time. X takes the highway from A to B to C and travels at an average speed of 61.875 km/h. Y takes the direct route AC and travels at 45 km/h on segment AD. Y's speed on segment DC is 55 km/h. (1999)

- 51) What is the average speed of Y?
 (a) 47.5 km/h (b) 49.5 km/h
 (c) 50 km/h (d) 52 km/h
- 52) The total distance travelled by Y during the journey is approximately
 (a) 105 km (b) 150 km
 (c) 130 km (d) Cannot be determined
- 53) What is the length of the road segment BD?
 (a) 50 km (b) 52.5 km
 (c) 55 km (d) Cannot be determined
- 54) Navjivan Express from Ahmedabad to Chennai leaves Ahmedabad at 6:30 am and travels at 50 km/h towards Baroda situated 100 km away. At 7:00 am, Howrah-Ahmedabad Express leaves Baroda towards Ahmedabad and travels at 40 km/h. At 7:30 am, Mr. Shah, the traffic controller at Baroda realises that both the trains are running on the same track. How much time does he have to avert a head-on collision between the two trains? (1999)
 (a) 15 min (b) 20 min (c) 25 min (d) 30 min
- 55) I started climbing up the hill at 6 am and reached the top of the temple at 6 pm. Next day, I started coming down at 6 am and reached the foothill at 6 pm. I walked on the same road. The road is so short that only one person can walk on it. Although I varied my pace on my way, I never stopped on my way. Then, which of the following must be true? (1998)
 (a) My average speed downhill was greater than that of uphill.
 (b) At noon, I was at the same spot on both the days.
 (c) There must be a point where I reached at the same time on both the days.
 (d) There cannot be a spot where I reached at the same time on both the days.

- 56) Distance between A and B is 72 km. Two men started walking from A and B at the same time towards each other. The person who started from A travelled uniformly with average speed 4 km/h. While the other man travelled with varying speed as follows : In first hour, his speed was 2 km/h, in the second hour, it was 2.5 km/h, in the third hour, it was 3 km/h and so on. When will they meet each other? (1998)

(a) 7 h (b) 10 h
 (c) 35 km from A (d) midway between A and B

- 57) A company has a job to prepare certain number cans and there are three machines A, B and C for this job. A can complete the job in 3 days, B can complete the job in 4 days and C can complete the job in 6 days. How many days the company will take to complete the job if all the machines are used simultaneously? (1998)

(a) 4 days (b) $\frac{4}{3}$ days
 (c) 3 days (d) 12 days

Directions (Q.Nos. 58-59) Answer the questions based on the following information.

The Weirdo Holiday Resort follows a particular system of holidays for its employees. People are given holidays on the days where the first letter of the day of the week is the same as the first letter of their names. All employees work at the same rate. (1997)

- 58) Raja starts working on February 25, 1996 and finishes the job on March 2, 1996. How much time would T and J take to finish the same job if both start on the same day as Raja?
 (a) 4 days (b) 5 days
 (c) Either 4 or 5 days (d) Cannot be determined
- 59) Starting on February 25, 1996, if Raja had finished his job on April 2, 1996, when would T and S likely to have completed the job, had they started on the same day as Raja?
 (a) March 15, 1996 (b) March 14, 1996
 (c) March 22, 1996 (d) Data insufficient

Directions (Q.Nos. 60-61) Answer the questions based on the following information.

A thief, after committing the burglary, started fleeing at 12 noon, at a speed of 60 km/h. He was then chased by a policeman X. X started the chase, 15 min after the thief had started, at a speed of 65 km/h. (1997)

- 60) At what time did X catch the thief?
 (a) 3 : 30 pm (b) 3 pm
 (c) 3 : 15 pm (d) None of these

- 61) If another policeman had started the same chase along with X , but at a speed of 60 km/h, then how far behind was he when X caught the thief?

(a) 18.75 km (b) 15 km
(c) 21 km (d) 37.5 km

Directions (Q.Nos. 62-64) Answer the questions based on the following information.

A certain race is made up of three stretches: A , B and C , each 2 km long and to be covered by a certain mode of transport. The table given further gives these modes of transport for the stretches and the minimum and the maximum possible speeds (in km/h) over these stretches. The speed over a particular stretch is assumed to be constant. The previous record for the race is 10 min.

(1997)

A	Car	40	60
B	Motorcycle	30	50
C	Bicycle	10	20

- 62) Anshuman travels at minimum speed by car over A and completes stretch B at the fastest speed. At what speed should he cover stretch C in order to break the previous record?

(a) Maximum speed for C (b) Minimum speed for C
(c) Cannot be determined (d) None of these

- 63) Mr. Hare completes the first stretch at the minimum speed and takes the same time for stretch B . He takes 50% more time than the previous record to complete the race. What is Mr. Hare's speed for the stretch C ?

(a) 10.9 km/h (b) 13.3 km/h
(c) 17.1 km/h (d) None of these

- 64) Mr. Tortoise completes the race at an average speed of 20 km/h. His average speed for the first two stretches is 4 times that for the last stretch. Find the speed over stretch C .

(a) 15 km/h (b) 12 km/h
(c) 10 km/h (d) Cannot be determined

Directions (Q.Nos. 65-67) Answer the questions based on the following information.

Boston is 4 h ahead of Frankfurt and 2 h behind India. X leaves Frankfurt at 6 pm on Friday and reaches Boston the next day. After waiting there for 2 h, he leaves exactly at noon and reaches India at 1 am. On his return journey, he takes the same route as before, but halts at Boston for 1 h less than his previous halt there. He then proceeds to Frankfurt. (1997)

- 65) If his journey, including stoppage, is covered at an average speed of 180 m/h, what is the distance between Frankfurt and India?

(a) 3600 miles (b) 4500 miles
(c) 5580 miles (d) Data insufficient

- 66) If X had started the return journey from India at 2 : 55 am on the same day that he reached there, after how much time would he reach Frankfurt?

(a) 24 h (b) 25 h
(c) 26 h (d) Data insufficient

- 67) What is X 's average speed for the entire journey (to and fro)?

(a) 176 m/h (b) 180 m/h
(c) 165 m/h (d) Data insufficient

- 68) A man travels from A to B at a speed x km/h. He then rests at B for x h. He then travels from B to C at a speed $2x$ km/h and rests for $2x$ h. He moves further to D at a speed twice as that between B and C . He thus reaches D in 16 h. If distances $A-B$, $B-C$ and $C-D$ are all equal to 12 km, the time for which he rested at B could be (1996)

(a) 3 h (b) 6 h (c) 2 h (d) 4 h

- 69) A man travel three-fifths of a distance AB at a speed $3a$ and the remaining at a speed $2b$. If he goes from B to A and returns at a speed $5c$ in the same time, then (1996)

(a) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ (b) $a + b = c$
(c) $\frac{1}{a} + \frac{1}{b} = \frac{2}{c}$ (d) None of these

- 70) In a mile race, Akshay can be given a start of 128 m by Bhairav. If Bhairav can give Chinmay a start of 4 m in a 100 m dash, then who out of Akshay and Chinmay will win a race of one and half miles and what will be the final lead given by the winner to the loser? (One mile is 1600 m) (1996)

(a) Akshay, $\frac{1}{2}$ mile (b) Chinmay, $\frac{1}{32}$ mile
(c) Akshay, $\frac{1}{24}$ mile (d) Chinmay, $\frac{1}{16}$ mile

- 71) A man can walk up a moving 'up' escalator in 30 s. The same man can walk down this moving 'up' escalator in 90 s. Assume that his walking speed is same upwards and downwards. How much time he take to walk up the escalator, when it is not moving? (1995)

(a) 30 s (b) 45 s (c) 60 s (d) 90 s

- 72) Two typists undertake to do a job. The second typist begin working one hour after the first. Three hours after the first typist has begun working, there is still $\frac{9}{20}$ of the work to be done.

When the assignment is completed, it turns out that each typist has done half the work. How many hours would it take each one to do the whole job individually? (1995)

- (a) 12 h and 8 h (b) 8 h and 5.6 h
(c) 10 h and 8 h (d) 5 h and 4 h

- 73) A group of men decided to do a job in 8 days. But since 10 men dropped out every day, the job got completed at the end of the 12th day. How many men were there at the beginning? (1995)

- (a) 165 (b) 175
(c) 80 (d) None of these

- 74) In a race of 200 m run, A beats S by 20 m and N by 40 m. If S and N are running a race of 100 m with exactly same speed as before, then by how many metres will S beat N? (1995)

- (a) 11.11 m (b) 10 m (c) 12 m (d) 25 m

- 75) A ship leaves on a long voyage. When it is 18 miles from the shore, a sea plane, whose speed is ten times that of the ship, is sent to deliver mail. How far from the shore does the sea plane catch up with the ship? (1995)

- (a) 24 miles (b) 25 miles
(c) 22 miles (d) 20 miles

- 76) There is a leak in the bottom of the tank. This leak can empty a full tank in 8 h. When the tank is full, a tap is opened into the tank which intakes water at rate of 6 L/h and the tank is now emptied in 12 h. What is the capacity of the tank? (1994)

- (a) 28.8 L (b) 36 L
(c) 144 L (d) Cannot be determined

- 77) The winning relay team in a high school sports competition clocked 48 min for a distance of 13.2 km. Its runners A, B, C and D maintained speeds of 15 km/h, 16 km/h, 17 km/h and 18 km/h, respectively. What is the ratio of the time taken by B to the time taken by D? (1994)

- (a) 5 : 16 (b) 5 : 17 (c) 9 : 8 (d) 8 : 9

- 78) A and B walk from X to Y, a distance of 27 km at 5 km/h and 7 km/h, respectively. B reaches Y and immediately turns back meeting A at Z. What is the distance from X to Z? (1994)

- (a) 25 km (b) 22.5 km
(c) 24 km (d) 20 km

- 79) Shyam went from Delhi to Shimla via Chandigarh by car. The distance from Delhi to Chandigarh is $\frac{3}{4}$ times the distance from Chandigarh to Shimla.

The average speed from Delhi to Chandigarh was half as much as that from Chandigarh to Shimla.

If the average speed for the entire journey was 49 km/h, what was the average speed from Chandigarh to Shimla? (1994)

- (a) 39.2 km/h (b) 63 km/h
(c) 42 km/h (d) None of the above

- 80) A water tank has three taps: A, B and C. A fills 4 buckets in 24 min, B fills 8 buckets in 1 h and C fills 2 buckets in 20 min. If all the taps are opened together, a full tank is emptied in 2 h. If a bucket contains 5 L water, what is the capacity of the tank? (1994)

- (a) 120 L (b) 240 L (c) 180 L (d) 60 L

- 81) One man can do as much work in one day as a woman can do in 2 days. A child does one-third the work in a day as a woman. If an estate owner hires 39 pairs of hands—men, women and children in the ratio 6 : 5 : 2 and pays them in all ₹ 1, 113 at the end of the day's work, what must the daily wages of a child be, if the wages are proportional to the amount of work done? (1994)

- (a) ₹ 14 (b) ₹ 5 (c) ₹ 20 (d) ₹ 7

- 82) Two towns A and B are 100 km apart. A school is to be built for 100 students of town B and students of town A. Expenditure on transport is ₹ 1.20 per kilometre per student. If the total expenditure on transport by all 130 students is to be as small as possible, then the school should be built at (1994)

- (a) 33 km from town A (b) 33 km from town B
(c) town A (d) town B

Directions (Q.Nos. 83-85) Answer the questions based on the following information.

Q started to move from point B towards point A exactly an hour after P started from A in the opposite direction. Q's speed was twice that of P. When P had covered one-sixth of the distance between the points A and B, Q had also covered the same distance. (1993)

- 83) The point where P and Q would meet, is

- (a) closer to A
(b) exactly between A and B
(c) closer to B
(d) P and Q will not meet at all

- 84) How many hours would P take to reach B?

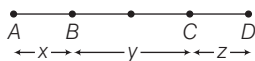
- (a) 2 (b) 5 (c) 6 (d) 12

- 85) How many more hours would P (compared to Q) take to complete his journey?

- (a) 4 (b) 5 (c) 6 (d) 7

HINTS & SOLUTIONS

- 1) Let us consider $AB = x$, $BC = y$ and $CD = z$



Since, the time taken by Ram to cover $x + y + y$ at the speed of 25 km/h is same as the time taken by Shyam to cover x at the speed of 5 km/h, therefore

$$\frac{x + y + y}{25} = \frac{x}{5} \Rightarrow y = 2x$$

Similarly, the time taken by Ram to cover $y + y + z$ at the speed of 25 km/h is same as the time taken by Hari to cover z at the speed of 5 km/h, therefore

$$\frac{y + y + z}{25} = \frac{z}{5} \Rightarrow y = 2z$$

So, we have $y = 2x = 2z$
or $x : y : z = 1 : 2 : 1$

It implies that $x = 25$ km, $y = 50$ km and $z = 25$ km

$$\begin{aligned} \text{Thus, the required time} &= \frac{x + y + y + y + z}{25} \\ &= \frac{200}{25} = 8 \text{ h} \end{aligned}$$

- 2) Given, $d \propto t^2$ ($\because d = \text{distance and } t = \text{time}$)

$$\Rightarrow \frac{d_2}{t_2} = \frac{d_1}{t_1}$$

$$\Rightarrow \frac{d_2}{10^2} = \frac{320}{8^2}$$

$$\Rightarrow d_2 = 500 \text{ m}$$

$\therefore$ Distance travelled in the 9th and 10th second
= Distance travelled in 10 s – Distance travelled in 8 s
= 500 m – 320 m = 180 m

- 3) (c) As soon as 60 gallons of water fills in the ferry, it will sink. Since, 15 gallons of water is already filled in, so only 45 gallons of water is needed to sink.

Further, we know that water enters at the rate of 10 L/h, so we have maximum 4.5 h before the ferry sinks.

In the first 1.5 h, ferry has travelled 27 km $[= 1.5 \times (20 - 2)]$, as the ferry was going against the stream.

Therefore, in remaining 4.5 h, ferry has to traverse 73 km $(= 100 - 27)$ till it reaches V and 100 km till it comes back to K from V.



Now, we can go through the given choices.

$$\text{Option (a), } \frac{73}{40 - 2} + \frac{100}{39 + 2} = 4.36$$

$$\text{Option (b), } \frac{73}{41 - 2} + \frac{100}{38 + 2} = 4.37$$

$$\text{Option (c), } \frac{73}{42 - 2} + \frac{100}{36 + 2} = 4.46$$

$$\text{Option (d), } \frac{73}{35 - 2} + \frac{100}{39 + 2} = 4.63$$

Option (d) is invalid, as ferry will sink, if it takes more than 4.5 h. As per options (a) and (b), ferry reaches too early to save time, which is unnecessary as ferry has 4.5 h to complete its trip.

So, option (c) is the most appropriate one.

- 4) (d) Distance covered by P , t h after starting from $X = at$.

When Q overtakes P , then he would have covered $(a + b)(t - p) = at - ap + bt - bp$ and this equals at

$$= at - ap + bt - bp = at$$

$$t = \frac{p(a + b)}{b} \quad \dots(i)$$

Let R start q h after Q started.

Distance covered by R when he overtakes P would be

$$(a + 2b)(t - p - q) = at \quad \dots(ii)$$

Substituting the value of t from Eq. (i) and simplifying, we get

$$q = \frac{pa}{a + 2b}$$

- 5) (c) Let the speeds of the cars leaving P and Q be p km/h and q km/h, respectively.

$$\text{Then, } px = qy \quad \dots(i)$$

$$\text{and } pz = qx \quad \dots(ii)$$

On dividing Eq. (i) by Eq. (ii), we get

$$\frac{x}{z} = \frac{y}{x}$$

$$\Rightarrow x = \sqrt{yz}$$

Solutions (Q. Nos. 6-7)



Taj Express started at 11 am at the speed of 72 km/h and after 2 h, i.e. 1 pm Qutub Express starts from Jhansi to Delhi at the speed of 90 km/h, also at their original speed they were supposed to cross at 3:30 pm, i.e. 2 h 30 min after Qutub Express started.

∴ Distance between Jhansi and Delhi

$$\begin{aligned}
 &= 72 \times 2 + (90 + 72) \times \frac{5}{2} \\
 &= 144 + 162 \times \frac{5}{2} \\
 &= 144 + 81 \times 5 = 144 + 405 \\
 &= 549 \text{ km}
 \end{aligned}$$

But at 2 pm their speed decrease by some value,
i.e. x km/h (let).

Till 2 pm distance covered by both trains

$$\begin{aligned}
 &= 72 \times 3 + 90 \times 1 \\
 &= 216 + 90 = 306 \text{ km}
 \end{aligned}$$

Distance left = $549 - 306 = 243$ km

- 6) (a) Now, they met at 6:30 pm, i.e. they covered 243 km in 4 h 30 min with relative speed of $[(90 - x) + (72 - x)]$.

$$\begin{aligned}
 \text{Then, } [(90 + 72) - 2x] &= \frac{243}{4 \frac{1}{2}} \\
 \Rightarrow (162 - 2x) &= \frac{243 \times 2}{9}
 \end{aligned}$$

$$\begin{aligned}
 \Rightarrow 162 - 2x &= 27 \times 2 \\
 \Rightarrow 2x &= 162 - 54 \\
 \Rightarrow 2x &= 108
 \end{aligned}$$

$$\therefore x = 54 \text{ km}$$

$$\begin{aligned}
 \therefore \text{Reduced speed of Taj Express} &= 72 - 54 \\
 &= 18 \text{ km/h}
 \end{aligned}$$

- 7) (d) If signal problem occurred at 3 pm, then they have travel 1 more with original speed.

∴ Distance left to cover after signal problem

$$\begin{aligned}
 &= 549 - (90 \times 2 + 72 \times 4) \\
 &= 549 - (180 + 288) \\
 &= 549 - 468 = 81 \text{ km}
 \end{aligned}$$

Now, time taken to cover 81 km with reduced speed

$$\begin{aligned}
 &= \frac{81}{[(90 - 54) + (72 - 54)]} \\
 &= \frac{81}{36 + 18} = \frac{81}{54} = 1.5
 \end{aligned}$$

i.e. 1 h 30 min

So, they have crossed each other at 3 pm + 1 h 30 min
= 4:30 pm

- 8) (d) Let $PQ = x$

When B overtakes A for the first time, both of them cover $\frac{3x}{10}$.

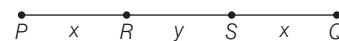
When B meets A after that, it (B) covers $\frac{7x}{10} + \frac{7x}{30}$ or

$\frac{28x}{30}$, while A covers $\frac{23x}{30} - \frac{9x}{30}$ or $\frac{14x}{30}$.

Therefore, B is twice as fast as A .

A starts 1 h after B , it catches up with in 1 h. Therefore, B covers $0.3x$ in 1 h or x in $\frac{10}{3}$ or $3\frac{1}{3}$ h.

- 9) (c) Let $PR = QS = x$ and $RS = y$



Case (i)

Let a and b be the speeds of cars A and B , respectively. Car A travelled a distance of x with a speed of ' a ' and a distance of y at a speed of $2a/3$.

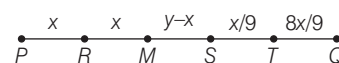
In the time car B has covered SQ (i.e., x), car A at $\frac{2a}{3}$ would cover a distance of $\frac{2}{3}(PR) + RS$

$$\text{i.e., } \frac{2x}{3} + y$$

∴ The ratio of their speeds

$$\begin{aligned}
 &= \frac{\frac{2}{3}a}{b} = \frac{\frac{2x}{3} + y}{x} = \frac{2x + 3y}{3x} \quad \dots (i)
 \end{aligned}$$

Case (ii)



Car A travelled PM (or $2x$) at a and MT at $\frac{2a}{3}$ while car B travelled QT ($= \frac{8x}{9}$) at b .

In the time car B covered a distance QT , car A at a speed of $2a/3$, would cover $\frac{2}{3}(PM) + MT$

$$\text{i.e., } \frac{4x}{3} + (y - x) + \frac{x}{9}$$

∴ The ratio of their speeds

$$\begin{aligned}
 &= \frac{\frac{2a}{3}}{b} = \frac{\frac{4x}{3} + (y - x) + \frac{x}{9}}{\frac{8x}{9}} = \frac{9y + 4x}{8x} \quad \dots (ii)
 \end{aligned}$$

Equating Eqs. (i) and (ii), we get

$$\frac{2x + 3y}{3x} = \frac{9y + 4x}{8x}$$

$$\Rightarrow 8(2x + 3y) = 3(9y + 4x) \Rightarrow y = \frac{4}{3}x$$

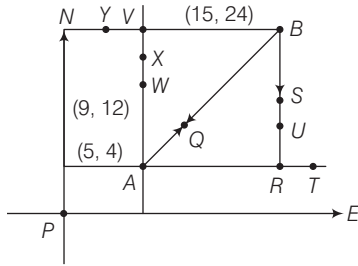
By substituting the value of y in Eq. (i), we get

$$\frac{2a}{3b} = \frac{\frac{2x}{3} + \frac{4x}{3}}{x} = \frac{2}{1}$$

$$\Rightarrow \frac{a}{b} = 3$$

∴ The ratio speed of A and B is 3 : 1.

- 10) (c) The ratio of the speeds is $V_A : V_B = 2 : 3$



∴ If they meet at Q , then $\frac{AQ}{BQ} = \frac{2}{3}$

$$\therefore Q \equiv 5 + \left[\frac{(15-5)(2)}{2+3}, 4 + \frac{(24-4)(2)}{2+3} \right]$$

$$Q \equiv (9, 12)$$

$$\therefore PQ = \sqrt{9^2 + 12^2} = 15 \text{ m}$$

- 11) (b) If A walks East, i.e. along AR and B walks South, i.e. along BR , then when A reaches R , i.e. covers $15 - 5 = 10 \text{ m}$

B would have covered exactly $10 \times (3/2) = 15 \text{ m}$ along BR .

So, say $BS = 15 \text{ m}$

Now, say after a covered another 2 m say from R to T , B comes from S to U , where $SU = 3 \text{ m}$.

$$\text{Now, } UT = \sqrt{(5-3)^2 - 2^2} = \sqrt{4} + 4 = 2\sqrt{2}$$

which is less than 5 .

$$\therefore d_1 < 5 \text{ m}$$

- 12) (a) In the time that A takes to run 200 m , S runs 180 m and N runs 160 m . So, in the time S takes to run 200 m , N runs $200 \left(\frac{160}{180} \right) = 177.77 \text{ m}$ or is beaten by 22.22 m . So, in 100 m , N is beaten by 11.11 m .

- 13) (a) Let the speed of faster car be 5 km/h . Then, speed of slower car is $(S-5) \text{ km/h}$.

$$\text{Time taken by faster car} = \frac{350}{S} \text{ h}$$

$$\text{Time taken by slower car} = \frac{350}{(S-5)} \text{ h}$$

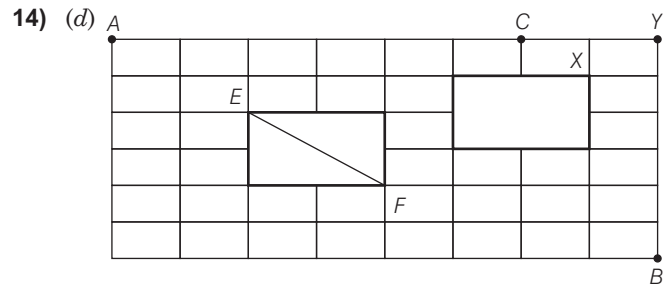
$$\frac{350}{S-5} - \frac{350}{S} = 2\frac{1}{3}$$

$$350 \left[\frac{S-S+5}{S(S-5)} \right] = \frac{7}{3}$$

$$S(S-5) = 750$$

By hit and trial method,

$$S = 30 \text{ km/h}$$



To follow the shortest route, Neelam will follow the following path

$$A \rightarrow E \rightarrow F \rightarrow B$$

$$\text{Number of ways to reach from } A \text{ to } E = \frac{(2+2)!}{(2)! \times (2)!} = 6$$

Number of ways to reach from E to $F = 1$

Number of ways to reach from F to B

$$= \frac{(4+2)!}{(4)! \times (2)!} = 15$$

∴ Total number of possible shortest paths

$$= 6 \times 1 \times 15 = 90$$

- 15) (a) Neelam has to reach C via B .

From A to B , the number of paths are 90 as solved in question 9.

From B to C , Neelam can take following routes.

I. $B \rightarrow X \rightarrow C$ or II. $B \rightarrow Y \rightarrow C$

$$\text{Number of ways of reach from } B \text{ to } X = \frac{(5+1)!}{(5)! \times (1)!} = 6$$

Number of ways to reach from X to C is 2 .

So, total number of ways $= 6 \times 2 = 12$

II. $B \rightarrow Y \rightarrow C$

From B to Y there is only one way.

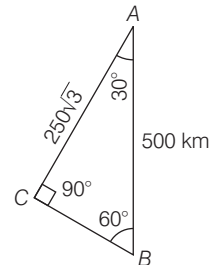
From Y to C number of ways

$$= 6 \times 2 + 1 = 13 \text{ ways}$$

⇒ Total number of ways of reaching from A to C

$$\text{via } B = 90 \times 13 = 1170$$

- 16) (b)



Since, $\angle A = 30^\circ$ and $\angle B = 60^\circ$

$$\therefore \angle C = 90^\circ$$

$$\therefore BC = 250 \text{ km and } AC = 250\sqrt{3} \text{ km}$$

Time taken by the train to reach from A to $C = \frac{250}{50}$, i.e.

5 h, i.e. at 13:00 train can reach C .

Time required by Rahim to reach $C = \frac{250\sqrt{3}}{70}$ h
 $= \frac{433}{70}$ h = 6 h 12 min

The time by which Rahim must start from

$$A = 13:00 - 0:15 - 6:12 = 6:33$$

The required answer = 6:30 am.

- 17) (c) Let the speed of the plane be x km/h and time difference between A and B be y hours.

Time taken from city B to city $A = 7$ h

Relative speed of plane = $(x - 50)$ km/h

$\therefore$ Distance = speed $\times$ time

$$3000 = (7 - y)(x - 50)$$

Only $x = 500$ and $y = 1$ satisfies the above equation, hence time difference is 1 h.

- 18) (c) As calculated above, the speed be 500 km/h.
 19) (c) Speed of Arun, Barun and Kiranmala are 30 km/h, 40 km/h and 60 km/h, respectively.
 Barun starts when Arun has already travelled for 2 h and covered = $2 \times 30 = 60$ km
 Time taken by Barun to cover Arun with a relative speed of $(40 - 30 = 10)$ km/h = $\frac{60}{10} = 6$ h

It means when Barun overtakes Arun, Arun has travelled for 8 h and Barun for 6 h.

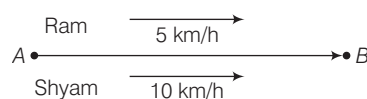
It is given that Barun and Kiranmala overtake Arun at the same instance. It means when Kiranmala overtakes Arun, both of them will have covered the same distance. Let us assume Kiranmala takes t hours to cover the same as covered by Arun in 8 h.

Therefore, $8 \times 30 = t \times 60$

$$\Rightarrow t = 4 \text{ h}$$

Kiranmala started after $(8 - 4 = 4)$ h, when Arun started.

- 20) (b) In 1 h Ram is at B , in that time Shyam covers



$$\frac{10}{4} = 2.5 \text{ km}$$

Remaining distance = 2.5 km

$$\text{Time} = \frac{2.5}{5 + 10} \times 60 = 10 \text{ min}$$

Therefore, they meet first time at 10:10 am.

- 21) (b) At the time when Shyam overtakes Ram, let Ram travels for $+t$ minutes, Shyam till that time travel for $+45$ min and both travel same distance.

$$\Rightarrow 5 \times t = 10(t - 45) \Rightarrow t = 90 \text{ min}$$

Hence, Shyam overtake Ram at 10:30 am.

- 22) (c)

A	B	C	D
- 20	+ 20		
+ 90		- 90	
- 10			+ 10
	- 100	- 50	+ 50
	+ 110	+ 100	
			- 110
Total + 60	+ 30	- 40	- 50

D gets emptied first, it gets emptied in 20 min.

- 23) (b) If the time taken by the man to cover the distance by 1 pm is t hours, then the time taken to cover the distance by 11 am will be $(t - 2)$ hours. As the distance travelled in both the cases is same.

$$10(t) = 15(t - 2) \Rightarrow t = 6$$

$\therefore$ The distance covered will be $10(6) = 60$ km.

Speed at which the man has to travel to reach the

$$\text{place by noon} = \frac{60}{t - 1} = \frac{60}{5} = 12 \text{ km/h}$$

- 24) (c) In the final one minute before collision, the two boats travel $5 \times \frac{1}{60}$ km and $10 \times \frac{1}{60}$ km, i.e. $\frac{1}{12}$ km and $\frac{1}{6}$ km.

As they move in opposite directions, distance between the boats one minute before collision is

$$\frac{1}{12} + \frac{1}{6} = \frac{1}{4} \text{ km.}$$

- 25) (d) In the first race when Karan runs 100 m, Arjun runs only 90 m. Hence, the ratio of speeds of Arjun and Karan is $90 : 100 = 9 : 10$. In the second race, Karan has to run 110 m. When he finishes the race, Arjun would have run = $\frac{9}{10} \times 110 = 99$ m (i.e., 1 m less than 100 m). Hence, Karan beats Arjun by 1 m.

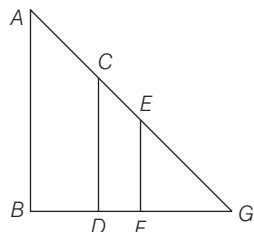
- 26) (c) Actual time needed by the nuts machine to manufacture 1000 nuts is 10 min.

Cleaning time after every 10 min (i.e., 1000 nuts) is 5 min. Time taken by the nuts machine to manufacture 9000 nuts = $(10)(9) + (5)(8) = 130$ min.

Similarly, time needed to manufacture 9000 bolts is $(6)(20) + (5)(10) = 170$ min.

$\therefore$ The minimum time (ignoring all other delays) to manufacture 9000 pairs of nuts and bolts is 170 min. (which is the maximum of the two times as calculated above).

- 27) (d) As the shadows of the father's head and son's head are incident at the same point of the ground, the angle between the ground and father's head, the angle between the ground and son's head and the angle between the ground and the top of the post are the same.



Let the heights of the post, father and son be represented by AB , CD and EF , respectively. Let DG be x .

Given, BD (distance between the father and the post) is 2.1 m, $AB = 6$ m, $CD = 1.8$ m and $EF = 0.9$ m.

$$\tan \theta = \frac{AB}{BG}, \text{ also } \tan \theta = \frac{CD}{DG}$$

$$\therefore \frac{AB}{BG} = \frac{CD}{DG} \Rightarrow \frac{6}{2.1 + x} = \frac{1.8}{x}$$

Hence, $x = 0.9$ m

$$\text{Similarly, } \frac{CD}{DG} = \frac{FE}{FG}$$

$$\text{So, } \frac{1.8}{0.9} = \frac{0.9}{FG} \Rightarrow FG = 0.45 \text{ m}$$

Hence, $DF = DG - FG = 0.45$ m

- 28) (c) The radius of the track is r metres.

$\therefore$ The circumference is $2\pi r$ metres.

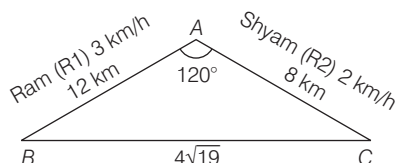
The average speed for successive time intervals of $\frac{1}{2}$,

1, 2, 4 etc, minutes $\frac{\pi r}{2}$, $\frac{\pi r}{4}$, $\frac{\pi r}{8}$ etc.,

metres/minute. Therefore, in each interval (of increasing duration) the distances travelled are $\frac{\pi r}{2}$, $\frac{\pi r}{2}$, $\frac{\pi r}{2}$, $\frac{\pi r}{2}$ etc., (i.e., exactly the same). For such intervals are needed to cover one round. The next four intervals are needed for the next round. As each interval in the second group is 16 times the corresponding interval in the previous group, the total time for each round is 16 times the time taken for the previous round.

- 29) (b) Applying cosine rule to find the third side

$$BC^2 = AB^2 + AC^2 - 2AB \cdot AC \cos 120^\circ$$



$$= 144 + 64 + 2 \times 12 \times 8 \times \frac{1}{2}$$

$$= 144 + 64 + 96$$

$$\Rightarrow BC = \sqrt{304} = 4\sqrt{19}$$

$\therefore$ Time taken by Ram to travel to A

$$= \frac{12 + 4\sqrt{19} + 8}{3}$$

Time taken by Shyam to go to A

$$= \frac{8 + 4\sqrt{19} + 12}{2}$$

$\therefore$ Required difference

$$= \frac{24 + 12\sqrt{19} + 36 - 24 - 8\sqrt{19} - 16}{6} = \frac{4\sqrt{19} + 20}{6} = \frac{2\sqrt{19} + 10}{3}$$

- 30) (b) Small pump = $\frac{2}{3}$ rd the rate of large pump

$\Rightarrow$ 3 small pump = 2 large pump

Hence, 3 small pump + 1 large pump = 3 large pump.

Hence, required fraction of time = $\frac{1}{3}$

- 31) (c) It is given that they indulge only in one activity per day. It is, therefore, clear that required number of days will be more than 22 days as these days they indulged in any one activity. Now, 24 morning and 14 evening they did nothing.

$\therefore$ Number of days stayed = Total morning hours
= Total evening hours.

$$x + y = 22 \text{ and } 24 + x = 14 + y$$

$$\Rightarrow x - y = -10$$

$$\Rightarrow x = 6, y = 16$$

$\therefore$ Required number of days = $24 + 6 = 30$ days

- 32) (d) Since, six technicians working at the same rate completely work of one server in 10 h.

Hence, total work = $10 \times 6 = 60$ man hours.

Now, from 11 : 00 am to 5 pm total man hours

$$= 6 \times 6 = 36$$

From 5 pm to 6 pm total man hours = 7

From 6 pm to 7 pm total man hours = 8

From 7 pm to 8 pm total man hours = 9

$\overline{60}$ Hence, the work will be completed at 8 pm.

- 33) (b) Let the length of the tunnel and speed of cat be 8 km and 8 km/h, respectively.

Time taken by cat to reach entrance of tunnel = 3 h

and time taken by cat to reach the exist of tunnel = 5 h

Time taken by train to cover tunnel = 2 h

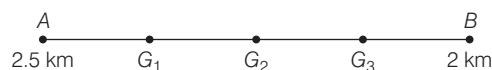
Hence, ratio of speeds of train and cat = 4 : 1

- 34) (b) Since, each word is put off after a second, hence the required least time

$$\begin{aligned} &= \text{LCM of } \left(\frac{5}{2} + 1, \frac{17}{4} + 1, \frac{41}{8} + 1 \right) \\ &= \text{LCM of } \left(\frac{7}{2}, \frac{21}{4}, \frac{49}{8} \right) \\ &= \frac{\text{LCM of } (7, 21, 49)}{\text{HCF of } (2, 4, 8)} = \frac{49 \times 3}{2} = 73.5 \text{ s} \end{aligned}$$

- 35) (c) Distance $AG_1 = BG_3 = 30 \times \frac{5}{60} = 2.5 \text{ km}$

$$\therefore \text{Distance } G_1G_3 = (20 - 2.5 - 2.5) = 15 \text{ km}$$



$$\text{Given, } G_1G_2 : G_2G_3 = 1 : 2$$

$$\therefore G_1G_2 = 5 \text{ km and } G_2G_3 = 10 \text{ km}$$

Now, time taken from reaching A to G_3 and back to A.

From A To $G_1 = 5 \text{ min}$ (given).

$$\text{From } G_1 \text{ to } G_3 = \frac{15}{60} \times 60 = 15 \text{ min}$$

$$\text{From } G_3 \text{ to } A = \frac{17.5}{60} \times 60 = 17.5 \text{ min}$$

and time elapsed for taking the patient into and out of the ambulance = 1 min

$$\text{Total time taken} = (5 + 15 + 17.5 + 1) = 38.5$$

$$\text{Remaining time} = (40 - 38.5) = 1.5 \text{ min}$$

- 36) (d) Let the speed of the superfast train be 4 unit, hence speed of passenger train would be 1 unit.

$$\therefore \text{Average speed} = \frac{2 \times 4 \times 1}{4 + 1} = 1.6 \text{ unit}$$

Since, train N is already late by 20 min, hence

available time would be $(60 - 20) = 40 \text{ min}$ or $\frac{2}{3} \text{ h}$. If

train has to reach the station at schedule time. Now, average speed would be $\frac{3}{2} \times 1.6 = 2.4 \text{ unit}$.

Now, given that new speed of superfast train = 8 unit
Let new speed of passenger train be y , then

$$\frac{2 \times 8 \times y}{8 + y} = 2.4 \Rightarrow y = 1.4$$

Hence, required ratio

$$= 1.4 : 8 = 1 : 6 \text{ (approximately).}$$

- 37) (b) Fuel consumption is given in litre per hour. It is, therefore, clear from the graph that in travelling 60 km fuel consumption is 4 L. Hence in travelling 200 km fuel consumption will be $\frac{4}{60} \times 200 = 13.33 \text{ L}$.

- 38) (b) At a speed of 40 km/h, 60 km/h and 80 km/h distance travelled to 1 L of petrol.

$$= \frac{40}{2.5} = 16 \text{ km, } \frac{60}{4} = 15 \text{ km, } \frac{80}{7.9} = 10.1 \text{ km,}$$

respectively.

Hence, at lower speed fuel consumption is less.

Hence, in order to minimize the fuel consumption, the speed should be decreased.

- 39) (b) Let the distance of race be x metres which is covered by A in t seconds. Then in the same time B covers $(x - 12)$ m and C covers $(x - 18)$ m.

$$\therefore \text{Speed of A} = \frac{x}{t} \text{ m/s,}$$

$$\text{Speed of B} = \frac{(x - 12)}{t} \text{ m/s}$$

$$\text{and Speed of C} = \frac{(x - 18)}{t} \text{ m/s}$$

Time taken by B to finish the race

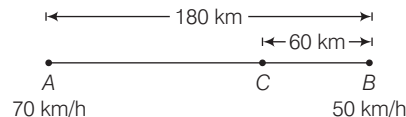
$$= \frac{x}{(x - 12)} = \frac{x}{(x - 12)} t \text{ s}$$

Now, distance travelled by C in this time

$$= \frac{x}{(x - 12)} \times t \times \frac{(x - 18)}{t} = x - 8$$

$$\Rightarrow \frac{x(x - 18)}{(x - 12)} = x - 8 \Rightarrow x = 48 \text{ m}$$

- 40) (a) Time taken by B to cover 60 km = $\frac{60}{50} = \frac{6}{5} \text{ h}$



$$\text{Time taken by Y at station C} = \frac{15}{60} = \frac{1}{4} \text{ h}$$

$$\text{Now, distance travelled by train X in } \left(\frac{6}{5} + \frac{1}{4} \right) = \frac{29}{20} \text{ h}$$

$$= 70 \times \frac{29}{20} = 101.5 \text{ km}$$

Distance between X and Y when Y starts from station

$$C = 180 - (101.5 + 60) = 18.5 \text{ km.}$$

Relative speed = $(70 + 50) = 120 \text{ km/h}$

Hence, time taken by them in crossing one another

$$= \frac{18.5}{120} = 0.15 \text{ h}$$

Now, distance travelled by X in 0.15 h

$$= 70 \times 0.15 = 10.5 \text{ km}$$

Therefore, distance of X from station A, when they

$$\text{meet} = (101.5 + 10.5) = 112 \text{ km}$$

- 41) (c) Let the time taken by Asit, Arnold and Afzal to complete the work alone be x , y and z hours, respectively.

Given, $(x-6) = (y-1) = \frac{z}{2}$

$\Rightarrow y = (x-5)$ and $z = (2x-12)$

Also, time taken by all of them to do the job

$$= \frac{xyz}{xy + yz + xz} = (x-6)$$

Substitute $y = (x-5)$ and $z = (2x-12)$ in the above equation, we get $x = \frac{20}{3}$ h.

$\therefore$ Time taken by all the three to complete the work

$$= \frac{20}{3} - 6 = \frac{2}{3} \text{ h} = 40 \text{ min}$$

- 42) (b) If Shyama takes 1 min for every 3 steps, then he takes $\frac{1}{3}$ min for every step.

$\therefore$ For every 25 steps, he will take $= \frac{25}{3}$ min

Similarly, Vyom takes $\frac{1}{2}$ min for every step,

hence for 20 steps, he will take 10 min.

Difference between their time

$$= \left(10 - \frac{25}{3}\right) = 1.66 \text{ min}$$

Escalator takes 5 steps in 1.66 min. Therefore, speed of escalator is 1 step for 0.33 min = 3 steps/min.

If escalator is moving, then Shyama takes 25 steps and escalator also takes 25 steps.

Hence, total number of steps = 50

- 43) (d) Let the speed of man in still water is x miles/h and speed of the current by y miles/h.

Then, $\frac{12}{x-y} - \frac{12}{x+y} = 6$... (i)

and $\frac{12}{2x-y} - \frac{12}{2x+y} = 1$... (ii)

Solving Eqs. (i) and (ii), we get $y = \frac{8}{3}$

- 44) (a) Salary received by A
 $= 12 \times 300 + 12 \times 330 + 12 \times 360 + \dots$
 $= 12 [300 + 330 + 360 + \dots]$
 $= 12 \times \frac{10}{2} [600 + 9 \times 30] = ₹ 52200$

Similarly, salary received by B
 $= 6 \times 200 + 6 \times 215 + 6 \times 230 + 6 \times 245 + \dots$
 $= 6 [200 + 215 + 230 + 245 + \dots]$
 $= 6 \times \frac{20}{2} [400 + 19 \times 15]$
 $= 6 [400 + 285]$
 $= 60 \times 685 = 41100$

Hence, total amount paid = $(52200 + 41100) = ₹ 93300$

- 45) (d) Working efficiency per day of A, B, C and D
 $= \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$ and $\frac{1}{32}$, respectively. Using options, we find that B and C does $\frac{3}{16}$ of work per day, A and D does $\frac{9}{32}$ work per day. Hence, A and D take $\frac{32}{9}$ days, B and C take $\frac{16}{3}$ days. Hence, the first pair must comprise of A and D.

- 46) (d) Let the conical tank hold x L of fuel, then cylindrical tank will hold $= (x + 500)$ L

Given, $(x + 300) = 2(x - 200)$

$\Rightarrow x = 700$ L

Hence, cylindrical tank will hold $(700 + 500) = 1200$ L of fuel.

- 47) (a) The installation and functioning of all the five machines will be as per the following figure.



The robot begins to give material to machine A and then to D, it thus covers 40 m in that time span and takes 4 s.

Also, it returns to the origin at the same time and takes 4 s covering 40 m again. When it arrives at the origin the messages of B and C are already present there. Hence, it starts to deliver the material to them taking in all 6 s in doing so and covers $30 + 30 = 60$ m. Hence, the distance travelled by the robot will be $40 \text{ m} + 40 \text{ m} + 60 \text{ m} = 140 \text{ m}$

- 48) (a) Once the robot has delivered the material to machines A and D, it shall reach the origin 2 (nearest) taking 6 s and covering 60 m. Then, it immediately moves to deliver material to machines C and B covering a distance of 40 m and finally back to origin (nearest). Thus, it covers a distance of 60 m. Hence, it covers a total distance of 120 m.

- 49) (d) Total distance travelled by Rajeev
 $= 35 \times 2 + 45 \times 2 = 160$. Aditi travels equal distances with speeds 30, 40, 50. Thus, she covers a distance of $\frac{160}{3}$ km by every speed. From graph, it is clear that fuel consumed

$$= \frac{160}{3} \times 16 + \frac{160}{3} \times 24 + \frac{160}{3} \times 16 = \frac{80}{9} \approx 9 \text{ L}$$

- 50) (a) In order to minimize the petrol consumption mileage has to be maximum from the graph given in question. Maximum mileage is 24 km/L and the distance to be travelled is 160 km. So, the minimum petrol consumption

$$= \frac{\text{Distance}}{\text{Mileage}} = \frac{160}{24} = 6.66 \text{ L}$$

- 51) (b) Time taken by Y to cover

$$AC = \frac{x}{45} + \frac{x}{55} = \frac{x \times 100}{55 \times 45}$$

Average speed of Y between AC

$$= \frac{2x \times 55 \times 45}{x \times 100} = 49.5 \text{ km/h}$$

- 52) (a) Since, X and Y reach C at the same time,

$$\frac{100 + BC}{61.875} = \frac{AC}{49.5}$$

$$BC^2 = AC^2 - AB^2 = (105)^2 - (100)^2 = 1025$$

$$\therefore BC = 32$$

$$\text{Hence, } \frac{100 + BC}{AC} = \frac{132}{105} = 1.25$$

In this triangle, $AD = DC = BD$

$$= \frac{105}{2} = 52.5 \text{ km}$$

- 53) (b) Solution as in questions 51 and 52.

- 54) (b) At 7:30 am Navjivan Express is at 50 km from A at the same time. Howrah-Ahmedabad Express is at 20 km from B .

Hence, distance between the trains at 7:30 am is 30 km.

Relative speed = $50 + 40 = 90 \text{ km/h}$

$$\text{Hence, time left} = \frac{30}{90} = \frac{1}{3} \text{ h} = 20 \text{ min}$$

- 55) (c) The time taken in climbing up and coming back is same also the distance is same, hence option (a) is not true.

Likewise option (b) is not definitely true as person kept varying his speed. However, option (c) is true because of the reason that time of start from both the points is same.

- 56) (d) Both the them are moving in opposite direction hence relative speed will be sum of their speeds. It means that in 1st hour they will travel 6 km, in second hour they will travel 6.5 km, in the third hour they will travel 7 km and so on. Hence, a distance of 72 km will be covered by them in

$$72 = \frac{n}{2} \left[2a + (n-1) \times \frac{1}{2} \right] \Rightarrow n = 9 \text{ h}$$

Now, the distance travelled by A in 9 h = $9 \times 4 = 36 \text{ km}$. Hence, both of them would meet midway between A and B .

- 57) (b) In one day, A would do $\frac{1}{3}$ of the job, B would do $\frac{1}{4}$ of the job and C would do $\frac{1}{6}$ of the job. Hence, if all

three of them work simultaneously, in one day they would do $\left(\frac{1}{3} + \frac{1}{4} + \frac{1}{6} \right) = \frac{3}{4}$ of the job. Hence, to complete

the entire job together, they would take $\frac{4}{3}$ days.

- 58) (c) 1996 is a leap year. Hence, Raja takes 7 days to complete a work. Let he completes 1 unit work per day, hence work completed in 7 days = 7 unit. (Because he does not have any holiday). Now, T will have two holidays in a week, i.e. Tuesday and Thursday and S will not have any holiday. Hence, there arrangement of work will follow the following pattern depending upon which day 25 Feb, 1996 falls on

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
2 unit	2 unit	1 unit	2 unit	1 unit	2 unit	2 unit

Hence, both of them will take either 4 or 5 days to complete the same work.

- 59) (c) Raja has worked 38 days. (Feb. = 5 days, March = 31 days, April = 2 days). Therefore, he completes 38 unit work in 38 days. In a week, T takes holidays on Tuesday and Thursday, while S takes holiday on Saturday and Sunday. Hence, their work arrangement will follow the following pattern.

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1 unit	2 unit	1 unit	2 unit	1 unit	2 unit	1 unit

Therefore, in a week they work 10 unit work. Hence in 3 weeks they would complete 30 unit work. Now, 8 unit work can be completed either on 5th or 6th day depending on which day the work begins. Hence, total number of days taken by T and S to complete the job = $(21 + 5) = 26$ days or $(21 + 6) = 27$ days.

- 60) (c) Distance travelled by the thief in 15 min

$$= 60 \times \frac{15}{60} = 15 \text{ km}$$

Hence, distance between police and thief when police started to chase = 15 km.

Relative speed = $(65 - 60) = 5 \text{ km/h}$

Hence, time taken by police to catch the thief

$$= \frac{15}{5} = 3 \text{ h}$$

Hence, required time

$$= (12 \text{ h} + 15 \text{ min} + 3 \text{ h}) = 3 : 15 \text{ pm}$$

- 61) (b) Since, the speed of the another policeman is same as that of thief. Hence, distance between thief and him will be 15 km. And this is the required distance.

- 62) (c) Total time taken to cover stretch A at a minimum speed = $\left(\frac{2}{40} \right) = \frac{1}{20} \text{ h} = 3 \text{ min}$

Likewise total time taken to cover stretch B at a maximum speed = $\left(\frac{2}{50} \right) = 2.4 \text{ min}$. Total time taken

in covering these two stretches = $(3 + 2.4) = 5.4 \text{ min}$.

To break the previous record the third stretch will have to be covered in $(10 - 5.4) = 4.6$ min. Required speed $= \frac{2}{4.6} = 0.434$ km/min $= 26.08$ km/h. Since, the

maximum speed is 20 km/h, hence it is not possible for C to break the previous record.

- 63) (d) Let the average speed for the last stretch be x km/h, hence his average speed for the first two stretches $= 4x$. So, total time taken to cover the three stretches $= \frac{4}{4x} + \frac{2}{x}$

$$\therefore \frac{4}{4x} + \frac{2}{x} = \frac{6}{20}$$

$$\Rightarrow x = 10 \text{ km/h}$$

- 64) (d) Time taken to cover the stretch A at minimum speed $= \frac{2}{40} = 3$ min

Time taken to cover stretch B $= 3$ min. Time taken by him in covering the entire race $= (1.5 \times 10) = 15$ min.

Hence, remaining time to cover stretch $= (15 - 6) = 9$ min

Therefore, required speed $= \left(\frac{2}{9}\right) = 0.22$ km/min
 $= 13.3$ km/h

- 65) (b) In all, X has travelled for 25 h (including stoppages) at an average speed of 180 miles per hour. Hence, the distance between Frankfurt and India $= (25 \times 180) = 4500$ miles.

- 66) (a) For the return journey X halts at Boston for one hour less than his previous halt. Hence, time taken by X for his return journey is 24 h.

- 67) (a) The distance between Frankfurt and India $= 4500$ miles. Therefore, total distance travelled by him $= (4500 + 4500) = 9000$ miles. Time taken by him including halting time $\left(1 \frac{11}{12} \text{ h}\right)$
- $$= \left(25 + 24 + 1 \frac{11}{12}\right) = 50.9 \text{ h}$$

Hence, average speed

$$= \frac{\text{Total distance}}{\text{Total time}} = \frac{9000}{50.9} = 176.81 \text{ m/h (approx.)}$$

- 68) (a) Total time taken from A to D

$$= \frac{12}{x} + x + \frac{12}{2x} + 2x + \frac{12}{4x} = 16$$

$$\Rightarrow \frac{21}{x} + 3x = 16 \Rightarrow 3x^2 - 16x + 21 = 0$$

$$\Rightarrow x = 3, \frac{7}{3}$$

- 69) (c) Time taken to cover AC $= \frac{3x}{5 \times 3a} = \frac{x}{5a}$ h

Time taken to cover CB $= \frac{x}{5b}$ h

Time taken to cover BA and back AB $= \frac{2x}{5c}$

$$\text{Given, } \frac{x}{5a} + \frac{x}{5b} = \frac{2x}{5c} \Rightarrow \frac{1}{a} + \frac{1}{b} = \frac{2}{c}$$

- 70) (d) When Bhairav covers 1600 m, Akshay covers $(1600 - 128)$ m. So, when Bhairav covers $(1600/16) = 100$ m, Akshay covers $(128/16)m = 8$ m less.

When, Bhairav covers 100 m, Chinmay covers $(100 - 4) = 96$ m.

Thus, the ratio in which Akshay and Chinmay cover distances is $92 : 96$. In 96 m, Chinmay gains $(96 - 92) = 4$ m over Akshay. So, in 1.5 miles, Chinmay gains

$100 \text{ m} = \left(\frac{1}{16}\right)$ miles over Akshay.

- 71) (b) Let the speed of escalator be y ft/s and speed of man's be x ft/s. Let us assume the length of the escalator be 90 ft.

$$\text{Then, } x + y = \frac{90}{30} \Rightarrow x + y = 3 \quad \dots (i)$$

$$\text{and } x - y = \frac{90}{90} \Rightarrow x - y = 1 \quad \dots (ii)$$

$\Rightarrow x = 2$. And time taken by the man to walk up the escalator when it is not moving $= \frac{90}{2} = 45$ s.

- 72) (c) Let the first typist takes x hours and second typist takes y hours to do the whole job. Now, given 3 h work of first and 2 h work of second $= \frac{11}{20}$

$$\Rightarrow \frac{3}{x} + \frac{2}{y} = \frac{11}{20} \quad \dots (i)$$

$$\text{Also, } \frac{x}{2} - \frac{y}{2} = 1 \quad \dots (ii)$$

Form Eqs. (i) and (ii), we get $x = 10$ h and $y = 8$ h

- 73) (d) Let these were originally x men. Then, work done by x men on first day $= \frac{1}{8}$, work done by $(x - 10)$ men in

second day $= \left(\frac{1}{8} - \frac{5}{4x}\right)$. Work done by $(x - 20)$ men in

third day $= \left(\frac{1}{8} - \frac{10}{4x}\right)$ and so on.

$$\text{Hence, } \frac{1}{8} + \left(\frac{1}{8} - \frac{5}{4x}\right) + \left(\frac{1}{8} - \frac{10}{4x}\right) + \dots 12 \text{ terms} = 1$$

$$\Rightarrow x = 55 \text{ men}$$

- 74) (a) In the time when A runs 200 m, S runs 180 m and N runs 160 m. In other words, in the time when S runs 180 m, N runs 160 m.

Therefore, when S runs 100 m, N will runs

$$= \left(100 \times \frac{160}{180}\right) = 88.89 \text{ m}$$

Hence, in a 100 m race, S will beat N by $(100 - 88.89) = 11.11$ m.

- 75) (d) Let the speed of the ship be 1 miles/h, then the speed of the sea plane would be 10 miles/h. Relative speed = $(10 - 1) = 9$ miles/h. Therefore, time taken to catch up the ship = $\frac{18}{9} = 2$ h. Hence, distance from the shore when the sea plane catch up with the ship = $2 \times 10 = 20$ miles.

- 76) (c) Working efficiency of leak per hour = $\frac{1}{8}$ and working efficiency of leak with tap = $\frac{1}{12}$

$\therefore$ Working efficiency of tap

$$= \frac{1}{8} - \frac{1}{12} = \frac{2}{48} = \frac{1}{24} \text{ tank}$$

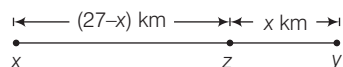
$\therefore$ Tap can fill the tank in 24 h, hence capacity of tank = $24 \times 6 = 144$ L.

- 77) (c) Time is inversely proportional to the speed.

Hence, ratio of time taken by B and D

$$= 18 : 16 = 9 : 8$$

- 78) (b) Time taken by A in covering $(27 - x)$ km is same as time taken by B in covering $(27 + x)$ km.



$$\Rightarrow \frac{(27-x)}{5} = \frac{(27+x)}{7}$$

$$\Rightarrow x = \frac{27}{6}$$

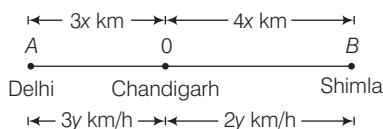
$$\therefore XZ = 27 - \frac{27}{6} = 27 \times \frac{5}{6} = 22.5 \text{ km}$$

- 79) (c) Time taken from Delhi to Chandigarh

$$= \frac{3x}{3y} = \frac{x}{y} \text{ h}$$

Time taken from Chandigarh to Shimla

$$= \frac{4x}{2y} = \frac{2x}{y} \text{ h}$$



Given, average speed from Delhi to Shimla

$$= \frac{7x}{\frac{x}{y} + \frac{2x}{y}} = 49 \Rightarrow y = 21 \text{ km/h}$$

Hence, average speed from Chandigarh to Shimla

$$= 21 \times 2 = 42 \text{ km/h}$$

- 80) (b) Tap A fills 20 L water in 24 min.

Tap B fills 40 L water in 60 min.

and Tap C fills 10 L water in 20 min.

Hence, work done by all the taps together in 2 h

$$= \left(\frac{20}{24} \times 120 + \frac{40}{60} \times 120 + \frac{10}{20} \times 120 \right) = 240 \text{ L}$$

and this is the capacity of the tank.

- 81) (d) Ratio of number of men, women and children = $6 : 5 : 2$, hence number of men = 18, number of women = 15 and number of children = 6.

Ratio of work done by men : women : children = $6 : 3 : 1$

$\therefore$ Ratio of work done by 18 men, 15 women and 6 children = $(18 \times 6) : (15 \times 3) : (6 \times 1) = 108 : 45 : 6$

Hence, ₹ 1113 would be divided in this ratio.

Hence, children would get

$$= \frac{6}{1590} \times 1113 = 42$$

Hence, wage of a child = $\frac{42}{6} = ₹ 7$

- 82) (d) If the school is located in town B, the expenditure will be minimum as calculated below :

Expenditure of town A students

$$= 30 \times 100 \times 1.2 = 3600$$

Expenditure of town B students = 0

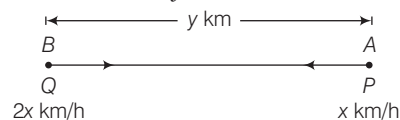
Hence, total expenses = 3600

- 83) (a) Let the distance between A and B be y km and speed of P and Q be x km/h and $2x$ km/h, respectively.

$$\therefore \frac{y/6}{x} - \frac{y/6}{2x} = 1$$

$$\Rightarrow \frac{y}{6x} - \frac{y}{12x} = 1$$

$$\Rightarrow y = 12x$$



Now, after 1 h both P and Q will be in motion for the first time with distance between them = $(12x - x) = 11x$ km and with relative speed = $(2x + x) = 3x$ km/h.

Hence, time taken by Q in meeting = $\frac{11x}{3x} = \frac{11}{3}$ h

Hence, distance travelled by Q = $2x \times \frac{11}{3} = 7.33$ km

So, both P and Q will meet closer to A.

- 84) (d) Time taken by P to reach B = $\frac{12x}{x} = 12$ h.

- 85) (c) Since, speed of Q is double the speed of P, hence will take half time, i.e. 6 h.

INTEREST AND AVERAGE

- 1) In a class of 5 students, the average weight of the 4 lightest students is 40 kg, average weight of the 4 heaviest students is 45 kg. What is the difference between the maximum and minimum possible average weight overall? (2016)
 - (a) 2.8 kg
 - (b) 3.2 kg
 - (c) 3 kg
 - (d) 4 kg
- 2) There are nine three-digits numbers with distinct unit's digits. Each number is reversed and the reversed number is subtracted from the original number. The results were found to have an average of 0. If for each number, the hundred's digit is not less than its unit's digit, then find the average of the hundred's digits of the greatest and the least numbers. (2014)
 - (a) 4
 - (b) 5
 - (c) 6
 - (d) 7
- 3) The members of club meet for lunch every Monday. Last week, just before the bill was presented, six of the members were called for an official meeting and hence they left. The remaining members were presented with a bill of 2160. It was customary to divide the bill equally. To cover the share of those who left, each member had to pay 81 more. How many members met for lunch? (2014)
 - (a) 16
 - (b) 12
 - (c) 18
 - (d) 24
- 4) There are two classes A and B. The average weight of the students in class A is 40 kg. The average weight of the students in class B is 60 kg. A student, whose weight is x kg left A and joined B. As a result, the average weight of A, as well as that of B decreased. Which of the following must be true? (2014)
 - (a) $35 < x \leq 40$
 - (b) $40 < x < 60$
 - (c) $60 < x < 65$
 - (d) $30 < x \leq 35$
- 5) In Rajdhani Express, there are 10 boggies which carries on an average of 20 passengers per boggie. If at least 12 passengers were sitting in each boggie and no any boggie has equal number of passenger then maximum, how many passengers can be accommodated in a boggie? (2013)
 - (a) 45
 - (b) 64
 - (c) 56
 - (d) None of these
- 6) Mohan is a carpenter who specialises in making chairs. For every assignment he undertakes, he charges his commission and cost. His commission is fixed and equals ₹ 560 per assignment while the cost equals ₹ $2n^2$, where n is the total number of chairs he makes. If for a certain assignment the average cost per chair is not more than ₹ 68, then the minimum and maximum possible numbers of chairs in the assignment are, respectively. (2011)
 - (a) 13 and 19
 - (b) 13 and 20
 - (c) 14 and 19
 - (d) 14 and 20
- 7) What is the present worth of a house which would be worth ₹ 50000 after 3 years, if it depreciates at the rate of 10%? (2009)
 - (a) ₹ 35765.74
 - (b) ₹ 67560.74
 - (c) ₹ 67655.74
 - (d) ₹ 68587.10
- 8) Consider the set $S = \{2, 3, 4, \dots, 2n + 1\}$, where n is a positive integer larger than 2007. Define X as the average of the odd integers in S and Y as the average of the even integers in S . What is the value of $X - Y$? (2007)
 - (a) 1
 - (b) $\frac{1}{2}n$
 - (c) $\frac{n+1}{2n}$
 - (d) $(n+1)$
 - (e) 0

Directions (Q.Nos. 9-10) Answer the questions based on the following information.

Shabnam is considering three alternatives to invest her surplus cash for a week. She wishes to guarantee maximum returns on her investment. She has three options, each of which can be utilized fully or partially in conjunction with others.

Option A Invest in a public sector bank. It promises a return of + 0.10%.

Option B Invest in mutual funds of ABC Ltd. A rise in the stock market will result in a return of +5%, while a fall will entail a return of -3%.

Option C Invest in mutual funds of CBA Ltd. A rise in the stock market will result in a return of -2.5%, while a fall will entail a return of +2%. (2007)

- 9) The maximum guaranteed return to Shabnam is (2007)

(a) 0.10% (b) 0.20% (c) 0.15%
(d) 0.30% (e) 0.25%

- 10) What strategy will maximize the guaranteed return to Shabnam? (2007)

(a) 36% in option B and 64% in option C
(b) 64% in option B and 36% in option C
(c) 1/3 in each of the three options
(d) 30% in option A, 32% in option B and 38% in option C
(e) 100% in option A

- 11) Three maths classes: X, Y and Z, take an algebra test. The average score of class X is 83. The average score of class Y is 76. The average score of class Z is 85. The average score of classes X and Y is 79 and average score of classes Y and Z is 81. What is the average score of classes X, Y and Z? (2001)

(a) 81.5 (b) 80.5 (c) 83 (d) 78

- 12) A shipping clerk has five boxes of different but unknown weights each weighing less than 100 kg. The clerk weighs the boxes in pairs. The weights obtained are 110, 112, 113, 114, 115, 116, 117, 118, 120 and 121 kg. What is the weight of the heaviest box? (2000)

(a) 60 kg (b) 62 kg
(c) 64 kg (d) Cannot be determined

- 13) Total expenses of a boarding house are partly fixed and partly varying linearly with the number of boarders. The average expense per boarder is ₹ 700 when there are 25 boarders and ₹ 600 when there are 50 boarders. What is the average expense per boarder when there are 100 boarders? (1999)

(a) 550 (b) 580
(c) 540 (d) 570

- 14) A yearly payment to the servant is ₹ 90 plus one turban. The servant leaves the job after 9 months and receives ₹ 65 and a turban. Then, find the price of the turban. (1998)

(a) ₹ 10 (b) ₹ 15
(c) ₹ 7.50 (d) Cannot be determined

Directions (Q.Nos. 15-17) Answer the questions based on the following information.

There are 60 students in a class. These students are divided into three groups A, B and C of 15, 20 and 25 students each. The groups A and C are combined to form group D. (1997)

- 15) What is the average weight of the students in group D?

(a) More than the average weight of A
(b) More than the average weight of C
(c) Less than the average weight of C
(d) Cannot be determined

- 16) If one student from group A is shifted to group B, which of the following will be true?

(a) The average weight of both the groups increases
(b) The average weight of both the groups decreases
(c) The average weight of the class remains the same
(d) Cannot be determined

- 17) If all the students of the class have the same weight, then which of the following is false?

(a) The average weight of all the four groups is the same
(b) The total weight of A and C is twice the total weight of B
(c) The average weight of D is greater than the average weight of A
(d) The average weight of all the groups remain the same even if a number of students are shifted from one group to another.

- 18) The average marks of a student in 10 papers are 80. If the highest and the lowest scores are not considered, the average is 81. If his highest score is 92, find the lowest. (1997)

(a) 55 (b) 60
(c) 62 (d) Cannot be determined

- 19) Ram purchased a flat at ₹ 1 lakh and Prem purchased a plot of land worth ₹ 1.1 lakh. The respective annual rates at which the prices of the flat and the plot increased were 10% and 5%. After two years, they exchanged their belongings and one paid the other the difference. Then, (1995)

(a) Ram paid ₹ 275 to Prem (b) Ram paid ₹ 475 to Prem
(c) Ram paid ₹ 375 to Prem (d) Prem paid ₹ 475 to Ram

- 20) A man invests ₹ 3000 at the rate of 5% per annum. How much more should he invest at the rate of 8%, so that he can earn a total of 6% per annum? (1995)

(a) ₹ 1200 (b) ₹ 1300 (c) ₹ 1500 (d) ₹ 2000

- 21) The rate of inflation was 1000%. Then, what will be the cost of an article, which costs 6 units of currency now, 2 yr from now? (1995)

(a) 666 (b) 660 (c) 720 (d) 726

HINTS & SOLUTIONS

- 1) (c) Let say that the students are named a, b, c, d and e , in increasing order of weights. The average of a, b, c and d is 40 kg, where as the average of b, c, d and e is 45 kg. The sum of a, b, c and d is 160 kg and the sum of b, c, d and e is 180 kg.

What is the total weight of all the students?

There are two ways of looking at this

(a) $160 + e$ (b) $180 + a$ Or e is 20 more than a .

The total weight is $160 + e$. So, the highest value of e will correspond to the highest possible average. The highest possible value of e occurs when it is 20 higher than the highest possible value for a , which is 40 (all the first 4 scores are equal to 40). So, the

highest possible average is $\frac{160 + 60}{5} = 44$.

This will be the case when the weights are 40 kg, 40 kg, 40 kg, 40 kg and 60 kg.

Conversely, the least possible value for the average occurs when a is the least. This happens when e is the least too (since, a is 20 less than e). The least possible value for e is $45 = \left(\frac{180}{4}\right)$.

So, the least possible value for a would be 25. The least possible average = $\frac{180 + 25}{5} = 41$

This will be the case when the weights are 25 kg, 45 kg, 45 kg, 45 kg and 45 kg.

So, the difference between maximum possible and minimum possible average = 3 kg.

- 2) (b) Let the numbers be $a_1b_1c_1, a_2b_2c_2, a_3b_3c_3, \dots, a_9b_9c_9$.

Average of the results = $\frac{1}{9}(a_1b_1c_1 - c_1b_1a_1 + a_2b_2c_2 - c_2b_2a_2 + a_3b_3c_3 - c_3b_3a_3 + \dots + a_9b_9c_9 - c_9b_9a_9)$
 $= \frac{1}{9}[99(a_1 - c_1 + a_2 - c_2 + a_3 - c_3 + \dots + a_9 - c_9)]$

For $i = 1$ to 9, $a_i \geq c_i$

As the average of the results is 0, it follows that $a_1 = c_1$.

As the unit's digits of the numbers are distinct, the unit's digits must be from 1 to 9. The greatest and the least hundred's digits are 9 and 1, respectively.

$\therefore$ Required average = $\frac{1+9}{2} = 5$

- 3) (a) Let us say N members met for lunch, then

$$\frac{2160}{N-6} = \frac{2160}{N} + 81$$

Substituting the choices in place of N in the above equation, we see that only option (a) satisfies it.

- 4) (b) As the average weight of A decreased after the student left, his weight must be more than the average weight of A . As the average weight of B decreased after the student joined, his weight must be less than the average weight of B .

So, his weight must be between 40 kg and 60 kg.

- 5) (c) Total number of passengers is the Rajdhani Express = $10 \times 20 = 200$

So, in the 9 boggies the minimum number of total passengers

$$= 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 144$$

Hence, the minimum number of passengers in one boggie can be $(200 - 144) = 56$.

- 6) (d) Fixed cost (commission) = ₹ 560/assignment
Variable cost = $2n^2$

Let the assignment be of x chairs,

then total cost = $560 + 2x^2$. Average cost = $\frac{560 + 2x^2}{x}$

Average cost $\leq$ ₹ 68 (given)

$$\therefore \frac{560 + 2x^2}{x} \leq ₹ 68$$

$$\Rightarrow 2x^2 - 68x + 560 \leq 0$$

$$\Rightarrow (x - 14)(x - 20) \leq 0 \Rightarrow 14 \leq x \leq 20$$

Hence, minimum number of chair is 14 and maximum number of chair is 20.

- 7) (d) Value of the house after 3 years = ₹ 50000

$$\therefore \text{Present worth} = \frac{50000}{\left(1 - \frac{10}{100}\right)^3} = \frac{50000}{(0.9)^3} \approx ₹ 68587$$

- 8) (a) Sum of odd integers in the set

$$S = \frac{n}{2}\{2 \times 3 + (n-1) \times 2\} = \frac{n}{2}(2n+4) = n \times (n+2)$$

Therefore, the average of the odd integers in the set S
 $= n + 2$

Sum of even integers in the set S

$$= \frac{n}{2}\{2 \times 2 + (n-1) \times 2\} = \frac{n}{2}(2n+2) = n(n+1)$$

Therefore, the average of the even integers in the set $S = n + 1$. Therefore, $X - Y = (n + 2) - (n + 1) = 1$

Solutions (Q. Nos. 9-10) Let us evaluate all the options of investment for each possibility stock market rise and stock market fall

Option (a)

Investment 36% in option B and 64% in option C

Return = $5 \times 0.36 - 2.5 \times 0.64 = 0.2$ (Rise in market)

Return = $-3 \times 0.36 + 2 \times 0.64 = 0.2$ (Fall in market)

Option (b)

64% in option *B* and 36% in option *C*

$$\text{Return} = 5 \times 0.64 - 2.5 \times 0.36 = 2.1 \quad (\text{Rise in market})$$

$$\text{Return} = -3 \times 0.64 + 2 \times 0.36 = -1.2 \quad (\text{Fall in market})$$

Option (c) $\frac{1}{3}$ in each of the three options

$$\text{Return} = 0.1 \times 0.33 + 5 \times 0.33 - 2.5 \times 0.33 = 0.858$$

(Rise in market)

$$\text{Return} = 0.1 \times 0.33 - 3 \times 0.33 + 2 \times 0.33 = -0.297$$

(Fall in market)

Option (d)

30% in option *A*, 32% in option *B* and 38% in option *C*

$$\text{Return} = 0.1 \times 0.3 + 5 \times 0.32 - 2.5 \times 0.38 = 0.653$$

(Rise in market)

$$\text{Return} = 0.1 \times 0.3 - 3 \times 0.32 + 2 \times 0.38 = -0.197$$

(Fall in market)

Option (e) 100% in option *A*, Return = 0.10

- 9) (b) In the above options, we see that maximum guaranteed return to Shabnam is 0.2 irrespective of change in market.

- 10) (a) 36% in option *B* and 64% in option *C* gives the maximum guaranteed return.

- 11) (a) Let the number of students in classes *X*, *Y* and *Z* be *a*, *b* and *c* respectively, then total score of *X* = 83*a*, total score of *Y* = 76*b*, total score of *Z* = 85*c* and

$$\frac{83a + 76b}{a + b} = 7a \Rightarrow 4a = 3b \quad \dots(i)$$

$$\frac{76b + 85c}{b + c} = 81 \Rightarrow 4c = 5b \quad \dots(ii)$$

From Eqs. (i) and (ii), we get $b = \frac{4}{3}a$, $c = \frac{5}{3}a$

$\therefore$ Average score of *X*, *Y*, *Z*

$$= \frac{83a + 76b + 85c}{a + b + c} = \frac{978}{12} = 81.5$$

- 12) (b) If each box is to be weighed (in pair) with every other box, then there would be ten such combinations of weight. The best way to solve the question is through option.

Max. weight cannot be 60 kg because to make the total weight of two boxes 121 kg other should be 61 kg. Again, if the max. weight is 64 kg then to make a total weight of 121 kg other box weight should be 57 kg and to make up to a total of 120 kg the next box weight should be 63 kg. Now, if we add up the weight of 63 kg and 64 kg boxes, the total becomes 127 and this combination is not given in the question. However, if we consider the max. weight to be 62 kg, then other boxes would be of 59 kg, 54 kg,

58 kg and 5 kg, respectively. Hence, the maximum weight would be 62 kg.

- 13) (a) Let *X* be the fixed cost and *Y* be the variable cost, then according to question.

$$X + 25Y = 17500 \quad \dots(i)$$

$$X + 50Y = 30000 \quad \dots(ii)$$

Solving the Eqs. (i) and (ii), we get

$$X = 5000, Y = 500$$

Now, if average expenses of 100 boarders be *k*.

$$\text{Then, } 100 \times k = 5000 + 500 \times 100 \Rightarrow A = 550$$

- 14) (a) Given, $\frac{(90 + T)}{4T - 3T} \times 9 = 65 + T \Rightarrow \frac{3}{4}(90 + T) = (65 + T)$
 $\Rightarrow (4T - 3T) = (270 - 260) \Rightarrow T = ₹ 10$

- 15) (d) Number of students in group *D* is maximum. But no information about the weight of the students is given, hence no comparison of weight of group *D* can be made with that of other group.

- 16) (c) If one student from group *A* is shifted to group *B*, the number of students in the class still remains the same and it does not affect the average weight of the class.

- 17) (a) Suppose the weight of each student be 10 kg, then average weight of class *A*, *B*, *C*, *D* would be $\frac{150}{15} = 10$,

$$\frac{200}{20} = 10, \frac{250}{25} = 10 \text{ and } \frac{400}{40} = 10.$$

Hence, (a) is true.

Total weight of *A* and *C* = (150 + 250) = 400 kg

Which is 2×200 . Hence, (b) is true.

In option (a), we have seen that average weight of all the four groups is same, hence average weight of *D* cannot be greater than the average weight of *A*.

Hence, option (a) is the correct answer.

- 18) (b) Total marks of 10 papers = $80 \times 10 = 800$

Total marks of 8 papers = $81 \times 8 = 648$

Total marks of two papers = $(800 - 648) = 152$

If highest total is 92, then the lowest total is $(152 - 92) = 60$

- 19) (a) Value of flat after two years = $1 \times 1.1 \times 1.1 = 1.21$ lakh

Value of plot after two years

$$= 1.1 \times 1.05 \times 1.05 = 1.21275 \text{ lakh}$$

Hence, difference in price after two years

$$(1.21275 - 1.21) \times 100000 = ₹ 275$$

- 20) (c) $3000 \times \frac{5}{100} + \frac{x \times 8}{100} = \frac{(3000 + x) \times 6}{100}$

$$\Rightarrow 2x = (18000 - 15000) \Rightarrow x = ₹ 1500$$

- 21) (d) Cost of article two years, hence $= 6 \left(1 + \frac{1000}{100} \right)^2 = ₹ 726$

MENSURATION

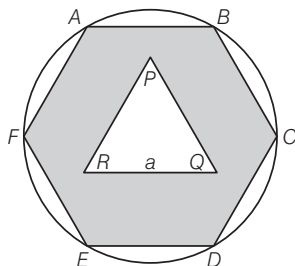
- 1) A regular polygon has an even number of sides. If the product of the length of its sides and the distance between two opposite sides is $\frac{1}{4}$ th of its area, then find the number of sides it has. (2016)

(a) 6 (b) 8
(c) 20 (d) 16

- 2) What is the area, circumradius and inradius of a regular hexagon of side 'a'? (2016)

(a) $\frac{3\sqrt{3}}{2}a^2$, a , $\frac{\sqrt{3}}{2}a$ (b) $\frac{3}{2}a^2$, $\frac{a}{2}$, $\frac{\sqrt{3}}{2}a$
(c) a^2 , $\frac{a}{2}$, $2a$ (d) $\frac{\sqrt{3}}{2}a^2$, a , $\sqrt{3}a$

- 3) $ABCDEF$ is a regular hexagon and PQR is an equilateral triangle of side a . The area of the shaded portion is X and $CD : PQ = 2 : 1$. Find the area of the circle circumscribing the hexagon in terms of X . (2015)



(a) $\frac{16\pi}{23\sqrt{3}}X$ (b) $\frac{42\pi}{5\sqrt{3}}X$ (c) $\frac{2\pi}{3\sqrt{3}}X$ (d) $2\sqrt{3}\pi X$

- 4) The radius of a cone is $\sqrt{2}$ times the height of the cone. A cube of maximum possible volume is cut from the same cone. The ratio of the volume of the cone to the volume of the cube is ... (upto 2 decimal places). (2015)

- 5) Consider a square $ABCD$ with mid-points E, F, G, H of AB, BC, CD and DA , respectively. Let L denote the line passing through F and H . Consider, points P and Q on L and inside $ABCD$, such that the angles APD and BQC both equal 120° . What is the ratio of the area of $ABQCDP$ to the remaining area inside $ABCD$? (2015)

(a) $\frac{4\sqrt{2}}{3}$ (b) $2 + \sqrt{3}$
(c) $\frac{10 - 3\sqrt{3}}{9}$ (d) $2\sqrt{3} - 1$

- 6) Let S_1 be a square of side a . Another square S_2 is formed by joining the mid-points of the sides of S_1 . The same process is applied to S_2 to form yet another square S_3 and so on. If $A_1, A_2, A_3, \dots$ are the areas and $P_1, P_2, P_3, \dots$ are the perimeters of $S_1, S_2, S_3, \dots$ respectively, then the ratio $\frac{P_1 + P_2 + P_3 + \dots}{A_1 + A_2 + A_3 + \dots}$ equals (2015)

(a) $\frac{2(1 + \sqrt{2})}{a}$ (b) $\frac{2(2 - \sqrt{2})}{a}$
(c) $\frac{2(2 + \sqrt{2})}{a}$ (d) $\frac{2(1 + 2\sqrt{2})}{a}$

- 7) Consider two different cloth-cutting processes. In the first one, n circular cloth pieces are cut from a square cloth piece of side a in the following steps: the original square of side a is divided into n smaller squares, not necessarily of the same size, then a circle of maximum possible area is cut from each of the smaller squares. In the second process, only one circle of maximum possible area is cut from the square of side a and the process ends there. The cloth pieces remaining after cutting the circles are scrapped in both the processes. The ratio of the total area of scrap cloth generated in the former to that in the latter is (2015)

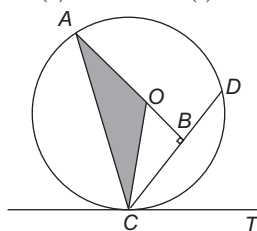
(a) 1 : 1 (b) $\sqrt{2} : 1$
(c) $\frac{n(4 - \pi)}{4n - \pi}$ (d) $\frac{4n - \pi}{n(4 - \pi)}$

- 8) The radius of a cone is r cm and its height is h cm. The change in volume when the height is decreased by x cm is the same as the change in volume when the radius is decreased by x cm. Find the relation between x, r and h . (2014)

(a) $x = \frac{2rh - r^2}{h}$ (b) $x = \frac{2rh + r^2}{h}$
(c) $x = \frac{r^2 - 2rh}{h}$ (d) $x = 2r + r^2$

- 9) A piece of paper is in the shape of a right angled triangle and is cut along a line that is parallel to the hypotenuse, leaving a smaller triangle. There was a 35% reduction in the length of the hypotenuse of the triangle. If the area of the original triangle was 34 square centimetres before the cut, what is the area of smaller triangle (in cm^2) formed after the cut? (2013)
- (a) 16.565 (b) 15.465 (c) 16.665 (d) 14.365

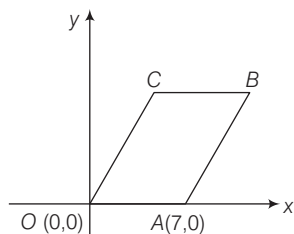
- 10) In the given diagram, CT is tangent at C , making an angle of 45° with CD . O is the centre of circle, $CD = 10$ cm. What is the perimeter of the shaded region (ΔAOC) approximately? (2013)
- (a) 25 cm (b) 26 cm (c) 27 cm (d) 28 cm



- 11) Kunal has 64 small cubes of 1 cm^3 each. He wants to arrange all of them in a cuboidal shape, such that surface area of the cuboid will be minimum. What is the diagonal of this larger cuboid? (2013)
- (a) $\sqrt{273}$ cm (b) $8\sqrt{2}$ cm
(c) $4\sqrt{3}$ cm (d) $\sqrt{129}$ cm

- 12) A rectangle is drawn such that none of its sides has length greater than ' a '. All lengths less than ' a ' are equally likely. The chance that the rectangle has its diagonal greater than ' a ' is (in terms of %)
- (2012)
- (a) 29.3% (b) 21.5% (c) 66.66% (d) 33.33%

- 13) In the figure given, $OABC$ is a parallelogram. The area of the parallelogram is 21 sq units and the point C lies on the line $x = 3$. Find the coordinates of B . (2012)



- (a) (3, 10) (b) (10, 3)
(c) (10, 10) (d) (8, 3)

- 14) A solid sphere of radius 12 inches is melted and cast into a right circular cone whose base diameter is $\sqrt{2}$ times its slant height. If the radius of the sphere and the cone are the same, how many such cones can be made and how much material is left out? (2012)
- (a) 4 and 1 cubic inch (b) 3 and 12 cubic inches
(c) 4 and 0 cubic inch (d) 3 and 6 cubic inches

- 15) On a plate in the shape of an equilateral triangle ABC with area $16\sqrt{3}$ sq cm, a rod GD , of height 8 cm, is fixed vertically at the centre of the triangle. G is a point on the plate. If the areas of the triangles AGD and BGD are both equal to $4\sqrt{19}$ sq cm, find the area of the triangle CGD (in sq cm). (2011)
- (a) $3\sqrt{19}$ (b) $4\sqrt{19}$
(c) $12\sqrt{3}$ (d) None of these

- 16) Rekha drew a circle of radius 2 cm on a graph paper of grid $1\text{ cm} \times 1\text{ cm}$. She then calculated the area of the circle by adding up only the number of full unit-squares that fell within the perimeter of the circle. If the value that Rekha obtained was d sq cm less than the correct value, then find the maximum possible value of d ? (2011)
- (a) 6.28 (b) 7.28 (c) 7.56 (d) 8.56

- 17) In the above question, what is the minimum possible value of d ? (2011)
- (a) 4.56 (b) 5.56 (c) 6.56 (d) 3.56

- 18) The circumference of a cylinder is 3 feet and its height is 16 feet. An insect climbs the pole such that its motion is a spiral and one complete spiral helps it to cover 4 feet in height. Thus, when the insect reaches the top, what is the total distance covered by it? (2009)
- (a) 16 feet (b) 18 feet (c) 20 feet (d) 25 feet

- 19) In a triangle ABC , the lengths of the sides AB and AC equal 17.5 cm and 9 cm, respectively. Let D be a point on the line segment BC such that AD is perpendicular to BC . If $AD = 3$ cm, then what is the radius (in cm) of the circle circumscribing the triangle ABC ? (2008)
- (a) 17.05 (b) 27.85 (c) 22.45
(d) 32.25 (e) 26.25

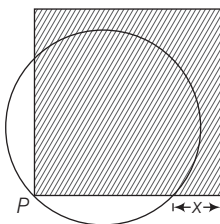
- 20) Two circles, both of radii 1 cm, intersect such that the circumference of each one passes through the centre of the other. What is the area (in sq cm) of the intersecting region? (2008)
- (a) $\frac{\pi}{3} - \frac{\sqrt{3}}{4}$ (b) $\frac{2\pi}{3} + \frac{\sqrt{3}}{2}$ (c) $\frac{4\pi}{3} - \frac{\sqrt{3}}{2}$
(d) $\frac{4\pi}{3} + \frac{\sqrt{3}}{2}$ (e) $\frac{2\pi}{3} + \frac{\sqrt{3}}{2}$

- 21) Consider a right circular cone of base radius 4 cm and height 10 cm. A cylinder is to be placed inside the cone with one of the flat surfaces resting on the base of the cone. Find the largest possible total surface area (in sq cm) of the cylinder. (2008)

- (a) $\frac{100\pi}{3}$ (b) $\frac{80\pi}{3}$ (c) $\frac{120\pi}{7}$
 (d) $\frac{130\pi}{9}$ (e) $\frac{110\pi}{7}$

Directions (Q. Nos. 22-23) Answer the questions based on the following informations.

A punching machine is used to punch a circular hole of diameter two units from a square sheet of aluminium of width 2 unit, as shown below. The hole is punched such that the circular hole touches one corner P of the square sheet and the diameter of the hole originating at P is in line with a diagonal of the square. (2006)



- 22) The proportion of the sheet area that remains after punching is

- (a) $\frac{(\pi + 2)}{8}$ (b) $\frac{(6 - \pi)}{8}$ (c) $\frac{(4 - \pi)}{4}$
 (d) $\frac{(\pi - 2)}{4}$ (e) $\frac{(14 - 3\pi)}{6}$

- 23) Find the area of the part of the circle (round punch) falling outside the square sheet.

- (a) $\frac{\pi}{4}$ (b) $\frac{(\pi - 1)}{2}$ (c) $\frac{(\pi - 1)}{4}$
 (d) $\frac{(\pi - 2)}{2}$ (e) $\frac{(\pi - 2)}{4}$

- 24) A semicircle is drawn with AB as its diameter. From C , a point on AB , a line perpendicular to AB is drawn meeting the circumference of the semicircle at D . Given that, $AC = 2$ cm and $CD = 6\frac{2\pi}{3} - \frac{\sqrt{3}}{2}$ cm, the area of the semicircle (in sq cm) will be

- (a) 32π (b) 50π
 (c) 40.5π (d) 81π
 (e) Undeterminable

(2006)

- 25) A jogging park has two identical circular tracks touching each other and a rectangular track enclosing the two circles. The edges of the rectangles are tangential to the circles. Two friends A and B , start jogging simultaneously from the point where one of the circular tracks touches the smaller side of the rectangular track. A jogs along the rectangular track, while B jogs along the two circular tracks in a figure of eight.

Approximately, how much faster than A does B have to run, so that they take the same time to return to their starting point? (2005)

- (a) 3.88% (b) 4.22%
 (c) 4.44% (d) 4.72%

- 26) Two identical circles intersect so that their centres and the points at which they intersect, form a square of side 1 cm. The area (in sq cm) of the portion that is common to the two circles is (2005)

- (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2} - 1$
 (c) $\frac{\pi}{5}$ (d) $\sqrt{2} - 1$

- 27) Rectangular tiles each of size $70\text{ cm} \times 30\text{ cm}$ must be laid horizontally on a rectangular floor of size $110\text{ cm} \times 130\text{ cm}$, such that the tiles do not overlap. A tile can be placed in any orientation so long as its edges are parallel to the edges of the floor. No tile should overshoot any edge of the floor. The maximum number of tiles that can be accommodated on the floor is (2005)

- (a) 4 (b) 5
 (c) 6 (d) 7

- 28) P, Q, S and R are points on the circumference of a circle of radius r , such that PQR is an equilateral triangle and PS is a diameter of the circle. What is the perimeter of the quadrilateral $PQSR$? (2005)

- (a) $2r(1 + \sqrt{3})$ (b) $2r(2 + \sqrt{3})$
 (c) $r(1 + \sqrt{5})$ (d) $2r + \sqrt{3}$

- 29) A rectangular sheet of paper, when halved by folding it at the mid-point of its longer side, results in a rectangle, whose longer and shorter sides are in the same proportion as the longer and shorter sides of the original rectangle. If the shorter side of the original rectangle is 2, what is the area of the smaller rectangle? (2004)

- (a) $4\sqrt{2}$ (b) $2\sqrt{2}$
 (c) $\sqrt{2}$ (d) None of these

- 30) A piece of paper is in the shape of a right angled triangle and is cut along a line that is parallel to the hypotenuse, leaving a smaller triangle. There was a 35% reduction in the length of the hypotenuse of the triangle. If the area of the original triangle was 34 square inches before the cut, what is the area (in square inches) of the smaller triangle? (2003)

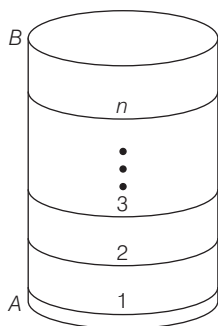
(a) 16.665 (b) 16.565 (c) 15.465 (d) 14.365

- 31) A square tin sheet of side 12 inches is converted into a box with open top in the following steps-The sheet is placed horizontally. Then, equal sized squares, each of side x inches, are cut from the four corners of the sheet. Finally, the four resulting sides are bent vertically upwards in the shape of a box. If x is an integer, then what value of x maximizes the volume of the box? (2003)

(a) 3 (b) 4 (c) 1 (d) 2

Directions (Q.Nos. 32-34) Answer the questions based on the following information.

Consider a cylinder of height h cm and radius $r = \frac{2}{\pi}$ cm as shown in the figure (not drawn to scale).

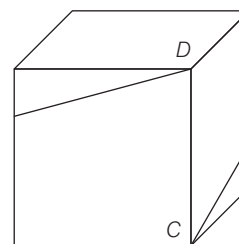


A string of a certain length, when wound on its cylindrical surface, starting at point A and ending at point B, gives a maximum of n turns (in other words, the string's length is the minimum length required to wind n turns. (2003)

- 32) What is the vertical spacing (in cm) between two consecutive turns?

(a) h/n
 (b) $h/\sqrt{n}$
 (c) h/n^2
 (d) Cannot be determined with given information

- 33) The same string, when wound on the exterior four walls of a cube of side n cm, starting at point C and ending at point D, can give exactly one turn (see figure, not drawn to scale). The length of the string (in cm) is



(a) $\sqrt{2}n$ (b) $\sqrt{17}n$ (c) n (d) $\sqrt{13}n$

- 34) In the setup of the previous two questions, how is h related to n ?

(a) $h = \sqrt{2}n$ (b) $h = \sqrt{17}n$
 (c) $h = n$ (d) $h = \sqrt{13}n$

- 35) The length of the circumference of a circle equals the perimeter of a triangle of equal sides and also the perimeter of a square. The areas covered by the circle, triangle and square are c , t and s , respectively. Then, (2003)

(a) $s > t > c$ (b) $c < s > t$
 (c) $c > s > t$ (d) $s > c > t$

- 36) A car is being driven in a straight line and at a uniform speed towards the base of a vertical tower. The top of the tower is observed from the car and in the process, it takes 10 min for the angle of elevation to change from 45° to 60° . After how much more time will this car reach the base of the tower? (2003)

(a) $5(\sqrt{3} + 1)$ (b) $6(\sqrt{3} + \sqrt{2})$
 (c) $7(\sqrt{3} - 1)$ (d) $8(\sqrt{3} - 2)$

- 37) Neeraj has agreed to mow the farm lawn, which is a 20 m by 40 m rectangle. The mower mows a 1 m wide strip. If Neeraj starts at one corner and mows around the lawn towards the centre, about how many times would he go round before he has mowed half the lawn? (2002)

(a) 2.5 (b) 3.5 (c) 3.8 (d) 4.0

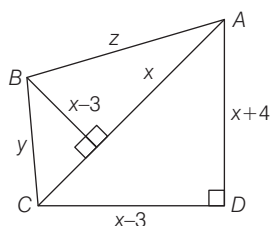
- 38) Four horses are tethered at four corners of a square plot of side 14 m, so that the adjacent horses can just reach one another. There is a small circular pond of area 20 m^2 at the centre. Find the ungrazed area. (2002)

(a) 22 m^2 (b) 42 m^2
 (c) 84 m^2 (d) 168 m^2

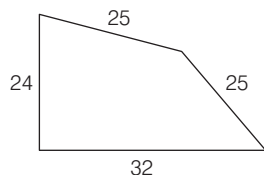
- 39) A rectangular pool 20 m wide and 60 m long is surrounded by a walkway of uniform width. If the total area of the walkway is 516 sq m , how wide (in m) is the walkway? (2001)

(a) 43 (b) 4.3 (c) 3 (d) 3.5

- 40) Based on the figure below, what is the value of x , if $y = 10$? (2001)



- (a) 10 (b) 11
(c) 12 (d) None of these
- 41) Euclid has a triangle in mind. Its longest side has length 20 and another of its sides has length 10. Its area is 80. What is the exact length of its third side? (2001)
- (a) $\sqrt{260}$ (b) $\sqrt{250}$ (c) $\sqrt{240}$ (d) $\sqrt{270}$
- 42) Two sides of a plot measure 32 m and 24 m and the angle between them is a perfect right angle. The other two sides measure 25 m each and the other three angles are not right angles. What is the area of the plot (in m^2)? (2001)



- (a) 768 (b) 534 (c) 696.5 (d) 684
- 43) A certain city has a circular wall around it and this wall has four gates pointing North, South, East and West. A house stands outside the city, 3 km North of the North gate and it can just be seen from a point 9 km East of the South gate. What is the diameter of the wall that surrounds the city? (2001)
- (a) 6 km (b) 9 km
(c) 12 km (d) None of these
- 44) A square, whose side is 2 m, has its corners cut away so as to form an octagon with all sides equal. Then, the length of each side of the octagon (in m) is (2001)
- (a) $\frac{\sqrt{2}}{\sqrt{2}+1}$ (b) $\frac{2}{\sqrt{2}+1}$
(c) $\frac{2}{\sqrt{2}-1}$ (d) $\frac{\sqrt{2}}{\sqrt{2}-1}$
- 45) What is the number of distinct triangles with integral valued sides and perimeter as 14? (2000)
- (a) 6 (b) 5 (c) 4 (d) 3

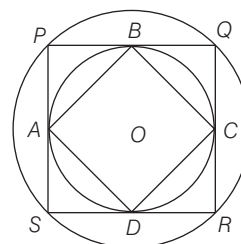
- 46) A farmer has decided to build a wire fence along one straight side of his property. For this, he planned to place several fence-posts at 6 m intervals, with posts fixed at both ends of the side. After he bought the posts and wire, he found that the number of posts he had bought was 51 less than required. However, he discovered that the number of posts he had bought would be just sufficient if he spaced them 8 m apart. What is the length of the side of his property and how many posts did he buy? (2000)

(a) 100 m, 15 (b) 100 m, 16 (c) 120 m, 15 (d) 120 m, 16

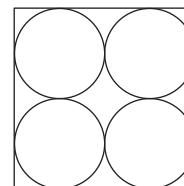
- 47) Consider a circle with unit radius. There are seven adjacent sectors $S_1, S_2, S_3, \dots, S_7$, in the circle such that their total area is $1/8$ of the area of the circle. Further, the area of the j th sector is twice that of the $(j-1)$ th sector, for $j = 2, \dots, 7$. What is the angle, in radians, subtended by the arc of S_1 at the centre of the circle? (2000)

(a) $\frac{\pi}{508}$ (b) $\frac{\pi}{2040}$ (c) $\frac{\pi}{1016}$ (d) $\frac{\pi}{1524}$

- 48) The figure below shows two concentric circles with centre O . $PQRS$ is a square inscribed in the outer circle. It also circumscribes the inner circle, touching it at point B, C, D and A . What is the ratio of the perimeter of the outer circle to that of polygon $ABCD$?



- (a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{2}$ (c) $\frac{\pi}{2}$ (d) π
- 49) Four identical coins are placed in a square. For each coin, the ratio of area to circumference is same as the ratio of circumference to area. Then, find the area of the square that is not covered by the coins. (1998)



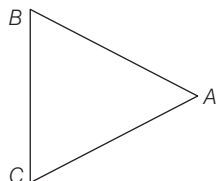
(a) $16(\pi - 1)$ (b) $16(8 - \pi)$ (c) $16(4 - \pi)$ (d) $16\left(4 - \frac{\pi}{2}\right)$

Directions (Q.Nos. 50-51) Answer the questions based on the following informations.

A cow is tethered at point A by a rope. Neither the rope nor the cow is allowed to enter the triangle ABC.

$\angle BAC = 30^\circ$, $AB = AC = 10$ m.

(1998)



- 50) What is the area that can be grazed by the cow, if the length of the rope is 8 m?

(a) $\frac{134\pi}{3}$ sq m (b) 121π sq m
(c) 132π sq m (d) $\frac{176\pi}{3}$ sq m

- 51) What is the area that can be grazed by the cow, if the length of the rope is 12 m?

(a) $\frac{133\pi}{6}$ sq m (b) 121π sq m
(c) 132π sq m (d) $\frac{176\pi}{3}$ sq m

- 52) In a rectangle, the difference between the sum of the adjacent sides and the diagonal is half the length of longer side. What is the ratio of the shorter to the longer side? (1997)

(a) $\sqrt{3} : 2$ (b) $1 : \sqrt{3}$
(c) $2 : 5$ (d) $3 : 4$

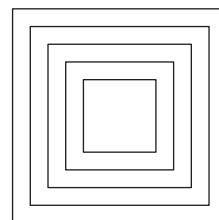
- 53) In $\triangle ABC$, points P, Q and R are the mid-points of sides AB, BC and CA, respectively. If area of $\triangle ABC$, is 20 sq unit, find the area of $\triangle PQR$. (1997)

(a) 10 sq unit (b) $5\sqrt{3}$ sq unit
(c) 5 sq unit (d) None of these

- 54) The value of each of a set of coins varies as the square of its diameter, if its thickness remains constant and varies as the thickness, if the diameter remain constant. If the diameter of two coins are in the ratio 4 : 3, what should be the ratio of their thicknesses be if the value of the first is four times that of the second? (1997)

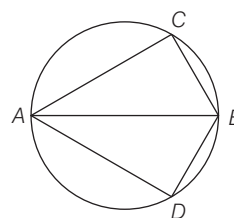
(a) 16 : 9 (b) 9 : 4 (c) 9 : 16 (d) 4 : 9

- 55) The figures given below shows a set of concentric squares. If the diagonal of the innermost square is 2 unit and if the distance between the corresponding corners of any two successive squares is 1 unit, find the difference between the areas of the eight and the seventh squares, counting from the innermost square. (1997)



(a) $10\sqrt{2}$ sq unit (b) 30 sq unit
(c) $35\sqrt{2}$ sq unit (d) None of these

- 56) AB is the diameter of the given circle, while points C and D lie on the circumference as shown. If AB is 15 cm, AC is 12 cm and BD is 9 cm, find the area of quadrilateral ACBD. (1997)

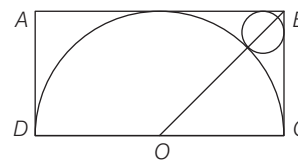


(a) 54 sq cm
(b) 216 sq cm
(c) 162 sq cm
(d) None of the above

- 57) The sum of the areas of two circles, which touch each other externally, is 153π . If the sum of their radii is 15, find the ratio of the larger to the smaller radius. (1997)

(a) 4 : 1 (b) 2 : 1
(c) 3 : 1 (d) None of these

- 58) The figure shows the rectangle ABCD with a semicircle and a circle inscribed inside in it as shown. What is the ratio of the area of the circle to that of the semicircle? (1996)



(a) $(\sqrt{2} - 1)^2 : 1$ (b) $2(\sqrt{2} - 1)^2 : 1$
(c) $(\sqrt{2} - 1)^2 : 2$ (d) None of these

- 59) A wooden box (open at the top) of thickness 0.5 cm, length 21 cm, width 11 cm and height 6 cm is painted on the inside. The expenses of painting are ₹ 70. What is the rate of painting per square centimetre? (1996)

(a) ₹ 0.7 (b) ₹ 0.5
(c) ₹ 0.1 (d) ₹ 0.2

- 60) From a circular sheet of paper with a radius 20 cm, four circles of radius 5 cm each are cut out. What is the ratio of the uncut to the cut portion? (1996)

(a) 1 : 3 (b) 4 : 1 (c) 3 : 1 (d) 4 : 3

- 61) A cube of side 12 cm is painted red on all the faces and then cut into smaller cubes, each of side 3 cm. What is the total number of smaller cubes having none of their faces painted? (1996)

(a) 16 (b) 8
(c) 12 (d) 24

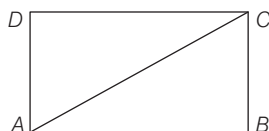
- 62) A right circular cone of height h is cut by a plane parallel to the base at a distance $h/3$ from the base, then the volumes of the resulting cone and the frustum are in the ratio. (1995)

(a) 1 : 3 (b) 8 : 19 (c) 1 : 4 (d) 1 : 7

- 63) The length of a ladder is exactly equal to the height of the wall it is leaning against. If lower end of the ladder is kept on a stool of height 3 m and the stool is kept 9 m away from the wall, the upper end of the ladder coincides with the top of the wall. Then, the height of the wall is (1995)

(a) 12 m (b) 15 m
(c) 18 m (d) 11 m

- 64) In the adjoining figure, $AC + AB = 5AD$ and $AC - AD = 8$. Then, the area of the rectangle $ABCD$ is (1995)

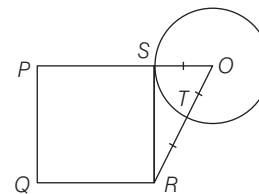


(a) 36 (b) 50
(c) 60 (d) Cannot be answered

- 65) The sides of a triangle are 5, 12 and 13 unit. A rectangle is constructed, which is equal in area to the triangle, has a width of 10 unit. Then, the perimeter of the rectangle is (1995)

(a) 30 unit (b) 36 unit (c) 13 unit (d) None of these

- 66) $PQRS$ is a square. SR is a tangent (at point S) to the circle with centre O and $TR = OS$. Then, the ratio of area of the circle to the area of the square is (1995)



(a) $\frac{\pi}{3}$ (b) $\frac{11}{7}$ (c) $\frac{3}{\pi}$ (d) $\frac{7}{11}$

- 67) Four friends start from four towns, which are at the four corners of an imaginary rectangle. They meet at a point which falls inside the rectangle, after travelling the distances of 40 m, 50 m and 60 m. The maximum distance that the fourth could have travelled is approximately. (1994)

(a) 67 m (b) 52 m
(c) 22.5 m (d) Cannot be determined

- 68) Three identical cones with base radius r are placed on their bases so that each is touching the other two. The radius of the circle drawn through their vertices is (1993)

(a) smaller than r (b) equal to r
(c) larger than r (d) depends on the height of the cones

- 69) The diameter of hollow cone is equal to the diameter of a spherical ball. If the ball is placed at the base of the cone, what portion of the ball will be outside the cone? (1993)

(a) 50% (b) Less than 50%
(c) More than 50% (d) 100%

- 70) A slab of ice 8 inches in length, 11 inches in breadth and 2 inches thick was melted and resolidified in the form of a rod of 8 inches diameter. The length of such a rod (in inches), in nearest to (1993)

(a) 3 (b) 3.5
(c) 4 (d) 4.5

- 71) Which one of the following cannot be the ratio of angles in a right angled triangle? (1993)

(a) 1 : 2 : 3
(b) 1 : 1 : 2
(c) 1 : 3 : 6
(d) None of the above

HINTS & SOLUTIONS

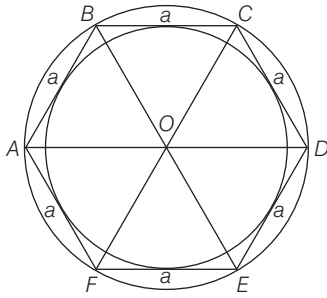
- 1) (d) Let the number of sides be $2n$. Let the length of the side be S and the length of the perpendicular from the centre to each side be P . Since, the number of sides is even, the opposite sides will be parallel and the distance between any two opposite sides is equal to $2P$.

Also, area of the polygon $(A) = 2n \left(\frac{SP}{2} \right) \dots(i)$

Given that, $S(2P) = A/4$ or $SP = A/8$

$\therefore A = n(A/8) \Rightarrow n = 8$ or $2n = 16$

- 2) (a) A hexagon is nothing but 6 equilateral triangles placed around a point.



So, $AF = a \Rightarrow OA = OF = a$

Circumradius = a

Inradius $\Rightarrow$ Radius of circle inside hexagon

If we have an incircle, side of hexagon should be tangent to the circle.

Inradius = Altitude of each equilateral triangle,

$$r = \frac{\sqrt{3}}{2} a$$

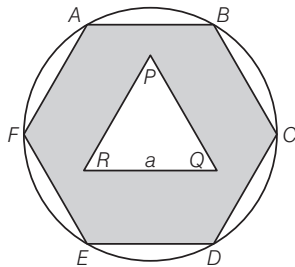
Area = 6 (area of equilateral triangles)

$$= 6 \times \frac{\sqrt{3}}{4} a^2 = \frac{3\sqrt{3}}{2} a^2$$

- 3) (a) Let each side of $\triangle PQR$ be a , therefore each side of hexagon is $2a$.

$\therefore$ Area of hexagon = $6 \left(\frac{\sqrt{3}}{4} \right) (2a)^2$

$\Rightarrow X = 6 \left(\frac{\sqrt{3}}{4} \right) (2a)^2 - \frac{\sqrt{3}}{4} a^2$



$$\Rightarrow X = \frac{23\sqrt{3}}{4} a^2 \Rightarrow a^2 = \frac{4X}{23\sqrt{3}}$$

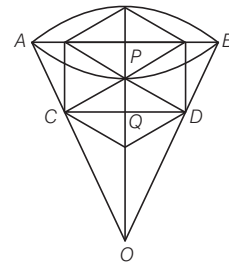
$\therefore$ Radius of the circle = Side of the hexagon

$\therefore$ Area of circle = $\pi (2a)^2$
 $= 4\pi a^2 = 4\pi \left(\frac{4X}{23\sqrt{3}} \right) = \frac{16\pi}{23\sqrt{3}} X$

- 4) Let the each side of cube be a , then

$$CD = \sqrt{2}a$$

$\therefore CQ = \frac{a}{\sqrt{2}}$



Let the radius of cone be r and height be h , then
 $r = h\sqrt{2}$

In $\triangle APO$ and $\triangle CQO$, (similar triangles)

$$\frac{AP}{PO} = \frac{CQ}{OQ} = \frac{r}{h} = \frac{\frac{a}{\sqrt{2}}}{(h-a)}$$

$$\Rightarrow \frac{\frac{a}{\sqrt{2}}}{(h-a)} = \sqrt{2} \Rightarrow a = 2(h-a) \Rightarrow h = \frac{3a}{2}$$

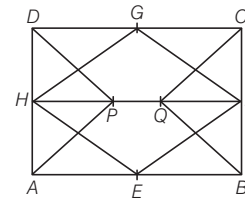
$\therefore r = \frac{3a}{2} \times \sqrt{2}$ and $h = \frac{3a}{2}$

$\therefore$ Volume of cone = $\frac{1}{3} \pi \times \left(\frac{3a\sqrt{2}}{2} \right)^2 \times \frac{3a}{2} = \frac{9}{4} a^3 \pi$

and volume of cube = a^3

$\therefore$ Required ratio = $\frac{\frac{9}{4} \pi a^3}{a^3} = \frac{9}{4} \pi = 2.25\pi \approx 7.07$

- 5) (d) Let the length of $AH = x$ cm



From the above figure, it is clear that $\triangle APD$ and $\triangle BQC$ will have the same area [there is no need to apply theorem/formulae, as the symmetry of figure is very clear].

$\therefore \angle APD$ is 120° and line L divides the square $ABCD$ in 2 equal halves, therefore $\angle APH = \angle HPD = 60^\circ$

In right angled $\triangle AHP$,

$$\tan 60^\circ = \frac{AH}{HP} \Rightarrow HP = \frac{x}{\sqrt{3}} \text{ cm}$$

Area of $\triangle APD = 2 \times \text{Area} \times \triangle AHP$

$$= 2 \times \frac{1}{2} \times x \times \frac{x}{\sqrt{3}} = \frac{x^2}{\sqrt{3}} \text{ cm}^2$$

Area of $ABQCDP = \text{Area}(ABCD) - 2 \text{Area}(\triangle ABD)$

$$= 4x^2 - \frac{2x^2}{\sqrt{3}}$$

$$\therefore \text{Required ratio} = \frac{4x^2 - 2x^2/\sqrt{3}}{2x^2/\sqrt{3}} = (2\sqrt{3} - 1)$$

- 6) (c) By the given condition in question,

Area and perimeter of $S_1 = \frac{a^2}{2}, 4a$

Area and perimeter of $S_2 = \frac{a^2}{2}, \frac{4a}{\sqrt{2}}$

Area and perimeter of $S_3 = \frac{a^2}{4}, \frac{4a}{(\sqrt{2})^2}$

Area and perimeter of $S_4 = \frac{a^2}{8}, \frac{4a}{(\sqrt{2})^3}$

$$\text{Then, required ratio} = \frac{4a + \frac{4a}{\sqrt{2}} + \frac{4a}{(\sqrt{2})^2} + \frac{4a}{(\sqrt{2})^3} + \dots}{a^2 + \frac{a^2}{2} + \frac{a^2}{4} + \frac{a^2}{8} + \dots}$$

$$= \frac{4a \left[1 + \frac{1}{\sqrt{2}} + \frac{1}{(\sqrt{2})^2} + \frac{1}{(\sqrt{2})^3} + \dots \right]}{a^2 \left[1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots \right]}$$

$$= \frac{4a \left[\frac{1}{1 - \frac{1}{\sqrt{2}}} \right]}{a^2 \left[\frac{1}{1 - \frac{1}{2}} \right]} = \frac{4 \left[\frac{\sqrt{2}}{\sqrt{2} - 1} \right]}{a^2 \times 2}$$

$$= \frac{4a \times \sqrt{2} (\sqrt{2} + 1)}{2a^2} = \frac{2\sqrt{2}(\sqrt{2} + 1)}{a} = \frac{2(2 + \sqrt{2})}{a}$$

- 7) (a) Area of total scrap in second process of cutting the cloth

$$= a^2 - \pi \left(\frac{a}{2} \right)^2 = \frac{a^2(4 - \pi)}{4}$$

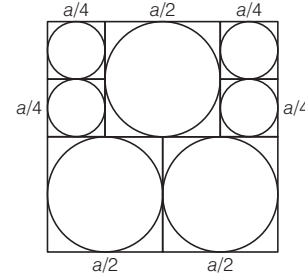
Now, by the first process of cutting the cloth.

Let us divide the big square in four equal squares of side $\frac{a}{2}$. Then, the area of total scrap

$$= 4 \left[\left| \frac{a}{2} \right|^2 - \pi \left| \frac{a}{4} \right|^2 \right] = \frac{a^2(4 - \pi)}{4}$$

So, required ratio = 1 : 1

Again, divide the big square in 7 small squares as shown in figure.



Now, total area of scrap

$$= 4 \left[\left| \frac{a}{2} \right|^2 - \pi \left| \frac{a}{4} \right|^2 \right] + 3 \left[\left| \frac{a}{2} \right|^2 - \pi \left| \frac{a}{4} \right|^2 \right]$$

$$= \frac{a^2(4 - \pi)}{4}$$

$\therefore$ Required ratio = 1 : 1

- 8) (a) If the height is decreased by x cm, then

Decrease in the volume

$$= (1/3)[\pi r^2 h - \pi r^2 (h - x)]$$

$$= \frac{1}{3} \pi r^2 x$$

If the radius decreased by x cm, then

Decrease in the volume

$$= (1/3)[\pi r^2 h - \pi (r - x)^2 h]$$

$$= (1/3)\pi [r^2 h - (r^2 - 2xr + x^2) h]$$

$$= (1/3)\pi [2xr h - x^2 h]$$

Combining the above results, $\pi r^2 x = \pi [2xr h - x^2 h]$

Cancelling π and x both sides, we get

$$r^2 = 2rh - xh$$

$$\therefore x = \frac{-r^2 + 2rh}{h}$$

- 9) (d) Here, length of hypotenuse is decreased by 35%.

So, total reduction in area of triangle,

$$= \left(2a - \frac{a^2}{100} \right) \% \quad (\text{here, } a = 35\%)$$

$$= \left[2 \times 35 - \frac{(35)^2}{100} \right] \%$$

$$= \left(70 - \frac{1225}{100} \right) \% = (70 - 12.25) \% = 57.75\%$$

So, new triangle (smaller triangle) will have area equal to $(100 - 57.75)\%$ of area of bigger triangle

$$= 42.25\% \text{ of } 34 \\ = \frac{42.25 \times 34}{100} = 14.365 \text{ cm}^2$$

- 10) (c) $\angle OCT = 90^\circ$, $\angle DCT = 45^\circ$ and $\angle OCB = 45^\circ$

Also, $\angle COB = 45^\circ$ ($\triangle BOC$ is a right angled triangle)

$$\angle AOC = 180^\circ - 45^\circ = 135^\circ$$

Here, $CD = 10$ cm

$$\therefore BC = 5 \text{ cm} = OB$$

Then, in $\triangle OBC$,

$$OC = 5\sqrt{2} \text{ (using Pythagoras theorem)}$$

$$OC = OA = 5\sqrt{2}$$

In $\triangle AOC$,

$$\begin{aligned} AC^2 &= OA^2 + OC^2 - 2OA \cdot OC \cdot \cos 135^\circ \\ &= 2(OA)^2 - 2(OA)^2 \cdot \cos 135^\circ \\ &= 2(5\sqrt{2})^2 - 2(5\sqrt{2})^2 \times \frac{-1}{\sqrt{2}} = 100 + \frac{100}{\sqrt{2}} \end{aligned}$$

$$AC^2 = 170.70$$

$$AC = 13 \text{ cm}$$

$$\begin{aligned} \therefore \text{Perimeter of } \triangle AOC &= AC + OC + AO \\ &= 13 + 5\sqrt{2} + 5\sqrt{2} \\ &= 13 + 10 \times 1.414 \\ &= 27 \text{ cm} \quad (\text{approx.}) \end{aligned}$$

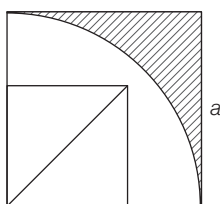
- 11) (c) For a given volume i.e., 64 cm^3 .

Cube has minimum surface area of

length of edge = 4 cm

$$\therefore \text{Its diagonal} = 4\sqrt{3} \text{ cm}$$

- 12) (b) Draw a square of side a and arc of radius a . All rectangles with diagonal less than or equal to a will lie within/on the quadrant of the circle.



Hence, required probability

$$= \frac{a^2 \left(1 - \frac{\pi}{4}\right)}{a^2} = \frac{4 - \pi}{4} = 0.215$$

$\Rightarrow 21.5\%$ chance.

- 13) (b) The coordinates of the point C are $(3, b)$. This means the height of the parallelogram is 3 units. As the area is given as 21 sq units, we get $b \times 7 = 21$ or $b = 3$. Thus, the coordinates of C are $(3, 3)$. The coordinates of D are $(10, 3)$ as $CO = 7$.

- 14) (c) The solid sphere is melted and recast into cones. The volume of material is the same before and after casting.

$$\text{Volume of the sphere} = \frac{4}{3} \pi r^3 \quad \dots(i)$$

$$\text{Volume of the right circular cone} = \frac{1}{3} \pi R H \quad \dots(ii)$$

$$\begin{aligned} \text{Diameter of the base of the cone} &= \sqrt{2} \text{ slant height} \\ &= \sqrt{2} S \text{ (say)} \quad \dots(iii) \end{aligned}$$

$$\Rightarrow 4R = 2S = 2(H^2 + R^2)$$

$$\Rightarrow 2R^2 = 2H$$

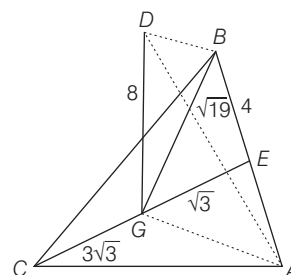
$$\Rightarrow R = H \quad \dots(iv)$$

$$\begin{aligned} \text{Volume of the cone} &= \frac{1}{3} \pi \cdot R H \\ &= \frac{1}{3} \pi r^2 \cdot (r) \quad (\text{since, } R = r) \\ &= \frac{1}{3} \pi r^3 \quad \dots(v) \end{aligned}$$

From Eqs. (i) and (v), it can be seen that the melted material creates exactly 4 cones of the specified dimensions. No material is left over.

Note The value of the radius of the sphere is not necessary to solve the problem.

- 15) (c) Since, area of $\triangle ABC = 16\sqrt{3}$



$$AB = 16\sqrt{3} \times 4\sqrt{3} = 8 \text{ cm}$$

$$\therefore \frac{\sqrt{3}}{4} \times AB^2 = 16\sqrt{3}$$

Since, the given triangle is equilateral, therefore its centre is the centroid.

Since, $\triangle BGD = \triangle AGD$

$$\frac{1}{2} (BG) (GD) = \frac{1}{2} (AG) (GD)$$

$\Rightarrow BG = GD \Rightarrow G$ is on the perpendicular bisector of AB .

$$\text{Also, } BG = \sqrt{19}, \text{ since } \frac{1}{2} BG(8) = 4\sqrt{19}$$

If E is mid-point of AB , then in right triangle BGE ,

$$BG^2 = BE^2 + GE^2$$

$$\Rightarrow GE = \sqrt{19 - 16} = \sqrt{3}$$

$$\text{and } CG = CE - GE = \frac{\sqrt{3}}{2} (8) - \sqrt{3} = 3\sqrt{3}$$

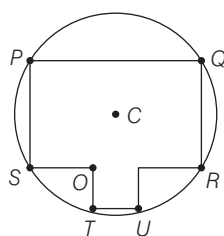
$$\triangle CGD = \frac{1}{2} CG(GD) = \frac{1}{2} (3\sqrt{3}) (8) = 12\sqrt{3}$$

- 16) (d) For the value of d to be the maximum the number of full unit-squares that Rekha counts must be the minimum, which is 4 unit-squares. (i.e., 4 full unit-squares will always fall within the circle)

$$\begin{aligned}\therefore d &= \pi r^2 - 4 = 4\pi - 4 = 4(\pi - 1) \\ &= 4(3.142 - 1) = 4(2.142) \cong 8.56\end{aligned}$$

- 17) (b) For d to be minimum the number of full squares falling within the circle must be the maximum, which is 7 unit sq.

The following figure illustrates this possibility.



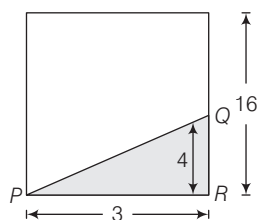
The points have the following coordinates

$$\begin{aligned}O &\rightarrow (0, 0), \\ \therefore C &\rightarrow (0.5, 0.7), P \rightarrow (-1, 2), Q \rightarrow (2, 2) \\ R &\rightarrow (2, 0), S \rightarrow (-1, 0) \\ T &\rightarrow (0, -1), U \rightarrow (1, -1)\end{aligned}$$

We will have seven full squares within the circle.

$$\therefore d = 4\pi - 7 \cong 5.56$$

- 18) (c) Now, cut and open the cylinder to form a rectangle.



PQ = one spiral

ΔPQR is right angled at R .

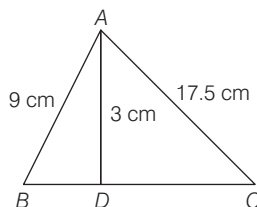
$$\therefore PQ = 5$$

Thus, for one spiral, it moves 5 feet.

4 feet height $\rightarrow$ 5 feet

$$\text{So, 16 feet height} \rightarrow \frac{16 \times 5}{4} = 20 \text{ feet}$$

- 19) (e)



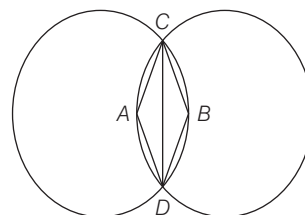
Given, $AB = 9 \text{ cm}$, $AC = 17.5 \text{ cm}$

$$AD \perp BC = 3 \text{ cm}$$

Circumradius of ΔABC is

$$\begin{aligned}R &= \frac{a \times b \times c}{4 \times (\text{Area of the } \Delta)} = \frac{a \times b \times c}{4 \times \frac{1}{2} \times a \times AD} \\ &= \frac{17.5 \times 9}{2 \times 3} = 26.25 \text{ cm}^2\end{aligned}$$

- 20) (e)



A and B are the centres of the circles and the two circles intersect at C and D .

$$AC = AD = AB = 1 \text{ cm}$$

$$\angle DAC = 120^\circ$$

Area of segment DCB = Area of sector $ACBD$ - Area of ΔACD

$$\text{Area of sector } ACBD = \left(\frac{1}{3}\right)\pi$$

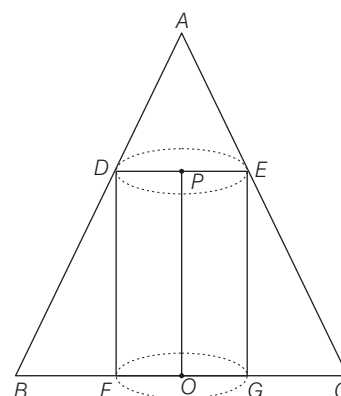
$$\text{Area of } \Delta ACD = \frac{1}{2} \times AC \times AD \times \sin 120^\circ$$

$$= \frac{1}{2} (1)(1) \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4}$$

Now, area of required region

$$= 2 \left[\frac{\pi}{3} - \frac{\sqrt{3}}{4} \right] = \frac{2\pi}{3} - \frac{\sqrt{3}}{2}$$

- 21) (a) Let the radius of cylinder $DEFG$ be $x \text{ cm}$.



$$\therefore OG = x \text{ cm}$$

ΔAPD and ΔAOB are similar.

$$\therefore \frac{AP}{PD} = \frac{AO}{BO} = \frac{5}{2}$$

($\because$ Height of case = 10 cm and radius = 4 cm)

$$\therefore AP = \frac{5}{2} \times x$$

$$\therefore \text{Height of cylinder} = PO = AO - AP \\ = \left(10 - \frac{5}{2}x\right)$$

$$\therefore \text{Total surface area of cylinder} = 2\pi r^2 + 2\pi r \times h \\ = 2\pi \left[x^2 + x \left(10 - \frac{5}{2}x\right) \right] \\ = 2\pi \left[x^2 + 10x - \frac{5x^2}{2} \right] \\ = 2\pi \left[10x - \frac{3}{2}x^2 \right]$$

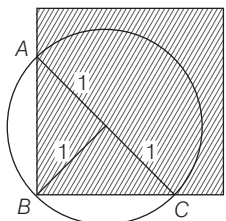
Now, maximum value of a quadratic equation

$$ax^2 + bx + c, \text{ where } a \neq 0, \text{ is } \frac{4ac - b^2}{4a}$$

$$\therefore \text{Max. value of } \left(10x - \frac{3}{2}x^2\right) \text{ is } \frac{50}{3}.$$

$$\text{Hence maximum total surface area of cylinder} \\ = \frac{100\pi}{3} \text{ sq cm}$$

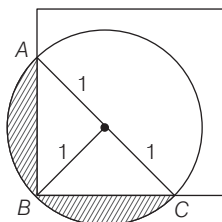
- 22) (b) Remaining area of sheet = area of square - (area of semicircle + area of triangle ABC)



$$= 4 - \left(\frac{\pi}{2} + \frac{1}{2} \times 2 \times 1\right) \\ = 4 - \left(\frac{\pi}{2} + 1\right) \\ = \frac{8 - \pi - 2}{2} = \frac{6 - \pi}{2}$$

$$\therefore \text{Remaining proportion} = \frac{\frac{6 - \pi}{2}}{4} = \frac{6 - \pi}{8}$$

- 23) (d)

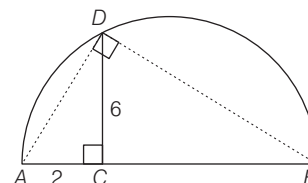


Required area
= area of the shaded portion

= area of the circle - (area of semicircle + area of $\triangle ABC$)

$$= \pi(1)^2 - \left(\frac{\pi}{2} + 1\right) \\ = \pi - \frac{\pi}{2} - 1 = \frac{\pi - 2}{2}$$

- 24) (b) $AC = 2$ cm, $CD = 6$ cm



$\triangle ADB$ is right angled triangle because angle made in semicircle is a right angle.

In $\triangle ADB$, $(CD)^2 = AC \times CB$

$$\Rightarrow 36 = 2 \times CB$$

$$\Rightarrow CB = 18$$

$$\therefore AB = 20 \text{ cm}$$

Radius of circle = 10 cm

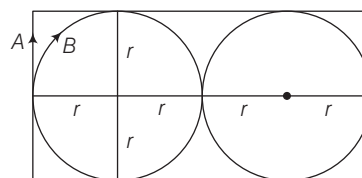
$$\text{Hence, area of semicircle} = \frac{\pi}{2} (10)^2 = 50\pi \text{ sq cm}$$

- 25) (d) A covers $2r + 2r + 4r + 4r = 12r$

B covers $2\pi r + 2\pi r = 4\pi r$ distance

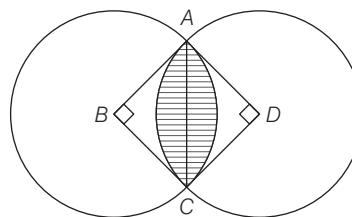
$$\frac{4\pi r}{S_B} = \frac{12r}{S_A}$$

$$\Rightarrow S_B = \frac{\pi}{3} S_A$$



$$\therefore \frac{S_B - S_A}{S_A} \times 100 = \frac{\pi - 3}{3} \times 100 = 4.72\%$$

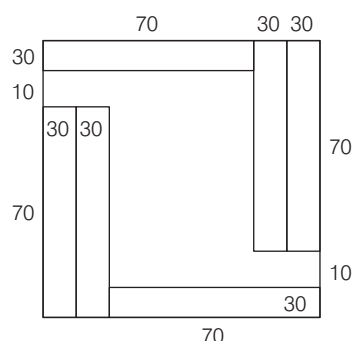
- 26) (b)



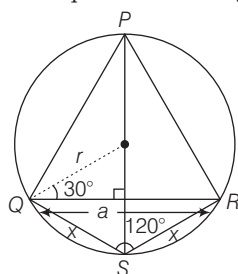
Shaded area = $2 \times (\text{area of sector } ADC - \text{area of } \triangle ADC)$

$$= 2 \times \left[\frac{\pi}{4} \times 1^2 - \frac{1}{2} \times 1 \times 1 \right] = \frac{\pi}{2} - 1$$

27) (c)


 28) (a) Here, $\cos 30^\circ = \frac{a}{2r}$

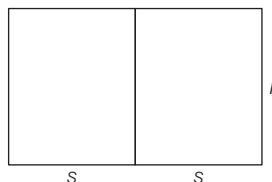
$$a = r\sqrt{3}$$

 Here, the side of equilateral triangle is $r\sqrt{3}$.


From the diagram,

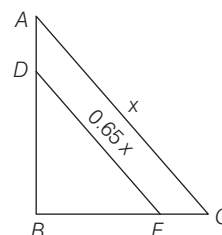
$$\cos 120^\circ = \frac{x^2 + x^2 - a^2}{2x^2}, a^2 = 3x^2, x = r$$

 Hence, the perimeter of the quadrilateral PQSR will be $2r(1 + \sqrt{3})$.

 29) (b) Let the longer and shorter sides after the sheet is folded be l and s . The figure shows the sheet, before it is folded.

 Then, the length and breadth of the original (bigger) rectangle is $2s$ and l respectively, because the breadth of the original rectangle becomes the length of the smaller rectangle.

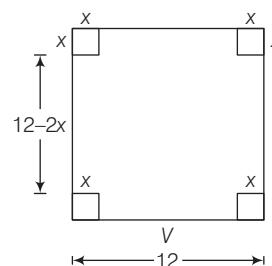
$$\text{We have, } \frac{l}{s} = \frac{2s}{l} \Rightarrow l = \sqrt{2}s$$

 As the shorter side of original sheet is 2, the area of the smaller rectangle = (b) $\left(\frac{2}{\sqrt{2}}\right) = 2\sqrt{2}$

 30) (d) It is apparent that we can apply SIMILARITY theorem to this problem. $\triangle ABC \sim \triangle BDE$


$$\therefore \frac{\Delta(ABC)}{\Delta(BDE)} = \left(\frac{AC}{DE}\right)^2 = \left(\frac{1}{0.65}\right)^2$$

$$\therefore \Delta(BDE) = (0.65)^2 \Delta(ABC) = 14.365$$

 31) (d) $\therefore$ Volume of the box will be $V = (12 - 2x)^2 \cdot x$

 For V to be maximum, $\frac{dV}{dx} = 0$

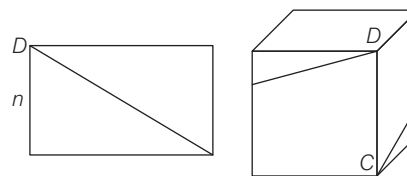
 This will give $x = 2$, 6. x cannot be 6, thus answer is (d).

 32) (a) Let each turn be of length $2\pi r = \frac{2\pi \times 2}{\pi} = 4$ cm

 Thus for n turns, length needed will be $4n$ cm

$$\text{Total surface area} = 2\pi rh \Rightarrow 2\pi \times \frac{2}{\pi} \times h = 4h$$

 If turns are equally spaced, then distances between vertical turns is $\frac{4h}{4n} = \frac{h}{n}$.

 33) (b) If we cut open the cube, we will get a rectangle with sides $4n$ and n .

 So, the length of the string is $\sqrt{17}n$.

 34) (c) Based on the above solution itself, we can say $h = n$.

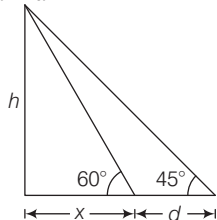
 35) (c) $2\pi r = 3a = 4x$

 Where, a = side of equilateral triangle and x = side of square.

$$\text{Then, } c : s : t = \frac{4}{\pi} : \frac{4\sqrt{3}}{9} : 1$$

 Thus, $c > s > t$.

36) (a) $\tan 45^\circ = \frac{h}{x+d} \Rightarrow h = (x+d) \tan 45^\circ \Rightarrow h = (x+d)$



$\Rightarrow \tan 60^\circ = \frac{h}{x} \Rightarrow h = x\sqrt{3}$

Now, speed is constant.

Thus, $\frac{d_1}{T_1} = \frac{d_2}{T_2}$

$\therefore (x+d) = x\sqrt{3}d = x(\sqrt{3}-1)$

$\therefore \frac{x}{T_1} = \frac{x(\sqrt{3}-1)}{10} \Rightarrow \frac{(\sqrt{3}-1)}{10} \times \frac{(\sqrt{3}+1)}{(\sqrt{3}+1)}$

By solving, we get

$t_1 = 5(\sqrt{3}+1)$

37) (c) Area of the plot = $20 \times 40 = 800$ sq m

Area left after moving 2 rounds

$= (40-4) \times (20-4)$

$= 36 \times 16 = 576$ sq m

Area left after moving 3 rounds

$= (40-6) \times (20-6) = 34 \times 14 = 476$ sq m

Similarly, area left after moving 4 rounds

$= 32 \times 12 = 384$ sq m

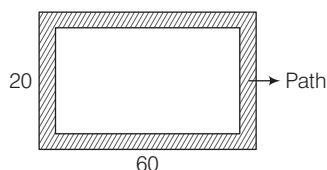
There he has to make rounds slightly less than 4 in order to move just less than half the area.

38) (a) Total area = $14 \times 14 = 196$ m²

Grazed area = $\frac{\pi \times r^2 \times 4}{4}$
 $= \frac{22 \times 7 \times 7}{7} = 154$ m²

$\therefore$ Ungrazed area = $196 - 154 - \text{Area of the pond}$
 $= 22$ m²

39) (c) Let the width of the path be x metres.



Area of the path = 516 m² (given)

$\therefore (60+2x)(20+2x) - 60 \times 20 = 516$

By solving, we get $x = 3$ m.

40) (d) For this question, we use options.

If we suppose $x = 10$, then

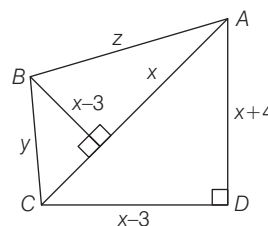
$AD^2 + CD^2$ should be equal to AC^2 .

$AD^2 + CD^2 = (13)^2 + (7)^2 = 218$

$CO = \sqrt{y^2 - (x-3)^2} = \sqrt{(10)^2 - (7)^2} = \sqrt{51} = 7.14$

$\therefore (AC)^2 = (10 + 7.14)^2 = (17.14)^2 = 293.7$

Hence, option (a) is correct.



Likewise, we can try for the options (b) and (c).

Since, none the values of x , i.e. 10, 11, 12 satisfy the above figure. Hence, none of the options follows.

41) (a) Let the 3rd side be x .

Then, by using Hero's formula,

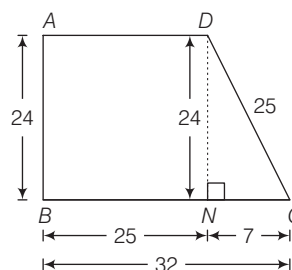
Area = $\sqrt{s(s-20)(s-10)(s-x)} = 80$

where, $s = \frac{20+10+x}{2} = \frac{30+x}{2}$

we get, $s = \sqrt{260}$

42) (d) Drawing $DN \perp BC$

Area of $ABND = AB \times AD = 25 \times 24 = 600$ sq unit

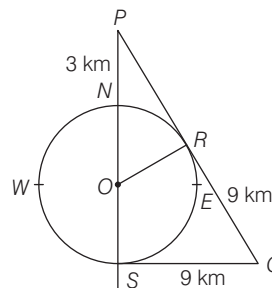


and area of $\triangle DNC = \frac{1}{2} \times NC \times ND = \frac{1}{2} \times 7 \times 24$
 $= 84$ sq unit

$\therefore$ Area of $ABCD = \text{area of } ABND + \text{area of } \triangle DNC$
 $= (600 + 84)$ sq unit = 684 sq unit

43) (b) $PN = 3$ km, $SQ = 9$ km

$OR = ON = OS = r$ (say)



ΔPOR and ΔPSQ are similar.

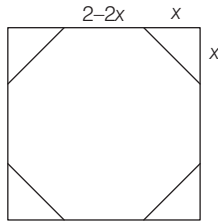
Hence, $\frac{OR}{OP} = \frac{SQ}{PQ}$

$$PQ = \sqrt{(9)^2 + (2r+3)^2}$$

$$\frac{r}{r+3} = \frac{9}{\sqrt{81 + (2r+3)^2}} \Rightarrow r = 4.5$$

Hence, diameter = 9 km

- 44) (a) Let the length of the edge cut away from the corners of the square be x .



Since, the resulting figure is a regular octagon,

$$\sqrt{x^2 + x^2} = 2 - 2x$$

$$\Rightarrow \sqrt{2}x = 2 - 2x$$

$$\Rightarrow \sqrt{2}x + 2x = 2$$

$$\Rightarrow \sqrt{2}x(1 + \sqrt{2}) = 2$$

$$\Rightarrow x = \frac{2}{\sqrt{2}(\sqrt{2} + 1)}$$

$$\Rightarrow x = \frac{\sqrt{2}}{\sqrt{2} + 1}$$

- 45) (c) For this the maximum number of possibilities are (4, 4, 6), (5, 5, 4), (6, 5, 3) and (6, 6, 2).

- 46) (d) It is given that placing the posts at a distance of 6 m and 8 m apart respectively, he covers his entire length. Hence, length should be divisible by 6 m and 8 m. From this options it is 120 m. Now, if he places the posts 6 m apart then posts required

$$= \frac{120}{6} + 1 = 21$$

Since, he purchased 5 less than required, hence number of posts purchased = $(21 - 5) = 16$

- 47) (a) Let the area of the sector S_1 be x units. Then, the area of the corresponding sectors shall be $2x, 4x, 8x, 16x, 32x$ and $64x$. Since, every successive sector has an angle which is twice the previous one, the total area then shall be $127x$ units. This is $\frac{1}{8}$ of the total area of

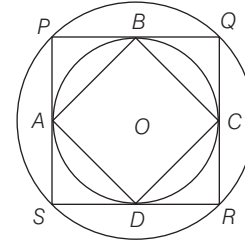
the circle.

Hence, the total area of the circle will be $127x \times 8 = 1016x$ units

$$\therefore \text{Area of sector, } S_1 = \frac{\pi r^2}{360^\circ} \times \theta$$

$$x = \frac{1016x}{2\pi} \times \theta \Rightarrow \theta = \frac{\pi}{508}$$

- 48) (c) Joining B to O and C to O .



Let the radius of the outer circle be r .

$$\therefore \text{Perimeter} = 2\pi r$$

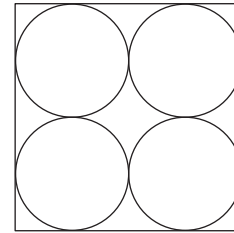
But $OQ = BC = r$ (diagonals of the square $BQCO$)

$$\therefore \text{Perimeter of } ABCD = 4r$$

$$\text{Hence, ratio} = \frac{2\pi r}{4r} = \frac{\pi}{2}$$

- 49) (c) Let r be the radius of each circle. Then, by given condition,

$$\frac{\pi R^2}{2\pi R} = \frac{2\pi R}{\pi R^2}$$



$$\Rightarrow R^2 = 4$$

$$\Rightarrow R = 2$$

$\therefore$ The length of the side of the square = 8

Now, the area covered by 4 coins

$$= 4 \times \pi(2)^2 = 16\pi$$

and area of the square = 64

$\therefore$ The area which is not covered by the coins

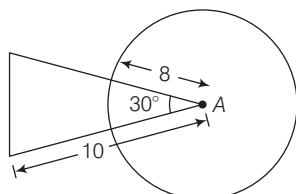
$$= 64 - 16\pi$$

$$= 16(4 - \pi)$$

- 50) (c) Since the length of the rope is more than that of the sides AB and AC , hence required area will be more than the area calculated as under (area of the circle with radius 12) – (area of the sector of the same circle with angle 30°)

$$\Rightarrow \pi(12)^2 - \frac{30}{360} \pi(12)^2 = 132\pi \text{ m}^2$$

- 51) (d) The length of the rope is 8 m, then the cow will be able to graze an area equal to the area of the circle with radius = 8 m, subtracting from that the area of the sector of the same circle with angle 30° .



Which is equal to

$$\begin{aligned} \pi(8)^2 - \frac{\theta}{360} \pi(8)^2 \\ = \pi \times 64 - \frac{30}{360} \pi \times 64 = \frac{176\pi}{3} \text{ m}^2 \end{aligned}$$

- 52) (d) Diagonal = $\sqrt{L^2 + B^2}$

$$\therefore L + B - \sqrt{L^2 + B^2} = \frac{1}{2} L$$

$$\Rightarrow \sqrt{L^2 + B^2} = \frac{1}{2} L + B$$

Squaring both the sides, we get

$$L^2 + B^2 = \left(\frac{L}{2} + B\right)^2$$

$$\therefore \frac{B}{L} = \frac{3}{4} \quad (\text{by solving})$$

- 53) (c) In a triangle, the line joining the mid-points of any 2 sides, is half the length of its side.

$\therefore$ Every side of ΔPQR would be half the sides of ΔABC . Hence, the area of ΔPQR would be $\frac{1}{4}$ the area of ΔABC

$$= \frac{1}{4} \times 20 = 5 \text{ sq unit}$$

- 54) (b) Let the diameters and thickness of the two coins be $d_1 t_1$ and $d_2 t_2$ respectively, then

$$\frac{v_1}{v_2} = \frac{d_1^2}{d_2^2} \times \frac{t_1}{t_2}$$

$$\Rightarrow \frac{4}{1} = \frac{4^2}{3^2} \times \frac{t_1}{t_2}$$

$$\Rightarrow \frac{9}{4} = \frac{t_1}{t_2}$$

- 55) (b) The diagonal of the innermost square is 2 unit.

$\therefore$ Diagonal of the 7th square = 14

and diagonal of the 8th square = 16

$\therefore$ Area of 7th square

$$= \frac{1}{2} \times 14^2 = 98$$

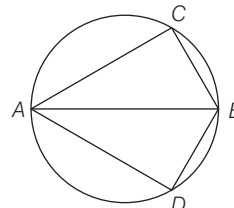
and area of the 8th square

$$= \frac{1}{2} \times 16^2 = 128$$

$\therefore$ Their difference = $128 - 98 = 30$

- 56) (d) $\angle ACB = 90^\circ$

($\because$ Diameter of a circle subtends 90° at all points on its circumference)



Now, $AB = 15$ and $AC = 12$

$\therefore$ By Pythagoras theorem, we find $BC = 9$

$\therefore$ Area of ΔABC = Area of ΔBAD

(all the 3 sides of the triangle's are equal)

$\therefore$ Area of

$$ACBD = 2 \times \frac{1}{2} \times AC \times CB = 108 \text{ cm}^2$$

- 57) (a) Let the radii of the 2 circles are r_1 and r_2 , then

$$r_1 + r_2 = 15 \quad (\text{given}) \dots(i)$$

$$\text{and } \pi r_1^2 + \pi r_2^2 = 153\pi \quad (\text{given}) \dots(ii)$$

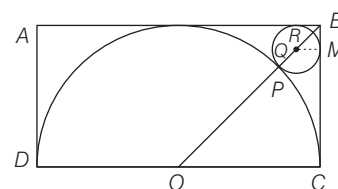
$$\Rightarrow r_1^2 + r_2^2 = 153$$

$$\Rightarrow r_1^2 + (15 - r_1)^2 = 153$$

Solving, we get $r_1 = 12$ and $r_2 = 3$

$\therefore$ Ratio of the larger radius to the smaller one is $= 12 : 3 = 4 : 1$

- 58) (d) $OC = OP = BC = R$ (say) radius of semicircle, then $OB = R\sqrt{2}$



Similarly, $PQ = QR = BM = QM = r$ (radius of circle)

$$\therefore BQ = r\sqrt{2}$$

$$\text{and } BP = r + r\sqrt{2} = r(\sqrt{2} + 1)$$

$$BP = OB - OP$$

$$= R\sqrt{2} - R$$

$$= R(\sqrt{2} - 1)$$

$$\therefore r(\sqrt{2} + 1) = R(\sqrt{2} - 1)$$

$$\Rightarrow r = R(\sqrt{2} - 1)^2$$

$$r = R(3 - 2\sqrt{2})$$

$$\begin{aligned}\frac{\text{Area of circle}}{\text{Area of semicircle}} &= \frac{\pi r^2}{\pi \frac{1}{2} R^2} \\ &= \frac{2R^2(3 - 2\sqrt{2})^2}{R^2} \\ &= \frac{2(17 - 12\sqrt{2})}{1}\end{aligned}$$

- 59) (c) As the box is painted from inside, the dimensions of the box from inside is

$$\text{length} = (21 - 0.5 - 0.5) = 20 \text{ cm}$$

$$\text{breadth} = (11 - 0.5 - 0.5) = 10 \text{ cm}$$

$$\text{and height} = (6 - 0.5) = 5.5$$

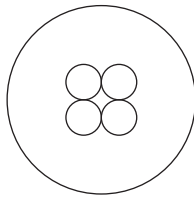
Total number of faces to be painted = 4 walls + one base. The dimensions of two of the walls = $2 \times (10 \times 5.5)$. The dimensions of the remaining two = $2 \times (20 \times 5.5)$ and that to the base = (20×10) and so the total area to be painted

$$\begin{aligned}&= 2 \times (10 \times 5.5) + 2 \times (20 \times 5.5) + (20 \times 10) \\ &= 530 \text{ cm}^2\end{aligned}$$

Since, the total expense of painting this area is ₹ 70, the rate of painting

$$= \frac{70}{530} = ₹ 0.13, 0.1 \text{ per sq cm (approximately)}$$

- 60) (c) Area of sheet of paper with radius 20 cm
 $= \pi(20)^2 = 400\pi \text{ cm}^2$



Area of 4 circles of radius 5 cm

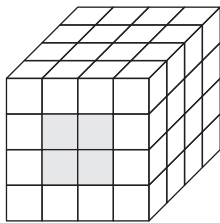
$$= 4 \times \pi(5)^2 = 100\pi \text{ cm}^2$$

∴ Area of remaining portion

$$= 400\pi - 100\pi = 300\pi \text{ cm}^2$$

∴ Required ratio = $300\pi : 100\pi = 3 : 1$

- 61) (b) In all there would be total 64 small cubes of side 3 cm each.



Now, clearly eight cubes just behind the shaded cubes will have no colour on any of the surfaces. Hence, there would be 8 smaller cubes having none of their faces painted.

- 62) (b) The volume of the original cone is $V = \frac{\pi R^2 h}{3}$.

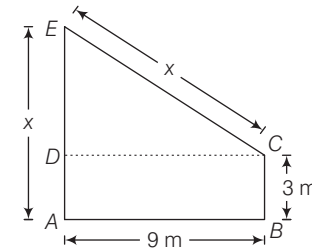
The height and the radius of the smaller cone are $\frac{2h}{3}$ and $\frac{2R}{3}$, respectively.

$$\text{So, its volume} = \frac{1}{3} \pi \left(\frac{2R}{3} \right)^2 \times \frac{2h}{3} = \frac{8V}{27}$$

$$\therefore \text{Volume of the frustum} = \left(V - \frac{8V}{27} \right) = \frac{19V}{27}$$

∴ Required ratio is 8 : 19.

- 63) (b) Let the height of the wall is x metres.



∴ Height of the ladder is also x metres.

From figure applying Pythagoras theorem,

$$ED^2 + DC^2 = EC^2$$

$$(x - 3)^2 + 9^2 = x^2$$

$$x^2 + 9 - 6x + 81 = x^2$$

After solving, we get $x = 15 \text{ m}$ = the height of the wall.

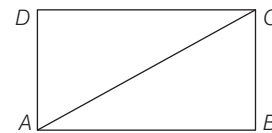
- 64) (c) $AC + AB = 5AD$ (given)

$$\text{or } AC + AB = 5BC \quad \dots(i)$$

(ABCD being a rectangle)

$$\text{and } AC - BC = 8 \quad \text{(given)}$$

$$\text{or } AC = BC + 8 \quad \dots(ii)$$



From Eq. (i), we get $AC + AB = 5BC$

$$BC + 8 + AB = 5BC \quad \text{[using Eq. (ii)]}$$

$$\Rightarrow AB = 4(BC - 2) \quad \dots(iii)$$

By the Pythagoras theorem,

$$AB^2 + BC^2 = AC^2$$

Expressing AB and AC in terms of BC, we get

$$BC = 5$$

$$\therefore AB = 12 \text{ and } AC = 13$$

So, area of the rectangle = $5 \times 12 = 60 \text{ sq unit}$

- 65) (d) By Pythagoras theorem, we find the given triangle is a right angled triangle with 12 as height and 5 as base.

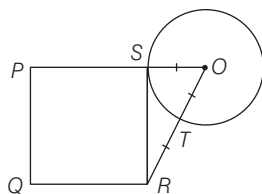
So, the area of the triangles is $\frac{1}{2} \times 12 \times 5 = 30$ sq unit.

$\therefore$ We find the length of the rectangle with width 10 and area 30, i.e. $10 \times \text{length} = 30$

$\therefore$ Length = 3 unit

Hence, the perimeter of the rectangle is $2 \times (10 + 3) = 26$ unit.

- 66) (a) Let the radius of the circle be r .



Then, area of the circle is πr^2 .

Now, $OR = OT + TR$

$$= r + r$$

$[\because TR = OS = r \text{ (given)}]$

$$= 2r$$

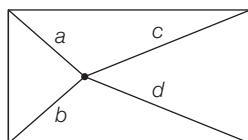
Now, by Pythagoras theorem, $SR = \sqrt{3}r$

So, area of $PQRS = 3r^2$

$$\therefore \text{Required ratio} = \frac{\pi r^2}{3r^2} = \frac{\pi}{3}$$

- 67) (a) For the condition as given in the questions,

$$a^2 + d^2 = b^2 + c^2$$



$$\Rightarrow 40^2 + d^2 = 50^2 + 60^2$$

$$\Rightarrow d^2 = 4500$$

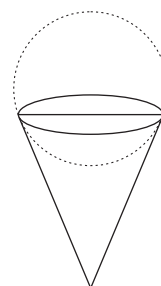
$$d = 67 \text{ m}$$

(approximately)

- 68) (c) The centres of the bases of the cones form a triangle of side $2r$. The circumference of the circle will be identical to a circle drawn through the vertices of the cones and thus, it will have a radius of $\frac{2}{\sqrt{3}}$ times

r , which is greater than r .

- 69) (c) Though it is given that diameter of the cone is equal to the diameter of the spherical ball. But the ball will not fit into the cone because of its slant shape. Hence, more than 50% of the portion of the ball will be outside the cone.



- 70) (b) Volume of the given ice cuboid = $8 \times 11 \times 2 = 176$
Let the length of the required rod is l .

$$\pi l \frac{8^2}{4} = 176$$

$$\therefore l = 3.5 \text{ inches}$$

- 71) (c) For the question, we take help of the options. The largest angle in a right angled triangle is 90° which corresponds to the highest part of the ratio. In option (a), the remaining two angles would be 30° and 60° , which is possible. Similarly, option (b) is possible. But in option (c), the remaining two angles are 15° and 45° , which is not possible as the sum of the angles of that triangle do not add up to 180° .

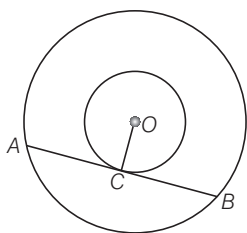
GEOMETRY

- 1) Trapezium $ABCD$ has side $AB = 8$ cm and $CD = 10$ cm parallel to each other. If the area of the trapezium is 27 cm^2 , then how far is the point of intersection of the diagonals from CD ? (2016)

- 2) A rectangle inscribed in a triangle has its base coinciding with the base b of the triangle. If the altitude of the triangle is h and the altitude x of the rectangle is half the base of the rectangle, then (2016)

(a) $x = \frac{1}{2}h$ (b) $x = \frac{bh}{h+b}$
 (c) $x = \frac{bh}{2h+b}$ (d) $x = \sqrt{\frac{hb}{2}}$

- 3) The line AB is 6 cm in length and is tangent to the inner one of the two concentric circles at point C . It is known that the radii of the two circles are integers. The radius of the outer circle is ... cm. (2015)



- 4) If in a rectangle the ratio of the length is to breadth is equal to that of the ratio of the sum of the length and breadth to the length, where l and b be the length and breadth of the rectangle, then find which of the following is true?

I. $\frac{l}{b} = \frac{l^2}{b^2} + 1$
 II. $\frac{b}{l-b} = \frac{l+b}{l}$

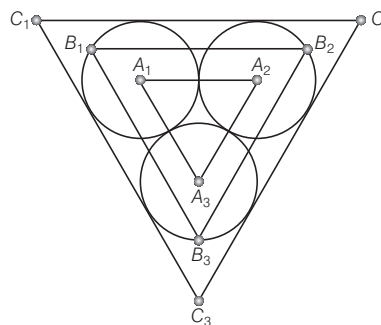
III. $lb = (l+b)(l-b)$

- (a) Only I is true
 (b) Only II is true
 (c) II and III are true
 (d) I and II are true

(2015)

Directions (Q. Nos. 5-7) Answer the questions based on the following information.

Consider three circular parks of equal size with centers at A_1, A_2 and A_3 , respectively. The parks touch each other at the edge as shown in the figure (not drawn to scale). There are three paths formed by the $\Delta A_1 A_2 A_3$, $\Delta B_1 B_2 B_3$ and $\Delta C_1 C_2 C_3$, as shown. Three sprinters A, B and C begin running from points A_1, B_1 and C_1 , respectively. Each sprinter traverses her respective triangular path clockwise and returns to her starting point. (2015)



- 5) Let the radius of each circular park be r and the distances to be traversed by the sprinters A, B and C be a, b and c , respectively. Which of the following is true?

(a) $b - a = c - b = 3\sqrt{r}$ (b) $b - a = c - b = 3\sqrt{3}r$
 (c) $b = \frac{a+c}{2} = 2(1+\sqrt{3})r$ (d) $c = 2b - a = (2+\sqrt{3})r$

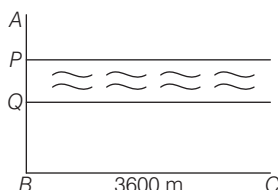
- 6) Sprinter A traverses distances $A_1 A_2, A_2 A_3$ and $A_3 A_1$ at average speeds of 20, 30 and 15, respectively. B traverses her entire path at a uniform speed of $(10\sqrt{3} + 20)$. C traverses distances $C_1 C_2, C_2 C_3$ and $C_3 C_1$ at average speeds of $\frac{40}{3} [\sqrt{3} + 1]$, $\frac{40}{3} [\sqrt{3} + 1]$ and 120, respectively. All speeds are in the same unit. Where would B and C be respectively when A finishes her sprint?

- (a) B_1, C_1
 (b) B_3, C_3
 (c) B_1, C_3
 (d) B_1 , somewhere between C_3 and C_1

- 7) Sprinters A , B and C traverse their respective paths at uniform speeds u , v and w , respectively. It is known that u^2, v^2, w^2 are equal to area A : area B : area C , where area A , area B and area C are the areas of $\Delta A_1 A_2 A_3$, $\Delta B_1 B_2 B_3$ and $\Delta C_1 C_2 C_3$, respectively. Where would A and C be when B reaches point B_3 ?

- (a) A_2, C_3
 (b) A_3, C_3
 (c) A_3, C_2
 (d) Somewhere between A_2 and A_3 , somewhere between C_3 and C_1

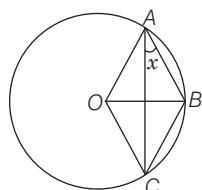
- 8) In the adjoining figure, river PQ is just perpendicular to the national highway AB . At a point B , highway just turns at right angle and reaches to C . $PA = 500$ m and $BQ = 700$ m and width of the uniformly wide river (i.e. PQ) is 300 m. Also, $BC = 3600$ m. A bridge has to be constructed across the river perpendicular to its stream in such a way that a person can reach from A to C via. bridge covering least possible distance PQ is the widthness of the river, then what is the minimum possible required distance from A to C including the length of bridge ... m? (2015)



- 9) $A_1, A_2, A_3, \dots, A_{11}, A_{12}$ are 12 distinct points equally spaced and arranged in the same order on the circumference of a circle. Find the distinct number of triangles, which can be formed using these points as vertices such that their circumcentre lies on one of the sides of a triangle. (2014)

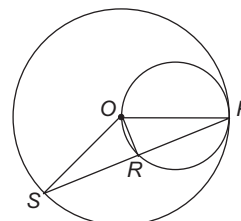
- (a) 9
 (b) 36
 (c) 54
 (d) 60

- 10) If O is the centre of the circle shown below and $OA = AB = BC$, then find the value of x . (2014)



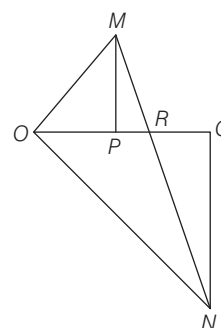
- (a) 15°
 (b) 30°
 (c) 60°
 (d) 45°

- 11) In the adjoining figure, the diameter of the larger circle is 20 cm and the smaller circle touches internally the larger circle at P and passes through O , the centre of the larger circle. Chord SP cuts the smaller circle at R and OR is equal to 8 cm. What is the length of chord SP ? (2013)



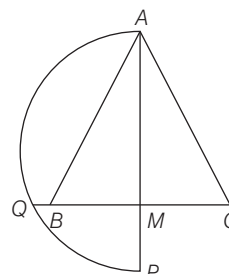
- (a) 9 cm
 (b) 6 cm
 (c) 12 cm
 (d) 14 cm

- 12) In the figure below, $\angle MON = \angle MPO = \angle NQO = 90^\circ$ and OQ is the bisector of $\angle MON$ and $QN = 10$, $QR = 40/7$. Find OP . (2012)



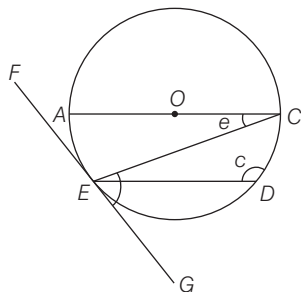
- (a) 4.8
 (b) 4.5
 (c) 4
 (d) 5

- 13) In the figure alongside, ΔABC is equilateral with area S . M in the mid-point of BC and P is a point on AM extended such that $MP = BM$. If the semicircle on AP intersects CB extended at Q and the area of a square with MQ as a side is T , which of the following is true? (2011)



- (a) $T = \sqrt{2}S$
 (b) $T = S$
 (c) $T = \sqrt{3}S$
 (d) $T = 2S$

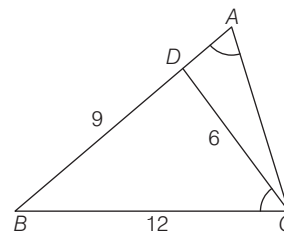
- 14) In the figure alongside, O is the centre of the circle and AC the diameter. The line FEG is tangent to the circle at E . If $\angle GEC = 52^\circ$, find the value of $\angle e + \angle c$. (2011)



- (a) 154° (b) 156° (c) 166° (d) 180°
- 15) Coordinates of the points X , Y and Z are $X \equiv (6, 4)$, $Y \equiv (-3, 5)$ and $Z \equiv (2, -4)$. Find the coordinates of a point which divides the medians from all the three vertices in the ratio $2 : 1$. (2009)
- (a) $\left(\frac{5}{3}, \frac{5}{3}\right)$ (b) $\left(\frac{5}{3}, \frac{5}{2}\right)$
 (c) $\left(\frac{7}{4}, \frac{3}{2}\right)$ (d) Data insufficient
- 16) In $\triangle LMN$, LO is the median. Also, LO is the bisector of $\angle MLN$. If $LO = 3$ cm and $LM = 5$ cm, then find the area of $\triangle LMN$. (2009)
- (a) 12 sq cm (b) 10 sq cm
 (c) 4 sq cm (d) 6 sq cm
- 17) Consider obtuse-angled triangles with sides 8 cm, 15 cm and x cm. If x is an integer, then how many such triangles exist? (2008)
- (a) 5 (b) 21 (c) 10
 (d) 15 (e) 14
- 18) Consider a square $ABCD$ with mid-points E , F , G , H of AB , BC , CD and DA , respectively. Let L denote the line passing through F and H . Consider points P and Q , on L and inside $ABCD$, such that the angles APD and BQC both equal 120° . What is the ratio of the area of $ABQCDP$ to the remaining area inside $ABCD$? (2008)
- (a) $\frac{4\sqrt{2}}{3}$ (b) $2 + \sqrt{3}$ (c) $\frac{10 - 3\sqrt{3}}{9}$
 (d) $1 + \frac{1}{\sqrt{3}}$ (e) $2\sqrt{3} - 1$
- 19) Two circles with centres P and Q cut each other at two distinct points A and B . The circles have the same radii and neither P nor Q falls within the intersection of the circles.

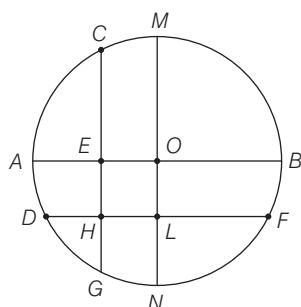
What is the smallest range that includes all possible values of the angle AQP in degrees? (2007)

- (a) Between 0 and 30 (b) Between 0 and 60
 (c) Between 0 and 75 (d) Between 0 and 45
 (e) Between 0 and 90
- 20) An equilateral triangle BPC is drawn inside a square $ABCD$. What is the value of the angle APD in degrees? (2006)
- (a) 75 (b) 90
 (c) 120 (d) 135
 (e) 150
- 21) What is the distance (in cm) between two parallel chords of lengths 32 cm and 24 cm in a circle of radius 20 cm? (2005)
- (a) 1 or 7 (b) 2 or 14 (c) 3 or 21 (d) 4 or 28
- 22) Four points A , B , C and D lie on a straight line in the $X - Y$ plane, such that $AB = BC = CD$ and the length of AB is 1 m. An ant at A wants to reach a sugar particle at D . But there are insect repellents kept at points B and C . The ant would not go within one metre of any insect repellent. The minimum distance (in metres) the ant must traverse to reach the sugar particle is (2005)
- (a) $3\sqrt{2}$ (b) $1 + \pi$ (c) $\frac{4\pi}{3}$ (d) 5
- 23) Consider the triangle ABC shown in the following figure where $BC = 12$ cm, $DB = 9$ cm, $CD = 6$ cm and $\angle BCD = \angle BAC$. What is the ratio of the perimeter of the triangle ADC to that of the triangle BDC ? (2005)



- (a) $\frac{7}{9}$ (b) $\frac{8}{9}$
 (c) $\frac{6}{9}$ (d) $\frac{5}{9}$

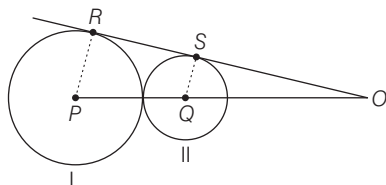
- 24) In the following figure, the diameter of the circle is 3 cm. AB and MN are two diameters such that MN is perpendicular to AB . In addition, CG is perpendicular to AB such that $AE : EB = 1 : 2$ and DF is perpendicular to MN such that $NL : LM = 1 : 2$. The length of DH (in cm) is (2005)



- (a) $2\sqrt{2}-1$ (b) $\frac{(2\sqrt{2}-1)}{2}$
 (c) $\frac{(3\sqrt{2}-1)}{2}$ (d) $\frac{(2\sqrt{2}-1)}{3}$

Directions (Q.Nos. 25-27) Answer the questions based on the following information.

In the adjoining figure, I and II are circles with centres P and Q , respectively. The two circles touch each other and have a common tangent that touches them at points R and S , respectively. This common tangent meets the line joining P and Q at O . The diameters of I and II are in the ratio $4 : 3$. It is also known that the length of PO is 28 cm. (2004)



25) What is the ratio of the length of PQ to that of QO ?

- (a) $1 : 4$ (b) $1 : 3$ (c) $3 : 8$ (d) $3 : 4$

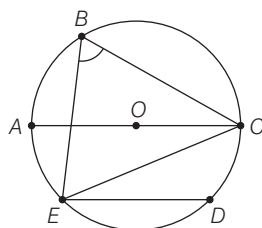
26) What is the radius of the circle II?

- (a) 2 cm (b) 3 cm (c) 4 cm (d) 5 cm

27) The length of SO is

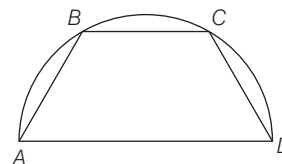
- (a) $8\sqrt{3}$ cm (b) $10\sqrt{3}$ cm
 (c) $12\sqrt{3}$ cm (d) $14\sqrt{3}$ cm

28) In the adjoining figure, chord ED is parallel to the diameter AC of the circle. If $\angle CBE = 65^\circ$, then what is the value of $\angle DEC$? (2004)



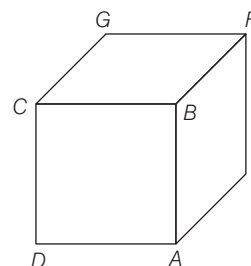
- (a) 35° (b) 55° (c) 45° (d) 25°

29) On a semicircle with diameter AD , chord BC is parallel to the diameter. Further, each of the chords AB and CD has length 2, while AD has length 8. What is the length of BC ? (2004)



- (a) 7.5 (b) 7
 (c) 7.75 (d) None of these

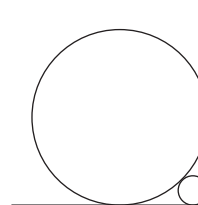
30) If the length of diagonals DF , AG and CE of the cube shown in the adjoining figure are equal to the three sides of a triangle, then the radius of the circle circumscribing that triangle will be (2004)



- (a) equal to the side of the cube
 (b) $\sqrt{3}$ times the side of the cube
 (c) $\frac{1}{\sqrt{3}}$ times the side of the cube
 (d) impossible to find from the given information

31) A circle with radius 2 is placed against a right angle. Another smaller circle is also placed as shown in the adjoining figure.

What is the radius of the smaller circle? (2004)



- (a) $3-2\sqrt{2}$ (b) $4-2\sqrt{2}$
 (c) $7-4\sqrt{2}$ (d) $6-4\sqrt{2}$

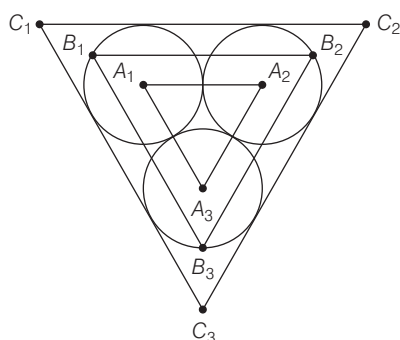
32) Let C be a circle with centre P_0 and AB be a diameter of C . Suppose P_1 is the mid-point of the line segment P_0B , P_2 is the mid-point of the line segment P_1B and so on. Let $C_1, C_2, C_3, \dots$ be circles with diameters $P_0P_1, P_1P_2, P_2P_3, \dots$, respectively.

Suppose the circles $C_1, C_2, C_3, \dots$ are all shaded. The ratio of the area of the unshaded portion of C to that of the original circle C is (2004)

- (a) 8 : 9 (b) 9 : 10
(c) 10 : 11 (d) 11 : 12

Directions (Q.Nos. 33-35) Answer the questions based on the following information.

Consider three circular parks of equal size with centers at A_1, A_2 and A_3 , respectively. The parks touch each other at the edge as shown in the figure (not drawn to scale). There are three paths formed by the triangles $A_1A_2A_3$, $B_1B_2B_3$ and $C_1C_2C_3$, as shown. Three sprinters A, B and C begin running from points A_1, B_1 and C_1 , respectively. Each sprinter traverses her respective triangular path clockwise and returns to her starting point. (2003)



- 33) Let the radius of each circular park be r and the distances to be traversed by the sprinters A, B and C be a, b and c , respectively.

Which of the following is true?

- (a) $b - a = c - b = \sqrt{3}r$
(b) $b - a = c - b = \sqrt{3}r$
(c) $b = \frac{a+c}{2} = 2(1 + \sqrt{3})r$
(d) $c = 2b - a = (2 + \sqrt{3})r$

- 34) Sprinter A traverses distances $A_1A_2A_3$ and A_3A_1 at average speeds of 20, 30 and 15, respectively. B traverses her entire path at a uniform speed of $(10\sqrt{3} + 20)$. C traverses distances C_1C_2, C_2C_3 and C_3C_1 at average speeds of $\frac{40}{3}[\sqrt{3} + 1]$, $\frac{40}{3}[\sqrt{3} + 1]$ and 120, respectively. All speeds are in the same unit. Where would B and C be respectively, when A finishes her sprint?

- (a) B_1, C_1
(b) B_3, C_3
(c) B_1, C_3
(d) B_1 somewhere between C_3 and C_1

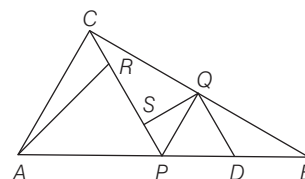
- 35) Sprinters A, B and C traverse their respective paths at uniform speeds u, v and w , respectively. It is known that u^2, v^2, w^2 is equal to Area A : Area B : Area C , where Area A , Area B and Area C are the areas of triangles $A_1A_2A_3, B_1B_2B_3$ and $C_1C_2C_3$, respectively. Where would A and C be when B reaches point B_3 ?

- (a) A_2, C_3
(b) A_3, C_3
(c) A_3, C_2
(d) Somewhere between A_2 and A_3 , somewhere between C_3 and C_1

- 36) Let $ABCDEF$ be a regular hexagon. What is the ratio of the area of the triangle ACE to that of the hexagon $ABCDEF$? (2003)

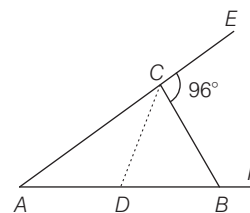
- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{5}{6}$

- 37) In the figure (not drawn to scale) given below, P is a point on AB such that $AP : PB = 4 : 3$. PQ is parallel to AC and QD is parallel to CP . In $\triangle ARC$, $\angle ARC = 90^\circ$ and in $\triangle PQS$, $\angle PSQ = 90^\circ$. The length of QS is 6 cm. What is ratio $AP : PD$? (2003)



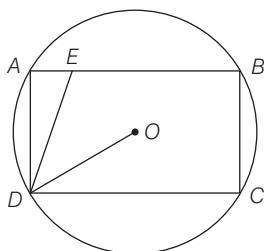
- (a) 10 : 3 (b) 2 : 1
(c) 7 : 3 (d) 8 : 3

- 38) In the figure (not drawn to scale) given below, if $AD = CD = BC$ and $\angle BCE = 96^\circ$, how much is $\angle DBC$? (2003)



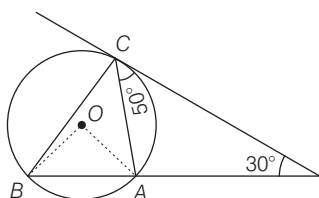
- (a) 32° (b) 84°
(c) 64° (d) Cannot be determined

- 39) In the figure given below (not drawn to scale), rectangle $ABCD$ is inscribed in the circle with centre at O . The length of side AB is greater than that of side BC . The ratio of the area of the circle to the area of the rectangle $ABCD$ is $\pi : \sqrt{3}$. The line segment DE intersects AB at E such that $\angle ODC = \angle ADE$. What is the ratio $AE : AD$? (2003)



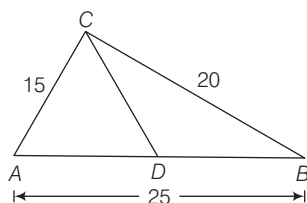
- (a) $1 : \sqrt{3}$ (b) $1 : \sqrt{2}$ (c) $1 : 2\sqrt{3}$ (d) $1 : 2$

- 40) In the figure given below (not drawn to scale), A , B and C are three points on a circle with centre O . The chord BA is extended to a point T such that CT becomes a tangent to the circle at point C . If $\angle ATC = 30^\circ$ and $\angle ACT = 50^\circ$, then the angle $\angle BOA$ is (2003)



- (a) 100° (b) 150° (c) 80°
(d) not possible to determine

- 41) In the given figure, ACB is a right angled triangle. CD is the altitude. Circles are inscribed within the triangles ACD , BCD . P and Q are the centres of the circles. The distance PQ is (2002)

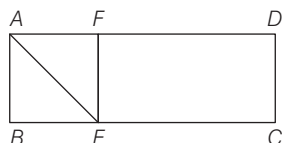


- (a) 5 (b) $\sqrt{50}$ (c) 7 (d) 8

- 42) The area of the triangle whose vertices are (a, a) , $(a + 1, a + 1)$, $(a + 2, a)$ is (2002)

- (a) a^3 (b) 1 (c) $2a$ (d) $2^{1/2}$

- 43) In the figure given below, $ABCD$ is a rectangle. The area of the isosceles right triangle $ABE = 7 \text{ cm}^2$, $EC = 3(BE)$. The area of $ABCD$ (in cm^2) is (2002)



- (a) 21 (b) 28
(c) 42 (d) 56

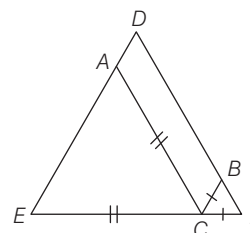
- 44) The length of the common chord of two circles of radii 15 cm and 20 cm whose centres are 25 cm apart, is (in cm) (2002)

- (a) 24 (b) 25
(c) 15 (d) 20

- 45) In a triangle ABC , the internal bisector of the angle A meets BC at D . If $AB = 4$, $AC = 3$ and $\angle A = 60^\circ$, then the length of AD is (2002)

- (a) $2\sqrt{3}$ (b) $\frac{12\sqrt{3}}{7}$ (c) $\frac{15\sqrt{3}}{8}$ (d) $\frac{6\sqrt{3}}{7}$

- 46) In triangle DEF shown below, points A , B and C are taken on DE , DF and EF respectively, such that $EC = AC$, $CF = BC$ and $\angle D = 40^\circ$, then what is angle $\angle ACB$ in degrees? (2001)



- (a) 140 (b) 70
(c) 100 (d) None of these

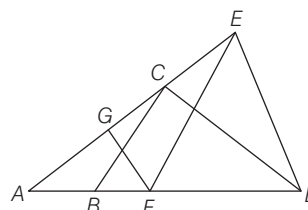
- 47) A ladder leans against a vertical wall. The top of the ladder is 8 m above the ground. When the bottom of the ladder is moved 2 m farther away from the wall, the top of the ladder rests against the foot of the wall. What is the length of the ladder? (2001)

- (a) 10 m (b) 15 m (c) 20 m (d) 17 m

- 48) $ABCD$ is a rhombus with the diagonals AC and BD intersecting at the origin on the x - y plane. The equation of the straight line AD is $x + y = 1$. What is the equation of BC ? (2000)

- (a) $x + y = -1$ (b) $x - y = -1$
(c) $x + y = 1$ (d) None of these

- 49) In the figure below, $AB = BC = CD = DE = EF = FG = GA$. Then, $\angle DAE$ is approximately. (2000)

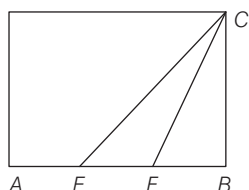


- (a) 15° (b) 20° (c) 30° (d) 25°

- 50) If a , b and c are the sides of a triangle and $a^2 + b^2 + c^2 = bc + ca + ab$, then the triangle is (2000)

(a) equilateral (b) isosceles
(c) right angled (d) obtuse angled

- 51) In the given diagram, $ABCD$ is a rectangle with $AE = EF = FB$. What is the ratio of the area of the triangle CEF and that of the rectangle? (2000)



(a) 1 : 4 (b) 1 : 6 (c) 2 : 5 (d) 2 : 3

- 52) There is a circle of radius 1 cm. Each member of sequence of regular polygons $S_1(n)$, $n = 4, 5, 6, \dots$, where n is the number of sides of the polygon, is circumscribing the circle and each member of the sequence of regular polygons $S_2(n)$, $n = 4, 5, 6, \dots$, where n is the number of sides of the polygon, is inscribed in the circle. Let $L_1(n)$ and $L_2(n) = 4, 5, 6, \dots$, where n is the number of sides of the polygon, in inscribed in the circle. Let $L_1(n)$ and $L_2(n)$ denote the perimeters of the corresponding polygons of $S_1(n)$ and $S_2(n)$, then $\frac{\{L_1(13) + 2\pi\}}{L_2(17)}$ is (1999)

(a) greater than $\pi/4$ and less than 1
(b) greater than 1 and less than 2
(c) greater than 2
(d) less than $\pi/4$

Directions (Q.Nos. 53-54) Answer the questions based on the following information.

A rectangle $PRSU$ is divided into two smaller rectangles $PQTU$ and $QRST$ by the line TQ . $PQ = 10$ cm, $QR = 5$ cm and $RS = 10$ cm. Points A, B, F are within rectangle $PQTU$ and points C, D, E are within the rectangle $QRST$. The closest pair of points among the pairs $(A, C), (A, D), (A, E), (F, C), (F, D), (F, E), (B, C), (B, D), (B, E)$ are $10\sqrt{3}$ cm apart. (1999)

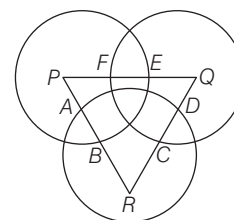
- 53) Which of the following statements is necessarily true?

(a) The closest pair of points among the six given points cannot be (F, C) .
(b) Distance between A and B is greater than that between F and C .
(c) The closest pair of points among the six given points is $(C, D), (D, E)$ or (C, E) .
(d) Cannot be determined.

- 54) $AB > AF > BF$; $CD > DE > CE$ and $BF = 6\sqrt{5}$ cm. Which is the closest pair of points among all the six given points?

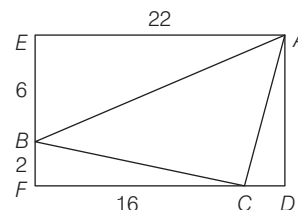
(a) B, F (b) C, D
(c) A, B (d) cannot be determined

- 55) Below shown are three circles, each of radius 20 and centres at P, Q and R ; further $AB = 5$, $CD = 10$, $EF = 12$. What is the perimeter of the triangle PQR ? (1998)



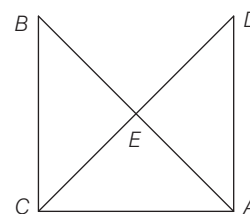
(a) 120 (b) 66 (c) 93 (d) 87

- 56) In the given figure, $FADF$ is a rectangle and ABC is a triangle whose vertices lie on the sides of $EADF$. $AE = 22$, $BE = 6$, $CF = 16$ and $BF = 2$. Find the length of the line joining the mid-points of the sides AB and BC . (1997)



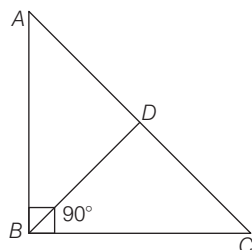
(a) $4\sqrt{2}$ (b) 5
(c) 3.5 (d) None of these

- 57) In the adjoining figure, points A, B, C and D lie on the circle. $AD = 24$ and $BC = 12$. What is the ratio of the area of $\triangle CBE$ to that of the triangle $\triangle ADE$? (1997)



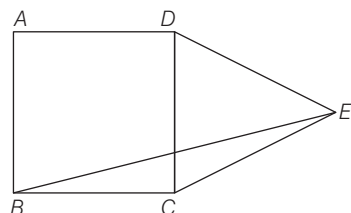
(a) 1 : 4 (b) 1 : 2
(c) 1 : 3 (d) Data insufficient

- 58) In $\triangle ABC$, $\angle B$ is a right angle, $AC = 6$ cm and D is the mid-point of AC . The length of BD is (1996)



- (a) 4 cm (b) $\sqrt{6}$ cm
(c) 3 cm (d) 3.5 cm

- 59) If $ABCD$ is square and BCE is an equilateral triangle, what is the measure of $\angle DEC$? (1996)

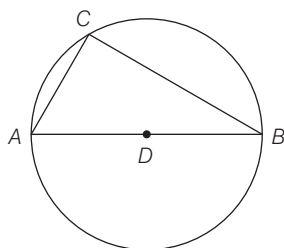


- (a) 15° (b) 30°
(c) 20° (d) 45°

- 60) The points of intersection of three lines $2X + 3Y - 5 = 0$, $5X - 7Y + 2 = 0$ and $9X - 5Y - 4 = 0$ (1996)

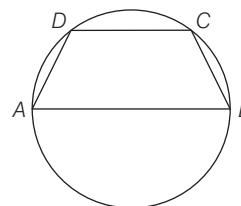
- (a) form a triangle
(b) are on lines perpendicular to each other
(c) are on lines parallel to each other
(d) are coincident

- 61) The figure shows a circle of diameter AB and radius 6.5 cm. If chord CA is 5 cm long, find the area of $\triangle ABC$. (1996)



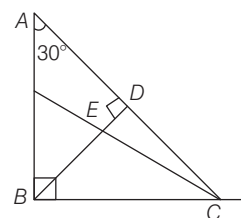
- (a) 60 sq cm (b) 30 sq cm
(c) 40 sq cm (d) 52 sq cm

- 62) In the given figure, AB is diameter of the circle and points C and D are on the circumference such that $\angle CAD = 30^\circ$ and $\angle CBA = 70^\circ$. What is the measure of $\angle ACD$? (1995)



- (a) 40° (b) 50°
(c) 30° (d) 90°

- 63) $AB \perp BC$, $BD \perp AC$, CE bisects $\angle C$, $\angle A = 30^\circ$. Then, what is $\angle CED$? (1995)



- (a) 30° (b) 60°
(c) 45° (d) 65°

Directions (Q.Nos. 64-67) Answer the questions based on the following information.

ABC forms an equilateral triangle in which B is 2 km from A . A person starts walking from B in a direction parallel to AC and stops when he reaches a point D directly East of C . He, then reverses direction and walks till he reaches a point E directly South of C . (1993)

- 64) Then, D is

- (a) 3 km East and 1 km North of A
(b) 3 km East and $\sqrt{3}$ km North of A
(c) $\sqrt{3}$ km East and 1 km South of A
(d) $\sqrt{3}$ km West and 3 km North of A

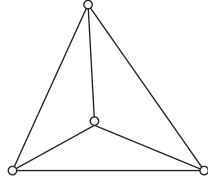
- 65) The total distance walked by the person is

- (a) 3 km (b) 4 km (c) $2\sqrt{3}$ km (d) 6 km

- 66) Consider the five points comprising the vertices of a square and the intersection point of its diagonals. How many triangles can be formed using these points?

- (a) 4 (b) 6 (c) 8 (d) 10

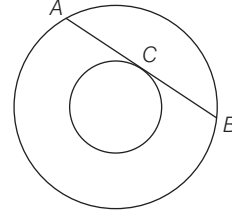
- 67) Four cities are connected by a road network as shown in the figure. In how many way can you start from any city and come back to it without travelling on the same road more than once? (1993)



(a) 8
(c) 16

(b) 12
(d) 20

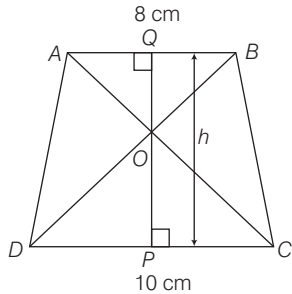
- 68) The line AB is 6 m in length and is tangent to the inner one of the two concentric circles at point C . It is known that the radii of the two circles are integers. The radius of the outer circle is (1993)



(a) 5 m (b) 4 m (c) 6 m (d) 3 m

HINTS & SOLUTIONS

- 1) Area = $\frac{1}{2} (8 + 10) h \Rightarrow 9 \times h = 27 \Rightarrow h = 3$ cm



In trapezium $ABCD$, $AB \parallel CD$

$\angle CAB = \angle OCD$ [alternate interior angles]

$\angle ABD = \angle CDB$ [alternate interior angles]

$\triangle AOB \sim \triangle COD$ [AA similarity]

$$\frac{AO}{OC} = \frac{BO}{OD} = \frac{AB}{CD} = \frac{4}{5}$$

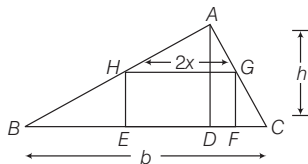
$$\frac{OP}{OQ} = \frac{10}{8} = \frac{5}{4}$$

[altitudes should also be in the same ratio]

$$\Rightarrow \frac{OP}{OP + OQ} = \frac{5}{5 + 4} \Rightarrow \frac{OP}{PQ} = \frac{5}{9}$$

$$\Rightarrow OP = \frac{5}{9} PQ \Rightarrow OP = \frac{5}{9} \times 3 \Rightarrow OP = \frac{5}{3} \text{ cm}$$

- 2) (c) Here, $\triangle BEH$ and $\triangle BDA$ are similar.



$$\frac{BE}{BD} = \frac{HE}{AD} \Rightarrow \frac{BE}{BD} = \frac{x}{h} \quad \dots(i)$$

$\triangle CFG$ and $\triangle CDA$ are similar.

$$\frac{CF}{CD} = \frac{FG}{DA} \Rightarrow \frac{CF}{CD} = \frac{x}{h} \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$BE = \frac{x}{h} BD \text{ and } CF = \frac{x}{h} CD$$

$$\therefore BE + CF = b - 2x$$

$$\Rightarrow b - 2x = \frac{x}{h} (BD + CD) = \frac{x}{h} (b) \Rightarrow bh - 2hx = xb$$

$$\Rightarrow x(b + 2h) = bh \Rightarrow x = \frac{bh}{b + 2h}$$

- 3) $\because AC = BC = 3$ cm (perpendicular from the centre bisects)

So, if the radii of the inner and outer circles are r_1 and r_2 respectively, then OCB is a right angled triangle.

$$r_1^2 + 3^2 = r_2^2$$

Getting, Geometry shortcut - Triplets

If one side is 3 cm, then other two sides will be 4 cm and 5 cm as only triplets with 3 in it is 3-4-5.

$$\therefore r_2 = 5 \text{ cm}$$

So, the radius of outer circle is 5 cm.

- 4) (c) $\because \frac{l}{b} = \frac{(l+b)}{l}$

$$\Rightarrow l^2 = b(l+b) = lb + b^2$$

$$\Rightarrow l^2 - b^2 = lb \quad \dots(i)$$

$$\Rightarrow (l+b)(l-b) = lb \quad \dots(ii)$$

$$\text{and } \frac{(l+b)}{l} = \frac{b}{(l-b)} \quad \dots(iii)$$

Therefore, Statements II and III are true from Eqs.

(ii) and (iii), respectively

$$\frac{l^2}{b^2} = \frac{bl + b^2}{b^2}$$

$$\Rightarrow \frac{l^2}{b^2} = 1 + \frac{l}{b} \Rightarrow \frac{l}{b} = \frac{l^2}{b^2} - 1$$

Hence, Statement I is not true.

- 5) (b) Given, radius of each circular park = r

$\therefore$ Distance travelled by $A = a = 3 \times 2r = 6r$

$\Delta A_1 B_1 D$ is a 30° , 60° and 90° triangle.

So, $B_1 D = \frac{\sqrt{3}r}{2}$

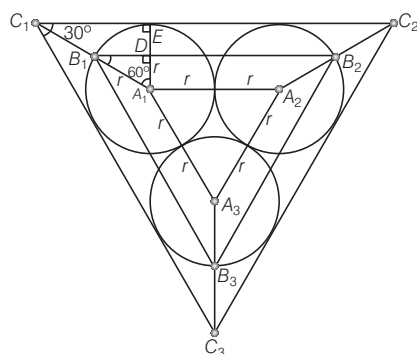
$$\Rightarrow B_1 B_2 = 2r + 2 \times \frac{\sqrt{3}r}{2} = r(2 + \sqrt{3})$$

Now, distance travelled by B

$$= b = 3 \times r(2 + \sqrt{3}) = 3r(2 + \sqrt{3})$$

$\Delta A_1 C_1 E$ is a 30° , 60° and 90° triangle.

So, $C_1 E = \sqrt{3}r$



$$\Rightarrow C_1 C_2 = 2r + 2\sqrt{3}r = 2r(1 + \sqrt{3})$$

and distance travelled by

$$C = c = 3 \times 2r(1 + \sqrt{3}) = 6r(1 + \sqrt{3})$$

Now, $b - a = 3\sqrt{3}r$ and $c - b = 3\sqrt{3}r$

- 6) (c) Time required by A to finish her sprint

$$= \frac{2r}{20} + \frac{2r}{30} + \frac{2r}{15} = \frac{3r}{10}$$

Now, distance travelled by B in this time

$$= \frac{3r}{10} \times (10\sqrt{3} + 20) = 3r(2 + \sqrt{3})$$

So, B will be at B_1 .

Now, distance travelled by C in this time

$$= \frac{40}{3} (1 + \sqrt{3}) \times \frac{3r}{10} = 4r(1 + \sqrt{3})$$

Hence, C will be on point C_3 .

- 7) (b) Here, $u^2 = \frac{\sqrt{3}}{4} \times (2r)^2 \Rightarrow u = 3^{1/4} \cdot r$

$$v^2 = \frac{\sqrt{3}}{4} \times \{r(2 + \sqrt{3})\}^2$$

$$\therefore v = \frac{3^{1/4} (2 + \sqrt{3})r}{2}$$

$$w^2 = \frac{\sqrt{3}}{4} \times \{2r(1 + \sqrt{3})\}^2$$

$$\therefore w = 3^{1/4} \cdot r(1 + \sqrt{3})$$

Time required by B to reach

$$B_3 = \frac{2r(2 + \sqrt{3}) \times 2}{3^{1/4} r(2 + \sqrt{3})} = \frac{4}{3^{1/4}}$$

$$\text{Distance covered by } A \text{ in this time} = 3^{1/4} \cdot r \cdot \frac{4}{3^{1/4}} = 4r$$

So, A will be at A_3 .

Distance covered by C in this time

$$= 3^{1/4} \cdot r \cdot (1 + \sqrt{3}) \times \frac{4}{3^{1/4}} = 4r(1 + \sqrt{3})$$

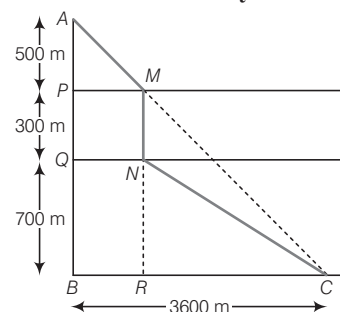
Hence, C will be at C_3 .

- 8) Let MN be the bridge.

Then, $\Delta APM \sim \Delta ABC$

$$\frac{AP}{PM} = \frac{AB}{BC} \Rightarrow \frac{500}{PM} = \frac{1500}{3600}$$

$$\Rightarrow PM = 1200 = QN = BR$$



$$\therefore RC = BC - BR = 2400 \text{ m}$$

$$\text{and } NR = BQ = 700 \text{ m}$$

$$\therefore NC = \sqrt{NR^2 + RC^2} \Rightarrow NC = 2500 \text{ m}$$

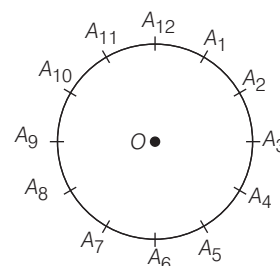
$$\text{Also, } AM = \sqrt{AP^2 + PM^2} \Rightarrow AM = 1300 \text{ m}$$

Hence, total distance to be travelled

$$= AM + MN + NC$$

$$= 1300 + 300 + 2500 = 4100 \text{ m}$$

- 9) (d) In order that the circumcentre lies on one of the sides, the triangle must be right angled.

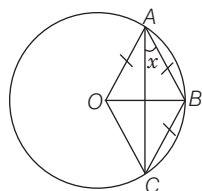


If A_6, A_{12} is one of the sides, there can be 10 other vertices to form 10 distinct right angled triangles.
Similarly, if A_1, A_7 is one of the sides, 10 other vertices can be taken to form 10 distinct right angled triangles.

There are 6 distinct diameters that can be drawn with the given set of twelve points.

$\therefore$ Number of right angled triangles = $6 \times 10 = 60$

- 10) (b) Given that, $OA = AB = BC$ and $OA = OC$ (radii)



Thus, we have a rhombus $OACB$.

As $OA = AB = OB$, we have an equilateral $\triangle OAB$

So, $\angle OAB = 60^\circ$

From the symmetry of the figure, $\triangle OAC$ and $\triangle ABC$ are congruent.

$$\therefore x = \frac{1}{2}(60^\circ) = 30^\circ$$

- 11) (c) In smaller circle, OP is the diameter of the circle.

So, $\angle ORP = 90^\circ$

$OP = 10$ cm (radius of bigger circle)

$OR = 8$ cm

In $\triangle OPR$, $OP^2 = OR^2 + RP^2$

$$10^2 = 8^2 + RP^2$$

$$100 - 64 = RP^2$$

$$RP = \sqrt{36} = 6 \text{ cm}$$

Also, $OR \perp SP$, so it passes through the centre.

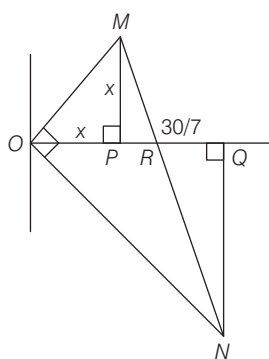
$$\therefore SP = 2 RP = 2 \times 6 = 12 \text{ cm}$$

- 12) (c) Let $OP = x$

$$\therefore PM = x$$

$$OR = 40/7$$

$$QN = 10 \quad (OQ = 10, RQ = 30/7)$$

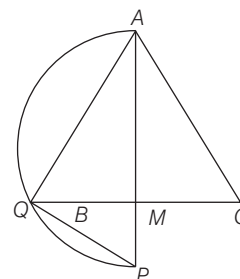


We have, $PM / PR = QN / QR$

$$\text{i.e., } \frac{x}{\frac{40}{7} - x} = \frac{10}{\frac{30}{7}} = \frac{7}{3} \Rightarrow \frac{7x}{40 - 7x} = \frac{7}{3}$$

$$\Rightarrow 21x = 280 - 49x \Rightarrow x = 4$$

- 13) (b)



$\angle PQA$ (as shown) = 90° (angle in a semi-circle)

$$(MP)(MA) = MQ^2$$

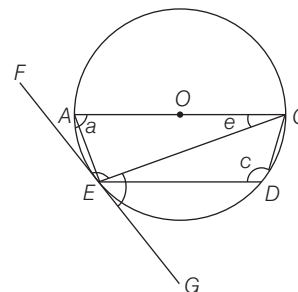
If $BM = 1$, $MP = 1$ and $AM = \sqrt{3}$

$\therefore AM$ is the median and $MQ = 3^{1/4}$

$$\therefore T = MQ^2 = \sqrt{3} \text{ while } S = \frac{\sqrt{3}}{4}(4) = \sqrt{3}$$

$$\therefore T = S$$

- 14) (c) Given, $\angle GEC = 52^\circ$



$\angle OAE = \angle GEC = 52^\circ$ (alternate segment theorem)

As, O is the centre of the circle A .

In $\triangle OAE$,

$$\therefore \angle OCE = 180^\circ - 90^\circ - 52^\circ = 38^\circ$$

($\because \angle AEC$ is an angle in a semi-circle)

$ACDE$ is a cyclic quadrilateral.

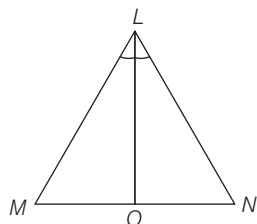
$$\therefore c = 180 - a = 180 - 52^\circ = 128^\circ$$

$$\therefore \angle e + \angle c = 38^\circ + 128^\circ = 166^\circ$$

- 15) (a) The point which divides all the medians in the ratio $2 : 1$ is the centroid of the triangle.

$$\begin{aligned} \text{Centroid of } \triangle XYZ &= O \equiv \left(\frac{6-3+2}{3}, \frac{4+5-4}{3} \right) \\ &\equiv \frac{5}{3}, \frac{5}{3} \end{aligned}$$

16) (a)



Since LO is the angle bisector of $\angle MLN$ and the median of MN .

$\therefore$ By interior angle bisector theorem,

$$\frac{LM}{LN} = \frac{MO}{ON} \text{ and } MO = ON$$

$$\therefore \frac{LM}{LN} = 1$$

$$\therefore LM = LN$$

$\therefore \triangle LMN$ is isosceles triangle.

$$\triangle LOM \cong \triangle LON \quad (\text{s-s-s test})$$

$$\therefore \angle LON = \angle LOM = 90^\circ$$

In right angled $\triangle LOM$, $LM = 5$, $LO = 3$

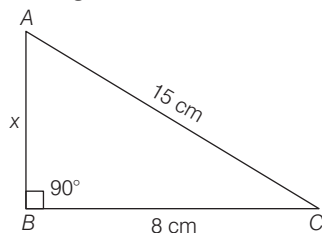
$$\therefore MO = 4$$

$$\begin{aligned} \therefore \text{Area of } \triangle LMN &= \frac{1}{2} \times MN \times LO \\ &= \frac{1}{2} \times 2 \times 4 \times 3 = 12 \text{ sq cm} \end{aligned}$$

17) (c) Given that three sides of the obtuse triangle are 8 cm, 15 cm and x cm.

Now, x will either be greater or smaller than 15. Let us discuss both the cases.

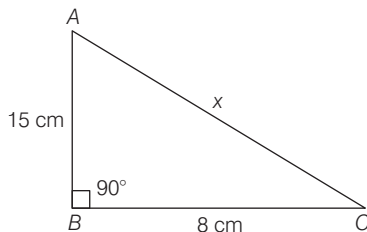
Consider the right $\triangle ABC$,



$$x = \sqrt{225 - 64} = 12.68 \text{ cm}$$

For all values of $x < 12.68$, the $\triangle ABC$ will be obtuse.

But the sum of two sides of triangle must be greater than the third side, hence $(x + 8) > 15$ or $x > 7$, thus the permissible values of x are 8, 9, 10, 11 and 12.



In the right $\triangle ABC$ above $x = \sqrt{15^2 + 8^2} = 17$

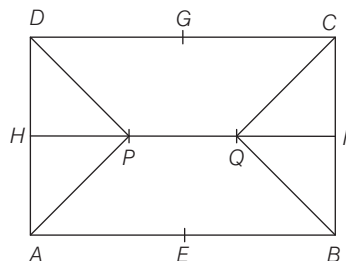
For all values of $x > 17$ $\triangle ABC$ will be obtuse.

But $x < (15 + 8)$ or $x < 23$.

The permissible values of x are 18, 19, 20, 21 and 22.

$\therefore$ In view of both the cases total number of triangles, so formed will be 10.

18) (e)



Let the length of $AH = x$ cm

From the figure, it is clear that $\triangle APD$ and $\triangle BQC$ will have the same area [There is no need to apply theorem/formulae, as the symmetry of figure is very clear].

$\because \angle APD$ is 120° and line L divides the square $ABCD$ in 2 equal halves, therefore $\angle APH = \angle HPD = 60^\circ$

$$\text{In } \triangle AHP, \tan 60^\circ = \frac{AH}{HP} \Rightarrow HP = \frac{x}{\sqrt{3}} \text{ cm}$$

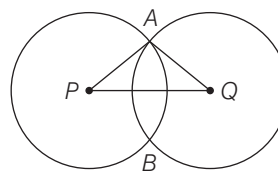
Area of $\triangle APD = 2 \times \text{area of } (\triangle AHP)$

$$= 3 \times \frac{1}{2} \times x \times \frac{x}{\sqrt{3}} = \frac{x^2}{\sqrt{3}} \text{ cm}^2$$

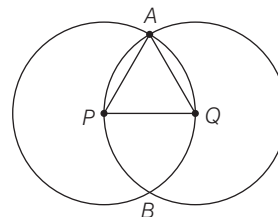
Area of $ABQCDP = \text{area } (ABCD) - 2 \text{ area } (\triangle ABD)$

$$= 4x^2 - \frac{2x^2}{\sqrt{3}} = \frac{2x^2(2\sqrt{3} - 1)}{\sqrt{3}} = (2\sqrt{3}) - 1 \text{ cm}^2$$

19) (b)



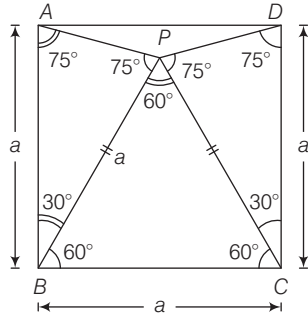
If P and Q lie on the intersections of the circles as shown in the figure given below.



In this case, triangle APQ is equilateral. So, the maximum possible measure of the angle AQP is 60° .

The answer is between 0° and 60° .

- 20) (e) Let the side of the square be a , then the sides of equilateral $\triangle PBC$ will be $PB = PC = BC = a$.

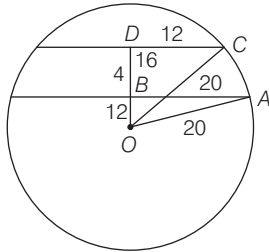


and $\angle PBC = \angle BCP = \angle CPB = 60^\circ$
 (angles of the equilateral triangle)
 $\angle BAP = \angle BPA = 75^\circ$
 (angles opposite to equal sides)

$$\therefore \angle PAD = \angle PDA = 15^\circ$$

$$\therefore \angle APD = 180^\circ - (15^\circ + 15^\circ) = 150^\circ$$

- 21) (d) $OB^2 = OA^2 - AB^2 = 20^2 - 16^2 = 144$



$$OB = 12$$

$$OD^2 = 20^2 - 12^2 = 400 - 144 = 256$$

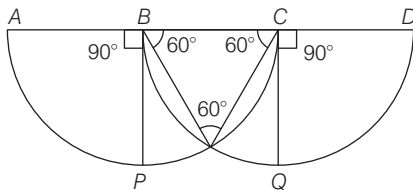
$$OD = 16$$

$$BD = 4$$

Only one option contains 4, hence other will be 28.

- 22) (b) Drawn figure since it have not to be within distance of 1 cm, so it will go along $APQD$.

$$AP = \frac{90^\circ}{360^\circ} \times 2\pi \times 1 = \frac{\pi}{2}$$

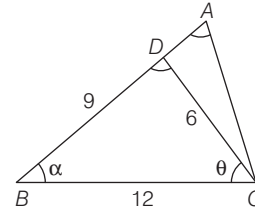


Also, $AP = QD = \frac{\pi}{2}$

So, the minimum distance the ant must travel.

$$= AP + PQ + QD = \frac{\pi}{2} + 1 + \frac{\pi}{2} = 1 + \pi$$

- 23) (a) Here, $\angle ACB = \theta + 180 - (2\theta + \alpha) = 180 - (\theta + \alpha)$



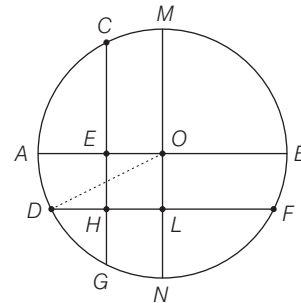
So, here we can say that $\triangle BCD$ and $\triangle ABC$ will be similar.

According to property of similarity, $\frac{AB}{12} = \frac{12}{9}$.

Hence, $\frac{AB}{6} = \frac{12}{9} \Rightarrow AC = 8$

Hence, $AD = 7, AC = 8$
 Now, $\frac{\text{Perimeter of } \triangle ADC}{\text{Perimeter of } \triangle BDC} = \frac{6 + 7 + 8}{9 + 6 + 12} = \frac{21}{27} = \frac{7}{9}$

- 24) (b) $HL = OE = \frac{1}{2}$



$$DL = DH + HL$$

$$DL = DH + \frac{1}{2}$$

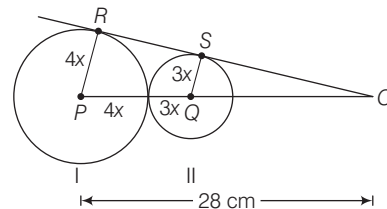
$$OB = AO = \text{radius} = 1.5$$

$$DO^2 = OL^2 + DL^2$$

$$\left(\frac{3}{2}\right)^2 = \left(\frac{1}{2}\right)^2 + \left(DH + \frac{1}{2}\right)^2$$

$$\Rightarrow \left(DH + \frac{1}{2}\right)^2 = 2 \Rightarrow DH = \sqrt{2} - \frac{1}{2} = \frac{2\sqrt{2} - 1}{2}$$

- 25) (b) In $\triangle OSQ$ and $\triangle QRP$,
 $\angle O$ is the common angle.



$\angle OSQ = \angle ORP = 90^\circ$ (angle between the radius and the tangent $= 90^\circ$).

As the two angles are equal, the third angle should also be equal, i.e. $\angle RPO = \angle SQO$.

$\therefore \triangle OSQ \sim \triangle ORP$

$$\therefore \frac{SQ}{RP} = \frac{OQ}{OP} = \frac{3}{4} \Rightarrow \frac{OQ}{OQ + PQ} = \frac{3}{4}$$

$$\Rightarrow 4OQ = 3OQ + 3PQ \Rightarrow OQ = 3PQ$$

$$\Rightarrow \frac{PQ}{OQ} = \frac{1}{3}$$

- 26) (b) From the above problem, as $PQ:QO$ is 1:3.

$$\Rightarrow PQ:OP (= PQ + QO) = 1:4$$

$$\therefore PQ = \frac{1}{4} \times OP = \frac{1}{4} \times 28 = 7$$

$PQ =$ Radius of circle I + radius of circle II

$= 4x + 3x$ (as the diameters of the two circles in the ratio is 4:3, the ratio of their radii is also 4:3)

$$\therefore 7x = 7 \Rightarrow x = 1$$

$\therefore$ Radius of circle II is $3x = 3 \times 1 = 3$ cm

- 27) (c) As $\triangle SOQ$ is a right angled triangle.

$$\therefore OS^2 + SQ^2 = OQ^2$$

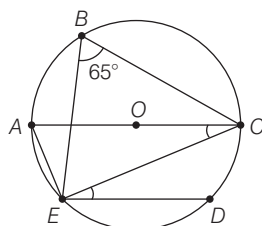
$$OS^2 + 3^2 = 21^2$$

$$(OS)^2 + 9 = 441$$

$$(OS) = \sqrt{441 - 9} = \sqrt{432} = 12\sqrt{3} \text{ cm}$$

- 28) (d) $ED \parallel AC$, $\angle CBE = 65^\circ$

Now, $\angle AEC = 90^\circ$ (angle in a semi-circle.)



$\angle CAE = \angle CBE = 65^\circ$ (angle in the same segment)

Since, $\angle CAE = 65^\circ$ and $\angle AEC = 90^\circ$

$$\angle ACE = 180^\circ - (90^\circ + 65^\circ)$$

$$\angle ACE = 25^\circ, \angle ACE = \angle DEC$$

(alternate angles are equal as $AC \parallel ED$)

$$\therefore \angle DEC = 25^\circ$$

- 29) (b) $BO = AO =$ radius $= \frac{8}{2} = 4$

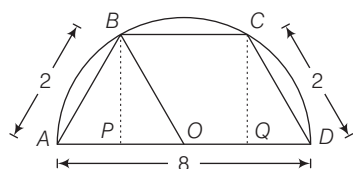


Fig. (a)

Now, consider the triangle ABO .

From B , drop a perpendicular (BD) on to AO .

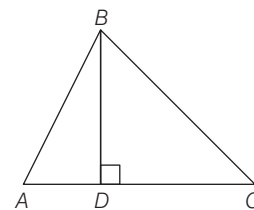


Fig. (b)

$\therefore$ Area of $\triangle ABO$ is $\frac{1}{2} \times AO \times BP$, which can also be calculated as $\sqrt{s(s-a)(s-b)(s-c)}$.

$\therefore$ We have, $\frac{1}{2} (d) (BP) = \sqrt{s(s-a)(s-b)(s-c)}$

$$s = \frac{4+4+2}{2} = 5$$

$$2 (BP) = \sqrt{5(a)(a)(b)} = \sqrt{15}$$

$$BP = \frac{\sqrt{15}}{2}$$

In $\triangle ADO$, we have $OP^2 = (OB)^2 - (BD)^2$

$$OP^2 = 16 - \frac{15}{4} = \frac{49}{4}$$

$$\Rightarrow OP = \frac{7}{2}$$

$$\text{Similarly, } OQ = \frac{7}{2}$$

In Fig. (a) drop perpendiculars from B and C meeting AD at P and Q , respectively.

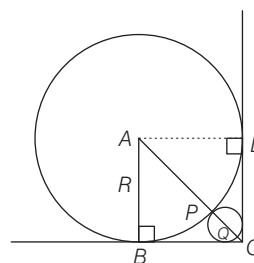
$\therefore$ We have, $BC = PQ$ and

$$PQ = PO + OQ = \frac{7}{2} + \frac{7}{2} = 7$$

- 30) (a) Let the side of the cube be a .

$\therefore$ The diagonal of the cube is $\sqrt{3}a$, i.e.

$$DF = AG = CE = \sqrt{3}a$$



$\therefore$ The length of the three sides of the triangle are each equal to $\sqrt{3}a$. So, we have an equilateral triangle of side $\sqrt{3}a$.

The altitude (or median) of this triangle is

$$\frac{\sqrt{3}}{2} (\sqrt{3}a) = \frac{3a}{2}$$

Now, radius of the circle circumscribing the triangle is $\frac{2}{3}$ of $\frac{3a}{2} = a$ (because centroid divides the altitude in

the ratio 2:1).

$\therefore$ Radius of the circumcircle is equal to the side of the cube.

- 31) (d) Let the radii of the bigger and smaller circles be R and r , respectively

$\therefore$ In the figure $AB = AD = R$.

As $\angle ADC = 90^\circ$; $\angle ABC = 90^\circ$ and $\angle DCB = 90^\circ$

$\therefore ABCD$ is a square.

$\therefore BC = R$ and $AC = \sqrt{2}R$ and $AC = AP + PQ + QC$
 $= R + r + \sqrt{2}r$ [$QC = \sqrt{2}r$ can be proved in the same way, as we proved $AC = \sqrt{2}R$]

$$\therefore r = \frac{(\sqrt{2} - 1)R}{\sqrt{2} + 1}$$

Rationalising the denominator, we get

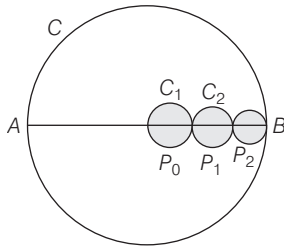
$$r = (3 - 2\sqrt{2})R$$

Given $R = 2$, we get

$$r = 2(3 - 2\sqrt{2}) \\ = 6 - 4\sqrt{2}$$

- 32) (d) Let $P_0B = R$, then Area of circle $C = \pi R^2$

Now, $P_0P_1 = P_1B = R/2$ (diameter of C_1)



$$\therefore \text{Area of circle } C_1 = \pi (R/4)^2 = \frac{\pi R^2}{16}, P_1P_2 = P_2B = R/4;$$

$$\text{Area of circle } C_2 = \pi (R/8)^2 = \frac{\pi R^2}{64}$$

Similarly, $P_3B = R/8$

$$\therefore \text{Area of circle } C_3 = \pi (R/16)^2 = \frac{\pi R^2}{256} \text{ and so on.}$$

$\therefore$ Area of shaded position

$$= \text{Area of } C_1 + \text{Area of } C_2 + \text{Area of } C_3 + \dots$$

$$= \pi R^2/16 + \pi R^2/64 + \pi R^2/256 + \dots$$

$$= \frac{\pi R^2}{16} \left[1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \dots \right]$$

$$= \frac{\pi R^2}{16} \left(\frac{1}{1 - \frac{1}{4}} \right) = \frac{\pi R^2}{16} \times \frac{4}{3} = \frac{\pi R^2}{12}$$

$\Rightarrow$ Area of the unshaded portion

$$= \pi R^2 - \frac{\pi R^2}{12} = \frac{11\pi R^2}{12}$$

Hence, ratio of area of unshaded area to area of circle C is

$$= \frac{11\pi R^2}{12} : \pi R^2 = 11:12$$

Alternative method

Let the radius and area of the big circle (C) be R and A , respectively. The diameter of the biggest of the smaller circles P_0P_1 is of $R/2$, i.e. its radius is $R/4$ and its area A_0 is $A/16$.

The areas of successive circles form a geometric progression with common ratio $1/4$. Therefore, the shaded area is $\frac{A/16}{1 - 1/4} = \left(\frac{A}{16}\right)\left(\frac{4}{3}\right) = \frac{A}{12}$

The unshaded portion is $\frac{11A}{12}$.

The ratio of the unshaded portion to the total area of circle (C) is 11:12.

- 33) (a) Given, radius of each circular park = r

$\Rightarrow$ Distance travelled by $A = a = 3 \times 2r = 6r$

ΔA_1B_1D is a $30^\circ, 60^\circ, 90^\circ$ triangle.

$$\text{So, } B_1D = \frac{\sqrt{3}r}{2}.$$

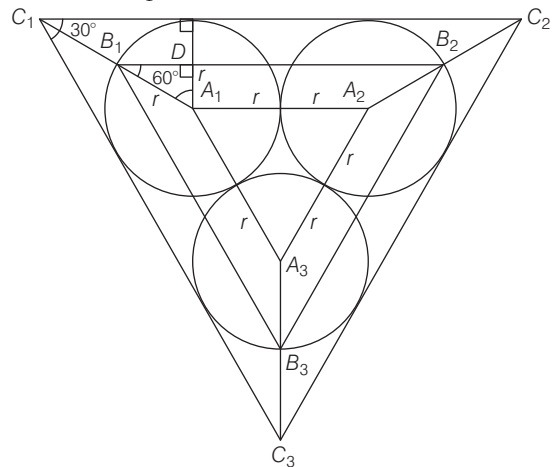
$$\Rightarrow B_1B_2 = 2r + 2 \times \frac{\sqrt{3}}{2} = r(2 + \sqrt{3})$$

$\Rightarrow$ Distance travelled by B

$$= b = 3 \times r(2 + \sqrt{3}) = 3r(2 + \sqrt{3})$$

ΔA_1C_1E is a $30^\circ, 60^\circ, 90^\circ$ triangle.

$$\text{So, } C_1E = \sqrt{3}r.$$



$$\Rightarrow C_1C_2 = 2r + 2\sqrt{3}r = 2r(1 + \sqrt{3})$$

$\Rightarrow$ Distance travelled by C

$$= c = 3 \times 2r(1 + \sqrt{3}) = 6r(1 + \sqrt{3})$$

$$\text{Now, } b - a = 3\sqrt{3}r \text{ and } c - b = 3\sqrt{3}r.$$

- 34) (c) Time required by A to finish her sprint

$$= \frac{2r}{20} + \frac{2r}{30} + \frac{2r}{15} = \frac{3r}{10}$$

Now, distance travelled by B in this time

$$= \frac{3r}{10} \times (10\sqrt{3} + 20) = 3(r + 2\sqrt{3})$$

So, B will be at B_1 .

Now, distance travelled by C in this time

$$= \frac{40}{3} (1 + \sqrt{3}) \times \frac{3r}{10} = 4r(1 + \sqrt{3})$$

So, C will be on point C_3 .

- 35) (b) $u^2 = \frac{\sqrt{3}}{4} \times (2r)^2 \Rightarrow u = 3^{1/4} \cdot r$

$$v^2 = \frac{\sqrt{3}}{4} \times \{r(2 + \sqrt{3})\}^2$$

$$\Rightarrow v = \frac{3^{1/4} (2 + \sqrt{3}) r}{2}$$

$$w^2 = \frac{\sqrt{3}}{4} \times \{2r(1 + \sqrt{3})\}^2$$

$$\Rightarrow w = 3^{1/4} \cdot r(1 + \sqrt{3})$$

Time required by to reach

$$B_3 = \frac{2r(2 + \sqrt{3}) \times 2}{3^{1/4} r(2 + \sqrt{3})} = \frac{4}{3^{1/4}}$$

Distance covered by A in this time $= 3^{1/4} \cdot r \cdot \frac{4}{3^{1/4}} = 4r$

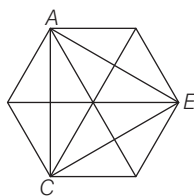
So, A will be at A_3 .

Distance covered by C in this time

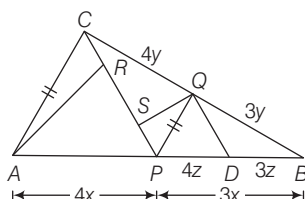
$$= 3^{1/4} \cdot r \cdot (1 + \sqrt{3}) \times \frac{4}{3^{1/4}} = 4r(1 + \sqrt{3})$$

So, C will be at C_3 .

- 36) (b) We can see that the hexagon is actually divided into 2 equal parts.



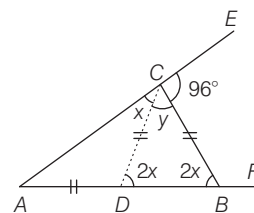
- 37) (c) $PD = \frac{4z}{7z} \times 3x = \frac{12x}{7}$



$$AP = 4x$$

$$\therefore AP:PD = 4x:\frac{12x}{7} = 7:3$$

- 38) (c) Refer to the diagram given sidewise. Thus,
 $x + y = 180 - 96$



$$\Rightarrow x + y = 84 \quad \dots(i)$$

Also, for $\triangle CDB$

$$4x + y = 180 \quad \dots(ii)$$

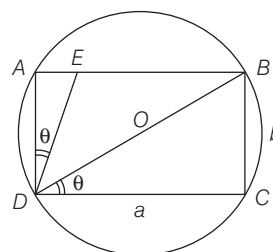
Solving Eqs. (i) and (ii), we get

$$3x = 96 \Rightarrow x = 32$$

$$\therefore \angle DBC = 2x = 64^\circ$$

- 39) (a) We have, $\frac{\pi R^2}{ab} = \frac{\pi}{\sqrt{3}}$

$$\Rightarrow \sqrt{3}R^2 = ab \quad \dots(i)$$



From $\triangle DBC$,

$$\tan \theta = \frac{BC}{DC} = \frac{b}{a} \quad \dots(ii)$$

From $\triangle DAE$,

$$\tan \theta = \frac{AE}{AD} = \frac{AE}{b} \quad \dots(iii)$$

From Eqs. (ii) and (iii), we get

$$\frac{AE}{AD} = \frac{b}{a}$$

From $\triangle DBC$, $4R^2 = a^2 + b^2$

$$\Rightarrow 4R^2 = a^2 + \frac{3R^4}{a^2}$$

$$\Rightarrow a^4 - 4R^2a^2 + 3R^4 = 0$$

$$\Rightarrow a^4 - 3R^2a^2 - R^2a^2 + 3R^4 = 0$$

$$\Rightarrow a^2(a^2 - 3R^2) - R^2(a^2 - 3R^2) = 0$$

$$\Rightarrow a^2 = R^2 \text{ and } a^2 = 3R^2$$

$$\Rightarrow a = R \text{ and } a = \sqrt{3}R$$

and $b = \sqrt{3}R$, when $a = R$.

$$b = R, \text{ when } a = \sqrt{3}R.$$

Hence, required ratio is $1:\sqrt{3}$.

- 40) (a) In triangle ACT, $\angle C = 50^\circ$, $\angle T = 30^\circ$

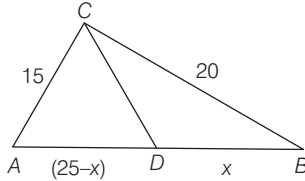
$$\therefore \angle A = 100^\circ$$

Applying tangent secant theorem,
 $\angle B = 50^\circ$ and since $\angle CAT$ each the external angle of the triangle ABC

$$\angle BCA = 50^\circ$$

$$\therefore \angle BOA = 100^\circ$$

$$\begin{aligned} 41) \text{ (c) In } \triangle CAD, CD^2 &= (15)^2 - (25-x)^2 \\ &= 225 - 625 - x^2 + 50x \end{aligned} \quad \dots(i)$$



$$\text{In } \triangle CDB, CD^2 = 400 - x^2 \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$50x - x^2 - 400 = 400 - x^2$$

$$\Rightarrow x = 16 \text{ cm}$$

Hence, $AD = 9 \text{ cm}$, $BD = 16 \text{ cm}$ and $CD = 12 \text{ cm}$

Now, For $\triangle CAD$,

$$\text{Area} = \frac{1}{2} \times 9 \times 12 = 54 \text{ cm}^2$$

$$\text{and } s = \frac{15 + 12 + 9}{2} = 18 \text{ cm}$$

$$\therefore \text{Radius } (r_1) = \frac{\text{Area}}{s} = \frac{54}{18} = 3 \text{ cm}$$

For $\triangle CDB$,

$$\text{Area} = \frac{1}{2} \times 16 \times 12 = 96 \text{ cm}^2$$

$$\text{and } s = \frac{16 + 12 + 20}{2} = 24 \text{ cm}$$

$$\therefore \text{Radius } (r_2) = \frac{\text{Area}}{s} = \frac{96}{24} = 4$$

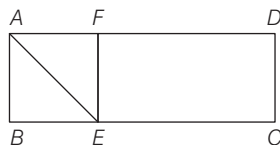
$$\text{Hence, } r_1 + r_2 = 4 + 3 = 7 \text{ cm.}$$

$$42) \text{ (b) Area of triangle whose vertices are } (a, a), (a+1, a+1) \text{ and } (a+2, a)$$

$$\begin{aligned} &= \frac{1}{2} \begin{vmatrix} a & a & 1 \\ a+1 & a+1 & 1 \\ a+2 & a & 1 \end{vmatrix} \\ &= \frac{1}{2} \{a(a+1-a) - a(a+1-a-2) + 1 \\ &\quad (a^2 + a - a^2 - 3a - 2)\} \\ &= -1 \end{aligned}$$

$$\therefore \text{Area} = 1 \text{ (taking only magnitude)}$$

$$43) \text{ (d) Area of } \triangle ABE = 7 \text{ cm}^2$$



$$\Rightarrow \frac{1}{2} \times AB \times BE = 7 \text{ cm}^2$$

$$\Rightarrow AB^2 = 14 \quad (\because AB = BE)$$

$$\Rightarrow AB = \sqrt{14} \text{ cm} = BE$$

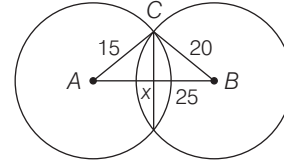
$$\text{Now, } EC = 3 BE \Rightarrow EC = 3\sqrt{14}$$

$$\therefore BC = 3\sqrt{14} + \sqrt{14} = 4\sqrt{14} = 56 \text{ cm}^2$$

$$\therefore \text{Area of rectangular } ABCD = 4\sqrt{14} \times \sqrt{14} = 56 \text{ cm}^2$$

$$44) \text{ (a) Given, } AP = 15 \text{ cm, } AQ = 20 \text{ cm and } PQ = 25 \text{ cm.}$$

Let OQ be y cm, then $OP = (25 - y)$ cm



$$\text{In } \triangle APO, AO^2 = (15)^2 - (25 - y)^2 \quad \dots(i)$$

$$\text{In } \triangle AQO, AO^2 = (20)^2 - y^2 \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$225 - 625 - y^2 + 50y = 400 - y^2 \Rightarrow y = 16$$

Hence, from Eq. (i),

$$AO^2 = (15)^2 - (25 - 16)^2 = 225 - 81$$

$$\Rightarrow AO^2 = 144 \Rightarrow AO = 12 \text{ cm}$$

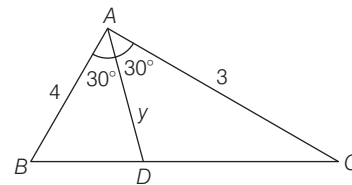
Hence, length of common chord

$$AB = 12 \times 2 = 24 \text{ cm}$$

$$45) \text{ (b) Let } BC = x \text{ and } AD = y, \text{ then as per bisector}$$

$$\text{theorem } \frac{BD}{DC} = \frac{AB}{AC} = \frac{4}{3}.$$

$$\text{Hence, } BD = \frac{4x}{7} \text{ and } DC = \frac{3x}{7}$$



Now, in $\triangle ABD$ using cosine rule,

$$\cos 30^\circ = \frac{(4)^2 + y^2 - \frac{16x^2}{49}}{2 \times 4 \times y}$$

$$\Rightarrow 4\sqrt{3}y = 16 + y^2 - \frac{16x^2}{49} \quad \dots(i)$$

Similarly, in $\triangle ADC$,

$$\cos 30^\circ = \frac{(3)^2 + y^2 - \frac{9x^2}{49}}{2 \times 3 \times y}$$

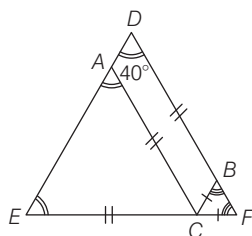
$$\Rightarrow 3\sqrt{3}y = 9 + y^2 - \frac{9x^2}{49} \quad \dots(ii)$$

$$\text{From Eqs. (i) and (ii), we get } y = \frac{12\sqrt{3}}{7}$$

- 46) (c) $CF = CB$

$$\therefore \angle CFD = \angle CBF$$

... (i)



Also, $EC = AC$

$$\therefore \angle CEA = \angle CAE$$

... (ii)

Now, $\angle EDF + \angle DFE + \angle FED = 180^\circ$

(sum of angles of a triangle)

$$\Rightarrow 40^\circ + \angle CBF + \angle EAC = 180^\circ$$

[using Eqs. (i) and (ii)]

$$\Rightarrow \angle CBF + \angle EAC = 140^\circ$$

$$\Rightarrow 180^\circ - \angle CBD + 180^\circ - \angle CAD = 140^\circ$$

$$\Rightarrow \angle CBD + \angle CAD = 220^\circ$$

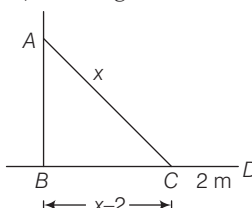
... (iii)

Now, $\angle ADB + \angle CBD + \angle CAD + \angle ACB = 360^\circ$

(sum of angles of a quadrilateral)

$$\therefore \angle ACB = 100^\circ$$

- 47) (d) Let $AC = x$, $m =$ length of the ladder



Using Pythagoras theorem, we get

$$x^2 = 8^2 + (x-2)^2$$

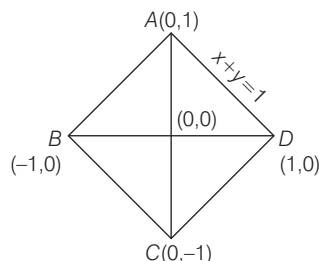
$$x^2 = 64 + x^2 + 4 - 4x$$

$$0 = 68 - 4x$$

$$68 = 4x$$

$$\Rightarrow x = 17 \text{ m}$$

- 48) (a) The slope of the equation $y = -x + 1$ is -1 .



Hence, equation of a line (BC), passing through $(-1,0)$ and parallel to $x + y = 1$ is $(y - 0) = -1(x + 1)$

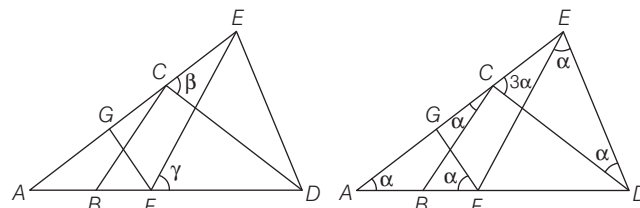
$$y = -x - 1$$

or

$$y + x = -1$$

- 49) (d) Let $\angle EAD = \alpha$. Then, $\angle AFG = \alpha$ and also $\angle ACB = \alpha$.

Hence, $\angle CBD = 2\alpha$ (exterior angle to $\triangle ABC$). Since, $CB = CD$, hence $\angle CDB = 2\alpha$.



$$\angle FGC = 2\alpha \text{ (exterior angle to } \triangle AFG\text{).}$$

Since, $GF = EF$, $\angle FEG = 2\alpha$

Now, $\angle DCE = \angle DEC = \beta$ (say)

Then, $\angle DEF = \beta - 2\alpha$.

Since, $\angle DCB = 180^\circ - (\alpha + \beta)$.

Therefore, in $\triangle DCB$,

$$180^\circ - (\alpha + \beta) + 2\alpha + 2\alpha = 180^\circ \text{ or } \beta = 3\alpha.$$

Further $\angle EFD = \angle EDF = \gamma$ (say)

Then, $\angle EDC = \gamma - 2\alpha$. If CD and EF meet in P , then

$$\angle FPD = 180^\circ - 5\alpha (\beta = 3\alpha).$$

Now, in $\triangle PED$,

$$180^\circ - 5\alpha + \gamma + 2\alpha = 180^\circ \text{ or } \gamma = 3\alpha$$

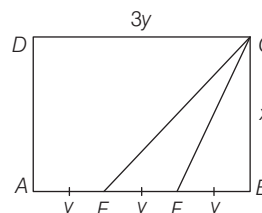
Therefore, in $\triangle EFD$,

$$\alpha + 2\gamma = 180^\circ \text{ or } \alpha + 6\alpha = 180^\circ$$

$$\text{or } \alpha = 26^\circ \text{ or approximately } 25^\circ.$$

- 50) (a) $a^2 + b^2 + c^2 = bc + ca + ab$

(given)



$$\Rightarrow a^2 + b^2 + c^2 - bc - ca - ab = 0$$

$$\Rightarrow 2a^2 + 2b^2 + 2c^2 - 2bc - 2ca - 2ab = 0$$

$$\Rightarrow (a-b)^2 + (b-c)^2 + (c-a)^2 = 0$$

Sum of perfect square is 0.

$\therefore$ All of them is 0.

$$\Rightarrow a - b = 0 = b - c = c - a \Rightarrow a = b = c$$

$\therefore$ Triangle is equilateral.

- 51) (b) Let $BC = x$ and $FB = y = EF = AE \Rightarrow CD = 3y$

Now, area of $\triangle CBF = \frac{1}{2}xy$

or area of $\triangle CBE = \frac{1}{2} \times x \times 2y = xy$

$$\therefore \text{Area of } \triangle CEF = xy - \frac{1}{2}xy = \frac{1}{2}xy$$

... (i)

and area of $\square ABCD = 3xy$

$$\therefore \frac{\text{Area } (\triangle CEF)}{\text{Area } (\square ABCD)} = \frac{\frac{1}{2}xy}{3xy} = 1:6$$

-

The diagram shows a rectangle $EADF$. Point B is on side EF . A line segment BC is drawn, and a dashed line segment is drawn from B perpendicular to AC . The length of EF is 22, and the length of BC is 6. The length of AD is 16.

$$\Rightarrow \angle CDE = \angle CED \quad \dots (v)$$

∴ From Eqs. (iv) and (v), we get

$$\angle CDE + \angle CED = 30^\circ$$

$$\Rightarrow 2\angle CDE = 30^\circ$$

$$\Rightarrow \angle CDE = 15^\circ = \angle DEC$$

60) (d) $2x + 3y - 5 = 0$

$$\Rightarrow y = -\frac{2}{3}x + \frac{5}{3}, \text{ slope } m_1 = -\frac{2}{3}$$

$$5x - 7y + 2 = 0$$

$$\Rightarrow y = \frac{5}{7}x + \frac{2}{7}, \text{ slope } m_2 = \frac{5}{7}$$

$$9x - 5y - 4 = 0$$

$$\Rightarrow y = \frac{9x}{5} - \frac{4}{5}, \text{ slope } m_3 = \frac{9}{5}$$

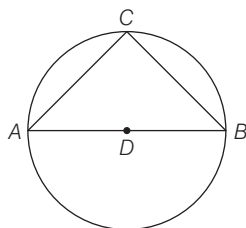
Lines are neither parallel because slopes are not equal nor they are perpendicular because product of slope is not -1 .

Now, if we solve Eqs. (i) and (ii), we get $x=1, y=1$ the same values are obtained solving Eqs. (ii) and (iii) and Eqs. (i) and (iii). Hence, the three lines are coincidental.

61) (b) $AD = 6.5$ (radius)

$$\therefore AB = 13 \text{ (diameter)}$$

Now, $\angle ACB = 90^\circ$ (Since, the diameter of a circle subtends 90° at the circumference)

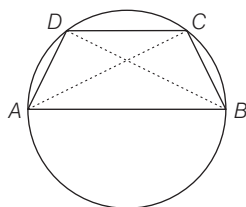


So, by Pythagoras theorem, $CB = 2$ cm

$$\therefore \text{Area of } \triangle ACB = \frac{1}{2} \times 5 \times 2 = 5 \text{ sq cm.}$$

62) (a) Drawing lines DB and AC

Now, $\angle DAC = \angle DBC$



(∵ A chord of a circle subtends equal angle on all its circumference)

$$\therefore \angle DBC = 30^\circ \Rightarrow \angle DBA = 70^\circ - 30^\circ = 40^\circ$$

$$\text{Now, } \angle DBA = \angle ACD = 40^\circ$$

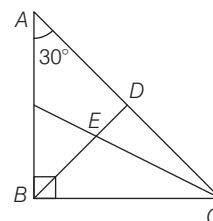
(∵ A chord of a circle subtends equal angle on all its circumference)

63) (b) $\angle BAC + \angle ABC + \angle BCA = 180^\circ$

(sum of angles of a triangle)

$$\Rightarrow 30^\circ + 90^\circ + \angle BCA = 180^\circ$$

$$\Rightarrow \angle BCA = 60^\circ$$



Now, CE bisects $\angle BCD$

(given)

$$\therefore \angle ECD = 30^\circ$$

$$\text{Now, } \angle CED + \angle EDC + \angle DCE = 180^\circ$$

(sum of angles of a triangle)

$$\therefore \angle CED = 60^\circ$$

64) (b) Since, ABC is an equilateral triangle, then each side of the triangle would be 2 km each. Required distance would be the altitude of the triangle.

$$\Rightarrow \frac{\sqrt{3}}{4} (2)^2 = \frac{1}{2} \times 2 \times \text{Altitude}$$

$$\Rightarrow \text{Altitude} = \sqrt{3} \text{ km}$$

65) (d) Since, each side of the triangle is 2 km each, hence required distance of $BD + DB + BE = 6$ km.

66) (c) To form a triangle, 3 points out of 5 can be chosen in ${}^5C_3$ ways

$$= \frac{5 \times 4 \times 3}{1 \times 2 \times 3} = 10 \text{ ways}$$

But of these, the 3 points using on the 2 diagonals will be collinear.

$$\text{So, } (10 - 2) = 8.$$

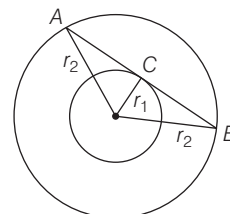
67) (b) Starting from A , the possible roots are

$ADBA, ACDBA, ACBA, ADCBA$

$ADCA, ADBCA, ABDA, ABDCA$

$ABCA, ABCDA, ACDA, ACBDA.$

68) (a) Perpendicular drawn from the centre bisects the chord, hence $AC = BC = 3$ m. Using options, we find that if the radius of outer circle is 5 m. Only then the radius of inner circle is an integer.



$$r_1^2 = (5)^2 - (3)^2 = 16 \Rightarrow r_1 = 4$$

Hence, $r_1 = 4$ m and $r_2 = 5$ m.

CHAPTER EIGHT

ALGEBRA

- 1) If p and q are the roots of the equation $x^2 - bx + c = 0$, then what is the equation if the roots are $(pq + p + q)$ and $(pq - p - q)$? (2016)

(a) $x^2 - 2cx + (c^2 - b^2) = 0$ (b) $x^2 - 2bx + (b^2 + c^2) = 0$
 (c) $cx^2 - 2(b + c)x + c^2 = 0$ (d) $x^2 + 2bx - (c^2 - b^2) = 0$

- 2) If $x^4 - 8x^3 + ax^2 - bx + 16 = 0$ has positive real roots, then find $a - b$. (2016)

- 3) The values of y which will satisfy the equations,

$$2x^2 + 6x + 5y + 1 = 0$$

$$2x + y + 3 = 0$$

may be found by solving (2016)

(a) $x^2 + 14y - 7 = 0$ (b) $y^2 + 8y + 1 = 0$
 (c) $y^2 + 10y - 7 = 0$ (d) $y^2 + y - 12 = 0$

- 4) If $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$, then $xy + yz + zx$ is equal to (2016)

(a) $\frac{(a + b + c)^2}{x^2 + y^2 + z^2}$
 (b) $\frac{x^2(a + b + c)^2 - a^2(x^2 + y^2 + z^2)}{2a^2}$

(c) $\frac{ax + by + cz}{(a + b + c)^2}$

(d) None of the above

- 5) The price of coffee in (₹ per kg) is $100 + 0.10n$, on the n th day of 2007 ($n = 1, 2, \dots, 100$) and then remain constant.

On the other hand, the price of Ooty tea in (₹ per kg) is $89 + 0.15n$, on the n th day of 2007 ($n = 1, 2, \dots, 365$).

On which date in 2007 will the prices of coffee and tea be equal? (2015)

(a) May 21 (b) April 11
 (c) May 20 (d) April 10

Directions (Q. Nos. 6-7) These questions are based on the following data.

Consider the following operators defined below

$x @ y$: gives the positive difference of x and y

$x \$ y$: gives the sum of the squares of x and y

$x \pounds y$: gives the positive difference of the squares of x and y

$x \& y$: gives the product of x and y

Also, $x, y \in R$ and $x \neq y$. The other standard algebraic operations are unchanged.

- 6) Given that $x @ y = x - y$, then find $(x \$ y) + (x \pounds y)$. (2015)

(a) $2x^2$
 (b) $2y^2$
 (c) $2(x^2 + y^2)$
 (d) Cannot be determined

- 7) The expression $[(x \pounds y) \div (x @ y)]^2 - 2(x \& y)$ will be equal to (2015)

(a) $x \pounds y$ (b) $x \$ y$
 (c) $(x \pounds y)(x @ y)$ (d) Cannot be determined

- 8) Find x , if $\log_{2x} \sqrt{x} + \log_{2\sqrt{x}} x = 0$, then $x = \dots\dots$

- 9) Select the correct alternative from the given choices.

p, q, r, s and t are five integers satisfying $p = 3q = 4r$ and $2q = 5s = 12t$. Which of the following pairs contains a number that can never be an integer? (2015)

(a) $(2p/15, q/t)$ (b) $(p/t, 4r/t)$
 (c) $(p/4, rs/180)$ (d) $(p/8, s/r)$

- 10) If $x + |y| = 8$, $|x| + y = 6$, then pairs of x, y satisfy these two equations. (2015)

- 11) If $x \geq y$ and $y > 1$, then the value of the expression $\log_x \left(\frac{x}{y} \right) + \log_y \left(\frac{y}{x} \right)$ can never be (2014)

(a) -1 (b) -0.5
 (c) 0 (d) 1

- 12) If $a_1 = 1$ and $a_{n+1} - 3a_n + 2 = 4n$ for every positive integer n , then a_{100} equals (2014)

(a) $3^{99} - 200$ (b) $3^{99} + 200$
 (c) $3^{100} - 200$ (d) $3^{100} + 200$

- 13) The number of common roots between the two equations $x^3 + 3x^2 + 4x + 5 = 0$, $x^3 + 2x^2 + 7x + 3 = 0$ is (2014)

(a) 0 (b) 1
 (c) 2 (d) 3

- 14)** If x and y are integers, then the equation $5x + 19y = 64$ has (2014)
- (a) no solution for $x < 300$ and $y < 0$
 (b) no solution for $x > 250$ and $y > -100$
 (c) a solution for $250 < x \leq 300$
 (d) a solution for $-59 < y < -56$
- 15)** If both a and b belong to the set $\{1, 2, 3, 4\}$, then the number of equation of the form $ax^2 + bx + 1 = 0$ having real roots, is (2014)
- (a) 10 (b) 7
 (c) 6 (d) 12
- 16)** What is the sum of n terms in the series $\log m + \log(m^2/n) + \log(m^3/n^2) + \log(m^4/n^3) + \dots$? (2014)
- (a) $\log \left[\frac{n^{(n-1)}}{m^{(n+1)}} \right]^{n/2}$ (b) $\log \left[\frac{m^m}{n^n} \right]^{n/2}$
 (c) $\log \left[\frac{m^{(1-n)}}{n^{(1-m)}} \right]^{n/2}$ (d) $\log \left[\frac{m^{(n+1)}}{n^{(n-1)}} \right]^{n/2}$
- 17)** Let S denote the infinite sum $2 + 5x + 9x^2 + 14x^3 + 20x^4 + \dots$, where $|x| < 1$ and the coefficient of x^{n-1} is $\frac{1}{2}n(n+3)$, ($n = 1, 2, \dots$). Then, S equals (2014)
- (a) $\frac{2-x}{(1-x)^3}$ (b) $\frac{2-x}{(1+x)^3}$
 (c) $\frac{2+x}{(1-x)^3}$ (d) $\frac{2+x}{(1+x)^3}$
- 18)** If $x^2 + 5y^2 + z^2 = 2y(2x + z)$, then which of the following statements are necessarily true? (2014)
- I. $x = 2y$ II. $x = 2z$ III. $2x = z$
 (a) Only I (b) Both II and III
 (c) Both I and II (d) None of these
- 19)** If $pqr = 1$, then the value of the expression $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$ is equal to (2014)
- (a) $p + q + r$ (b) $\frac{1}{p+q+r}$
 (c) 1 (d) $p^{-1} + q^{-1} + r^{-1}$
- 20)** For which of the following values of k will $3x + (k+3)y = 1$ and $kx + 6y = 4$ have a unique solution? (2014)
- (a) 3
 (b) -6
 (c) 6
 (d) Any value except 3 and -6
- 21)** If $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$, then $xy + yz + zx$ is equal to (2013)
- (a) $\frac{(a+b+c)^2}{x^2 + y^2 + z^2}$
 (b) $\frac{x^2(a+b+c)^2 - a^2(x^2 + y^2 + z^2)}{2a^2}$
 (c) $\frac{ax + by + cz}{(a+b+c)^2}$
 (d) $\frac{ax^2 + by^2 + cz^2}{(a+b+c)^2}$
- 22)** Let u and v be the roots of the equation $x^2 - 2x + p = 0$ and let y and z be the roots of the equation $x^2 - 18x + q = 0$. If $u < v < y < z$ are in arithmetic progression, then p, q respectively equal to (2013)
- (a) 8, 17 (b) 3, 7
 (c) -3, 11 (d) None of these
- 23)** Find the values of x and y for the given equations
- I. $xy^2 = 4$
 II. $\log_3(\log_2 x) + \log_{1/3}(\log_{1/2} y) = 1$ (2013)
- (a) $x = \frac{1}{8}, y = 64$ (b) $x = 64, y = \frac{1}{4}$
 (c) $x = 16, y = \frac{1}{2}$ (d) $x = \frac{1}{16}, y = 48$
- 24)** The sum of first ten terms of an AP is 155 and the sum of first two terms of a GP is 9. The first term of the AP is equal to common ratio of the GP and the first term of the GP is equal to the common difference of the AP. Which can be the AP as per the given conditions? (2013)
- (a) 2, 4, 6, 8, ... (b) 2, 5, 8, 11, ...
 (c) $\frac{25}{2}, \frac{79}{6}, \frac{83}{6}, \dots$ (d) Both (b) and (c)
- 25)** If $a_1, a_2, a_3, \dots, a_n$ be an AP and S_1, S_2 and S_3 be the sum of first $n, 2n$ and $3n$ terms respectively, then $S_3 - S_2 - S_1$ is equal to (where, a is the first term and d is common difference) (2013)
- (a) $3a - 2n - d$ (b) $a(n + 2d)$
 (c) $3a + 2nd$ (d) $2n^2d$
- 26)** Consider a sequence S whose n th term T_n is defined as $1 + 3/n$ where $n = 1, 2, \dots$. Find the product of all the consecutive terms of S starting from the 4th term to the 60th term. (2012)
- (a) 1980.55
 (b) 1985.55
 (c) 1990.55
 (d) 1975.55

- 27)** If the roots of the equation $(a^2 + b^2)x^2 + 2(b^2 + c^2)x + (b^2 + c^2) = 0$ are real, which of the following must hold true? (2012)
- (a) $c^2 \geq a^2$ (b) $c^4 \geq a^2(b^2 + c^2)$
 (c) $b^2 \geq a^2$ (d) $a^4 \leq b^2(a^2 + c^2)$
- 28)** If $(a^2 + b^2)$, $(b^2 + c^2)$ and $(a^2 + c^2)$ are in geometric progression, which of the following holds true? (2012)
- (a) $b^2 - c^2 = \frac{a^4 - c^4}{b^2 + a^2}$ (b) $b^2 - a^2 = \frac{a^4 - c^4}{b^2 + c^2}$
 (c) $b^2 - c^2 = \frac{b^4 - a^4}{b^2 + a^2}$ (d) $b^2 - a^2 = \frac{b^4 - c^4}{b^2 + a^2}$
- 29)** p is a prime and m is a positive integer. How many solutions exist for the equation $p^6 - p = (m^2 + m + 6)(p - 1)$? (2012)
- (a) 0 (b) 1
 (c) 2 (d) Infinite
- 30)** If x is a real number, $[x]$ is greatest integer less than or equal to x , then $3[x] + 2 - [x] = 0$. Will the above equation have any real root? (2012)
- (a) Yes
 (b) No
 (c) Will have real roots for $x < 0$
 (d) Will have real roots for $x > 0$
- 31)** If $a = \frac{x}{y+z}$, $b = \frac{y}{z+y}$, $c = \frac{z}{x+y}$, then which of the following statements is/are true?
- I. $\frac{b+c-1}{yz} + \frac{a+c-1}{xz} + \frac{a+b-1}{yx} = 1$
 II. $\frac{x^2}{a(1-bc)} = \frac{y^2}{b(1-ca)} = \frac{z^2}{c(1-ab)}$
 III. $(a+b)c + (b+c)a + (a+c)b = \frac{2(x+y+z)(xy+xz+yz) - 6xyz}{(x+y)(y+z)(z+x)}$ (2012)
- (a) I and II (b) I and III
 (c) II and III (d) None of these
- 32)** If α and β are the roots of the quadratic equation $x^2 - 10x + 15 = 0$, then find the quadratic equation whose roots are $\left(\alpha + \frac{\alpha}{\beta}\right)$ and $\left(\beta + \frac{\beta}{\alpha}\right)$. (2012)
- (a) $15x^2 + 71x + 210 = 0$
 (b) $5x^2 - 22x + 56 = 0$
 (c) $3x^2 - 44x + 78 = 0$
 (d) Cannot be determined
- 33)** If $ax^2 + bx + c = 0$ and $2a$, b and $2c$ are in arithmetic progression, which of the following are the roots of the equation (2012)
- (a) a, c (b) $-a, -c$
 (c) $-\frac{a}{2}, -\frac{c}{2}$ (d) $-\frac{c}{a}, -1$
- 34)** If $\log_x(a-b) - \log_x(a+b) = \log_x(b/a)$, find $\frac{a^2}{b^2} + \frac{b^2}{a^2}$. (2012)
- (a) 4 (b) 2
 (c) 3 (d) 6
- 35)** The equation, $2x^2 + 2(p+1)x + p = 0$, where p is real, always has roots that are (2010)
- (a) equal
 (b) equal in magnitude but opposite in sign
 (c) irrational
 (d) real
- 36)** Ram Kumar buys every year Bank's cash certificates of value exceeding the last year's purchase by ₹ 300. After 20 yr, he finds that the total value of the certificates purchased by him is ₹ 83000. Find the value of the certificates purchased by him in the 13th year. (2010)
- (a) ₹ 4900 (b) ₹ 6900
 (c) ₹ 1300 (d) None of these
- 37)** Which of the following statements is not correct? (2010)
- (a) $\log_{10} 10 = 1$
 (b) $\log(2+3) = \log(2 \times 3)$
 (c) $\log_{10} 1 = 0$
 (d) $\log(1+2+3) = \log 1 + \log 2 + \log 3$
- 38)** The sum of 3rd and 15th elements of an arithmetic progression is equal to the sum of 6th, 11th and 13th elements of the same progression. Then, which element of the series should necessarily be equal to zero? (2010)
- (a) 1st (b) 9th
 (c) 12th (d) None of these
- 39)** Let $u = (\log_2 x)^2 - 6\log_2 x + 12$, where x is a real number. Then, the equation $x^u = 256$, has (2010)
- (a) no solution for x
 (b) exactly one solution for x
 (c) exactly two distinct solutions for x
 (d) exactly three distinct solutions for x
- 40)** If the roots of the quadratic equation $y^2 + My + N$ are equal to N and M , then find the possible number of pairs of (M, N) . (2009)
- (a) 0 (b) 1 (c) 2 (d) 3

- 41) If x , y and z are in harmonic progression, which of the following statement(s) is/are true? (2009)

I. $x = \frac{y(x+z)}{2z}$ II. $x = \frac{z(x-y)}{y-z}$
 III. $x = \frac{y-z}{x-z}$

- (a) Only I (b) I and II
 (c) Only II (d) II and III

- 42) N , the set of natural numbers, is divided into subsets $A_1 = (1)$, $A_2 = (2, 3)$, $A_3 = (4, 5, 6)$, $A_4 = (7, 8, 9, 10)$ and so on. What is the sum of the elements of the subset A_{50} ? (2009)

- (a) 42455 (b) 61250 (c) 62525 (d) 65525

- 43) If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are three consecutive integers, then what is the smallest possible value of b ? (2008)

- (a) $-\frac{1}{\sqrt{3}}$ (b) -1 (c) 0
 (d) 1 (e) $\frac{1}{\sqrt{3}}$

Directions (Q.Nos. 44-45) Answer the questions based on the following information.

Let S be the set of all pairs (i, j) , where $1 \leq i < j \leq n$ and $n \geq 4$. Any two distinct members of S are called "friends", if they have one constituent of the pairs in common and "enemies" otherwise. For example, if $n = 4$, then $S = \{(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)\}$. Here, $(1, 2)$ and $(1, 3)$ are friends, $(1, 2)$ and $(2, 3)$ are also friends but $(1, 4)$ and $(2, 3)$ are enemies. (2007)

- 44) For general n , how many enemies will each member of S have?

- (a) $\frac{1}{2}(n^2 - 3n - 2)$ (b) $2n - 7$ (c) $\frac{1}{2}(n^2 - 5n + 6)$
 (d) $\frac{1}{2}(n^2 - 7n + 14)$ (e) $(n - 3)$

- 45) For general n , consider any two members of S that are friends. How many other members of S will be common friends of both these members?

- (a) $2n - 6$ (b) $\frac{1}{2}n(n - 3)$
 (c) $n - 2$ (d) $\frac{1}{2}(n^2 - 7n + 16)$
 (e) $\frac{1}{2}(n^2 - 5n + 8)$

Directions (Q.Nos. 46-47) Answer the questions based on the following information.

Let $a_1 = p$ and $b_1 = q$, where p and q are positive quantities. Define $a_n = pb_{n-1}$, $b_n = qb_{n-1}$, for even $n > 1$ and $a_n = pa_{n-1}$, $b_n = qa_{n-1}$, for odd $n > 1$. (2007)

- 46) Which of the following best describes $a_n + b_n$ for even n ?

- (a) $qp^{\frac{1}{2}n-1}(p+q)$ (b) $q^{\frac{1}{2}n}(p+q)$
 (c) $q^{\frac{1}{2}n}(p+q)^{\frac{1}{2}n}$ (d) $q(pq)^{\frac{1}{2}n-1}(p+q)^{\frac{1}{2}n}$
 (e) $q(pq)^{\frac{1}{2}n-1}(p+q)$

- 47) If $p = \frac{1}{3}$ and $q = \frac{2}{3}$, then what is the smallest odd n such that $a_n + b_n < 0.01$?

- (a) 13 (b) 11 (c) 9
 (d) 15 (e) 7

- 48) A quadratic function $f(x)$ attains a maximum of 3 at $x = 1$. The value of the function at $x = 0$ is 1. What is the value of $f(x)$ at $x = 10$? (2007)

- (a) -159 (b) -110 (c) -180
 (d) -105 (e) -119

- 49) What are the values of x and y that satisfy both the equations? (2006)

$$2^{0.7x} \cdot 3^{-1.25y} = \frac{8\sqrt{6}}{27}, \quad 4^{0.3x} \cdot 9^{0.2y} = 8.(81)^{1/5}$$

- (a) $x = 2, y = 5$ (b) $x = 2.5, y = 6$
 (c) $x = 3, y = 5$ (d) $x = 3, y = 4$
 (e) $x = 5, y = 2$

- 50) The number of solutions of the equation $2x + y = 40$, where both x and y are positive integers and $x \leq y$ is (2006)

- (a) 7 (b) 13 (c) 14 (d) 18
 (e) 20

- 51) Consider the set $S = \{1, 2, 3, \dots, 1000\}$. How many arithmetic progressions can be formed from the elements of S that start with 1 and end with 1000 and have at least 3 elements? (2006)

- (a) 3 (b) 4
 (c) 6 (d) 7
 (e) 8

- 52) What values of x satisfy $x^{2/3} + x^{1/3} - 2 \leq 0$? (2006)

- (a) $-8 \leq x \leq 1$ (b) $-1 \leq x \leq 8$
 (c) $1 < x < 8$ (d) $1 \leq x \leq 8$
 (e) $-8 \leq x \leq 8$

- 53) If $\log_y x = (a \cdot \log_z y) = (b \cdot \log_z z) = ab$, then which of the following pairs of values for (a, b) is not possible? (2006)

- (a) $\left(-2, \frac{1}{2}\right)$ (b) $(1, 1)$
 (c) $(0.4, 2.5)$ (d) $\left(\pi, \frac{1}{\pi}\right)$
 (e) $(2, 2)$

- 54) For a positive integer n , let P_n denote the product of the digits of n and S_n denote the sum of the digits of n . The number of integers between 10 and 1000 for which $P_n + S_n = n$ is (2005)
- (a) 81 (b) 16
(c) 18 (d) 9
- 55) If $x \geq y$ and $y > 1$, then the value of the expression $\log_x\left(\frac{x}{y}\right) + \log_y\left(\frac{y}{x}\right)$ can never be (2005)
- (a) 2 (b) -0.5 (c) 0 (d) 1
- 56) A telecom service provider engages male and female operators for answering 1000 calls per day. A male operator can handle 40 calls per day where as a female operator can handle 50 calls per day. The male and the female operators get a fixed wage of ₹ 250 and ₹ 300 per day, respectively. In addition, a male operator gets ₹ 15 per call he answers and a female operator gets ₹ 10 per call she answers. To minimize the total cost, how many male operators should the service provider employ assuming he has to employ more than 7 of the 12 female operators available for the job? (2005)
- (a) 15 (b) 14 (c) 12 (d) 10
- 57) Three Englishmen and three Frenchmen work for the same company. Each of them knows a secret not known to others. They need to exchange these secrets over person-to-person phone calls so that eventually each person knows all six secrets. None of the Frenchmen knows English and only one Englishman knows French. What is the minimum number of phone calls needed for the above purpose? (2005)
- (a) 5 (b) 10 (c) 9 (d) 15
- 58) Consider a triangle drawn on the X - Y plane with its three vertices at (41, 0), (0, 41) and (0, 0) each vertex being represented by its (X , Y) coordinates. The number of points with integer coordinates inside the triangle (excluding all the points on the boundary) is (2005)
- (a) 780 (b) 800
(c) 820 (d) 741
- 59) The digits of a three-digit number A are written in reverse order to form another three-digit number B . If $B > A$ and $B - A$ is perfectly divisible by 7, then which of the following is necessarily true? (2005)
- (a) $100 < A < 299$ (b) $106 < A < 305$
(c) $112 < A < 311$ (d) $118 < A < 317$
- 60) If $a_1 = 1$ and $a_{n+1} - 3a_n + 2 = 4n$ for every positive integer n , then a_{100} equals (2005)
- (a) $3^{99} - 200$ (b) $3^{99} + 200$
(c) $3^{100} - 200$ (d) $3^{100} + 200$
- 61) The total number of integer pairs (x, y) satisfying the equation $x + y = xy$ is (2004)
- (a) 0 (b) 1
(c) 2 (d) None of these
- 62) Suppose n is an integer such that the sum of the digits of n is 2 and $10^{10} < n < 10^{11}$. The number of different values for n is (2004)
- (a) 11 (b) 10
(c) 9 (d) 8
- 63) If $\frac{a}{b+c} = \frac{b}{c+a} = \frac{c}{a+b} = r$, then r cannot take any value except (2004)
- (a) $\frac{1}{2}$ (b) -1
(c) $\frac{1}{2}$ or -1 (d) $-\frac{1}{2}$ or -1
- 64) Let $u = (\log_2 x)^2 - 6(\log_2 x) + 12$, where x is a real number. Then, the equation $x^n = 256$, has (2004)
- (a) no solution for x
(b) exactly one solution for x
(c) exactly two distinct solutions for x
(d) exactly three distinct solutions for x
- 65) Which one of the following conditions must p, q and r satisfy so that the following system of linear simultaneous equations has at least one solution, such that $p + q + r \neq 0$
- $$\begin{aligned} x + 2y - 3z &= p \\ 2x + 6y - 11z &= q \\ x - 2y + 7z &= r \end{aligned}$$
- (2003)
- (a) $5p - 2q - r = 0$ (b) $5p + 2q + r = 0$
(c) $5p + 2q - r = 0$ (d) $5p - 2q + r = 0$
- 66) The sum of 3rd and 15th elements of an arithmetic progression is equal to the sum of 6th, 11th and 13th elements of the progression. Then, which element of the series should necessarily be equal to zero. (2003)
- (a) 1st (b) 9th
(c) 12th (d) None of these
- 67) The number of non-negative real roots of $2^x - x - 1 = 0$ equals (2003)
- (a) 0 (b) 1 (c) 2 (d) 3

- 68) Let a, b, c, d be four integers such that $a + b + c + d = 4m + 1$, where m is a positive integer. Given m , which one of the following is necessarily true? (2003)
- (a) The minimum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2 - 2m + 1$
 (b) The minimum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2 + 2m + 1$
 (c) The maximum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2 - 2m + 1$
 (d) The maximum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2 + 2m + 1$
- 69) The 288th term of the series $a, b, b, c, c, c, d, d, d, d, e, e, e, e, f, f, f, f, f, \dots$ is (2003)
- (a) u (b) v
 (c) w (d) x
- 70) Let p and q be the roots of the quadratic equation $x^2 - (\alpha - 2)x - \alpha - 1 = 0$. What is the minimum possible value of $p^2 + q^2$? (2003)
- (a) 0 (b) 3
 (c) 4 (d) 5
- 71) If $\log_3 2, \log_3(2^x - 5), \log_3(2^x - 7/2)$ are in arithmetic progression, then the value of x is equal to (2003)
- (a) 5 (b) 4
 (c) 2 (d) 3
- 72) There are 8436 steel balls, each with a radius of 1 cm, stacked in a pile, with 1 ball on top, 3 balls in the second layer, 6 in the third layer, 10 in the fourth and so on. The number of horizontal layers in the pile is (2003)
- (a) 34 (b) 38
 (c) 36 (d) 32
- 73) If the product of n positive real numbers is unity, then their sum is necessarily (2003)
- (a) a multiple of n (b) equal to $n + \frac{1}{n}$
 (c) never less than n (d) a positive integer
- 74) Given that $-1 \leq v \leq 1, -2 \leq u \leq -0.5$ and $-2 \leq z \leq -0.5$ and $w = vz/u$, then which of the following is necessarily true? (2003)
- (a) $-0.5 \leq w \leq 2$ (b) $-4 \leq w \leq 4$
 (c) $-4 \leq w \leq 2$ (d) $-2 \leq w \leq -0.5$
- 75) If x, y, z the distinct positive real numbers, then $\frac{x^2(y+z) + y^2(x+z) + z^2(x+y)}{xyz}$ would be (2003)
- (a) greater than 4 (b) greater than 5
 (c) greater than 6 (d) None of these
- 76) In a certain examination paper, there are n questions. For $j = 1, 2, \dots, n$, there are 2^{n-j} students who answered j or more questions wrongly. If the total number of wrong answers is 4095, then the value of n is (2003)
- (a) 12 (b) 11
 (c) 10 (d) 9
- 77) The infinite sum $1 + \frac{4}{7} + \frac{9}{7^2} + \frac{16}{7^3} + \frac{25}{7^4} + \dots$ equals (2003)
- (a) $\frac{27}{14}$ (b) $\frac{21}{13}$ (c) $\frac{49}{27}$ (d) $\frac{256}{147}$
- 78) The number of roots common between the two equations $x^3 + 3x^2 + 4x + 5 = 0$ and $x^3 + 2x^2 + 7x + 3 = 0$ is (2003)
- (a) 0 (b) 1
 (c) 2 (d) 3
- 79) A real number x satisfying $1 - \frac{1}{n} < x \leq 3 + \frac{1}{n}$, for every positive integer n , is best described by (2003)
- (a) $1 < x < 4$ (b) $1 < x \leq 3$
 (c) $0 < x \leq 4$ (d) $1 \leq x \leq 3$
- 80) If three positive real numbers x, y, z satisfy $y - x = z - y$ and $xyz = 4$, then what is the minimum possible value of y ? (2003)
- (a) $2^{1/3}$ (b) $2^{2/3}$
 (c) $2^{1/4}$ (d) $2^{3/4}$
- 81) If n is such that $36 \leq n \leq 72$, then $x = \frac{n^2 + 2\sqrt{n(n+4)} + 16}{n + 4\sqrt{n+4}}$ satisfies (2003)
- (a) $20 < x < 54$ (b) $23 < x < 58$
 (c) $25 < x < 64$ (d) $28 < x < 60$
- 82) If $13x + 1 < 2z$ and $z + 3 = 5y^2$, then (2003)
- (a) x is necessarily less than y
 (b) x is necessarily equal to y
 (c) x is necessarily greater than y
 (d) None of the above
- 83) If $|b| \geq 1$ and $x = -|a|b$, then which one of the following is necessarily true? (2003)
- (a) $a - xb < 0$ (b) $a - xb \geq 0$
 (c) $a - xb > 0$ (d) $a - xb \leq 0$
- 84) Let a, b, c, d and e be integers such that $a = 6b = 12c$ and $2b = 9d = 12e$. Then, which of the following pairs contains a number that is not an integer? (2003)
- (a) $\left| \frac{a}{27}, \frac{b}{e} \right|$ (b) $\left| \frac{a}{36}, \frac{c}{e} \right|$
 (c) $\left| \frac{a}{12}, \frac{bd}{18} \right|$ (d) $\left| \frac{a}{6}, \frac{c}{d} \right|$

- 85) Consider the set $T_n = \{n, n+1, n+2, n+3, n+4\}$, where $n = 1, 2, 3, \dots, 96$. How many of these sets contain 6 or any integral multiple thereof (i.e. any one of the numbers 6, 12, 18, ...)? (2003)
- (a) 80 (b) 81
(c) 82 (d) 83
- 86) If $\frac{1}{3} \log_3 M + 3 \log_3 N = 1 + \log_{0.008} 5$, then (2003)
- (a) $M^9 = \frac{9}{N}$ (b) $N^9 = \frac{9}{M}$
(c) $M^3 = \frac{3}{N}$ (d) $N^3 = \frac{3}{M}$
- 87) If x and y are integers, then the equation $5x + 19y = 64$ has (2003)
- (a) no solution for $x < 300$ and $y < 0$
(b) no solution for $x > 250$ and $y > -100$
(c) a solution for $250 < x < 300$
(d) a solution for $-59 < y < -56$
- 88) If $\log_{10} x - \log_{10} \sqrt{x} = 2 \log_x 10$, then a possible value of x is given by (2003)
- (a) 10 (b) $\frac{1}{100}$
(c) $\frac{1}{1000}$ (d) None of these
- 89) Once I had been to the post-office to buy stamps of five rupees, two rupees and one rupee. I paid the clerk ₹ 20 and since he did not have change, he gave me three more stamps of one rupee. If the number of stamps of each type that I had ordered initially was more than one, what was the total number of stamps that I bought. (2003)
- (a) 10 (b) 9
(c) 12 (d) 8
- 90) The n th element of a series is represented as $X_n = (-1)^n X_{n-1}$. If $X_0 = x$ and $x > 0$, then the following is always true. (2002)
- (a) X_n is positive if n is even
(b) X_n is positive if n is odd
(c) X_n is negative if n is even
(d) None of the above
- 91) If x, y and z are real numbers, such that $x + y + z = 5$ and $xy + yz + zx = 3$. What is the largest value that x can have? (2002)
- (a) $\frac{5}{3}$ (b) $\sqrt{19}$
(c) $\frac{13}{3}$ (d) None of these
- 92) Amol was asked to calculate the arithmetic mean of ten positive integers each of which had two digits. By mistake, he interchanged the two digits, say a and b , in one of these ten integers. As a result, his answer for the arithmetic mean was 1.8 more than what it should have been. Then, $b - a$ equals (2002)
- (a) 1 (b) 2
(c) 3 (d) None of these
- 93) A child was asked to add first few natural numbers (that is, $1 + 2 + 3 + \dots$) so long his patience permitted. As he stopped he gave the sum as 575. When the teacher declared the result wrong the child discovered he had missed one number in the sequence during addition. The number he missed was (2002)
- (a) less than 10 (b) 10
(c) 15 (d) more than 15
- 94) The number of real roots of the equation $\frac{A^2}{x} + \frac{B^2}{x-1} = 1$, where A and B are real numbers not equal to zero simultaneously is (2002)
- (a) None (b) 1 (c) 2 (d) 1 or 2
- 95) Let x, y and z be distinct integers. x and y are odd positive and z is even and positive. Which one of the following statements cannot be true? (2001)
- (a) $(x-z)^2 y$ is even (b) $(x-z)y^2$ is odd
(c) $(x-z)y$ is odd (d) $(x-y)^2 z$ is even
- 96) If $x > 5$ and $y < -1$, then which of the following statements is true? (2001)
- (a) $(x+4y) > 1$ (b) $x > -4y$
(c) $-4x < 5y$ (d) None of these
- 97) Two men X and Y started working for a certain company at similar jobs on January 1, 1950. X asked for an initial salary of ₹ 300 with an annual increment of ₹ 30. Y asked for an initial salary of ₹ 200 with a rise of ₹ 15 every six months. Assume that the arrangements remained unaltered till December 31, 1959. Salary is paid on the last day of the month. What is the total amount paid to them as salary during the period? (2001)
- (a) ₹ 93300 (b) ₹ 93200
(c) ₹ 93100 (d) None of these
- 98) x and y are real numbers satisfying the conditions $2 < x < 3$ and $-8 < y < -7$. Which of the following expressions will have the least value? (2001)
- (a) $x^2 y$ (b) xy^2
(c) $5xy$ (d) None of these

- 99) m is the smallest positive integer such that for any integer $n \leq m$, the quantity $n^3 - 7n^2 + 11n - 5$ is positive. What is the value of m ? (2001)
 (a) 4 (b) 5 (c) 8 (d) None of these
- 100) All the pages numbers from a book are added, beginning at page 1. However, one page number was mistakenly added twice. The sum obtained was 1000. Which page number was added twice? (2001)
 (a) 44 (b) 45 (c) 10 (d) 12
- 101) If a, b, c and d are four positive real numbers such that $abcd = 1$, what is the minimum value of $(1+a)(1+b)(1+c)(1+d)$? (2001)
 (a) 4 (b) 1 (c) 16 (d) 18
- 102) For a Fibonacci sequence, from the third term onwards, each term in the sequence is the sum of the previous two terms in that sequence. If the difference in squares of seventh and sixth terms of this sequence is 517, what is the tenth term of this sequence? (2001)
 (a) 147 (b) 76 (c) 123 (d) Cannot be determined
- 103) Let x, y be two positive numbers such that $x + y = 1$. Then, the minimum value of $\left(x + \frac{1}{x}\right)^2 + \left(y + \frac{1}{y}\right)^2$ is (2001)
 (a) 12 (b) 20 (c) 12.5 (d) 13.3
- 104) Let b be a positive integer and $a = b^2 - b$. If $b \leq 4$, then $a^2 - 2a$ is divisible by (2001)
 (a) 15 (b) 20 (c) 24 (d) None of these
- 105) Ujagar and Keshab attempted to solve a quadratic equation. Ujagar made a mistake in writing down the constant term. He ended up with the roots (4, 3). Keshab made a mistake in writing down the coefficient of x . He got the roots as (3, 2). What will be the exact roots of the original quadratic equation? (2001)
 (a) (6, 1) (b) (-3, -4) (c) (4, 3) (d) (-4, -3)
- 106) Find the following sum (2000)
 $1/(2^2 - 1) + 1/(4^2 - 1) + 1/(6^2 - 1) + \dots + 1/(20^2 - 1)$
 (a) 9/10 (b) 10/11 (c) 19/21 (d) 10/21
- 107) $x > 2, y > -2$, then which of the following holds good? (2000)
 (a) $xy > -2$ (b) $xy < -2$ (c) $x > -2/y$ (d) None of these
- 108) A, B and C are 3 cities that form a triangle and where every city is connected to every other one by at least one direct root. There are 33 routes direct and indirect from A to C and there are 23 direct routes from B to A . How many direct routes are there from A to C ? (2000)
 (a) 15 (b) 10 (c) 20 (d) 25
- 109) If the equation $x^3 - ax^2 + bx - a = 0$ has three real roots, then the following is true (2000)
 (a) $a = 11$ (b) $a \neq 1$ (c) $b = 1$ (d) $b \neq 1$
- 110) $|x^2 + y^2| = 0.1$ and $|x - y| = 0.2$, then the value of $|x| + |y|$ is (2000)
 (a) 0.6 (b) 0.2 (c) 0.36 (d) 0.4
- 111) For the given pair (x, y) of positive integers, such that $4x - 17y = 1$ and $x \leq 1000$, how many integer values of y satisfy the given conditions (1999)
 (a) 55 (b) 56 (c) 57 (d) 58
- Directions (Q.Nos 112-113) Answer the questions based on the following information.**
 These are m vessels with known volumes $V_1, V_2, \dots, V_m$ arranged in ascending order of volumes, where V_1 is greater than 0.5 L and V_m is less than 1 L. Each of these is full of water. The water is emptied into a minimum number of white empty vessels each having volume 1 L. If the volumes of the vessels increases with the value of lower bound 10^{-1} . (1999)
- 112) What is the maximum possible value of m ?
 (a) 7 (b) 6 (c) 10 (d) 8
- 113) If m is maximum, then what is minimum number of white vessels required to empty it?
 (a) 7 (b) 6 (c) 5 (d) 8
- 114) If m is maximum, then what is range of the volume remaining empty in the vessel with the maximum empty space?
 (a) 0.45 - 0.55 (b) 0.55 - 0.65 (c) 0.1 - 0.75 (d) 0.75 - 0.85
- 115) One year payment to the servant is ₹ 90 plus one turban. The servant leaves after 9 months and receives ₹ 65 and a turban. Then, find the price of the turban. (1998)
 (a) ₹ 10 (b) ₹ 15 (c) ₹ 7.5 (d) Cannot be determined

- 116)** You can collect rubies and emeralds as many as you can. Each ruby is worth ₹ 4 crore and each emerald is worth of ₹ 5 crore. Each ruby weighs 0.3 kg and each emerald weighs 0.4 kg. Your bag can carry at the most 12 kg. What you should collect to get the maximum wealth? (1998)
- (a) 20 rubies and 15 emeralds
(b) 40 rubies
(c) 28 rubies and 9 emeralds
(d) None of the above
- 117)** $\log_2[\log_7(x^2 - x + 37)] = 1$, then what could be the value of x ? (1997)
- (a) 3 (b) 5
(c) 4 (d) None of these
- 118)** P and Q are two integers such that $(PQ) = 64$. Which of the following cannot be the value of $P + Q$? (1997)
- (a) 20 (b) 65 (c) 16 (d) 35
- 119)** If the roots x_1 and x_2 , of the quadratic equation $x^2 - 2x + c = 0$ also satisfy the equation $7x_2 - 4x_1 = 47$, then which of the following is true? (1997)
- (a) $c = -15$ (b) $x_1 = -5, x_2 = 3$
(c) $x_1 = 4.5, x_2 = -2.5$ (d) None of these
- 120)** Given the quadratic equation $x^2 - (A - 3)x - (A - 2)$, for what value of A will the sum of the squares of the roots be zero? (1996)
- (a) -2 (b) 3
(c) 6 (d) None of these
- 121)** Which of the following values of x do not satisfy the inequality $(x^2 - 3x + 2 > 0)$ at all? (1996)
- (a) $1 \leq x \leq 2$ (b) $-1 \geq x \geq -2$
(c) $0 \leq x \leq 2$ (d) $0 \geq x \geq -2$
- 122)** What is the value of m which satisfies $3m^2 - 21m + 30 < 0$? (1995)
- (a) $m < 2$ or $m > 5$ (b) $m > 2$
(c) $2 < m < 5$ (d) $m < 5$
- 123)** The value of $\frac{(55)^3 + (45)^3}{(55)^2 - 55 \times 45 + (45)^2}$ is (1995)
- (a) 100 (b) 105
(c) 125 (d) 75
- 124)** $5^6 - 1$ is divisible by (1995)
- (a) 13 (b) 31
(c) 5 (d) None of these
- 125)** One root of $x^2 + kx - 8 = 0$ is square of the other, then the value of k is (1995)
- (a) 2 (b) 8
(c) -8 (d) -2
- 126)** If $\log_7 \log_5(\sqrt{x+5} + \sqrt{x}) = 0$, find the value of x . (1994)
- (a) 1 (b) 0
(c) 2 (d) None of these
- 127)** If $a + b + c = 0$, where $a \neq b \neq c$, then $\frac{a^2}{2a^2 + bc} + \frac{b^2}{2b^2 + ac} + \frac{c^2}{2c^2 + ab}$ is equal to (1994)
- (a) zero (b) 1
(c) -1 (d) abc
- 128)** If the harmonic mean between two positive numbers is to their geometric mean as 12 : 13, then the numbers could be in the ratio (1994)
- (a) 12 : 13 (b) 1/12 : 1/13
(c) 4 : 9 (d) 2 : 3
- 129)** If one root of $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots, then the value of q is (1994)
- (a) 49/4 (b) 4/49
(c) 4 (d) 1/4
- 130)** Fourth term of an arithmetic is 8. What is the sum of the first 7 terms of the arithmetic progression? (1994)
- (a) 7 (b) 64
(c) 56 (d) Cannot be determined

HINTS & SOLUTIONS

- 1) (a) In the given quadratic equation,

$$x^2 - bx + c = 0$$

$$\text{Sum of roots} = p + q = b \quad \dots(i)$$

$$\text{Product of roots} = pq = c \quad \dots(ii)$$

We have to formulate a quadratic equation whose roots are $(pq + p + q)$ and $(pq - p - q)$.

$$\text{Sum of roots} = pq + p + q + pq - p - q = 2pq$$

But from Eq. (ii), we get

$$pq = c$$

$$\therefore \text{Sum of roots} = 2c$$

$$\begin{aligned} \text{Product of roots} &= (pq + p + q)(pq - p - q) \\ &= (pq)^2 - (p + q)^2 \end{aligned}$$

From Eqs. (i) and (ii), we get

$$\text{Product of roots} = c^2 - b^2$$

$$\therefore \text{Required equation is } x^2 - 2cx + c^2 - b^2 = 0.$$

- 2) Let p, q, r and s be the roots of the equation

$$p + q + r + s = 8$$

$$pqrs = 16$$

This happens only when

$$p = q = r = s = 2$$

$$\frac{p + q + r + s}{4} = 2$$

$$\sqrt[4]{pqrs} = 2$$

Arithmetic mean is equal to geometric mean. This is possible only when all the numbers are equal.

$$p = q = r = s = 2$$

$$pq + pr + ps + qr + qs + rs = a$$

$$\Rightarrow 24 = a$$

$$pqr + pqs + prs + qrs = b$$

$$\Rightarrow 32 = b$$

$$\text{So, } a - b = 24 - 32 = -8$$

- 3) (c) $2x^2 + 6x + 5y + 1 = 0 \quad \dots(i)$

$$2x + y + 3 = 0 \quad \dots(ii)$$

In the options, all the equations involved have only y in them. So, we take x in terms of y from one equation and substitute it in the other.

From Eq. (ii), we get

$$x = -\left(\frac{y+3}{2}\right)$$

On substituting the value of x in Eq. (i), we get

$$\frac{2(y+3)^2}{4} - \frac{6(y+3)}{2} + 5y + 1 = 0$$

$$\Rightarrow \frac{y^2 + 6y + 9}{2} - 3(y+3) + 5y + 1 = 0$$

$$\Rightarrow y^2 + 6y + 9 + 4y - 16 = 0 \Rightarrow y^2 + 10y - 7 = 0$$

- 4) (b) Let $\frac{x}{a} = \frac{y}{b} = \frac{z}{c} = k$

$$\therefore x = ak, y = bk, z = ck$$

$$(x + y + z) = k(a + b + c)$$

Squaring on both sides, we get

$$\Rightarrow (x + y + z)^2 = k^2(a + b + c)^2$$

$$x^2 + y^2 + z^2 + 2(xy + yz + zx) = k^2(a + b + c)^2$$

$$\Rightarrow 2(xy + yz + zx) = k^2(a + b + c)^2 - (x^2 + y^2 + z^2)$$

$$\begin{aligned} \Rightarrow xy + yz + zx &= \frac{k^2}{2}(a + b + c)^2 - \frac{1}{2}(x^2 + y^2 + z^2) \\ &= \frac{x^2(a + b + c)^2 - a^2(x^2 + y^2 + z^2)}{2a^2} \left[\because k = \frac{x}{a} \right] \end{aligned}$$

- 5) (c) $\therefore$ Price of coffee in (₹ per kg) is $100 + 0.10n$ and price of Ooty tea in (₹ per kg) is $89 + 0.15n$.

$$\therefore \text{Price of coffee on 100th day} = 100 + 0.1 \times 100 = 110$$

When price of tea and coffee will be equal, then

$$89 + 0.15n = 110 \Rightarrow n = 140$$

$\therefore$ Number of days in January, February, March and April in the year

$$2007 = 31 + 28 + 31 + 30 = 120$$

Therefore, the price of both tea and coffee will be equal on 20th May.

- 6) (d) Given, $x @ y = x - y$

The positive difference of x and y is $x - y \Rightarrow x > y$

But still we cannot conclude anything about the positive difference of the squares of x and y , since say $x = 1$ and $y = -3$.

$$\Rightarrow x @ y = x - y \text{ and } x \& y = y^2 - x^2.$$

But if $x = 3$ and $y = 1$, then $x \& y = x^2 - y^2$

So, we cannot determine the value of the given expression.

- 7) (b) Given, $\left[\frac{(x^2 \sim y^2)}{(x \sim y)} \right]^2 - 2xy$

$$= \left[\frac{\pm(x^2 - y^2)}{(x - y)} \right]^2 - 2xy$$

$$= (x + y)^2 - 2xy$$

$$= x^2 + y^2 = x \& y$$

- 8) Suppose, $\log_2 x = t$, then

$$\log_{2\sqrt{x}} x = \frac{\log_2 x}{\log_2 2\sqrt{x}} = \frac{t}{1 + \frac{t}{2}} = \frac{2t}{2 + t}$$

$$\text{and } \log_{2x} \sqrt{x} = \frac{\log_2 \sqrt{x}}{\log_2 2x} = \frac{\frac{1}{2} \log_2 x}{1 + \log_2 x} = \frac{t/2}{1 + t} = \frac{t}{2 + 2t}$$

$$\therefore \log_{2\sqrt{x}} x + \log_{2x} \sqrt{x} = \frac{2t}{2+t} + \frac{t}{2+2t} = 0$$

$$\Rightarrow 2t(2+2t) + t(2+t) = 0$$

$$\Rightarrow 4t + 4t^2 + 2t + t^2 = 0$$

$$\Rightarrow 5t^2 + 6t = 0$$

$$\Rightarrow t(5t+6) = 0$$

$$\Rightarrow t = 0 \text{ or } t = -\frac{6}{5}$$

$$\text{When } \log_2 x = 0, \text{ then } x = 2^0 = 1$$

$$\text{and } \log_2 x = -\frac{6}{5}, \text{ then } x = 2^{-6/5}$$

$$\therefore x = 1 \text{ and } x = 2^{-6/5}$$

9) (d) Given, $p = 3q = 4r$

$$\Rightarrow 2p = 6q = 8r \quad \dots(i)$$

$$\text{and } 2q = 5s = 12t$$

$$\Rightarrow 6q = 15s = 36t \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$2p = 6q = 8r = 15s = 36t$$

$$\text{Let } k = \text{LCM of } (2, 4, 8, 15, 36) = 360$$

$$\text{Again, } \frac{2p}{k} = \frac{6q}{k} = \frac{8r}{k} = \frac{15s}{k} = \frac{36t}{k} = c \text{ (let)}$$

$$\Rightarrow \frac{2p}{360} = \frac{6q}{360} = \frac{8r}{360} = \frac{15s}{360} = \frac{36t}{360} = c$$

$$\Rightarrow p = 180c, q = 60c, r = 45c, s = 24c, t = 10c$$

Now, going from the choices only the pair $\left(\frac{p}{8}, \frac{s}{r}\right)$

contains a number that can never be an integer as it equals $\left(\frac{45c}{2}, \frac{24}{45}\right)$.

- 10) We start with the knowledge that the modulus of a number can never be negative, though the number itself may be negative.

The first equation is a pair of lines defined by the equations

$$y = 8 - x \quad (\text{when } y \text{ is positive}) \quad \dots(i)$$

$$\text{and } y = x - 8 \quad (\text{when } y \text{ is negative}) \quad \dots(ii)$$

With the condition that $x \leq 8$ (because if x becomes more than 8, $|y|$ will be forced to be negative, which is not allowed).

The second equation is a pair of lines defined by the equations

$$y = 6 - x \quad (\text{when } x \text{ is positive}) \quad \dots(iii)$$

$$\text{and } y = 6 + x \quad (\text{when } x \text{ is negative}) \quad \dots(iv)$$

With the condition that y cannot be greater than 6, because if $y > 6$, $|x|$ will have to be negative.

On checking the slopes, you will see that lines (i) and (iii) are parallel. Also, (ii) and (iv) are parallel and lines (i) and (iv) will intersect, but only for $x = 1$; which is not possible as Eq. (iv) holds good only when

x is negative. Lines (ii) and (iii) do intersect within the given constraints, we get $x = 7, y = -1$.

So, only one solution is possible.

$$\begin{aligned} 11) (d) \text{ Let } P &= \log_x \left(\frac{x}{y}\right) + \log_y \left(\frac{y}{x}\right) \\ &= \log_x x - \log_x y + \log_y y - \log_y x \\ &= 2 - \log_x y - \log_y x \end{aligned}$$

Again, let $t = \log_x y$

$$\therefore P = 2 - \frac{1}{t} - t = -\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^2$$

which obviously can never be 1.

12) (c) Given, $a_1 = 1, a_{n+1} - 3a_n + 2 = 4n$

$$\text{or } a_{n+1} = 3a_n + 4n - 2$$

$$\text{When } n = 1, \text{ then } a_2 = 3 + 4 - 2 = 5$$

$$\text{When } n = 2, \text{ then } a_3 = 3 \times 5 + 4 \times 2 - 2 = 21$$

So, it is satisfying $3^{n+1} - 2 \times (n+1)$.

$$\text{Hence, } a_{100} = 3^{100} - 2 \times 100 = 3^{100} - 200$$

13) (a) On subtracting the given equations, we get

$$x^2 - 3x + 2 = 0 \Rightarrow (x-1)(x-2) = 0$$

$x = 1$ and 2 do not satisfy any of the original equation in case these were a common root, it will be the root of the subtracted equation.

Hence, the number of common root is 0 (zero).

14) (c) Given, $5x + 19y = 64$

We see that, if $y = 1$, we get an integer solution for $x = 9$. Now, if y changes (increases or decreases) by 5, x will change (decrease or increase) by 19.

Looking at options, if $x = 256$, we get $y = 64$

Using these values, we see options (a), (b) and (d) are eliminated and also that there exists a solution for $250 < x \leq 300$.

15) (b) Given, $ax^2 + bx + 1 = 0$

$$\text{For real roots, } b^2 - 4ac \geq 0$$

$$\text{Now, } b^2 - 4a \geq 0 \Rightarrow b^2 \geq 4a$$

$$4a = \{4, 8, 12, 16\}$$

$$b^2 = \{1, 4, 9, 16\}$$

$$\text{For } b^2 = 4, \text{ number of solutions} = 1$$

$$\text{For } b^2 = 9, \text{ number of solutions} = 2$$

$$\text{For } b^2 = 16, \text{ number of solutions} = 4$$

$$\therefore \text{Total number of solutions} = 4 + 2 + 1 = 7$$

16) (d) $S = \log m + \log \frac{m^2}{n} + \log \frac{m^3}{n^2} + \dots + n \text{ terms}$

$$= \log \left(m \cdot \frac{m^2}{n} \cdot \frac{m^3}{n^2} \cdots \frac{m^n}{n^{n-1}} \right)$$

$$= \log \left(\frac{m^{\frac{n(n+1)}{2}}}{n^{\frac{n(n-1)}{2}}} \right) = \log \left(\frac{m^{(n+1)}}{n^{(n-1)}} \right)^{n/2}$$

17) (a) $\frac{2-x}{(1-x)^3} = (2-x)(1-x)^{-3}$

By using Binomial theorem,

$$= (2-x)(1+3x+6x^2+10x^3+\dots+\frac{(r+1)(r+2)}{2}x^r+\dots)$$

$$= 2+5x+9x^2+14x^3+\dots$$

which is same series as the given series.

18) (c) $x^2+5y^2+z^2=2y(2x+z)$

Put $x=2y$, $4y^2+5y^2+z^2=2y(4y+z)$

$$\Rightarrow 9y^2+z^2=8y^2+2yz \quad \dots(i)$$

which is not necessarily true.

Put $y=z$ in Eq. (i), we get

$$9z^2+z^2=8z^2+2z^2 \Rightarrow 10z^2=10z^2$$

Eq. (i) is true, for $y=z$ ($x=2y$ and $x=2z \Rightarrow y=z$)

Therefore, both I and II satisfy the given result.

19) (c) Given, $pqr=1$

$$\begin{aligned} \therefore & \frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}} \\ &= \frac{q}{q+pq+1} + \frac{r}{r+qr+1} + \frac{p}{p+pr+1} \\ &= \frac{q}{q+\frac{1}{r}+1} + \frac{r}{r+\frac{1}{p}+1} + \frac{p}{p+\frac{1}{q}+1} \\ &= \frac{qr}{qr+1+r} + \frac{pr}{pr+1+p} + \frac{p}{p+pr+1} \\ &= \frac{qr}{\frac{1}{p}+1+r} + \frac{pr}{pr+p+1} + \frac{p}{p+pr+1} \\ &= \frac{pqr}{1+p+pr} + \frac{pr}{1+p+pr} + \frac{p}{1+p+pr} \\ &= \frac{pqr+pr+p}{1+p+pr} = \frac{p(qr+r+1)}{1+p+pr} = \frac{p(1/p+r+1)}{1+p+pr} \\ & \quad (\because pqr=1) \\ &= \frac{1+p+pr}{1+p+pr} = 1 \end{aligned}$$

20) (d) As the system has a solution, the coefficients are not proportional.

$$\frac{3}{k} \neq \frac{k+3}{6} \Rightarrow k(k+3) \neq 18$$

If $k(k+3)=3(6)$ or $(-6)(-3)$, i.e. if $k=3$ or -6 , the system does not have a unique solution.

Hence, any value other than $k=3$ and $k=-6$ will result in a unique solution.

21) (b) $\frac{x}{a} = \frac{y}{b} = \frac{z}{c} = k$ (let)

Then, $x=ak$, $y=bk$ and $z=ck$

$$(x+y+z)=ak+bk+ck$$

On squaring both sides, we get

$$(x+y+z)^2=(ak+bk+ck)^2$$

$$x^2+y^2+z^2+2(xy+yz+zx)=k^2(a+b+c)^2$$

$$\therefore 2(xy+yz+zx)=k^2(a+b+c)^2-(x^2+y^2+z^2)$$

$$xy+yz+zx=\frac{k^2(a+b+c)^2-(x^2+y^2+z^2)}{2}$$

Also, $k=\frac{x}{a}$

$$k^2=\frac{x^2}{a^2}$$

$$\therefore xy+yz+zx=\frac{x^2(a+b+c)^2-(x^2+y^2+z^2)a^2}{2a^2}$$

22) (d) Let $u=a-3d$, $v=a-d$, $y=a+d$ and $z=a+3d$.

Now, sum of producers in first equation,

$$(a-3b)+(a-d)=2$$

$$2a-4d=2 \quad \dots(i)$$

Similarly, sum of products in second equation,

$$(a+d)+(a+3d)=18$$

$$2a+4d=18 \quad \dots(ii)$$

On solving Eqs. (i) and (ii), we get

$$a=5, d=2$$

Then, $u=5-2 \times 3=-1$

$$v=5-2=3$$

$$y=5+2=7$$

$$z=5+2 \times 3=11$$

$$p=u \times v=-1 \times 3=-3 \quad (\text{products of roots})$$

$$q=y \times z=7 \times 11=77$$

23) (b) $\log_3(\log_2 x) + \log_{1/3}(\log_{1/2} y) = 1$

$$\Rightarrow \log_3(\log_2 x) - \log_3(\log_{1/2} y) = 1$$

$$\Rightarrow \log_3\left(\frac{\log_2 x}{\log_{1/2} y}\right) = 1$$

$$\Rightarrow \log_3\left(\frac{\log_2 x}{\log_{1/2} y}\right) = \log_3 3$$

$$\Rightarrow \frac{\log_2 x}{\log_{1/2} y} = 3$$

$$\Rightarrow \log_2 x = 3 \log_{1/2} y$$

$$\Rightarrow \log_2 x = -3 \log_2 y$$

$$\Rightarrow x = y^{-3}$$

$$\therefore x = \frac{1}{y^3}, \quad xy^3 = 1 \quad \dots(i)$$

Also, $xy^2 = 4$

$$\dots(ii)$$

From Eqs. (i) and (ii), we get $x=64$, $y=\frac{1}{4}$

24) (d) Let the AP be $a, a+d, a+2d, \dots$

and GP be $A, Ar^2, Ar^3, Ar^4, \dots$

Then, sum of 10 terms of AP = 155

$$\Rightarrow \frac{n}{2} [2a + (n-1)d] = 155$$

$$\Rightarrow \frac{10}{2} [2a + 9d] = 155$$

$$\Rightarrow 2a + 9d = 31 \quad \dots(i)$$

$$\text{Also, } A + Ar = 9$$

$$\text{Given that, } A = d, r = a$$

$$\text{So, } d + ad = 9 \quad \dots(ii)$$

On solving Eqs. (i) and (ii), we get

$$a = 2, \frac{25}{2} \quad \text{and} \quad d = 3, \frac{2}{3}$$

So, the AP can be 2, 5, 8, 11, ... and $\frac{25}{2}, \frac{79}{6}, \frac{83}{6}, \dots$

- 25) (d) Let us consider an AP of 6 terms, i.e. 1, 2, 3, 4, 5 and 6 be in AP.

$$\text{Then, } 3n = 6, 2n = 4, n = 2$$

$$\text{Now, } S_3 - S_2 - S_1$$

$$= (1 + 2 + 3 + 4 + \dots + 6) - (1 + 2 + 3 + 4) - (1 + 2) \\ = 21 - 10 - 3 = 8$$

Now, in the above assumed series

$$n = 2, d = 1, a = 1$$

Going through the options, we get

$$2n^2d = 2 \times 2^2 \times d = 8$$

which is equal to $S_3 - S_2 - S_1$ as calculated above, hence is the correct answer.

26) (b) $T_n = \frac{n+3}{n}, T_4 = \frac{7}{4}, T_5 = \frac{8}{5}$

$$T_6 = \frac{9}{6}, T_7 = \frac{10}{7}$$

$$\begin{aligned} \text{Product} &= \left(\frac{7}{8}\right)\left(\frac{8}{5}\right)\left(\frac{9}{6}\right)\left(\frac{10}{7}\right) \dots T_{58}T_{59}T_{60} \\ &= \left(\frac{7}{4}\right)\left(\frac{8}{5}\right)\left(\frac{9}{6}\right)\left(\frac{10}{7}\right)\left(\frac{11}{8}\right)\left(\frac{12}{9}\right) \dots \left(\frac{61}{58}\right)\left(\frac{62}{59}\right)\left(\frac{63}{60}\right) \\ &= \frac{(61)(62)(63)}{(4)(5)(6)} \\ &\quad (\because \text{Numerator of } T_x = \text{Denominator of } T_{x+3}) \\ &= \frac{(61)(31)(21)}{(4)(5)} = \frac{(61)(651)}{20} = 1985.55 \end{aligned}$$

- 27) (a) As the roots of the equation

$$(a^2 + b^2)x^2 + 2(b^2 + c^2)x + (b^2 + c^2) = 0 \text{ are real.}$$

$$[2(b^2 + c^2)]^2 - 4(a^2 + b^2)(b^2 + c^2) \geq 0$$

$$\Rightarrow (b^2 + c^2) - (a^2 + b^2) \geq 0 \Rightarrow c^2 \geq a^2$$

- 28) (b) $(b^2 + c^2)^2 = (a^2 + b^2)(a^2 + c^2)$

$$\Rightarrow b^4 + c^4 + 2b^2c^2 = a^4 + a^2b^2 + a^2c^2 + b^2c^2$$

$$\Rightarrow b^4 + c^4 + b^2c^2 = a^4 + a^2b^2 + a^2c^2$$

$$\Rightarrow b^2(b^2 + c^2) + c^4 = a^2(b^2 + c^2) + a^4$$

$$\Rightarrow (b^2 - a^2)(b^2 + c^2) = a^4 - c^4$$

$$\text{Hence, } b^2 - a^2 = \frac{a^4 - c^4}{b^2 + c^2}$$

- 29) (b) Since, $\frac{p^6 - p}{p - 1} = p^5 + p^4 + p^3 + p^2 + p$;

the equation can also be written as

$p^5 + p^4 + p^3 + p^2 + p = m(m+1) + 6$. The RHS is even as m or $m+1$ is even, the first term is even and the second term is even. Since, the only even primes is 2, we have $p=2$. Substituting, we get $m^2 + m - 56 = 0$

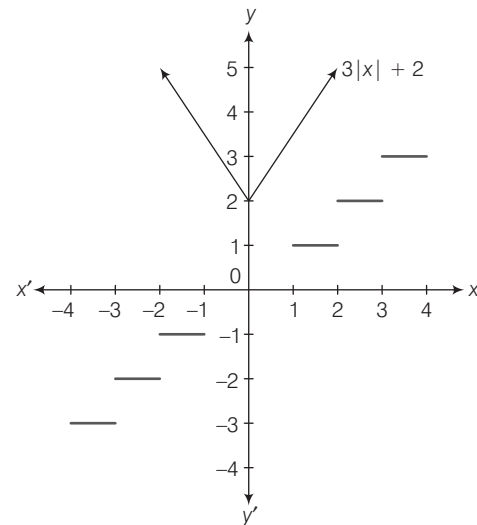
$$\therefore (m+8)(m-7) = 0$$

$$\therefore m = -8 \text{ or } 7$$

But m is a positive integer $\Rightarrow m = 7$

Thus, $p=2$ and $m=7$ is the only solution.

- 30) (b) The best way to tackle such problems is to resort to graphs.



The graphs $3|x| + 2$ and $[x]$ will never meet.

So, the equation, $3|x| + 2 = [x]$ will have no real root.

Alternatively

Since, $[x] \leq x$ and $3|x| + 2 > x$ cannot be $[x]$.

31) (c) $a = \frac{x}{y+z}, b = \frac{y}{x+z}, c = \frac{z}{x+y}$

$$\therefore x = a(y+z), y = b(x+z), z = c(x+y) \quad \dots (i)$$

Statement I

$$\begin{aligned} &\frac{b+c-1}{yz} + \frac{a+c-1}{xz} + \frac{a+b-1}{yx} \\ &= \frac{bx+cx-x+ay+cy-y+az+bz-z}{xyz} \\ &= \frac{a(y+z) + b(x+z) + c(x+y) - (x+y+z)}{xyz} \end{aligned}$$

$$= 0$$

[from Eq. (i)]

$\therefore$ Statement I is not true.

Statement II

$$\text{Consider } \frac{x^2}{a(1-bc)}$$

$$\text{Now, } (1-bc) = \frac{x^2 + yx + xz}{(x+z)(x+y)}$$

$$a(1-bc) = \frac{x^2 + yx + xz}{(x+z)(x+y)} \times \frac{x}{y+z}$$

$$= \frac{x^2(x+y+z)}{(x+z)(x+y)(y+z)}$$

$$\therefore \frac{x^2}{a(1-bc)} = \frac{(x+z)(x+y)(y+z)}{(x+y+z)}$$

Similarly, we get

$$\frac{y^2}{b(1-ac)} = \frac{(x+z)(x+y)(y+z)}{(x+y+z)} - \frac{z^2}{c(1-ab)}$$

$\therefore$ Statement II is true.

Statement III

$$(x+y+z)(xy+xz+yz)$$

$$= x^2y + x^2z + xyz + xy^2 + xyz + y^2z + xyz + xz^2 + yz^2$$

$$= 3xyz + xy(x+y) + yz(y+z) + xz(z+x)$$

$$\text{RHS} = \frac{2(x+y+z)(xy+xz+yz) - 6xyz}{(x+y)(y+z)(z+x)}$$

$$= \frac{2[xy(x+y) + yz(y+z) + xz(z+x)]}{(x+y)(y+z)(z+x)}$$

$$= 2 \left[\frac{xy}{(y+z)(z+x)} + \frac{yz}{(x+y)(x+z)} + \frac{xz}{(x+y)(y+z)} \right]$$

$$= 2[ab + bc + ac]$$

$$= ac + bc + ab + ac + ab + bc$$

$$= (a+b)c + (b+c)a + (a+c)b$$

$\therefore$ Statement III is also true.

- 32) (c) The coefficient of x in the new equation is

$$-\left[\left(\alpha + \frac{\alpha}{\beta} \right) + \left(\beta + \frac{\beta}{\alpha} \right) \right]$$

$$= - \left[\alpha + \beta + \frac{(\alpha + \beta)^2 - 2\alpha\beta}{\alpha\beta} \right]$$

$$= - \left[10 + \frac{100 - 30}{15} \right] = - \left[\frac{150 + 70}{15} \right]$$

$$= - \left[\frac{220}{15} \right] = \frac{-44}{3}$$

and the constant term of the equation

$$= \left(\alpha + \frac{\alpha}{\beta} \right) \times \left(\beta + \frac{\beta}{\alpha} \right)$$

$$= \alpha\beta + \alpha + \beta + 1 = 15 + 10 + 1 = 26$$

$\therefore$ The required equation is

$$x^2 - \frac{44}{3}x + 26 = 0 \text{ i.e.}$$

$$3x^2 - 44x + 78 = 0$$

- 33) (d) As $2a$, b and $2c$ are in arithmetic progression,

$$\Rightarrow 2b = 2a + 2c$$

$$b = a + c$$

$$x = \frac{-b \pm \sqrt{(a+c)^2 - 4ac}}{2a}$$

$$= \frac{-b \pm (a-c)}{2a}$$

$$= \frac{-(a+c) \pm (a-c)}{2a} = \frac{-c}{a} \text{ or } -1$$

- 34) (d) $\log_x a - b/a + b = \log_x b/a$

$$\Rightarrow a(a-b) = b(a+b)$$

$$\Rightarrow a^2 - ab = ab + b^2$$

$$\Rightarrow a^2 - b^2 = 2ab$$

$$\Rightarrow a^2 - 2ab - b^2 = 0$$

$$\Rightarrow \left(\frac{a}{b} \right)^2 - 2 \left(\frac{a}{b} \right) - 1 = 0$$

This is a quadratic in $\frac{a}{b}$. The product of the roots is -1 ,

i.e. if α is a root, then $\frac{-1}{\alpha}$ will also be root, i.e.,

if $\frac{a}{b}$ (or α) is one root, then the other root is $\frac{-b}{a}$ (or $\frac{-1}{\alpha}$).

$$\text{Therefore, } \left(\frac{a}{b} \right)^2 + \left(\frac{b}{a} \right)^2 = \alpha^2 + \frac{1}{\alpha^2}$$

$$= \left[\alpha + \left(\frac{-1}{\alpha} \right) \right]^2 + 2 = 2^2 + 2$$

$$= 6 \text{ (as the sum of the roots is 2)}$$

- 35) (d) The value of the discriminant of a quadratic equation will determine the nature of the roots of a quadratic equation.

The discriminant of a quadratic equation

$$ax^2 + bx + c = 0$$

is given by $b^2 - 4ac$.

- If the value of the discriminant is positive, i.e. greater than 0, then the roots of the quadratic equation will be real.
- If the value of the discriminant is 0, then the roots of the quadratic equation will be real and equal.
- If the value of the discriminant is negative, i.e. lesser than 0, then the roots of the quadratic equation will be imaginary. The two roots will be complex conjugates of the form $p + iq$ and $p - iq$.

Using this basic information, we can solve this problem as shown below.

In this question,

$$a = 2, b = 2(p+1) \text{ and } c = p$$

Therefore, the discriminant will be

$$[2(p+1)]^2 - 4 \times 2 \times p = 4(p+1)^2 - 8p$$

$$= 4[(p+1)^2 - 2p]$$

$$= 4[p^2 + 2p + 1 - 2p] = 4(p^2 + 1)$$

For any real value of p , $4(p^2 + 1)$ will always be positive as p^2 cannot be negative for real p .

Hence, the discriminant $b^2 - 4ac$ will always be positive.

When the discriminant is greater than 0 or is positive, the roots of a quadratic equation will be real. Therefore, the answer choice is (d).

- 36) (a) Let the value of certificates purchased in the first year be ₹ a .

The difference between the value of the certificates is ₹ 300 ($d = 300$).

Since, it follows Arithmetic Progression, the total value of certificates after 20 yr is given by

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$83000 = \frac{20}{2} [2a + (20-1)300]$$

$$83000 = 10(2a + 5700)$$

$$\Rightarrow 2a + 5700 = 8300$$

On simplifying, we get

$$a = ₹ 1300$$

The value of the certificates purchased by him in 13th year

$$\begin{aligned} &= a + (n-1)d \\ &= 1300 + (13-1) \times 300 \\ &= ₹ 4900 \end{aligned}$$

- 37) (b) From the property of logarithms.

$$\log(a \times b) = \log a + \log b$$

- 38) (c) If we consider the third term to be x .

The 15th term will be $(x + 12d)$

6th term will be $(x + 3d)$

11th term will be $(x + 8d)$

and 13th term will be

$$(x + 10d)$$

Thus, as per the given condition,

$$2x + 12d = 3x + 21d$$

$$\text{or } x + 9d = 0$$

$x + 9d$ will be the 12th term.

- 39) (b) $x^u = 256$

Take log on base 2, $u \log_2 x = 8$

Let $\log_2 x = p$

$$\text{Then, } \frac{8}{p} = p^2 - 6p + 12$$

$$p^3 - 6p^2 + 12p - 8 = 0$$

$$p^2(p-2) - 4p(p-2) + 4(p-2) = 0$$

$$(p^2 - 4p + 4)(p-2) = 0$$

$$(p-2)^3 = 0$$

$$p = 2$$

Hence, exactly one solution.

Answer option is (b).

- 40) (c) Since, M and N are the roots of $y^2 + My + N = 0$

$$M + N = -M \text{ and } MN = N$$

$$MN = N \Rightarrow N = 0 \text{ or } M = 1$$

If $N = 0$, then $M = -M \Rightarrow M = 0$

and If $M = 1$, then $N = -2M \Rightarrow N = -2$

i.e. two (M, N) pairs, $(0, 0)$ and $(1, -2)$ are possible.

- 41) (b) x, y and z are in Harmonic progression.

So, $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$ are in Arithmetic progression.

$$\frac{1}{z} - \frac{1}{y} = \frac{1}{y} - \frac{1}{x}$$

$$\frac{y-z}{yz} = \frac{x-y}{xy}$$

Multiplying both the sides by xyz , we get

$$x(y-z) = z(x-y)$$

$$x = \frac{z(x-y)}{y-z}$$

$\Rightarrow$ II is true

$$\text{and } \frac{1}{z} - \frac{1}{y} = \frac{1}{y} - \frac{1}{x} \Rightarrow \frac{2}{y} = \frac{1}{z} + \frac{1}{x}$$

$$\Rightarrow \frac{2}{y} = \frac{z+x}{xz} \Rightarrow x = \frac{y(x+z)}{2z}$$

$\Rightarrow$ I is true

- 42) (c) A_1 has 1 element, A_2 has 2 elements, A_3 has 3 elements, ..., A_{49} has 49 elements.

Number of elements in $A_1, A_2, A_3, \dots, A_{49}$ all combined

$$= 1 + 2 + 3 + \dots + 49 = \frac{49 \times 50}{2}$$

$$= 49 \times 25 = 1225$$

Thus, $A_{50} = (1226, 1227, \dots, 1275)$

Thus, sum of elements in A_{50}

$$= \frac{50}{2} (1226 + 1275) = 25 \times 2501 = 62525$$

- 43) (b) Let the roots of the equation $x^3 - ax^2 + bx - c = 0$ be

$$(\alpha - 1), \alpha, (\alpha + 1)$$

$$\Rightarrow \alpha(\alpha - 1) + \alpha(\alpha + 1) + (\alpha + 1)(\alpha - 1) = b$$

(according to the properties of roots)

$$\Rightarrow \alpha^2 - \alpha + \alpha^2 + \alpha + \alpha^2 - 1 = b$$

$$\Rightarrow 3\alpha^2 - 1 = b$$

Minimum value of b is -1 when $\alpha = 0$.

- 44) (c) For $n = 4$, the members of

$$S = \{(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)\}$$

Let us consider the member $(1, 2)$ the enemies of $(1, 2)$ is only $(3, 4)$, hence for $n = 4$, the number of enemies

is 1. For $n = 4$ only option (c), $\frac{1}{2}(n^2 - 5n + 6)$ gives

number of enemies 1.

Test it for $n = 6$, the members of

$$S = \{(1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6), (5, 6)\}$$

The enemies of (1, 2) are

$$\{(3, 4), (3, 5), (3, 6), (4, 5), (4, 6), (5, 6)\}$$

$\therefore$ For $n = 6$, number of enemies are 6 only option

(c) gives 6 enemies for $n = 6$.

- 45) (c) For $n = 6$, let's consider the members (1, 2) and (1, 3). Friends of the member (1, 2) in the set S are $\{(1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6)\}$. Friends of members (1, 3) in the set S (1, 4) (1, 5), (1, 6), (2, 3), (3, 4), (3, 5), (3, 6)

The number of members of S that are common friends to the above member are 4 i.e. (1, 4), (1, 5), (1, 6), (2, 3), hence the answer is $(n - 2)$.

- 46) (e) Using the information given in the question

$$\begin{aligned} a_1 &= p & b_1 &= q \\ a_2 &= pq & b_2 &= q^2 \\ a_3 &= p^2q & b_3 &= pq^2 \\ a_4 &= p^2q^2 & b_4 &= pq^3 \\ a_5 &= p^3q^2 & b_5 &= p^2q^3 \\ a_6 &= p^3q^3 & b_6 &= p^2q^4 \text{ and so on.} \end{aligned}$$

From the above relation, we conclude that

$$a_n = p^{n/2} \cdot q^{n/2} \text{ and } b_n = p^{\frac{n-1}{2}} \cdot q^{\frac{n}{2}+1}$$

Hence, $a_n + b_n$ (for even n)

$$\begin{aligned} &= p^{n/2} \cdot q^{n/2} + p^{\frac{n-1}{2}} \cdot q^{\frac{n}{2}+1} \\ &= p^{n/2} \cdot q^{n/2} + p^{n/2} \cdot p \cdot q^{n/2} \cdot q \\ &= q(pq)^{\frac{n-1}{2}} (p + q) \end{aligned}$$

- 47) (d)

- 48) (a) Let $f(x) = ax^2 + bx + c$

$$\text{At } x = 1, f(1) = a + b + c = 3$$

$$\text{At } x = 0, f(0) = c = 1$$

The maximum of the function $f(x)$ is attained at

$$x = \frac{-b}{2a} = 1 = \frac{a-2}{2a} \Rightarrow a = -2 \text{ and } b = 4$$

$$\text{Therefore, } f(x) = -2x^2 + 4x + 1$$

$$\text{Therefore, } f(10) = -159$$

- 49) (e) Given equations are

$$2^{0.7x} \times 3^{-1.25y} = \frac{8\sqrt{6}}{27} \quad \dots(i)$$

$$\text{and } 4^{0.3x} \times 9^{0.2y} = 8 \times (81)^{1/5} \quad \dots(ii)$$

From Eq. (ii), we get

$$\begin{aligned} &4^{0.3x} \times 9^{0.2y} = 8 \times (81)^{1/5} \\ \Rightarrow &(2^2)^{0.3x} \times (3^2)^{0.2y} = 8 \times (81)^{1/5} \\ \Rightarrow &(2)^{0.6x} \times (3)^{0.4y} = (2)^3 \times (3)^{4/5} \end{aligned}$$

$$\Rightarrow 0.6x = 3 \Rightarrow x = 5$$

$$\text{and } 0.4y = \frac{4}{5} \Rightarrow y = 2$$

If we substitute the values of x and y in Eq. (i) these values satisfy the Eq. (i). So, the answer is $x = 5, y = 2$. Hence, the correct option is (e).

- 50) (b) The given equation is $2x + y = 40$, where $x \leq y$
 $\Rightarrow y = (40 - 2x)$

The values of x and y that satisfy the equation are

x	1	2	3	4	...	13
y	38	36	34	32	...	14

Thus, there are 13 positive values of (x, y) which satisfy the equation such that $x \leq y$.

- 51) (d) Let number of terms in an arithmetic progression be n , then

$$\begin{aligned} 1000 &= 1 + (n-1)d \\ \Rightarrow (n-1)d &= 999 = 3^3 \times 37 \end{aligned}$$

Possible values of $(n-1)$ are 3, 37, 9, 111, 27, 333, 999.

Therefore, the number of possible values of n will also be 7, hence required progressions can be made.

- 52) (a) $x^{2/3} + x^{1/3} - 2 \leq 0$

$$\begin{aligned} \Rightarrow &x^{2/3} + 2x^{1/3} - x^{1/3} - 2 \leq 0 \\ \Rightarrow &(x^{1/3} - 1)(x^{1/3} + 2) \leq 0 \Rightarrow 2 \leq x^{1/3} \leq 1 \\ \Rightarrow &-8 \leq x \leq 1 \end{aligned}$$

- 53) (e) Given that, $\log_y x = a \log_z y = b \log_x z = ab$

$$\begin{aligned} \Rightarrow a &= \frac{\log_y x}{\log_z y} \text{ and } b = \frac{\log_y x}{\log_x z} \\ \Rightarrow a \times b &= \frac{\log_y x}{\log_z y} \times \left(\frac{\log_y x}{\log_x z} \right) = \left(\frac{\log_k x}{\log_k y} \right) \times \left(\frac{\log_k x}{\log_k z} \right) \\ &= \left(\frac{\log_k x}{\log_k y} \right)^3 = (\log_y x)^3 = (ab)^3 \end{aligned}$$

$$\text{Therefore, } ab - a^3 b^3 = 0$$

$$\Rightarrow ab(1 - a^2 b^2) = 0 \Rightarrow ab = \pm 1$$

Only option (e) does not satisfy. Hence, it is the required choice.

- 54) (d) $10 < n < 1000$

Let n is two digit number.

$$n = 10a + b \Rightarrow P_n = ab, S_n = a + b$$

$$\text{Then, } ab + a + b = 10a + b \Rightarrow ab = 9a \Rightarrow b = 9$$

There are 9 such numbers 19, 29, 33, ..., 99.

Then, let n is three digit number.

$$\Rightarrow n = 100a + 10b + c$$

$$\Rightarrow P_n = abc, S_n = a + b + c$$

$$\text{Then, } abc + a + b + c = 100a + 10b + c$$

$$\Rightarrow abc = 99a + 9b$$

$$\Rightarrow bc = 99 + 9\frac{b}{a}$$

But the maximum value for $bc = 81$ and RHS is more than 99. Hence, no such number is possible.

$$\begin{aligned} 55) (d) p &= \log_x \left(\frac{x}{y} \right) + \log_y \left(\frac{y}{x} \right) \\ &= \log_x x - \log_x y + \log_y y - \log_y x \\ &= 2 - \log_x y - \log_x y - \log_y x \\ &= 2 - 2\log_x y \\ t &= \log_x y \\ \Rightarrow P &= 2 - \frac{1}{t} - t = -\left(\sqrt{t} + \frac{1}{\sqrt{t}} \right)^2 \end{aligned}$$

Which can never be 1.

$$\begin{aligned} 56) (d) \text{ There are two equations to be formed} \\ 40m + 50f = 1000 \\ 250m + 300f + 40 \times 15m + 50 \times 10 \times f = A \\ 850m + 8000f = A \end{aligned}$$

m and f are the number of males and females A is amount paid by the employer.

Then, the possible values of $f = 8, 9, 10, 11, 12$

If $f = 8, m = 15$

If $f = 9, 10, 11$, then m will not be an integer while $f = 12$, then m will be 10.

By putting $f = 8$ and $m = 15$, $A = 18800$. When $f = 12$ and $m = 10$, then $A = 18100$. Therefore, the number of males will be 10.

- 57) (c) There have to be 2 calls from each person to the Englishman who knows French to get all the information. So, there should be 10 calls. But when the fifth guy call he would get all the information of the previous 4 guys alongwith Englishman's information. Hence, 1 call can be saved. So, the total number of calls = 9.

- 58) (a) The equation forming from the data is $x + y < 41$. The values which will satisfy this equation are

$$\begin{aligned} (1, 39), (1, 38) \dots (1, 1), \\ (2, 38), (2, 37) \dots (2, 1) \\ \vdots \\ (39, 1) \end{aligned}$$

So, the total number of cases are

$$39 + 38 + 37 + \dots + 1 = \frac{39 \times 40}{2} = 780$$

- 59) (b) Let $A = 100x + 10y + z$
 $\Rightarrow B = 100z + 10y + x$
 $B - A = 99(z - x)$

For $B - A$ to be divided by 7, $z - x$ has to be divisible by 7. Only possibility is $z = 9, x = 2$.

$\therefore$ Biggest number A can be 299.

$\therefore$ Option (b) is correct answer

- 60) (c) $a_1 = 1, a_{n+1} - 3a_n + 2 = 4n$

$$a_{n+1} = 3a_n + 4n - 2$$

When $n = 2$, then $a_2 = 3 + 4 - 2 = 5$

When $n = 3$, then $a_3 = 3 \times 5 + 4 \times 2 - 2 = 21$

So, it is satisfying $3^n 2 \times n$

Hence, $a_{100} = 3^{100} - 2 \times 100$

- 61) (c) Given $xy - x - y = 0$

Adding 1 to both sides of the equation, we get

$$xy - x - y + 1 = +1$$

$$y(x-1) - 1(x-1) = 1$$

$$(y-1)(x-1) = 1 \quad \dots(i)$$

As x and y are integers, $x-1$ and $y-1$ are integers. Hence, $x-1$ and $y-1$ must both be 1 or -1 to satisfy Eq. (i) i.e. $x = 2, y = 2$ or $x = 0, y = 0$. Hence, only two integer pairs satisfy the condition $x + y = xy$.

- 62) (a) $10^{10} = 10000000000$. If any one of the zeros is replaced by 1, the value of the result is between 10^{10} and 10^{11} . There are 10 possible numbers since any of the 10 zeroes can be replaced by 1.2×10^{10} .

(2 followed by 10 zeroes) also lies between 10^{10} and 10^{11} . Moreover, the sum of digits of each of the 11 numbers is two. Hence, n is 11.

- 63) (c) As, $\frac{a}{b+c} = \frac{b}{c+a} = \frac{c}{a+b} = \frac{a+b+c}{b+c+c+a+a+b}$
 $= \frac{a+b+c}{2(a+b+c)} = r = \frac{1}{2}$ (assuming $a+b+c \neq 0$)

If $a+b+c = 0$,

$$\frac{a}{b+c} = \frac{a}{a+b+c-a}$$

(by adding and subtracting a in the denominator)

$$= \frac{a}{0-a} = \frac{a}{-a} = r = -1$$

$$\left(\text{Similarly, } \frac{b}{c+a} = \frac{c}{a+b} = r = -1 \right)$$

Hence, r can take only $\frac{1}{2}$ or -1 as values.

Hence, the correct option is (c).

- 64) (b) $u = (\log_2 x)^2 - 6(\log_2 x) + 12$

$$\text{Let } \log_2 x = p \quad \dots(i)$$

$$\Rightarrow u = p^2 - 6p + 12$$

$$x^u = 256 (= 2^8)$$

Applying log to base 2 on both sides, we get

$$u \log_2 x = \log_2 2^8, \quad u \log_2 x = 8 \quad \dots(ii)$$

Dividing Eq. (ii) by Eq. (i), we get

$$u = 8/p \Rightarrow 8/p = p^2 - 6p + 12$$

$$\Rightarrow 8 - p^3 - 6p^2 + 12p \text{ or } p^3 - 6p^2 + 12p - 8 = 0$$

$$(p-2)^3 = 0, \quad p = 2$$

$$\log_2 x = 2 \Rightarrow x = 2^2 = 4$$

Thus, we have exactly one solution.

- 65) (a) Working from the choices, $5p - 2q - r$
 $= (5x + 10y - 15z) - (4x + 12y - 22z) - (x - 2y + 7z) = 0$
 For no other choices is the condition satisfied,
 hence (a).

- 66) (c) $T_n = a + (n-1)d$. Hence, we get 3rd + 5th term
 $= (a + 2d) + (a + 4d) = 2a + 6d$. Similarly, 6, 11 and
 13th terms.
 $= (a + 5d) + (a + 10d) + (a + 12d) = 3a + 27d$. Now,
 $2a + 6d = 3a + 27d$, hence $a + 11d = 10$. This means
 that the 12th term is zero.

- 67) (c) It is clear that the equation $2^x - x - 1 = 0$ is
 satisfied by $x = 0$ and 1 only. For $x > 1$, $f(x) = 2x^2 - x - 1$
 starts increasing.

- 68) (b) Minimum value of $4m + 1$ is $4(1) + 1 = 5$.

Since, $a + b + c + d = 5$.

We can have $a = b = c = 1$ and $d = 2$.

Then, $a^2 + b^2 + c^2 + d^2 = 1^2 + 1^2 + 1^2 + 2^2 = 7$

- 69) (d) This represents an AP with first term as 1 and
 common difference as 1 .

Sum of terms $= \frac{n(n+1)}{2}$, which must be close to 288 .

By hit and trial we get for $n = 23$,

Sum $= \frac{23(24)}{2} = 276$. The 24th alphabet is x , hence the
 288th terms is x .

- 70) (d) Sum of roots, $p + q = \alpha - 2$

Product of roots, $pq = -\alpha - 1$

Now, $p^2 + q^2 = (p + q)^2 - 2pq = (\alpha - 2)^2 + 2(\alpha + 1)$
 $= \alpha^2 + 4 - 4\alpha + 2\alpha + 2 = (\alpha + 1)^2 + 5$

Hence, the minimum value of this will be 5 .

- 71) (d) In an AP, the three terms a, b, c are related as
 $2b = a + c$

Hence, $2[\log_3(2^x - 5)] = \log_3 2 + \log_3\left(2^x - \frac{7}{2}\right)$

$$\log(2^x - 5)^2 = (2^{x+1} - 7)$$

Substitute the choices, only $x = 3$ satisfies the
 conditions.

- 72) (c) The number of balls in each layer is $1, 3, 6, 10, \dots$
 (each term is sum of natural numbers upto $1, 2, 3, \dots, n$ digits).

$$\therefore \sum \frac{n(n+1)}{2} = 8436 \Rightarrow \sum n^2 + \sum n = 8436 \times 2$$

$$\frac{n(n+1)(2n+1)}{6} + \frac{n(n+1)}{2} = 8436 \times 2$$

On solving, we get $n = 36$.

- 73) (c) The numbers must be reciprocals of each other.

Hence, $2 \times \frac{1}{2} = 1$ and $2 + \frac{1}{2} = 2\frac{1}{2} > 2$.

Hence, the sum is greater than the product of
 numbers.

- 74) (b) Substitute the extreme values in the inequalities
 $v = 1, u = -0.5, z = -2$. Then, $w = vz/u = 4$. Only (b)
 option gives this.

Simply substitute $x = 1, y = 2$ and $z = 3$ in the
 expression to get the answer.

- 75) (c)

- 76) (a) There are 2^{n-j} students who answer wrongly. For
 $j = 1, 2, 3, \dots, n$, the number of students will be a GP
 with base 2 . Hence, $1 + 2 + 2^2 + \dots + 2^{n-1} = 4095$. Using
 the formula, we get $2^n = 4095 + 1 \Rightarrow n = 12$

$$77) (c) S_n = 1 + \frac{4}{7} + \frac{9}{7^2} + \frac{16}{7^3} + \dots \quad \dots(i)$$

$$\frac{1}{7} S_n = \frac{1}{7} + \frac{4}{7^2} + \frac{9}{7^3} + \frac{16}{7^4} + \dots \quad \dots(ii)$$

Subtracting Eq. (ii) from Eq. (i), we get

$$S_n \left(\frac{6}{7} \right) = 1 + \frac{3}{7} + \frac{5}{7^2} + \frac{7}{7^3} + \dots \quad \dots(iii)$$

$$S_n \left(\frac{6}{7^2} \right) = \frac{1}{7} + \frac{3}{7^2} + \frac{5}{7^3} + \dots \quad \dots(iv)$$

Subtracting Eq. (iv) from Eq. (iii), we get

$$S_n \left(\frac{36}{49} \right) = 1 + \frac{2}{7} + \frac{2}{7^2} + \dots$$

This becomes a GP with first term $= 1$ and common
 ratio $= 1/7$

$$\Rightarrow S_n \left(\frac{36}{49} \right) = 1 + \frac{2}{7} \left(\frac{1}{1 - \frac{1}{7}} \right)$$

$$\text{or } S_n = \frac{49}{27}$$

- 78) (a) Subtract the two equations

$$x^2 - 3x + 2 = 0 \Rightarrow (x-1)(x-2) = 0$$

The root 1 and 2 do not satisfy any of the original
 equation in case these was a common root, it will be
 the root of subtracted equation.

So, no root.

- 79) (c) $0 < \frac{1}{n} \leq 1$ for positive n .

$$\Rightarrow 0 \leq 1 - \frac{1}{n} < 1 \Rightarrow 3 < 3 + \frac{1}{n} \leq 4$$

$$\Rightarrow 0 \leq 1 - \frac{1}{n} < x \leq 4 \Rightarrow 0 < x \leq 4$$

- 80) (b) $y = \frac{x+z}{2}, xyz = 4 \Rightarrow (x+z)xz = 8$

$$\text{Let } x + z = a \Rightarrow az(a-z) = 8 \Rightarrow az^2 - a^2z + 8 = 0$$

$$\Rightarrow \text{For } z \text{ to be real, } b^2 - 4ac > 1$$

$$\therefore a^4 - 32a > 0 \Rightarrow a^3 > 32$$

$$y = \frac{x+z}{2} = \frac{(32)^{1/3}}{2} = 2^{2/3}$$

$$81) (d) x = \frac{n^2 + 2\sqrt{n}(n+4) + 16}{n + 4\sqrt{n} + 4}$$

$$\text{Let } \sqrt{n} = t$$

$$\Rightarrow x = \frac{t^4 + 2t(t^2 + 4) + 16}{t^2 + 4t + 4} = \frac{(t+2)(t^3 + 8)}{(t+2)^2}$$

$$= \frac{t^3 + 8}{t+2} = t^2 - 2t + 4$$

For $t = 6$ to $t = 6\sqrt{2}$ (putting in above equation)

$$(40 - 12) < x < (72 + 4 - 12\sqrt{2})$$

$$\Rightarrow 28 < x < 76 - 12\sqrt{2} \approx 28$$

$$\Rightarrow 28 < x < 60$$

$$82) (d) 13x + 1 < 2z \text{ and } z + 3 = 5y^2$$

$$\Rightarrow 13x + 1 < 2(5y^2 - 3)$$

$$\Rightarrow 13x + 7 < 10y^2 \Rightarrow 10y^2 > 13x + 7$$

In the above equation, all the options (a), (b) and (c) are possible.

$$83) (b) b \geq 1 \text{ or } b \leq -1, x = -|a|b$$

$$a - xb = a - (-|a|b)b$$

$$= a + |a|b^2 \geq 0, \text{ since } b^2 \geq 1.$$

$$84) (d) \text{ Given, } a = 6b = 12c$$

$$2b = 9d = 12e$$

$$\text{So, } a = 12c, b = 2c, d = \frac{4}{9}c, e = \frac{c}{3}$$

From the options, only (d) option $\left|\frac{a}{6}, \frac{c}{d}\right|$ will have a fraction.

$$85) (a) \text{ Consider } T_1\{1, 2, 3, 4, 5\}. \text{ This does not contain a multiple.}$$

$$T_2 = \{2, 3, 4, 5, 6\}$$

$$T_3 = \{3, 4, 5, 6, 7\}$$

$$T_4 = \{4, 5, 6, 7, 8\}$$

$$T_5 = \{5, 6, 7, 8, 9\}$$

$$T_6 = \{6, 7, 8, 9, 10\}$$

All these do contain multiples of 6.

T_7 once again does not contain a multiple of 6. Also, one part out of every 6 taken in a sequence will not

contain a multiple of 6. Therefore, $\frac{96}{6} = 16$ sets will

not contain multiples of 6.

$\therefore 96 - 16 = 80$ will contain

$$86) (b) \frac{1}{3} \log_3 M + 3 \log_3 N = 1 + \log_{0.008} 5$$

$$\log_e M^{\frac{1}{3}} + \log_3 N^3 = 1 + \frac{\log_e 5}{\log_e 0.008}$$

$$\log_e (M \cdot N^9)^{1/3} = 1 + \frac{\log_e 5}{\log_e \frac{8}{1000}}$$

$$= 1 + \frac{\log_e 10 - \log_e 2}{\log_e 8 - \log_e 1000}$$

$$= 1 + \frac{\log_e 10 - \log_e 2}{3 \log_e 2 - 3 \log_e 10}$$

$$= 1 + \frac{\log_e 10 - \log_e 2}{-3 (\log_e 10 - \log_e 2)}$$

$$\log_3 (MN^9)^{1/3} = 1 - \frac{1}{3} = \frac{2}{3}$$

$$(MN^9)^{\frac{1}{3}} = 3^{\frac{2}{3}} = (9)^{\frac{1}{3}}$$

$$MN^9 = 9$$

$$N^9 = \frac{9}{M}$$

$$87) (c) \text{ If } x, y \in I, 5x + 19y = 64$$

For $x = 256$, we get that $y = -64$

Then, equation stands satisfied by $y = -64$ and $x = 256$.

$$88) (b) \log_{10} x - \log_{10} \sqrt{x} = 2 \log_x 10$$

$$\log_{10} x - \frac{1}{2} \log_{10} x = 2 \log_x 10$$

$$\frac{1}{2} \log_{10} x = 2 \log_x 10$$

$$\log_{10} xc = 4 \log_x 10$$

$$\log_{10} x = \log_x 10^4$$

$$\log_{10} x = \log_x 10000$$

Now, putting the value of $x = 10$.

$$1 = 4, \text{ which is not possible}$$

Putting the value of $x = \frac{1}{100}$, $-2 = -2$. Thus, answer

is (b). (x also satisfies the equation at $x = 100$).

$$89) (a) \text{ The number of stamps that were initially bought were more than one of each type. Hence, the total number of stamps}$$

$$= 2 (5 \text{ rupee}) + 2 (2 \text{ rupee}) + 3 (1 \text{ rupee}) + 3 (1 \text{ rupee})$$

$$= 10 \text{ tickets}$$

$$90) (d) X_n = (-1)^n X_{n-1}$$

$$\text{Put } n = 1, X_1 = (-1)^1 x_0$$

$$X_1 = -x (x_0 = x, \text{ given})$$

$$\text{As } x > 0 \quad (\therefore X_1 \text{ is -ve})$$

$$X_2 = (-1)^2 X_1 = -x, X_2 \text{ is -ve}$$

$$X_3 = (-1)^3 X_2 = x \Rightarrow X_3 \text{ is +ve}$$

$$X_4 = (-1)^4 X_3 = x \Rightarrow X_4 \text{ is +ve}$$

Therefore, none of these.

$$91) (c) \text{ We know,}$$

$$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$$

$$\text{or } (5)^2 = x^2 + y^2 + z^2 + 2 \times 3$$

$$\Rightarrow x^2 + y^2 + z^2 = 19$$

For maximum value of $x, y = z = 0$
but both cannot be zero at the same time as
 $xy + yz + zx \neq 0$

So, $x^2 < 19$

$\therefore x$ can be $\frac{13}{3}$ as $x^2 = \frac{169}{9} = 18.8$

- 92) (b) Let $x_1, x_2, \dots, x_{10}$ are +ve numbers.

Let digits of x_{10} are interchanged.

Original $x_{10} = 10a + b$

After interchanging $x_{10} = 10b + a$

According to question,

$$\frac{x_1 + x_2 + \dots + x_9 + 10b + a}{10} = 1.8 + \frac{x_1 + \dots + x_9 + 10a + b}{10}$$

$$\Rightarrow \frac{x_1 + x_2 + \dots + x_9 + 10b + a}{10} - \frac{x_1 + x_2 + \dots + x_9 + 10a + b}{10} = 1.8$$

$$\Rightarrow \frac{9b - 9a}{10} = 1.8 \Rightarrow (b - a) = \frac{1.8 \times 10}{9} = 2$$

- 93) (d) Since, the child missed the number so actual result would be more than 575, therefore we choose n such that $\frac{n(n+1)}{2} > 575$

For this least value of n is 34.

$$\therefore \text{Correct answer} = \frac{34(34+1)}{2} = 595$$

Missing number = $595 - 575 = 20$

- 94) (d) $\frac{A^2}{x} + \frac{B^2}{x-1} = 1$

If only $A = 0$, there is only one root.

If only $B = 0$, there is only one root.

If both A and B are not zero, then there would be two roots (because quadratic equation forms)

$\therefore$ Roots be 1 or 2

- 95) (a) $x, y, z > 0$; x and y are odd, z is even.

Note [odd - even is odd], [odd - odd is even]

[odd $\times$ odd is odd] since $(x-z)$ is odd.

$\therefore (x-z)^2$ is also odd and $(x-z)^2 y$ is odd.

- 96) (d) $(x-z)^2 y$ cannot be even.

$$x > 5 \text{ and } y < -1 \Rightarrow 4y < -4$$

$$(i) \quad x > 5 \text{ and } 4y < -4, \text{ so } x + 4y < 1$$

$$\text{Let } x > -4y \text{ be true } \Rightarrow 4y < -4 \text{ or } -4y > 4$$

So, $x > 4$, which is not true as given $x > 5$.

So, $x > -4y$ is not necessarily true.

$$(ii) \quad x > 5 \Rightarrow -4x < -20 \text{ and } 5y < -5$$

It is not necessary that $-4x < 5y$ as $-4x$ can be greater than $5y$, since $5y < -5$.

Hence, none of the options is true.

- 97) (a) For total salary paid to X

$$= 12 \times (300 + 330 + 390 + 420 + 450 + 480 + 510 + 540 + 570)$$

$$= 12 \times \frac{10}{2} [2 \times 300 + 9 \times 30] \quad (\because \text{sum of AP})$$

$$= 60 \times 870 = ₹ 52200$$

For total salary paid to Y

$$= 6 \times [200 + 215 + 230 + 245 + 260 \dots 20 \text{ terms}]$$

$$= 6 \times 10 \times [2 \times 200 + 19 \times 15] \quad (\because \text{sum of AP})$$

$$= 60 \times [400 + 285] = ₹ 41000$$

Total sum of both = ₹ 93300

- 98) (c) $2 < x < 3$ and $-8 < y < -7$, $-32 < x^2 y < -28$

While $-80 < 5xy < -70$

Hence, $5xy$ is the least because xy^2 is positive.

- 99) (d) Let $y = n^3 - 7n^2 + 11n - 5$

At $n = 1, y = 0$

$$\therefore (n-1)(n^2 - 6n + 5) = (n-1)^2(n-5)$$

Now, $(n-1)^2$ is always positive.

Now, for $n < 5$, the expression gives a negative quantity.

Therefore, the least value of n will be 6. Hence, $m = 6$

- 100) (c) $\frac{x(x+1)}{2} = 1000 - y$, $x = 44$, $y = 10$

- 101) (c) $abcd = 1$

Minimum value of $(1+a)(1+b)(1+c)(1+d)$ is

$$\Rightarrow 1 + a \geq 2\sqrt{a} \quad (\text{AM} \geq \text{GM})$$

$\therefore$ Minimum value

$$= 2\sqrt{a} \times 2\sqrt{b} \times 2\sqrt{c} \times 2\sqrt{d} = 16\sqrt{abcd} = 16$$

- 102) (c) $x_{n+1} = x_n + x_{n-1}$

$$x_8 = x_7 + x_6, \quad x_7^2 - x_6^2 = 517$$

Taking $x_7 = 29$ and $x_6 = 18$, we have $x_8 = 47$

$$\therefore x_9 = 47 + 29 = 76 \text{ and } x_{10} = 76 + 47 = 123$$

- 103) (c) $\therefore x + y = 1$

$$\left(x + \frac{1}{x}\right)^2 + \left(y + \frac{1}{y}\right)^2 = x^2 + y^2 + \frac{1}{x^2} + \frac{1}{y^2} + 4$$

Minimum value of $x^2 + y^2$ occur when $x = y$

($\because x + y = 1$)

$$\therefore \text{Put } x = y = \frac{1}{2},$$

$$\text{Minimum value} = \left(\frac{5}{2}\right)^2 + \left(\frac{5}{2}\right)^2 = \frac{25}{2} = 12.5$$

- 104) (c) $a = b(b-1)$

$$a^2 - 2a = b^2[b^2 + 1 - 2a] - 2b(b-1)$$

$$\text{or } a(a-2) = b(b-1)(b^2 - b - 2)$$

$$= b(b-1)(b^2 - 2b + b - 2)$$

$$= b(b-1)(b+1)(b-2)$$

So, this is divisible by 24 for $b \leq 4$.

- 105)** (a) $(x^2 - 7x + 12) \Rightarrow$ wrong equation $\Rightarrow$ Ujagar
(sum of roots = 7, product of roots = 12)
 $x^2 - 5x + 6 \Rightarrow$ wrong equation $\Rightarrow$ Keshab
(sum of roots = 5, product of roots = 6)
Hence, the correct equation is $x^2 - 7x + 6$, so roots are 6 and 1.

- 106)** (d) n th term,

$$\begin{aligned} T_n &= \frac{1}{(4n^2 - 1)} = \frac{1}{2} \left[\frac{(2n+1) - (2n-1)}{(2n+1)(2n-1)} \right] \\ &= \frac{1}{2} \left[\frac{1}{(2n-1)} - \frac{1}{(2n+1)} \right] \\ S &= \frac{1}{2} \left[\frac{1}{1} - \frac{1}{3} + \frac{1}{3} - \frac{1}{5} + \frac{1}{5} - \dots - \frac{1}{19} + \frac{1}{19} - \frac{1}{21} \right] \\ &= \frac{1}{2} \left[1 - \frac{1}{21} \right] = \frac{10}{21} \end{aligned}$$

- 107)** (d) By putting different values of x and y , we see that none of these three hold good.

- 108)** (b) Let the number of direct routes from A to B be x , from A to C be z and that from C to B be y . Then, the total number of routes from A to C are $xy + z = 33$. Since, the number of direct routes from A to B are 23, $x = 23$. Therefore, $23y + z = 33$. Then, y must take value 1 and then $z = 10$, thus answer is (b).

- 109)** (d) Let $f(x) = x^3 - ax^2 + bx - a = 0$

In the given equation, there are 3 sign changes, therefore there are at most 3 positive roots. If $f(-x)$ there is no sign change. Thus, there is no negative real root, i.e. if α, β and γ are the roots, then they are all positive and we have

$$\begin{aligned} f(x) &= \frac{(x-\alpha)(x-\beta)(x-\gamma)}{x^3 - \alpha + \beta + \gamma x^2 + \alpha\beta + \beta\gamma + \gamma\alpha x - \alpha\beta\gamma} = 0 \\ \Rightarrow b &= \alpha\beta + \beta\gamma + \gamma\alpha \Rightarrow a = \alpha + \beta + \gamma = \alpha\beta\gamma \\ \Rightarrow (\alpha + \beta + \gamma) / \alpha\beta\gamma &= 1 \\ \Rightarrow \frac{1}{\alpha\beta} + \frac{1}{\alpha\gamma} + \frac{1}{\beta\gamma} &= 1 \\ \Rightarrow \alpha\beta, \alpha\gamma, \beta\gamma &> 1 \Rightarrow b > 3 \end{aligned}$$

Thus, $b \neq 1$

- 110)** (d) $x - y = +0.2$ or $(x - y)^2 = 0.04$

Also, $x^2 + y^2 = 0.1$ (since $x^2 + y^2 > 0$)

And solving this two we get $2xy = 0.6$ from this we can find value of $x + y$ which comes out to be $+0.4$ or -0.4 and solving this two we get $|x| + |y| = 0.4$.

- 111)** (d) $4x - 17y = 1$ and given that $1000 \geq x$

Hence, we can say that $17y + 1 \leq 4000$

i.e. $y \leq 235$

Further also note that every 4th value of y e.g. 3, 7, 11, ... will give an integer value of x .

So, number of values of $y = 235/4 = 58$.

- 112)** (c) The lower bound is 0.5 and increases with 0.05. It forms an arithmetic progression, where 0.05 is the common difference and 0.5 is the first term. The term is less than 1 and hence it is 0.95. To find the number of terms in the series use the formulae on n th term i.e., $T_n = a + (n-1)d$, where ' a ' is the first term and ' d ' is the common difference.

Now, $0.95 = 0.5 + (n-1)0.05 \Rightarrow n = 10$

Hence, the value of n comes as 10, Maximum possible value of m is 10.

- 113)** (d) To find the minimum number of white vessel required to empty the vessel for maximum possible value of m , i.e. 10, we have to use the formulae of sum to n terms of this AP series. Sum to n terms is given by

$$S_n = \frac{n \times (\text{first term} + \text{last term})}{2}$$

Where, n is the number of terms in the series. For this series,

$$S_n = \frac{10 \times (0.5 + 0.95)}{2} = 7.25 \approx 8$$

Hence, minimum number of white vessels that is required is 8 as the capacity of white vessel is 1 L.

- 114)** (c) From the above solution, we can see that the eighth vessel empty by 0.75 L and hence that is the upper limit for the range. Further for the lower limit, make all the vessels equally full, which makes them all 0.1 parts empty. So, the option that satisfies the above condition is (c).

- 115)** (a) Let turban be of cost ₹ x , so payment to the servant = $90 + x$ for 12 month.

$$\text{For 9 month} = \frac{9}{12} \times (90 + x) = 64 + x$$

$$\Rightarrow x = ₹ 10$$

- 116)** (d) Basically, the question is of weights, so let us analyse them only 4 rubies weight as much as 3 emeralds.

4 rubies = 16 crores

3 emeralds = 15 crores

$\therefore$ All rubies, multiple of 4 allowed is the best deal.

$$\text{So, } \frac{12}{0.3} = 40 \text{ rubies.}$$

- 117)** (c) $\log_2[\log_7(x^2 - x + 37)] = 1$, use $\log_p x = y \Rightarrow p^y = x$

$$\therefore 2 = \log_7(x^2 - x + 37)$$

$$\Rightarrow 49 = x^2 - x + 37 \Rightarrow x^2 - x - 12 = 0$$

$$\Rightarrow (x-4)(x+3) = 0$$

$$\therefore x = 4$$

- 118)** (d) $PQ = 64 = 1 \times 64 = 2 \times 32 = 4 \times 16 = 8 \times 8$

Corresponding values of $P + Q$ are 65, 34, 20, 16.

Therefore, $P + Q$ cannot be equal to 35.

119) (a) $7x_2 - 4x_1 = 47$

$$x_1 + x_2 = 2$$

On solving, we get $11x_1 = 55$

$$x_1 = 5 \text{ and } x_2 = -3$$

$$\therefore c = -15$$

120) (d) Let the roots be m and n . The given quadratic equation can be written as $ax^2 + bx + c = 0$,

where $a = 1$, $b = -(A - 3)$, $c = -(A - 7)$

The sum of the roots is

$$(m + n) = -(b/a) = A - 3$$

and the product of the roots is $(nm) = (c/a) = -(A - 7)$.

The sum of the squares of the roots is

$$[(m + n)^2 - 2mn] = (A - 3)^2 - 2(-)(A - 7) = 0$$

On solving, we get $A = 5$ or -1

None of these values are given in the options.

121) (a) $x^2 - 3x + 2 > 0$

$$\Rightarrow x^2 - 2x - x + 2 > 0$$

$$\Rightarrow x(x - 2) - 1(x - 2) > 0$$

$$\Rightarrow (x - 2)(x - 1) > 0$$

This gives $(x > 2)$ as one range and $(x < 1)$ as the other.

In between these two extremes, there is no value of x which satisfies the given inequality.

122) (c) $3m^2 - 21m + 30 < 0$

$$\Rightarrow m^2 - 7m + 10 < 0$$

$$\Rightarrow m^2 - 5m - 2m + 10 < 0$$

$$\Rightarrow m(m - 5) - 2(m - 5) < 0$$

$$\Rightarrow (m - 2)(m - 5) < 0$$

Case I $m - 2 > 0$ and $m - 5 < 0$

$$\Rightarrow m > 2 \text{ and } m < 5 \Rightarrow 2 < m < 5$$

Case II $m - 2 < 0$ and $m - 5 > 0 \Rightarrow m < 2$ and $m > 5$ nothing common.

Hence, $2 < m < 5$

123) (a) We know, $\frac{a^3 + b^3}{a^2 - ab + b^2} = a + b = 45 + 55 = 100$

124) (b) $5^6 - 1 = (125)^2 - 1 = (125 - 1)(125 + 1)$
 $= 124 \times 126 = 15624$

Which is divisible by 31.

125) (d) $x^2 + kx - 8 = 0$

$$\text{Sum of roots} = a + b = -k = a + a^2 \quad \dots(i)$$

$$\text{Product of roots} = ab = -8 = a^3 \Rightarrow a = -2$$

Using $a = -2$ in Eq. (i), $-k = -2 + 4 = 2$ or $k = -2$

126) (b) $\log_7 \log_5 (\sqrt{x} + 5 + \sqrt{x}) = 0$

$$\log_5 (\sqrt{x} + 5 + \sqrt{x}) = 7^0 = 1$$

$$\sqrt{x} + 5 + \sqrt{x} = 5^1 = 5 \Rightarrow 2\sqrt{x} = 0$$

$$\therefore x = 0$$

127) (b) Take any value of a, b, c such that

$$a + b + c = 0 \text{ and } a \neq b \neq c$$

Say $a = 1$, $b = -1$ and $c = 0$

Substituting these values in

$$\frac{a^2}{2a^2 + bc} + \frac{b^2}{2b^2 + ac} + \frac{c^2}{2c^2 + ab} = \frac{1}{2} + \frac{1}{2} + 0 = 1$$

128) (c) $\frac{HM}{GM} = \frac{12}{13} \Rightarrow \frac{2ab}{(a+b)\sqrt{ab}} = \frac{12}{13}$

$$\Rightarrow \frac{2\sqrt{ab}}{a+b} = \frac{12}{13} \Rightarrow \frac{a+b}{2\sqrt{ab}} = \frac{13}{12}$$

By componendo and dividendo,

$$\frac{a+b+2\sqrt{ab}}{a+b-2\sqrt{ab}} = \frac{13+12}{13-12} = \frac{25}{1}$$

$$\frac{(\sqrt{a} + \sqrt{b})^2}{(\sqrt{a} - \sqrt{b})^2} = \frac{25}{1}$$

$$\frac{\sqrt{a} + \sqrt{b}}{\sqrt{a} - \sqrt{b}} = \frac{5}{1}$$

Again, by componendo and dividendo,

$$\frac{2\sqrt{a}}{2\sqrt{b}} = \frac{6}{4} \Rightarrow \frac{a}{b} = \frac{9}{4} \Rightarrow \frac{b}{a} = \frac{4}{9}$$

129) (a) $x^2 + px + 12 = 0$

$x = 4$ will satisfy this equation

$$\therefore 16 + 4p + 12 = 0 \Rightarrow p = -7$$

Other equation becomes $x^2 - 7x + q = 0$

Its roots are equal, so $b^2 = 4ac$

$$\Rightarrow 49 = 4q$$

$$\text{or } q = \frac{49}{4}$$

130) (c) Fourth term $= 8 \Rightarrow a + 3d = 8$

Sum of seven terms,

$$S_7 = \frac{7}{2} [2a + (7-1)d]$$

$$= \frac{7}{2} \times 2(a + 3d)$$

$$= 7 \times 8 = 56$$

PERMUTATIONS, COMBINATIONS AND PROBABILITY

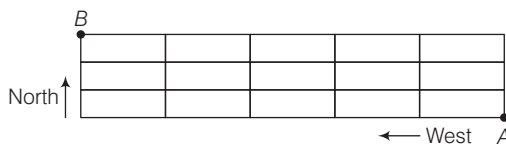
- 1) If $0 < x < 270^\circ$, then what is the probability that $\sin x > \cos x$? (2016)
 - (a) 6
 - (b) 7
 - (c) 8
 - (d) More than 8
- 2) The first n natural numbers, 1 to n , have to be arranged in a row from left to right. The n numbers are arranged such that there are an odd number of numbers between any two even numbers as well as between any two odd numbers. If the number of ways in which this can be done is 72, then find the value of n . (2016)
 - (a) 6
 - (b) 7
 - (c) 8
 - (d) More than 8
- 3) One red flag, three white flags and two blue flags are arranged in a line such that
 - I. no two adjacent flags are of the same colour.
 - II. the flags at the two ends of the line are of different colours.
 In how many ways can the flags be arranged? (2015)
 - (a) 7
 - (b) 3
 - (c) 2
 - (d) 6
- 4) From 5 consonants and 4 vowels, ... words can be formed using 3 consonants and 2 vowels? (2015)
 - (a) 6500
 - (b) 7200
 - (c) 6200
 - (d) 5200
- 5) Three of the six vertices of a regular hexagon are chosen at random. The probability that the triangle with these three vertices is equilateral, equals (express your answer in decimal). (2015)
- 6) In a chess tournament held this year in kolkata, there were only two women participant among all the members participate in the tournament. Every participant played two games with each other participant. The number of games that men played between them selves proved to exceed by 66, as compared to the number of games the men played with women.

How many participant were there in the tournament? (2013)

 - (a) 156
 - (b) 13
 - (c) 610
 - (d) 108
- 7) A shopkeeper received a pack of 15 pens, out of which 4 were defective. The shopkeeper decided to examine every pen one by one selecting a pen at random. The pens examined are not put back. What is the probability that ninth one examined is the last defective pen? (2013)
 - (a) $\frac{11}{195}$
 - (b) $\frac{16}{195}$
 - (c) $\frac{8}{195}$
 - (d) $\frac{17}{195}$
- 8) Letters of the word "ATTRACT" are written on cards and are kept on a table. Manish is asked to lift three cards at a time, write all possible combinations of the three letters on a piece of paper and then replace the three cards. The exercise ends when all possible combinations of letters are exhausted.

Then, he is asked to strike out all words in his list, which look the same when seen in a mirror. How many words is he left with? (2012)

 - (a) 40
 - (b) 20
 - (c) 30
 - (d) None of these
- 9) A student is asked to form numbers between 3000 and 9000 with digits 2, 3, 5, 7 and 9. If no digit is to be repeated, in how many ways can the student do so? (2012)
 - (a) 24
 - (b) 120
 - (c) 60
 - (d) 72
- 10) The side of an equilateral triangle is 10 cm long. By drawing parallels to all its sides, the distance between any two parallel lines being the same. The triangle is divided into smaller equilateral triangle, each of which has sides of length 1 cm. How many such small triangles are formed? (2012)
 - (a) 60
 - (b) 90
 - (c) 120
 - (d) None of these

- 11) Rajat draws a 10×10 grid on the ground such that there are 100 identical squares numbered 1 to 100. If he has to place two identical stones on any two separate squares in the grid, how many distinct ways are possible? (2011)
(a) 2475 (b) 4950 (c) 9900 (d) 1000
- 12) Vaibhav wrote a certain number of positive prime numbers on a piece of paper. Vikram wrote down the product of all possible triplets among those numbers. For every pair of numbers written by Vikram, Vishal wrote down the corresponding GCD. If 90 of the numbers written by Vishal were prime, how many numbers did Vaibhav write? (2011)
(a) 6 (b) 8 (c) 10 (d) Cannot be determined
- 13) How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed? (2010)
(a) 499 (b) 500 (c) 375 (d) 376
- 14) How many five-digit positive integers that are divisible by 3 can be formed using the digits 0, 1, 2, 3, 4 and 5 without any of the digits getting repeating? (2010)
(a) 15 (b) 96 (c) 216 (d) 120
- 15) There are four boxes. Each box contains two balls: one red and one blue. You draw one ball from each of the four boxes. What is the probability of drawing at least one red ball? (2010)
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{16}$ (d) $\frac{15}{16}$
- 16) A garland is to be made from six different flowers and a large pendant which has two different faces. In how many ways can the garland be made? (2009)
(a) 240 (b) 600 (c) 720 (d) None of these
- 17) Five persons entered the lift cabin on the ground floor of a seven storied building. Suppose that each of them independently and with equal probability, can leave the cabin at any floor beginning with the first. What will be the probability of all the five persons leaving at different floors? (2009)
(a) 0.02 (b) 0.15 (c) 0.37 (d) 0.38
- 18) In a chess competition involving some boys and girls of a school, every student had to play exactly one game with every other student. It was found that in 45 games both the players were girls and in 190 games both were boys. The number of games in which one player was a boy and the other was a girl is (2005)
(a) 200 (b) 216 (c) 235 (d) 256
- 19) If $R = \frac{30^{65} - 29^{65}}{30^{64} + 29^{64}}$, then (2005)
(a) $0 < R \leq 0.1$ (b) $0.1 < R \leq 0.5$ (c) $0.5 < R \leq 1.0$ (d) $R > 1.0$
- 20) For which value of k does the following pair of equations yield a unique solution for x such that the solution is positive?
 $x^2 - y^2 = 0, (x - k)^2 + y^2 = 1$ (2005)
(a) 2 (b) 0 (c) $\sqrt{2}$ (d) $-\sqrt{2}$
- 21) If $x = (16^3 + 17^3 + 18^3 + 19^3)$, then x divided by 70 leaves a remainder of (2005)
(a) 0 (b) 1 (c) 69 (d) 35
- 22) In the figure, given below the lines represent one-way roads allowing travel only Northwards or only Westwards. Along how many distinct routes can a car reach point B from point A? (2004)
(a) 15 (b) 56 (c) 120 (d) 336
- 
- 23) A new flag is to be designed with six vertical stripes using some or all of the colours yellow, green, blue and red. Then, the number of ways this can be done such that no two adjacent stripes have the same colour is (2004)
(a) 12×81 (b) 16×192 (c) 20×125 (d) 24×216
- 24) An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ..., 9 such that the first digit of the code is non-zero. The code, handwritten on a slip, can however potentially create confusion, when read upside down—for example, the code 91 may appear as 16. How many codes are there for which no such confusion can arise? (2003)
(a) 80 (b) 78 (c) 71 (d) 69

- 25) How many numbers can be made with digits 0, 7, 8 which are greater than 0 and less than a million?

(2002)

(a) 496 (b) 486 (c) 1084 (d) 728

- 26) In how many ways is it possible to choose a white square and a black square on a chess-board, so that the squares must not lie in the same row or column?

(2002)

(a) 56 (b) 896 (c) 60 (d) 768

Directions (Q.Nos. 27-28) Answer the questions based on the following information.

Each of the 11 letters *A, H, I, M, O, T, U, V, W, X* and *Z* appears same when looked at in a mirror. They are called symmetric letters. Other letters in the alphabet are asymmetric letters.

(2002)

- 27) How many four-letter computer passwords can be formed using only the symmetric letters (no repetition allowed)?

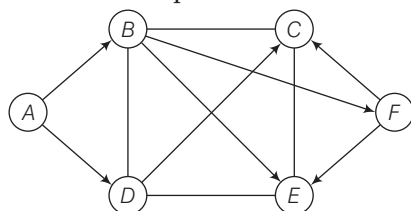
(a) 7920 (b) 330 (c) 146.4 (d) 419430

- 28) How many three-letter computer passwords can be formed (no repetition allowed) with at least one symmetric letter?

(a) 990 (b) 2730 (c) 12870 (d) 1560000

- 29) The figure below shows the network connecting cities *A, B, C, D, E* and *F*. The arrows indicate permissible direction of travel. What is the number of distinct paths from *A* to *F*?

(2001)

(a) 9
(c) 11(b) 10
(d) None of these

- 30) There are three cities : *A, B* and *C*. Each of these cities is connected with the other two cities by at least one direct road. If a traveller wants to go from one city (origin) to another city (destination), she can do so either by traversing a road connecting the two cities directly, or by traversing two roads, the first connecting the origin to the third city and the second connecting the third city to the destination. In all, there are 33 routes from *A* to *B* (including those *via C*). Similarly, there are 23 routes from *B* to *C* (including those *via A*). How many roads are there from *A* to *C* directly?

(2000)

(a) 6 (b) 3 (c) 5 (d) 10

- 31) Three labelled boxes containing red and white cricket balls are all mislabelled. It is known that one of the boxes contains only white balls and one only red balls. The third contains a mixture of red and white balls. You are required to correctly label the boxes with the labels red, white and red and white by picking a sample of one ball from only one box. What is the label on the box you should sample?

(1999)

(a) White
(b) Red
(c) Red and white
(d) Not possible to determine from a sample of one ball

- 32) For a scholarship, at the most n candidates out of $2n + 1$ can be selected. If the number of different ways of selection of at least one candidate is 63, the maximum number of candidates that can be selected for the scholarship is

(1999)

(a) 3 (b) 4
(c) 6 (d) 5

- 33) Ten points are marked on a straight line and 11 points are marked on another straight line. How many triangles can be constructed with vertices from among the above points?

(1999)

(a) 495 (b) 550
(c) 1045 (d) 2475

- 34) How many numbers can be formed from 1, 2, 3, 4, 5 (without repetition), when the digit at the unit's place must be greater than that in the ten's place?

(1998)

(a) 54 (b) 60 (c) $\frac{51}{3}$ (d) $2 \times 4!$

- 35) Five-digit numbers are formed using only 0, 1, 2, 3, 4 exactly once. What is the difference between the greatest and smallest numbers that can be formed?

(1998)

(a) 19800 (b) 41976
(c) 32976 (d) None of these

- 36) In how many ways can eight directors, Vice-chairman and Chairman of a firm be seated at a round table, if the Chairman has to sit between the Vice-chairman and a Director?

(1997)

(a) $9! \times 2$ (b) $2 \times 8!$
(c) $2 \times 7!$ (d) None of these

- 37) A man has 9 friends : 4 boys and 5 girls. In how many ways can he invite them, if there have to be exactly 3 girls in the invites?

(1996)

(a) 320 (b) 160
(c) 80 (d) 200

- 38) Boxes numbered 1, 2, 3, 4 and 5 are kept in a row and they which are to be filled with either a red or a blue ball, such that no two adjacent boxes can be filled with blue balls. Then, how many different arrangements are possible, given that all balls of a given colour are exactly identical in all respects? (1995)
 (a) 8 (b) 10 (c) 15 (d) 22
- 39) A, B, C and D are four towns, any three of which are non-collinear. Then, the number of ways to construct three roads each joining a pair of towns, so that the roads do not form a triangle is (1995)
 (a) 7 (b) 8
 (c) 9 (d) 24
- 40) If a 4 digit number is formed with digits 1, 2, 3 and 5. What is the probability that the number is divisible by 25, if repetition of digits is not allowed? (1995)
 (a) $\frac{1}{12}$ (b) $\frac{1}{4}$
 (c) $\frac{1}{6}$ (d) None of these
- 41) A five-digit number is formed using digits 1, 3, 5, 7 and 9 without repeating anyone of them. What is the sum of all such possible numbers? (1993)
 (a) 6666600 (b) 6666660
 (c) 6666666 (d) None of these
- 42) 139 persons have signed for an elimination tournament. All players are to be paired up for the first round, but because 139 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches is required to determine the champion, the number of matches with must be played is (1993)
 (a) 136 (b) 137 (c) 138 (d) 139
- 43) A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the red ball selected is the smallest red ball is (1993)
 (a) $\frac{1}{18}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{2}{3}$

HINTS & SOLUTIONS

- 1) If $0 < x < 45^\circ$, $\sin x < \cos x$
 If $x = 45^\circ$, $\sin x = \cos x$
 If $45^\circ < x \leq 90^\circ$, $\sin x > \cos x$
 If $90^\circ < x \leq 180^\circ$, $\sin x > \cos x$ (as $\sin x$ is always + ve in that zone)
 If $180^\circ < x < 225^\circ$, $\sin x > \cos x$
 If $x = 225^\circ$, $\sin x = \cos x$
 If $225^\circ < x < 270^\circ$, $\sin x < \cos x$
 Hence, probability

$$= \frac{(90^\circ - 45^\circ) + (180^\circ - 90^\circ) + (225^\circ - 180^\circ)}{270^\circ}$$

$$= \frac{180^\circ}{270^\circ} = \frac{2}{3}$$
- 2) (a) If there are an odd number of numbers between any two numbers, the two numbers occupy positions of the same parity (i.e. both are in even places or both are in odd places).
 There are an odd number of numbers between any two even numbers as well as between any two odd numbers, i.e. the even numbers occupy the even positions and the odd numbers occupy the odd position or *vice-versa*. If $n = 6$, this can be done in $3! + 3! = 12$ or 12 ways. For other values of n , this is not 12.

Alternate Method

If n even, i.e. say $n = 2m$, then the number of ways is $2 \times m! \times m!$, i.e. m odd numbers in alternate places and m even numbers in alternate places.

If n is odd, i.e. say $n = 2m + 1$, then

Number of ways = $m!(m + 1)!$

Hence, either $2(m!)^2 = 72$ or $m!(m + 1)! = 72$

If $2(m!)^2 = 72 \Rightarrow m! = 6 \Rightarrow m = 3$

For $m!(m + 1)! = 72$, there is no solution.

Hence, $m = 3$ and $n = 2m = 6$.

- 3) (d) The required possibilities are given as under $w^*w^*w^*$ or $*w^*w^*w$, where $*$ shows the position occupied by 2 blue and 1 red flag.
 $\therefore$ Total number of permutations = $2 \cdot \frac{3!}{2!} = 6$
- 4) (b) From 5 consonants, 3 consonants can be selected in ${}^5C_3$ ways. From 4 vowels, 2 vowels can be selected in ${}^4C_2$ ways. Now, with every selection, number of ways of arranging 5 letters is ${}^5P_5$.
 $\therefore$ Total number of words = ${}^5C_3 \times {}^4C_2 \times {}^5P_5$

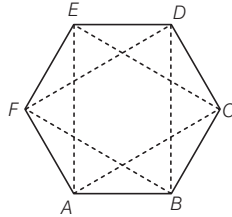
$$= \frac{5 \times 4}{2 \times 1} \times \frac{4 \times 3}{2 \times 1} \times 5!$$

$$= 10 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$= 7200$$

- 5) There are 6 vertices in a hexagon. Using 3 vertices out of 6 vertices we can form ${}^6C_3$ triangles. But there can be only triangles out of ${}^6C_3$ triangles which are equilateral (see the figure)
(i) $\triangle ACE$ (ii) $\triangle BDF$.

$$\begin{aligned}\therefore \text{Required probability} &= \frac{2}{{}^6C_3} = \frac{2}{20} \\ &= \frac{1}{10} = 0.1\end{aligned}$$



- 6) (b) Let the total number of women participant be x . Since, every participant played two games with each other participant.

So, total number of games played among men

$$= 2 \times {}^nC_2 = 2 \times \frac{n!}{2!(n-2)!} = n(n-1)$$

Number of games played with each women $= 2n$

Since, each women must have played two games with each men.

$\therefore$ Total match played by women $= 2 \times 2n = 4n$

Now, according to the question,

$$n(n-1) - 4n = 66$$

$$n^2 - n - 4n = 66$$

$$n^2 - 5n - 66 = 0$$

$$n^2 - 11n + 6n - 66 = 0$$

$$(n-11)(n+6) = 0$$

$$n = 11, -6$$

($\because n > 0$, so -6 is not possible)

$\therefore$ Number of total participant $= 11 + 2 = 13$

- 7) (c) Let A be the event getting exactly 3 defectives in the examination of 8 pens and B be the event of getting ninth pen defective.

Then, required probability $= P(A \cap B) = P(A)P\left(\frac{B}{A}\right)$

$$\text{Now, } P(A) = \frac{{}^4C_3 + {}^{11}C_5}{{}^{15}C_8}$$

and $P\left(\frac{B}{A}\right)$ = Probability that the ninth examined

pen is defective, given that there were 3 pens defective in first 8 pens examined $= \frac{1}{7}$

Hence, required probability

$$= \frac{{}^4C_3 \times {}^{11}C_5}{{}^{15}C_8} \times \frac{1}{7} = \frac{8}{195}$$

- 8) (a) To find all the 3 letters words possible, we consider 4 cases

(1) Number of words using 3 T's $\rightarrow 1$

(2) Number of words using 2 T's $\rightarrow 3 \times 3 = 9$, since the 3rd letter may be anyone of A, C, R and can be placed in anyone of 3 positions eg., CTT, TCT, TTC.

(3) Number of words using 2 A's $\rightarrow 3 \times 3 = 9$

(4) Number of words with all 3 letters distinct $\rightarrow {}^4P_3 = 24$

Total $= 24 + 9 + 9 + 1 = 43$ words

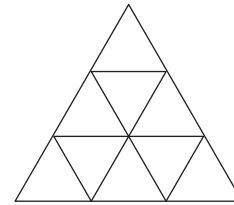
3 words TTT , ATA , TAT are striken out as they look the same in a mirror.

$\therefore 43 - 3 = 40$ words.

- 9) (d) The first digit can be chosen from 3, 5, 7 in 3 ways. Having chosen the first digit, the remaining three digits can be chosen from the remaining four numbers in ${}^4P_3 = 24$ ways.

$\therefore$ Total number of ways $= 3 \times 24 = 72$

- 10) (d) Each side is divided into 10 equidistant parts.



The number of triangles in the first row is 1, in the second 3, in the third 5, in the n th it is $2n-1$. Hence, the total number is n^2 , since sum of first n odd numbers is equal to n^2 .

Hence, total number of triangles $= (10)^2 = 100$

- 11) (b) Two identical stones are to be placed on any two separate squares in the grid.

$$\therefore r = 2$$

Total number of squares $= 100$

$\therefore$ Total number of stones, $n = 100$

The number of ways of selecting two things out of 100 is ${}^nC_r = {}^{100}C_2 = 4950$

$\therefore$ Option (b) is correct.

- 12) (a) Vaibhav wrote say m prime numbers.

Vikram wrote down $n = {}^mC_3$ numbers of the form $p_i p_j p_k$, where p_i, p_j, p_k are the numbers written by Vaibhav.

Vishal wrote down $n(n-1)/2$ instances of some numbers.

Some of these were 1 (and hence not prime).

Some were of the form p_i and others were of the form $p_i p_j$ (and hence not prime).

Each of the prime numbers (of Vaibhav) were written down by Vishal a certain number of times. Consider one particular number, say p_1 . Among the other

$(m-1)$ numbers, we have to count pairs of numbers of the form $p_1 p_i p_j$ and $p_1 p_r p_s$, where no two of i, j, r, s are equal and none of them is equal to 1.

The number of ways of choosing p_i, p_j is ${}^{m-1}C_2$.

Among the remaining $m-3$ numbers the number of ways of choosing 2 is ${}^{m-3}C_2$.

But in the product $({}^{m-1}C_2)({}^{m-3}C_2)$ each such pair has been counted twice. Therefore, the number of distinct pairs is $({}^{m-1}C_2)({}^{m-3}C_2)/2$.

Vishal writes down so many numbers for each of the m primes of Vaibhav.

∴ Number of instances of primes that Vishal writes.

$$\begin{aligned} & \frac{m({}^{m-1}C_2)({}^{m-3}C_2)}{2} \\ \therefore & \frac{m}{2} \cdot \frac{(m-1)(m-2)}{2} \cdot \frac{(m-3)(m-4)}{2} = 90 \\ \Rightarrow & m(m-1)(m-2)(m-3)(m-4) = (90)(8) \\ & 6(5)(4)(3)(2) \\ \Rightarrow & m = 6 \end{aligned}$$

- 13) (d) The smallest number in the series is 1000, a 4-digit number.

The largest number in the series is 4000, the only 4-digit number to start with 4.

The left most digit (thousands place) of each of the 4 digit numbers other than 4000 can take one of the 3 values 1 or 2 or 3.

The next 3 digits (hundreds, tens and units place) can take any of the 5 values 0 or 1 or 2 or 3 or 4.

Hence, there are $3 \times 5 \times 5 \times 5$ or 375 numbers from 1000 to 3999.

Including 4000, there will be 376 such numbers.

- 14) (b) **Test of divisibility for 3**

The sum of the digits of any number that is divisible by 3 is divisible by 3.

For instance, take the number 54372.

Sum of its digits is $5 + 4 + 3 + 7 + 2 = 21$.

As, 21 is divisible by 3, 54372 is also divisible by 3.

There are six-digits viz, 0, 1, 2, 3, 4 and 5. To form 5-digit numbers we need exactly 5 digits. So, we should not be using one of the digits.

The sum of all the six digits 0, 1, 2, 3, 4 and 5 is 15. We know that any number is divisible by 3 if and only if the sum of its digits are divisible by 3.

Combining the two criteria that we use only 5 of the 6 digits and pick them in such a way that the sum is divisible by 3, we should not use either 0 or 3 while forming the five digit numbers.

Case 1 If we do not use 0, then the remaining 5 digits can be arranged in $5!$ ways = 120 numbers.

Case 2 If we do not use 3, then the arrangements should take into account that 0 cannot be the first digit as a 5-digit number will not start with 0.

The first digit from the left can be any of the 4 digits 1, 2, 4 or 5.

Then the remaining 4 digits including 0 can be arranged in the other 4 places in $4!$ ways.

So, there will be $4 \times 4!$ numbers

$$= 4 \times 24 = 96 \text{ numbers.}$$

Combining Case 1 and Case 2, there are a total of $120 + 96 = 216$ 5 digit numbers divisible by 3 that can be formed using the digits 0 to 5.

- 15) (d) Since, we need the probability of at least one red ball, turn the question around. In what scenario would you not get even one red ball? That would happen if you got all blue balls.

Hence, probability of at least one red ball

$$= 1 - (\text{Probability of all blue balls})$$

Since, the probability of drawing one blue ball is $\frac{1}{2}$, the probability of drawing all four blue balls will be

$$\left(\frac{1}{2}\right)^4 = \frac{1}{16}$$

Hence, the answer to the question is

$$1 - \frac{1}{16} = \frac{15}{16}$$

and the correct answer is option (d).

- 16) (c) Six different flowers and a large pendant are 7 different things that are to be arranged in a circular manner, which can be done in $(7-1)! = 6! = 720$ ways.

- 17) (b) Besides the ground floor, there are seven floors. The total number of ways in which each of the five persons can leave the cabin at any of the 7 floors = 7^5 . And, the favourable number of ways, i.e. the number of ways in the which the 5 persons leave at different floors is ${}^7P_5$.

$$\therefore \text{Required probability} = \frac{{}^7P_5}{7^5} = 0.15$$

- 18) (a) Let there be m boys and n girls.

$$\text{Then, } n_{C_2} = 45 = \frac{n(n-1)}{2}$$

$$\Rightarrow n(n-1) = 90 \Rightarrow n = 10$$

$$\Rightarrow m_{C_2} = 190$$

$$\Rightarrow \frac{m(m-1)}{2} = 190$$

$$\Rightarrow m(m-1) = 380 \Rightarrow m = 20$$

$$\begin{aligned} \text{Number of games between one boy and one girl} \\ = {}^{10}C_1 \times {}^{20}C_1 = 10 \times 20 = 200 \end{aligned}$$

19) (d) $\frac{30^{65} - 29^{65}}{30^{64} + 29^{64}} > 1$

As, $30^{65} - 29^{65} > 30^{64} + 29^{64}$
 $30^{64}(30 - 1) > 29^{64}(29 + 1)$
 $30^{64} \times 29 > 29^{64} \times 30$
 $30^{63} > 29^{63}$

20) (c) $y^2 = x^2$

$$2x^2 - 2kx + k^2 - 1 = 0$$

$$D = 0$$

$$\Rightarrow 4k^2 = 8k^2 - 8$$

$$\Rightarrow 4k^2 = 8$$

$$\Rightarrow k = \sqrt{2}$$

21) (a) $x = 16^3 + 17^3 + 18^3 + 19^3$ is even number.

Therefore, 2 divides x .

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$\Rightarrow a + b \text{ always divides } a^3 + b^3.$$

Therefore, $16^3 + 19^3$ is divisible by 35,

$18^3 + 17^3$ is divisible by 35.

Hence, x is divisible by 70.

22) (b) Any route from A to B consists of $3 + 5 = 8$ segments, where the car can move only 5 segments to the West and only 3 segments to the North.

The number of distinct routes is equal to the number of ways of choosing 3 out of the 8 segments along which the car can go North or choosing 5 segments along which the car can go West.

Therefore, the number of distinct routes from A to B

$$\text{is } {}^8C_3 = \frac{8(7)(6)}{3(2)(1)} = 56.$$

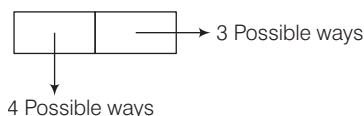
23) (a) Any of the 4 colours can be chosen for the first stripe. Any of the remaining 3 colours can be used for the second stripe. The third stripe can again be coloured in 3 ways (we can repeat the colour of the first stripe but not use the colour of the second stripe).

Similarly, there are 3 ways to colour each of the remaining stripes.

$\therefore$ The number of ways the flag can be coloured is

$$4(3)^5 = (12)(3^4).$$

24) (d) The available digits are 0, 1, 2, ..., 9. The first digit can be chosen in 9 ways (0 not acceptable), the second digit can be accepted in 9 ways (digits repetition not allowed). Thus, the code can be made in $9 \times 9 = 81$ ways.



Now, there are only 4 digits which can create confusion 1, 6, 8, 9. The same can be given in the following ways.

Total number of ways confusion can arise $= 4 \times 3 = 12$

Thus, required answer $= 81 - 12 = 69$

25) (d) Number of ways for selecting single digit $= 2$

Number of ways for selecting two digit

$$= 2 \times 3 = 6$$

Number of ways for selecting three digits

$$= 2 \times 3 \times 3 = 18$$

Number of ways for selecting four digits

$$= 2 \times 3 \times 3 \times 3 = 54$$

Number of ways for selecting five digits

$$= 2 \times 3 \times 3 \times 3 \times 3 = 162$$

Number of ways for selecting six digits

$$= 2 \times 3 \times 3 \times 3 \times 3 \times 3 = 486$$

Hence, total number of ways

$$= (2 + 6 + 18 + 54 + 162 + 486) = 728$$

26) (d) There are 32 black and 32 white squares on a chess-board, then number of ways in choosing one white and one black square on the chess

$$= {}^{32}C_1 \times {}^{32}C_1 = 32 \times 32 = 1024$$

Number of ways in which square lies in the same row (white square = 4, black square = 4, Number of rows

$$= 8) = {}^4C_1 \times {}^4C_1 \times 8 = 128$$

$\therefore$ Number of ways in which square lie on the same column $= {}^4C_1 \times {}^4C_1 \times 8 = 128$

Total number in which square lie on the same row or same column $= 128 + 128 = 256$

Hence, required number of ways $= 1024 - 256 = 768$.

27) (a) Ist place of four letter password can be filled in 11 ways.

IInd place of four letter password can be filled in 10 ways.

IIIrd place of four letter password can be filled in 9 ways.

IVth place of four letter password can be filled in 8 ways.

Hence, required number of ways

$$= 11 \times 10 \times 9 \times 8 = 7920 \text{ ways}$$

28) (c) Three letter password from 26 letters can be selected in $26 \times 25 \times 24$ ways. Three letter password from 15 asymmetric letters can be selected in $15 \times 14 \times 13$ ways.

Hence, three letter password with at least one symmetric letter can be made in

$$(26 \times 25 \times 24) - (15 \times 14 \times 13) = 12870 \text{ ways.}$$

- 29) (b) All the routes from A to F are given here under :
 $ABDF, ACEF, ABF, ABEF, ACDF, BCDEF, ACDEF, ABDEF, ABCDF, ABCEF$.
- 30) (a) Let the number of direct roads from A to B , B to C and C to A be x , y and z , respectively. Then,
 $x + yz = 33, y + xz = 23 \Rightarrow z = 6$.
- 31) (a) We can start by testing the boxes labelled red and white. If the ball is red, label the box-red. Now, the box which has the label white is either red or red and white. However, it cannot be red. Hence, it is red and white. The last box is white.
- 32) (a) Atleast one candidate out of $(2n + 1)$ candidates can be selected in $(2^{n+1} - 1)$ ways.
 $\therefore 2^{2n+1} - 1 = 63$
 $\Rightarrow 2^{2n+1} = 64 = (2)^6$
 $\Rightarrow n = 2.5$
 Since, n cannot be a fraction. Hence, $n = 3$.
- 33) (c) Required number of triangles
 $= {}^{10}C_2 \times 11 + {}^{11}C_2 \times 10$
 $= 45 \times 11 + 55 \times 10 = 1045$
- 34) (b) The digit in the unit's place should be greater than that in the ten's place. Hence, if digit 5 occupies the unit place, then remaining four digits need not to follow any order, hence required numbers = $4!$. However, if digit 4 occupies the unit place, then 5 cannot occupies the ten's positions. Hence, digits at the ten's place will be one among 1, 2 or 3. This can happen in 3 ways. The remaining 3 digits can be filled in the remaining three places in $3!$ ways. Hence, in all we have $(3 \times 3!)$ numbers ending in 4.
 Similarly, if we have 3 in the unit's place, the ten's place can be either 1 or 2. This can happen in 2 ways. The remaining 3 digits can be arranged in the remaining 3 places in $3!$ ways. Hence, we will have $(2 \times 3!)$ numbers ending in 3. Similarly, we can find that there will be $3!$ numbers ending in 2 and no number ending with 1. Hence, total number of numbers
 $= 4! + (3 \times 3!) + (2 \times 3!) + 3!$
 $= 4! + 6 \times 3! = 24 + (6 \times 6) = 60$
- 35) (c) Greatest five digit number is 43210 and smallest five digit number is 10234.
 Hence, difference = $43210 - 10234 = 32976$
- 36) (b) We consider Vice-chairman and the Chairman as 1 unit. Now, 9 persons can be arranged along a circular table in $8!$ ways. And Vice-chairman and Chairman can be arranged in 2 different ways. Hence, required number of ways = $2 \times 8!$
- 37) (b) 3 girls can be selected out of 5 girls in ${}^5C_3$ ways. Since, number of boys to be invited is not given, hence out of 4 boys, he can invite them $(2)^4$ ways.
 Hence, required number of ways
 $= {}^5C_3 \times (2)^4 = 10 \times 16 = 160$
- 38) (d) Total number of ways of filling the 5 boxes numbered as (1, 2, 3, 4 and 5) with either blue or red balls = $2^5 = 32$. Two adjacent boxes with blue can be got in 4 ways, i.e. (12), (23), (34) and (45). Three adjacent boxes with blue can be got in 3 ways i.e. (123), (234) and (345). Four adjacent boxes with blue can be got in 2 ways i.e. (1234) and (2345) and five boxes with blue can be got in 1 way. Hence, the total number of ways of filling the boxes such that adjacent boxes have blue = $(4 + 3 + 2 + 1) = 10$
 Hence, the number of ways of filling up the boxes such that no two adjacent boxes have blue = $32 - 10 = 22$.
- 39) (d) To construct 2 roads, three towns can be selected out of 4 in $4 \times 3 \times 2 = 24$ ways. Now, if the third road goes from the third town to the first town, a triangle is formed and if it goes to the fourth town, a triangle is not formed. So, there are 24 ways to form a triangle and 24 ways of avoiding a triangle.
- 40) (a) The total number of 4 digit numbers that can be formed = $4!$. If the number is divisible by 25, then the last two digits are 25. So, the first two digits can be arranged in $2!$ ways.
 Hence, required probability = $\frac{2!}{4!} = \frac{1}{12}$
- 41) (a) Keeping one digit in fixed position, other four can be arranged in $4!$ ways = 24 ways. Thus, each of the 5 digits will occur in each of five places $4!$ times.
 Hence, the sum of digits in each position is $24(1 + 3 + 5 + 7 + 9) = 600$. So, the sum of all numbers = $6000(1 + 10 + 100 + 1000 + 10000)$
 $= 6666600$
- 42) (c) Required number of matches played will be $(139 - 1) = 138$.
- 43) (c) Required probability = $1/6$.

FUNCTIONS

- 1) Consider two figures A and D that are defined in the coordinate plane. Each figure represents the graph of a certain function, as defined below

A. $|x| - |y| = a$

B. $|y| = d$

If the area enclosed by A and D is 0, which of the following is a possible value of (a, d) ? (2016)

- (a) (2, 1) (b) (-2, 1)
(c) (-2, 3) (d) (2, 3)

- 2) If $[\log_{10} 1] + [\log_{10} 2] + [\log_{10} 3] + [\log_{10} 4] + \dots + [\log_{10} n] = n$, where $[x]$ denotes the greatest integer less than or equal to x , then (2016)

- (a) $96 \leq n < 104$ (b) $104 \leq n < 107$
(c) $107 \leq n < 111$ (d) $111 \leq n < 116$

- 3) What is the range of $2\sin x + 3\cos x$? (2016)

- (a) $[-5, +5]$ (b) $(-5, +5)$
(c) $(0, +3]$ (d) $[-\sqrt{13}, +\sqrt{13}]$

- 4) Find the maximum value of $f(x)$; if $f(x)$ is defined as the Min $[-(x-1)^2 + 2(x-2)^2 + 1]$. (2016)

- (a) 1 (b) 2
(c) 0 (d) 3

- 5) $f(x) = f(x+p)$ for all x , $g(x) = g(x+q)$ for all x . $p, q \neq 0$, p and q are integers $f(x)$ is an even function, $g(x)$ is an odd function. Which of the following is/are true?

I. $f(x) \times g(x)$ is an odd function.

II. $f(x-p)$ is an even function.

III. $p(x) = f(x) \times g(x)$ is also a periodic function.

IV. If $h(x) = f(x)g(x)$ and $h(x+p) = h(x)$ for all x .

Then, p should be equal to q . (2016)

- (a) I, II and IV (b) I, II and III
(c) I and II (d) All of these

- 6) For what values of ' x ' is the function $\sqrt{x^2 - 6x - 40}$ defined in the real domain? (2016)

- (a) $-10 < x < 4$
(b) $-4 < x < 10$
(c) x does not lie between the closed interval -10 and 4
(d) x does not lie between the open interval -4 and 10

Directions (Q.Nos. 7-9) Answer the questions based on the following information.

x and y are non-zero real numbers $f(x, y) = +(x+y)^{0.5}$

If $(x+y)^{0.5}$ is real, otherwise $=(x+y)^2$

$$g(x, y) = (x+y)^2$$

If $(x+y)^{0.5}$ is real, otherwise $=(x+y)^2$ (2015)

- 7) For which of the following is $f(x, y)$ necessarily greater than $g(x, y)$?

- (a) x and y are positive (b) x and y are negative
(c) x and y are greater than -1
(d) None of the above

- 8) Which of the following is necessarily false?

- (a) $f(x, y) \geq g(x, y)$ for $0 \leq x, y < 0.5$
(b) $f(x, y) > g(x, y)$ when $x, y < -1$
(c) $f(x, y) > g(x, y)$ for $x, y > 1$
(d) None of the above

- 9) If $f(x, y) = g(x, y)$, then

- (a) $x = y$ (b) $x + y = 1$
(c) $x + y = -2$ (d) Both (b) and (c)

- 10) In the XY -plane, the area of the region bounded by the graph of $|x+y| + |x-y| = 4$ is (2014)

- (a) 8 (b) 12 (c) 16 (d) 20

- 11) If a function is defined as $f(x) = \frac{a^x + a^{-x}}{2}$, where $a > 0$, then what is the value of $f(x+y) + f(x-y)$? (2013)

- (a) $f(x) + f(y)$ (b) $f(x)f(y)$ (c) $2f(x)f(y)$ (d) $4f(x)f(y)$

- 12) Find the complete set of values that satisfy the relations $|x-3| < 2$ and $|x-2| < 3$. (2012)

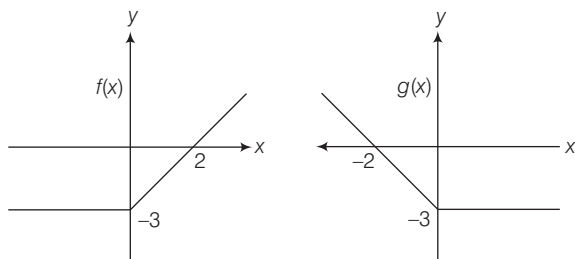
- (a) $(-5, 5)$ (b) $(-5, -1) \cup (1, 5)$
(c) $(1, 5)$ (d) $(-1, 1)$

- 13) Let $f_{n+1}(x) = f_n(x) + 1$, if n is a multiple of 3 $= f_n(x) - 1$ otherwise.

If $f_1(1) = 0$, then what is $f_{50}(1)$? (2011)

- (a) -18 (b) -16
(c) -17 (d) Cannot be determined

- 14) The graphs given alongside represent two functions $f(x)$ and $g(x)$, respectively. Which of the following is true? (2011)



- (a) $g(x) = |f(x)|$ (b) $g(x) = f(-x)$
(c) $g(x) = -f(x)$ (d) None of these

Direction (Q.Nos. 15-16) Answer the questions based on the following information.

For these questions, consider the function given by $f(x) = |x - 1| - x$. (2011)

- 15) What is the area of the triangle bounded by the graph of the given function with the coordinate axis given by $x = 0$ and $y = 0$?
(a) 2 (b) $1/4$ (c) $1/2$ (d) 1
- 16) Which of the following is not true about the graph of $f(x)$?
(a) A portion of the graph is parallel to the line $y = 25$.
(b) A portion of graph is in 2nd quadrant.
(c) Some portion of graph lies in 1st quadrant.
(d) Some portion of graph lies in 3rd quadrant.
- 17) The function $f(x) = |x - 2| + |25 - x| + |3.6 - x|$, where x is a real number, attains a minimum at
(a) $x = 2.3$ (b) $x = 2.5$ (c) 2
(d) $x = 2.7$ (e) None of these (2010)

Directions (Q.Nos. 18-20) Answer the questions based on the following information.

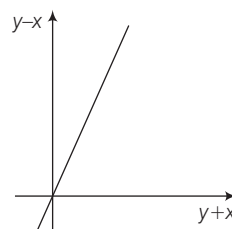
Let $f(x) = ax^2 + bx + c$, where a, b and c are certain constants and $a \neq 0$. It is known that $f(5) = -3f(2)$ and that 3 is a root of $f(x) = 0$. (2008)

- 18) What is the other root of $f(x) = 0$?
(a) -7 (b) -4 (c) 2
(d) 6 (e) Cannot be determined
- 19) What is the value of $a + b + c$?
(a) 9 (b) 14 (c) 13
(d) 37 (e) Cannot be determined
- 20) Let $f(x)$ be a function satisfying $f(x)f(y) = f(xy)$ for all real x, y . If $f(2) = 4$, then what is the value of $f\left(\frac{1}{2}\right)$?

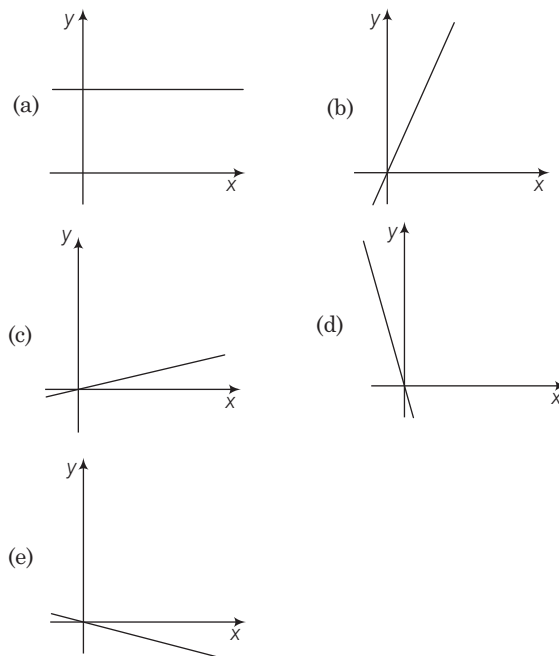
- (a) 0 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$
(d) 1 (e) Cannot be determined

- 21) A function $f(x)$ satisfies $f(1) = 3600$ and $f(1) + f(2) + \dots + f(n) = n^2 f(n)$, for all positive integers $n > 1$. What is the value of $f(9)$? (2007)
(a) 240 (b) 200
(c) 100 (d) 120
(e) 80

- 22) The graph of $y - x$ against $y + x$ is as shown below. (All graphs in this question are drawn to scale and the same scale has been used on each axis.)



Which of the following shows the graph of y against x ? (2006)



- 23) Let $f(x) = \max(2x + 1, 3 - 4x)$, where x is any real number. Then, the minimum possible value of $f(x)$ is (2006)
(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$
(d) $\frac{4}{3}$ (e) $\frac{5}{3}$

- 24) Let $g(x)$ be a function such that $g(x+1) + g(x-1) = g(x)$ for every real x . Then, for what value of p is the relation $g(x+p) = g(x)$ necessarily true for every real x ? (2005)

(a) 5 (b) 3
(c) 2 (d) 6

- 25) Let $f(x) = ax^2 - b|x|$, where a and b are constants. Then, at $x = 0$, $f(x)$ is (2004)

(a) maximized whenever $a > 0, b > 0$
(b) maximized whenever $a > 0, b < 0$
(c) minimized whenever $a > 0, b > 0$
(d) minimized whenever $a > 0, b < 0$

- 26) If $f(x) = x^3 - 4x + p$ and $f(0)$ and $f(1)$ are of opposite signs, then which of the following is necessarily true? (2004)

(a) $-1 < p < 2$ (b) $0 < p < 3$
(c) $-2 < p < 1$ (d) $-3 < p < 0$

Directions (Q. Nos. 27-28) Answer the questions based on the following information. (2004)

$f_1(x) = x$	$0 \leq x \leq 1$
$= 1$	$x \geq 1$
$= 0$	otherwise
$f_2(x) = f_1(-x)$	for all x
$f_3(x) = -f_2(x)$	for all x
$f_4(x) = f_3(-x)$	for all x

- 27) How many of the following products are necessarily zero for every x
 $f_1(x)f_2(x), f_2(x)f_3(x), f_2(x)f_4(x)$?
 (a) 0 (b) 1
 (c) 2 (d) 3

- 28) Which of the following is necessarily true?
 (a) $f_4(x) = f_1(x)$ for all x (b) $f_1(x) = -f_3(-x)$ for all x
 (c) $f_2(-x) = f_4(x)$ for all x (d) $f_1(x) + f_3(x) = 0$ for all x

- 29) Let $g(x) = \max(5-x, x+2)$. The smallest possible value of $g(x)$ is (2003)
 (a) 4.0 (b) 4.5
 (c) 1.5 (d) None of these

- 30) When the curves $y = \log_{10} x$ and $y = x^{-1}$ are drawn in the x - y plane, how many times do they intersect for values $x \geq 1$? (2003)
 (a) Never (b) Once
 (c) Twice (d) More than twice

- 31) Consider the following two curves in the x - y plane;
 $y = x^3 + x^2 + 5; y = x^2 + x + 5$

Which of the following statements is true for $-2 \leq x \leq 2$? (2003)

(a) The two curves intersect once
 (b) The two curves intersect twice
 (c) The two curves do not intersect
 (d) The two curves intersect thrice

Directions (Q. Nos. 32-34) Answer the question on the basis of the table given below.

Two binary operations $\oplus$ and $*$ are defined over the set (a, e, f, g, h) as per the following tables

	a	e	f	g	h
a	a	e	f	g	h
e	e	f	g	h	a
f	f	g	h	a	e
g	g	h	a	e	f
h	h	a	e	f	g
$*$	a	e	f	g	h
a	a	a	a	a	a
e	a	e	f	g	h
f	a	f	h	e	g
g	a	g	e	h	f
h	a	h	g	f	e

Thus, according to the first table $f \oplus g = a$, while according to the second table $g * h = f$ and so on.

Also, let $f^2 = f * f, g^3 = g * g * g$ and so on. (2003)

- 32) What is the smallest positive integer n such that $g^n = e$?
 (a) 4 (b) 5 (c) 2 (d) 3

- 33) Upon simplification, $f \oplus [f * \{f \oplus (f * f)\}]$ equals
 (a) e (b) f
 (c) g (d) h

- 34) Upon simplification, $\{a^{10} * (f^{10} \oplus g^9)\} \oplus e^8$ equals
 (a) e (b) f
 (c) g (d) h

Directions (Q. Nos. 35-36) Answer the questions independent of each other. (2002)

- 35) If $f(x) = \log \left\{ \frac{1+x}{1-x} \right\}$, then $f(x) + f(y)$ is
- (a) $f(x+y)$ (b) $f \left\{ \frac{x+y}{1+xy} \right\}$
- (c) $(x+y)f \left\{ \frac{1}{1+xy} \right\}$ (d) $\frac{f(x) + f(y)}{1+xy}$

- 36) Suppose, for any real number x , $[x]$ denotes the greatest integer less than or equal to x . Let $L(x, y) = [x] + [y] + [x+y]$ and $R(x, y) = [2x] + [y]$. Then, it's impossible to find any two positive real numbers x and y for which
- (a) $L(x, y) = R(x, y)$ (b) $L(x, y) = R(x, y)$
- (c) $L(x, y) < R(x, y)$ (d) $L(x, y) > R(x, y)$

Directions (Q.Nos. 37-38) Answer the questions based on the following information.

Certain relation is defined among variables A and B . Using the relation answer the questions given below

@ (A, B) = average of A and B

$\therefore (A, B)$ = product of A and B

$x(A, B)$ = the result when A is divided by B (2000)

- 37) The sum of A and B is given by
- (a) $\setminus (@ (A, B), 2)$ (b) $@ (\setminus (A, B), 2)$
- (c) $@ (X (A, B), 2)$ (d) None of these
- 38) The average of A, B and C is given by
- (a) $@ (X (\setminus (@ (A, B), 2), C), 3)$
- (b) $\setminus (X (\setminus (@ (A, B), C 2))$
- (c) $X (@ (\setminus (@ (A, B), 2), C, 3))$
- (d) $X \setminus (@ (\setminus (@ (A, B), 2), C), 2), 3)$

Directions (Q.Nos. 39-40) Answer the questions independent of each other.

x	1	2	3	4	5	6
y	4	8	14	22	32	44

(2000)

- 39) Which of the following equation will be best fit for above data?
- (a) $y = ax + b$ (b) $y = a + bx + cx^2$
- (c) $y = e^{ax+b}$ (d) None of these
- 40) If $f(0, y) = y + 1$ and $f(x+1, y) = f(x, f(x, y))$. Then, what is the value of $f(1, 2)$?
- (a) 1 (b) 2
- (c) 3 (d) 4

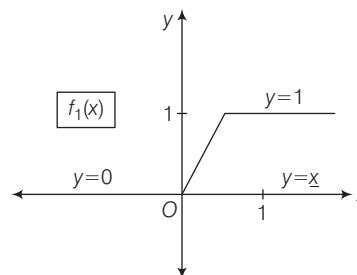
Directions (Q. Nos. 41-43) Answer the questions based on the following information.

Graphs of some functions are given mark the options.

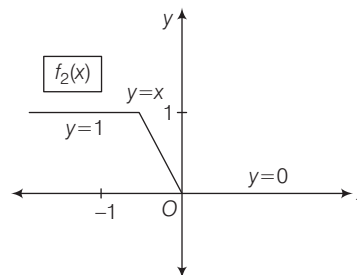
- (a) If $f(x) = 3f(-x)$
- (b) If $f(x) = f(-x)$
- (c) If $f(x) = -f(-x)$
- (d) If $3f(x) = 6f(-x)$ for $x > 0$

(2000)

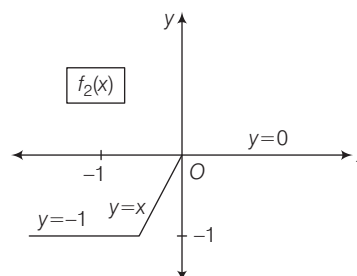
41)



42)



43)



Directions (Q. Nos. 44-46) Answer the questions based on the following information.

Functions m and M are defined as follows

$$m(a, b, c) = \min(a+b, c, a)$$

$$M(a, b, c) = \max(a+b, c, a) \quad (2000)$$

- 44) If $a = -2$, $b = -3$ and $c = 2$ what is the maximum between $[m(a, b, c) + M(a, b, c)]/2$ and $[m(a, b, c) - M(a, b, c)]/2$?
- (a) $\frac{3}{2}$ (b) $\frac{7}{2}$
- (c) $-\frac{3}{2}$ (d) $-\frac{7}{2}$

- 45) If a and b, c are negative, then what gives the minimum of a and b ?

(a) $m(a, b, c)$ (b) $-M(-a, a, -b)$
(c) $m(a + b, b, c)$ (d) None of these

- 46) What is $m(M(a - b, b, c), m(a + b, c, b), -M(a, b, c))$ for $a = 2, b = 4, c = 3$?

(a) -4 (b) 0 (c) -6 (d) 3

Directions (Q.Nos. 47-48) Answer the questions based on the following information.

$$f(x) = \frac{1}{(1+x)}, \text{ if } x \text{ is positive}$$

$$= 1 + x, \text{ if } x \text{ is negative or zero}$$

$$f^n(x) = f[f^{n-1}(x)] \quad (2000)$$

- 47) If $x = 1$, find $f^1(x)f^2(x)f^3(x)f^4(x)\dots f^9(x)$

(a) $\frac{1}{5}$ (b) $\frac{1}{6}$ (c) $\frac{1}{7}$ (d) $\frac{1}{8}$

- 48) If $x = -1$, what will $f(x)$ be

(a) $\frac{2}{3}$ (b) $\frac{1}{2}$
(c) $\frac{8}{5}$ (d) $\frac{1}{8}$

Directions (Q. Nos. 49-50) Answer the questions based on the following information.

The batting average (BA) of a test batsman is computed from runs scored and innings played-completed innings and incomplete innings (not out) in the following manner

r_1 = number of runs scored in completed innings

n_1 = number of completed innings

r_2 = number of runs scored in incomplete innings

n_2 = number of incomplete innings

$$BA = \frac{r_1 + r_2}{n_1}$$

To better assess a batsman's accomplishments, the ICC is considering two other measures $MB A_1$ and $MB A_2$ defined as follows

$$MBA_1 = \frac{r_1}{n_1} + \frac{r_2}{n_1} \max\left[0, \left(\frac{r_2}{n_2} - \frac{r_1}{n_1}\right)\right]; \quad MBA_2 = \frac{r_1 + r_2}{n_1 + n_2} \quad (2000)$$

- 49) Based on the information provided which of the following is true?

(a) $MB A_1 \leq BA \leq MB A_2$ (b) $BA \leq MB A_2 \leq MB A_1$
(c) $MB A_2 \leq BA \leq MB A_1$ (d) None of these

- 50) An experienced cricketer with no incomplete innings has a BA of 50. The next time he bats, the innings is incomplete and he scores 45 runs. It can be inferred that

(a) BA and $MB A_1$ will both increase
(b) BA will increase and $MB A_2$ will decrease
(c) BA will increase and not enough data is available to assess change in $MB A_1$ and $MB A_2$
(d) None of the above

Directions (Q.Nos. 51-53) Answer the questions based on the following information.

If x and y are real numbers, the functions are defined as $f(x, y) = |x + y|$, $F(x, y) = -f(x, y)$ and $G(x, y) = -F(x, y)$. Now, with the help of this information answer the following questions : (1999)

- 51) Which of the following will be necessarily true?

(a) $G[f(x, y), F(x, y)] > F[f(x, y), G(x, y)]$
(b) $F[F(x, y), F(x, y)] = F[G(x, y), G(x, y)]$
(c) $F\{G(x, y), (x + y)\} \neq G[F(x, y), (x - y)]$
(d) $f[f(x, y), F(x - y)] = G[F(x, y), f(x - y)]$

- 52) If $y =$ which of the following will give x^2 as the final value

(a) $f(x, y) G(x, y) / 4$ (b) $G[f(x, y) f(x, y)] F(x, y) / 8$
(c) $-F(x, y) G(x, y) / \log_2 16$
(d) $-f(x, y) G(x, y) F(x, y) / F(3x, 3y)$

- 53) What will be the final value given by the function $G(f(G(F(f(2, -3), 0) - 2), 0))$?

(a) 2 (b) -2 (c) 1 (d) -1

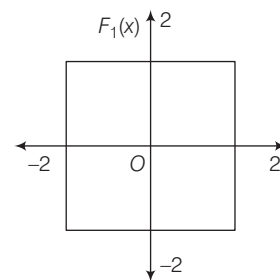
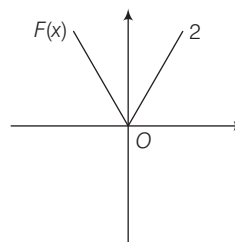
Directions (Q.Nos. 54-57) Answer the questions based on the following information.

Any function has been defined for a variable x , where range of $x \in (-2, 2)$. (1999)

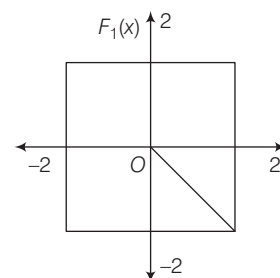
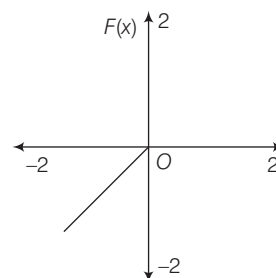
Mark (a) if $F1(x) = -F(x)$, Mark (b) if $F1(x) = F(-x)$

Mark (c) if $F1(x) = -F(-x)$, Otherwise, mark (d)

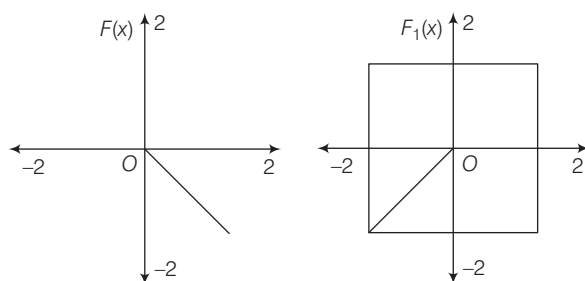
- 54)



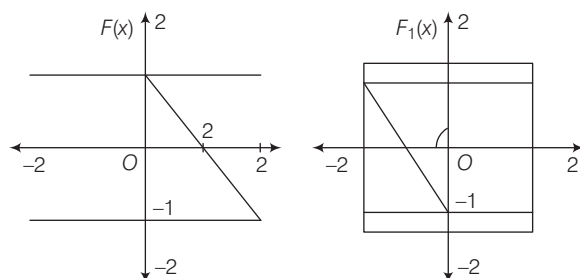
- 55)



56)



57)



Directions (Q. Nos. 58-60) Answer the questions based on the following information.

The following operations are defined for real numbers $a \# b = a + b$, if a and b both are positive else $a \# b = 1$. $a \nabla b = (ab)^{a+b}$ if ab is positive else $a \nabla b = 1$.

(1998)

58) $\frac{(2 \# 1)}{(1 \nabla 2)}$ is equal to

- (a) $\frac{1}{8}$ (b) 1 (c) $\frac{3}{8}$ (d) 3

59) $\frac{\{((1 \# 1) \# 2) - (10^{1.3} \nabla \log_{10} 0.1)\}}{(1 \nabla 2)}$ is equal to

- (a) $\frac{3}{8}$ (b) $\frac{4 \log_{10} 0.1}{8}$
(c) $\frac{(4 + 10^{1.3})}{8}$ (d) None of these

60) $\frac{(X \# -Y)}{(-X \nabla Y)} = \frac{3}{8}$, then which of the following must be true?

- (a) $X = 2, Y = 1$ (b) $X > 0, Y < 0$
(c) X, Y both positive (d) X, Y both negative

Directions (Q. Nos. 61-63) Answer the questions based on the following information.

The following functions have been defined.

$$la(x, y, z) = \min(x + y, y + z)$$

$$le(x, y, z) = \max(x - y, y - z)$$

$$ma(x, y, z) = \left(\frac{1}{2}\right)[le(x, y, z) + la(x, y, z)]$$

(1997)

61) Given that $x > y > z > 0$, which of the following is necessarily true?

- (a) $la(x, y, z) < le(x, y, z)$ (b) $ma(x, y, z) < la(x, y, z)$
(c) $ma(x, y, z) < le(x, y, z)$ (d) None of these

62) What is the value of $ma(10, 4, le(la(10, 5, 3), 5, 3))$?

- (a) 7.0 (b) 6.5 (c) 8.0 (d) 7.5

63) For $x = 15, y = 10$ and $z = 9$, find the value of: $le(x, \min(y, x - z), le(9, 8, ma(x, y, z)))$

- (a) 5 (b) 12 (c) 9 (d) 4

Directions (Q. Nos. 64-65) Answer the questions based on the following information.

A, S, M and D are functions of x and y and they are defined as follows

$$A(x, y) = x + y, S(x, y) = x - y$$

$$M(x, y) = xy, D(x, y) = \frac{x}{y}, \text{ where } y \neq 0$$

(1996)

64) What is the value of $M(M(A(M(x, y), S(y, x)), A(y, x)))$ for $x = 2, y = 3$?

- (a) 50 (b) 140
(c) 25 (d) 70

65) What is the value of $S[M(D(A(a, b), 2), D(A(a, b), 2)), M(D(S(a, b), 2), D(S(a, b), 2))]$?

- (a) $a^2 + b^2$ (b) ab (c) $a^2 - b^2$ (d) $\frac{a}{b}$

Directions (Q. Nos. 66-69) Answer the questions based on the following information.

$le(x, y)$ = least of (x, y) , $mo(x) = |x|$, $me(x, y)$ = maximum of (x, y)

(1995)

66) Find the value of $me(a + mo(lo(a, b))); mo(a + me(mo(a), mo(b)))$, at $a = -2$ and $b = -3$.

- (a) 1 (b) 0
(c) 5 (d) 3

67) Which of the following must always be correct for $a, b > 0$?

- (a) $mo(le(a, b)) \geq (me(mo(a), mo(b)))$
(b) $mo(le(a, b)) > (me(mo(a), mo(b)))$
(c) $mo(le(a, b)) < (me(mo(a), mo(b)))$
(d) $mo(le(a, b)) = le(mo(a), mo(b))$

68) For what values of a is $me(a^2 - 3a, a - 3) < 0$?

- (a) $1 < a < 3$ (b) $0 < a < 3$
(c) $a < 0$ and $a < 3$ (d) $a < 0$ or $a < 3$

69) For what values of a is $le(a^2 - 3a, a - 3) < 0$?

- (a) $1 < a < 3$ (b) $0 < a < 3$
(c) $a < 0$ and $a < 3$ (d) $a < 0$ or $a < 3$

Directions (Q.No. 70) Answer the questions independently.

(1995)

70) Largest value of $\min(2 + x^2, 6 - 3x)$, when $x > 0$ is

- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 71-72) Answer the questions based on the following information.

If $\text{md}(x) = |x|$, $\text{mn}(x, y)$ = minimum of x and y and $\text{Ma}(a, b, c, \dots)$ = maximum of $a, b, c, \dots$

(1994)

71) Value of $\text{Ma}[\text{md}(a), \text{mn}(\text{md}(b), a), \text{mn}(ab, \text{md}(ac))]$, where $a = -2$, $b = -3$, $c = 4$ is

- (a) 2 (b) 6
(c) 8 (d) -2

72) Given that $a > b$, then the relation $\text{Ma}[\text{md}(a) \cdot \text{mn}(a, b)] = \text{mn}[\text{Ma}(a, \text{md}(\text{Ma}(a, b)))]$ does not hold, if

- (a) $a < 0, b < 0$
(b) $a > 0, b > 0$
(c) $a > 0, b < 0, |a| < |b|$
(d) $a > 0, b < 0, |a| > |b|$

Directions (Q.Nos. 73-76) Answer the questions based on the following information.

If $f(x) = 2x + 3$ and $g(x) = \frac{x-3}{2}$, then

(1994)

73) $\text{fog}(x)$ is equal to

- (a) 1 (b) $\text{gof}(x)$ (c) $\frac{15x+9}{16x-5}$ (d) $\frac{1}{x}$

74) For what value of x ; $f(x) = g(x-3)$?

- (a) -3 (b) $\frac{1}{4}$
(c) -4 (d) None of these

75) What is the value of $(\text{gofogogogof})(x)(\text{fogofog})(x)$?

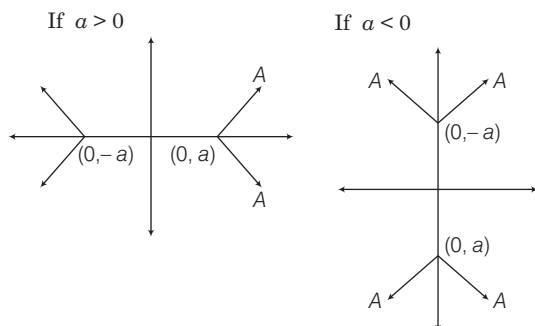
- (a) x (b) x^2
(c) $\frac{5x+3}{4x-1}$ (d) $\frac{(x+3)(5x+3)}{(4x-5)(4x-1)}$

76) What is the value of $\text{fo}(\text{fog})\text{o}(\text{gof})(x)$?

- (a) x (b) x^2
(c) $2x+3$ (d) $\frac{x+3}{4x-5}$

HINTS & SOLUTIONS

- 1) (b) The lines represented by A , where $a > 0$ and when $a < 0$ are given in the following figures.



The area enclosed by A and D would be zero if $d < |a|$. In option (b), $d = 1$ and $a = -2$. i.e. $d < |a|$.

If $a > 0$, then the only case when the area enclosed by A and D will be zero, is when $d = 0$.

- 2) (c) $[\log_{10} x] = 0$, for any value of $x \in \{1, 2, \dots, 9\}$... (i)
Similarly, $[\log_{10} x] = 1$, for $x \in \{10, 11, 12, \dots, 99\}$... (ii)
and $[\log_{10} x] = 2$, for $x \in \{100, 101, 102, \dots, 999\}$... (iii)
Now consider, $1 \leq n \leq 99$, then
 $[\log_{10} 1] + [\log_{10} 2] + [\log_{10} 3] + \dots + [\log_{10} n] = 0$

Hence, the expression given in the question cannot be satisfied.

Now, consider $10 \leq n \leq 99$, then

$$[\log_{10} 1] + [\log_{10} 2] + \dots + [\log_{10} n]$$

From Eqs. (i) and (ii), the above expression becomes

$$(0 + 0 + \dots + 9 \text{ times}) + (1 + 1 + \dots + (n-9) \text{ times}) = n - 9$$

Using the same approach, for

$$100 \leq n \leq 999, [\log_{10} 1] + [\log_{10} 2] + \dots + [\log_{10} n] = 90 + 2(n-99)$$

It can be seen that, only for the third case, i.e. $100 \leq n \leq 999$, can the expression given in the question be satisfied.

$$\text{Hence, } 90 + 2(n-99) = n$$

$$\Rightarrow n = 198 - 90 = 108$$

- 3) (d) $2 \sin x + 3 \cos x = \sqrt{2^2 + 3^2}$

$$\left(\frac{2 \sin x}{\sqrt{2^2 + 3^2}} + \frac{3 \cos x}{\sqrt{2^2 + 3^2}} \right) = \sqrt{13} \left(\frac{2 \sin x}{\sqrt{13}} + \frac{3 \cos x}{\sqrt{13}} \right)$$

Let $\cos y = \frac{2}{\sqrt{13}}$ and $\sin y = \frac{3}{\sqrt{13}}$ and this will be true

as you can verify that $\sin^2 y + \cos^2 y = 1$.

$$= \sqrt{13} (\sin x \cos y + \cos x \sin y) = \sqrt{13} \sin(x+y)$$

Range of $\sin(x+y)$ is

$$-1 \leq \sin(x+y) \leq 1$$

Therefore, $-\sqrt{13} \leq \sqrt{13} \sin(x+y) \leq \sqrt{13}$

Hence, $-\sqrt{13} \leq (2 \sin x + 3 \cos x) \leq \sqrt{13}$.

- 4) (b) First let us find the range where $\text{Min}(-(x-1)^2 + 2)$ is $-(x-1)^2 + 2$

In other words, in which range is

$$-(x-1)^2 + 2 < (x-2)^2 + 1.$$

$$-(x^2 - 2x + 1) + 2 < x^2 - 4x + 4 + 1$$

$$0 < 2x^2 - 6x + 4 \Rightarrow x^2 - 3x + 2 > 0$$

$$(x-1)(x-2) > 0 \Rightarrow x > 2 \text{ or } x < 1$$

So, for $x \in (1, 2)$, $f(x) = (x-2)^2 + 1$

And $f(x) = -(x-1)^2 + 2$ elsewhere.

Let us also compute $f(1)$ and $f(2)$

$$f(1) = 2, f(2) = 1$$

For $x \in (-\infty, 1)$, $f(x) = -(x-1)^2 + 2$

$$f(1) = 2$$

For $x \in (1, 2)$, $f(x) = -(x-2)^2 + 1$

$$f(2) = 1$$

For $x \in (2, \infty)$, $f(x) = -(x-1)^2 + 2$

For $x < 1$ and $x > 2$, $f(x)$ is (square) + 2 and so less than 2.

When x lies between 1 and 2, the maximum value it can take is 2. $f(1) = 2$ is the highest value $f(x)$ can take.

- 5) (b) **Statement I**

$$h(x) = f(x) \times g(x)$$

$$h(-x) = (f(-x)) \times (g(-x))$$

$$\Rightarrow f(x) \times (g(-x)) \Rightarrow -h(x) \text{ is an odd function}$$

Statement I is true.

Statement II

$$f(x) = f(x+p) \text{ for all } x \Rightarrow m(x) = f(x-p)$$

$$m(-x) = f(-x-p) = f(x+p) = f(x) = f(x-p)$$

$$\Rightarrow m(x) = m(-x) \text{ for all } x$$

$$\Rightarrow f(x-p) \text{ is an even function}$$

$\Rightarrow$ Statement II is true.

Statement III

$$p(x) = f(x)g(x)$$

$$p(x+pq) = f(x+pq)g(x+pq)$$

$$f(x+pq) = f(x); g(x+pq) = g(x)$$

$$p(x+pq) = f(x)g(x) = p(x)$$

Statement IV

Statement IV need not be true. The period of product of 2 functions could be the LCM of the 2 functions.

Given, $\text{LCM}(p, q) = p$, we get

q is a factor of p . q need not be equal to p .

- 6) (d) The function $\sqrt{x^2 - 6x - 40}$ is defined in the real domain only when $x^2 - 6x - 40 \geq 0$.

When $x^2 - 6x - 40 < 0$, the function will be imaginary.

Now, let us find out range of values for which $x^2 - 6x - 40 \geq 0$.

Factorising the quadratic expression, we get

$$(x-10)(x+4) \geq 0$$

This expression $(x-10)(x+4)$ will be greater than or equal to 0 when both $(x-10)$ and $(x+4)$ are greater than or equal to 0 or when both $(x-10)$ and $(x+4)$ are less than or equal to 0.

Case I When both $(x-10)$ and $(x+4)$ are greater than or equal to 0.

$x \geq 10$ and $x \geq -4 \Rightarrow$ when $x \geq 10$ it will be greater than -4 .

Therefore, it will suffice to say that $x \geq 10$.

Case II When both $(x-10)$ and $(x+4)$ are less than or equal to 0.

i.e. $x \leq 10$ and $x \leq -4 \Rightarrow$ when $x \leq -4$, it will be less than 10.

Therefore, it will suffice to say that $x \leq -4$.

Hence, the range in which the given function will be defined in the real domain will be when x does not lie between -4 and 10 .

- 7) (d) We have, $\begin{cases} x^2 < x, 0 < x < 1, f(x, y) = (x+y)^{0.5} \\ x^2 > x, 1 < x, g(x, y) = (x+y)^2 \end{cases}$

when x and y are positive.

$$\text{For } x+y > 1, (x+y)^{0.5} < (x+y)^2$$

$$\therefore f(x, y) < g(x, y)$$

We can therefore eliminate answer option (a), if x and y are both negative, then $f(x, y) = (x+y)$

$$g(x, y) = -(x+y).$$

Now for $-1 < x+y < 0$, $(x+y)^2 < -(x+y)$

Therefore, $f(x, y) < g(x, y)$

Thus, answer option (b) is eliminated. As in option (d) from the above discussion, for x and $y > -$ cannot again guarantee that $f(x, y) > g(x, y)$.

- 8) (c) When $0 \leq x, y < 0.5$, $x+y$ may be < 1 or 1 , so option (a) can be true or false.

When $x, y < -1$, again option (b) can be true or false.

When $x, y > 1$, $x+y > 1$, hence $f(x, y) < g(x, y)$,

$$f(x, y) > g(x, y)$$

Thus, option (c) given is necessarily false.

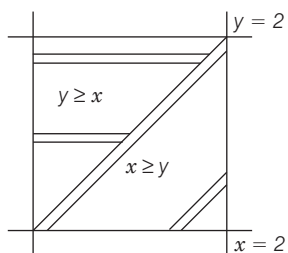
- 9) (b) When $x+y=1$, we have $(x+y)^2 = (x+y)^{0.5}$, i.e. $f(x, y) = g(x, y)$. Thus, option (b) is correct.

- 10) (c) Let $x \geq 0, y \geq 0$ and $x \geq y$

$$\text{Then, } |x+y| + |x-y| = 4$$

$$\Rightarrow x+y+x-y=4$$

$$\Rightarrow x=2$$



and in case $x \geq 0, y \geq 0, x \leq y$

$$x + y + y - x = 4$$

$$\Rightarrow y = 2$$

Area in the first quadrant is 4.

By symmetry, total area = $4 \times 4 = 16$ sq unit

$$11) (c) f(x) = \frac{a^x + a^{-x}}{2}, f(y) = \frac{a^y + a^{-y}}{2}$$

$$\therefore f(x+y) = \frac{a^{x+y} + a^{-(x+y)}}{2} \quad \dots(i)$$

$$\text{and } f(x-y) = \frac{a^{x-y} + a^{-(x-y)}}{2} \quad \dots(ii)$$

On adding Eqs. (i) and (ii), we get

$$f(x+y) + f(x-y) = \frac{a^{x+y} + a^{-x-y}}{2} + \frac{a^{x-y} + a^{-x+y}}{2}$$

$$= \frac{1}{2} [a^x (a^y + a^{-y}) + a^{-x} (a^y + a^{-y})]$$

$$= \frac{1}{2} (a^x + a^{-x}) (a^y + a^{-y}) = 2f(x)f(y)$$

$$12) (b) \text{ Let } |x| = P (P \geq 0) \quad \dots(i)$$

$$\text{So, } |P-3| < 2 \text{ and } |P-2| < 3$$

$$\Rightarrow 1 < P < 5 \quad \dots(ii)$$

$$\text{and } -1 < P < 5 \quad \dots(iii)$$

The conditions (i), (ii) and (iii) are satisfied by $1 < P < 5$ i.e., $-5 < x < -1$ or $1 < x < 5$.

Therefore, x belongs to $(-5, -1) \cup (1, 5)$.

$$13) (c) f_1(1) = 0$$

$$f_2(1) = f_1(1) - 1 = -1 \quad (\text{since } n = 1)$$

$$f_3(1) = f_2(1) - 1 = -1 - 1 = -2 \quad (\text{since } n = 2)$$

$$f_4(1) = f_3(1) + 1 = -2 + 1 = -1 \quad (\text{since } n = 3)$$

$$f_5(1) = -2f_3(1) = -3$$

$$f_6(1) = -3f_3(1) = -4$$

$$f_7(1) = -2f_{10}(1) = -3$$

$$\text{Similarly, } f_{48}(1) = -17 \Rightarrow f_{49}(1) = f_{48}(1) + 1$$

$$= -17 + 1 = -16$$

$$\therefore f_{50}(1) = f_{49}(1) - 1 = -16 - 1 = -17$$

$$14) (b) \text{ As is seen from the graphs } g(x) \text{ is reflected about } y \text{ axis.}$$

$$\therefore \text{It follows that } g(x) = f(-x)$$

Solutions (Q. Nos. 15-16) We plot the graph by plotting the following points

$$f(x) = |x-1|x$$

$$\text{Case (i) For, } x \geq 1, |x-1| = x-1$$

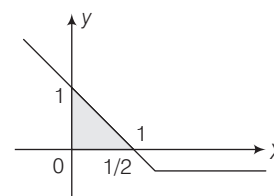
$$\text{So, } f(x) = (x-1) - x = -1$$

$$\text{Case (ii) For, } x < 1, |x-1| = -x+1$$

$$\text{So, } f(x) = -x+1 - x = -2x+1$$

$$\text{So, } f(x) = -2x+1 \text{ for } x < 1$$

$$-1 \geq x \geq 1$$



$$15) (b) \text{ The area of the triangle is } \frac{1}{2} \times \frac{1}{2} \times 1 = \frac{1}{4}$$

$$16) (d) \text{ Clearly from graph, there is no part of the graph lying in the 3rd quadrant.}$$

$$17) (b) \text{ Case 1. If } x < 2, \text{ then}$$

$$y = 2 - x + 2.5 - x + 3.6 - x = 8.1 - 3x$$

This will be least if x is highest, i.e. just less than 2.

In this case, y will be just more than 2.1.

Case 2. If $2 < x < 2.5$, then

$$y = x - 2 + 2.5 - x + 3.6 - x = 4.1 - x$$

Again, this will be least if x is the highest case y will be just more than 1.6.

Case 3. $2.5 < x < 3.6$, then

$$y = x - 2 + x - 2.5 + 3.6 - x = x - 0.9$$

This will be least if x is least, i.e. $x = 2.5$

Case 4. If in this case $y = 1.6 < x < 3.6$, then

$$y = x - 2 + x - 2.5 + x - 3.6 = 3x - 8.1$$

The minimum value of this will be at

$$x = 3.6 = 27$$

Hence, the minimum value of y is attained at $x = 2.5$

Solutions (Q. Nos. 18-20) It is given that 3 is one of the roots of $f(x)$. Let k be the other root.

$$\therefore f(x) = m[(x-3)(x-k)]$$

$$= m[x^2 - (3+k)x + 3k] = 0$$

$$\text{Given that, } f(5) = -3f(2)$$

$$m[25 - (3+k)5 + 3k]$$

$$= -3m[4 - (3+k)2 + 3k]$$

$$\Rightarrow k = -4, \text{ hence the root of } f(x) = 0, k = -4$$

$$\therefore f(x) = m[x^2 + x - 12]$$

Since, the value of m cannot be determined from the given information the values of a , b and c cannot be found out.

- 18) (b) As solved above the second root of $f(x) = 0$ is -4 .
 19) (e) Value of $a + b + c$ cannot be uniquely determined.

- 20) (b) Given, $f(xy) = f(x)f(y)$ for $x, y \in R$

$$\begin{aligned} \text{Now, } f(2) &= f(2 \times 1) = f(2) \times f(1) \\ f(2) &= f(2) \times f(1) \\ \Rightarrow f(1) &= 1. \text{ As, } f(2) \neq 0 \\ \Rightarrow f(1) &= 1 \\ \text{Now, } f(1) &= f(2) \times f\left(\frac{1}{2}\right) = f\left(2 \times \frac{1}{2}\right) \\ \Rightarrow 4 \times f\left(\frac{1}{2}\right) &= f(1) \\ 4 \times f\left(\frac{1}{2}\right) &= 1 \\ \therefore f\left(\frac{1}{2}\right) &= \frac{1}{4} \end{aligned}$$

- 21) (e) Given function

$$= f(1) + f(2) + f(3) + \dots + f(n) = n^2 f(n)$$

$$\text{Given, } f(1) = 3600$$

$$\text{For } n = 2, f(1) + f(2) = 2^2 f(2)$$

$$\Rightarrow 2^2 f(2) - f(2) = f(1)$$

$$\Rightarrow f(2) = \frac{f(1)}{(2^2 - 1)}$$

$$\text{For } n = 3, f(1) + f(2) + f(3) = 3^2 f(3)$$

$$\Rightarrow f(1) + \frac{f(1)}{(2^2 - 1)} = 3^2 f(3) - f(3)$$

$$\Rightarrow f(1) + \frac{f(1)}{(2^2 - 1)} = f(3)(3^2 - 1)$$

$$\Rightarrow f(1) \left[1 + \frac{1}{(2^2 - 1)} \right] = f(3)(3^2 - 1)$$

$$\therefore f(3) = f(1) \times \frac{2^2}{2^2 - 1} \times \frac{1}{3^2 - 1}$$

$$\text{Similarly, } f(9) = f(1) \times \frac{2^2 \times 3^2 \times 4^2 \times \dots \times 8^2}{(2^2 - 1)(3^2 - 1)(4^2 - 1) \dots (9^2 - 1)}$$

$$\text{Therefore, } f(9) = 80.$$

- 22) (d) From the graph of $(y - x)$ versus $(y + x)$, it is obvious that inclination is more than 45° .

$$\text{Slope of line} = \frac{y - x}{y + x} = \tan(45^\circ + \theta)$$

$$\Rightarrow \frac{y - x}{y + x} = \frac{1 + \tan \theta}{1 - \tan \theta}$$

$$\text{By componendo-dividendo } \frac{y}{x} = \frac{-1}{\tan \theta}, \text{ which is nothing}$$

but the slope of the line that shows the graph of y versus x and as $0^\circ < \theta < 45^\circ$, absolute value of $\tan \theta$ is less than 1.

$$\frac{-1}{\tan \theta} \text{ is negative also greater than } 1.$$

$\Rightarrow$ The slope of the graph y versus x must be negative and greater than 1. Accordingly, only option (d) satisfies. This can also be tried by putting the values of $(y + x) = 2$ (say) and $(y - x) = 4$ (anything more than 2 for that matter).

Hence, we can solve for values of y and x and cross-check with the given options.

- 23) (e) $f(x) = \max(2x + 1, 3 - 4x)$

Therefore, the two equations are

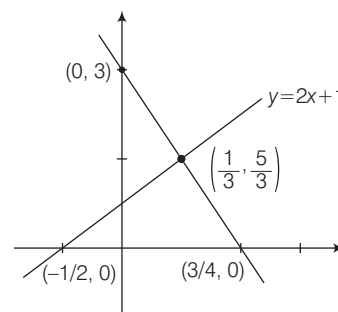
$$y = 2x + 1 \text{ and } y = 3 - 4x$$

$$\text{Now, } y - 2x = 1$$

$$\Rightarrow \frac{y}{1} + \frac{x}{-1/2} = 1$$

Similarly, $y + 4x = 3$

$$\Rightarrow \frac{y}{3} + \frac{x}{3/4} = 1$$



$\therefore$ Their point of intersection would be

$$2x + 1 = 3 - 4x$$

$$\Rightarrow 6x = 2$$

$$\Rightarrow x = \frac{1}{3}$$

So, when $x \leq \frac{1}{3}$, then $f(x)_{\max} = 3 - 4x$

and when $x \geq \frac{1}{3}$, then $f(x)_{\max} = 2x + 1$

Hence, the minimum of this would be at $x = \frac{1}{3}$

$$\text{i.e., } y = \frac{5}{3}$$

Alternative method

$$\text{As } f(x) = \max(2x + 1, 3 - 4x)$$

We know that $f(x)$ would be minimum at the point of intersection of these curves.

$$\text{i.e., } 2x + 1 = 3 - 4x$$

$$\text{i.e., } 6x = 2 \Rightarrow x = \frac{1}{3}$$

Hence, minimum value of $f(x)$ is $\frac{5}{3}$.

- 24) (d) $g(x + 1) + g(x - 1) = g(x)$

$$g(x + 2) + g(x) = g(x + 1)$$

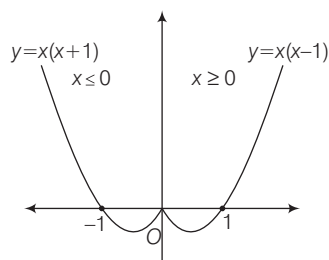
Adding these two equations, we get

$$\begin{aligned} &g(x+2) + g(x-1) = 0 \\ \Rightarrow &g(x+3) + g(x) = 0 \\ \Rightarrow &g(x+4) + g(x+1) = 0 \\ \Rightarrow &g(x+5) + g(x+2) = 0 \\ \Rightarrow &g(x+6) + g(x+3) = 0 \\ \Rightarrow &g(x+6) - g(x) = 0 \end{aligned}$$

25) (d) $y = ax^2 - b|x|$

As the options (a) and (c) include $a > 0$, $b > 0$

We take $a = b = 1$

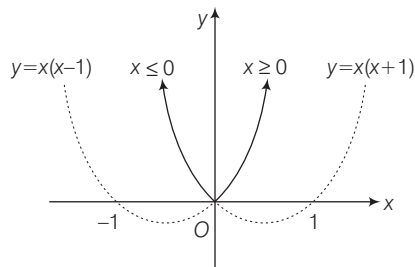


Accordingly the equation becomes $y = x^2 - |x|$.

A quick plot gives us.

So, at $x = 0$, we neither have a maxima nor a minima.

As the options (b) and (d) include $a > 0$, $b < 0$



We take $a = 1$, $b = -1$

Accordingly the equation becomes $y = x^2 + |x|$

So, at $r = 0$, we have a minima.

26) (b) $f(x) = x^3 - 4x + p$

$$f(0) = p, f(1) = p - 3$$

Given, $f(0)$ and $f(1)$ are of opposite signs, $p(p-3) < 0$

If $p < 0$, then $p-3$ is also less than 0.

$\therefore p(p-3) > 0$ i.e., p cannot be negative.

$\therefore$ Choices (a), (c) and (d) are eliminated.

$$0 < p < 3$$

27) (c) Consider the product $f_1(x) f_2(x)$;

for $x \geq 0$, $f_2(x) = 0$, hence $f_1(x) f_2(x) = 0$

and for $x < 0$, $f_1(x) = 0$, hence $f_1(x) f_2(x) = 0$

Consider the product $f_2(x) f_3(x)$;

for $x \geq 0$, $f_2(x) = 0$, $f_3(x) = 0$, hence $f_2(x) f_3(x) = 0$

for $x < 0$, $f_2(x) > 0$, $f_3(x) < 0$, hence $f_2(x) f_3(x) < 0$

Consider the product $f_2(x) f_4(x)$

for $x \geq 0$, $f_2(x) = 0$, hence $f_2(x) f_4(x) = 0$

for $x < 0$, $f_4(x) = 0$, hence $f_2(x) f_4(x) = 0$

$\therefore f_1(x) \cdot f_2(x)$ and $f_2(x) \cdot f_4(x)$ always take a zero value.

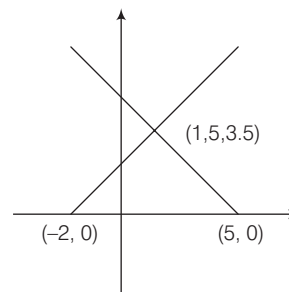
28) (b) **Choice (a)** from the graphs it can be observed that $f_1(x) = f_4(x)$, for $x \leq 0$ but $f_1(x) \neq f_4(x)$, for $x > 0$.

Choice (b) The graph of $f_3(x)$ is to be reflected in x -axis followed by a reflection in y -axis (in either order), to obtain the graph of $-f_3(-x)$ this would give the graph of $f_1(x)$.

Choice (c) The graph of $f_2(-x)$ is obtained by the reflection of the graph of $f_2(x)$ in y -axis, which gives us the graph of $f_1(x)$ and not $f_4(x)$, hence option 3 is ruled out.

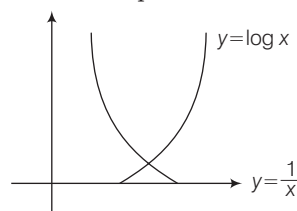
Choice (d) For $x > 0$, $f_1(x) > 0$ and $f_3 = 0$, hence $f_1(x) + f_3(x) > 0$.

29) (d) $g(x) = \max(5-x, x+2)$. Drawing the graph.



The dark lines represent the function $g(x)$. It clearly shows the smallest value of $g(x) = 3.5$.

30) (b) The curves can be plotted as follows



We see that they meet once.

31) (d) Substitute values $-2 \leq x \leq 2$ in the given curves. We find the curves will intersect at $x = 0, 1$ and -1 .

32) (a) From the table, we have $g * g = h$ (this is g squared)

$$h * g = f \text{ (this is } g \text{ cubed)}$$

$$f * g = e \text{ (this is } g \text{ to the power 4)}$$

33) (d) $f \oplus [f * \{f \oplus (f * f)\}]$ is to be simplified. So, we start from the innermost bracket.

$$f * f = h$$

$$f \oplus h = e$$

$$f * e = f$$

$$f \oplus f = h$$

34) (a) $\{a^{10} * (f^{10} \oplus g^9)\} \oplus e^8$
 $f * f = hg * g = ha * a = ae * e = e$
 $h * f = gh * g = fa^{10} = ae^8 = e$
 $g * f = ef * g = e$
 $e * f = fe * g = g$
 $f^5 = f * f^4 = g$
 $f^{10} = f^5 * f^5 = g * g = h$
 $g^9 = g^5 * g^4 = g * e = g$
Hence, $\{a^{10} * (f^{10} \oplus g^9)\} \oplus e^8$
 $\{a * (h \oplus g)\} \oplus e$
 $\{a * f\} \oplus e \Rightarrow e$

35) (b) $f(x) = \log\left(\frac{1+x}{1-x}\right)$ and $f(y) = \log\left(\frac{1+y}{1-y}\right)$
 $\therefore f(x) + f(y) = \log\left(\frac{1+x}{1-x}\right) + \log\left(\frac{1+y}{1-y}\right)$
 $= \log\left\{\left(\frac{1+x}{1-x}\right)\left(\frac{1+y}{1-y}\right)\right\}$
 $= \log\left(\frac{1+x+y+xy}{1-x-y+xy}\right)$
 $= \log\frac{(1+xy)\left(1+\frac{x+y}{1+xy}\right)}{(1+xy)\left(1-\frac{x+y}{1+xy}\right)}$
[Divide the Nr. and Dr. by $(1+xy)$]
 $= \log\frac{1+\frac{x+y}{1+xy}}{1-\frac{x+y}{1+xy}} = f\left(\frac{x+y}{1+xy}\right)$

36) (d) $[x]$ means if $x = 5.5$, then $[x] = 5$
 $L[x, y] = [x] + [y] + [x + y]$
 $R(x, y) = [2x] + [2y]$
Relationship between $L(x, y)$ and $R(x, y)$ can be found by putting various values of x and y .
Put $x = 1.6$ and $y = 1.8$
 $L(x, y) = 1 + 1 + 3 = 5$
and $R(x, y) = 3 + 3 = 6$
So, (b) and (c) are wrong.
If $x = 1.2$ and $y = 2.3$
and $L(x, y) = 1 + 2 + 3 = 6$
 $R(x, y) = 2 + 4 = 6$
or $R(x, y) = L(x, y)$, so (a) is not true.
We see that (d) will never be possible.

37) (a) $@(A, B) = \frac{A+B}{2}$
 $\backslash (@(A, B), 2) = \left(\frac{A+B}{2}\right) \times 2$
 $= A + B$

38) (d) $X(\backslash (@(\backslash (@(A, B), 2), C), 2), 3)$
 $= \left(\left(\left(\left(\frac{A+B}{2}\right) * 2\right) + C\right) / 2\right) * 2 / 3 = \frac{A+B+C}{3}$
 $=$ average of A, B and C .

39) (b) It is not linear in x and y , that's why option (a) is neglected. It also can't be exponential. By substituting X and Y in $y = a + bx + cx^2$, we see that it gets satisfied.

40) (d) $f(x+1, y) = f[f, f(x, y)]$
Put $x = 0$, $f(1, y) = f[0, f(0, y)]$
 $= f[0, y+1]$
 $= y+1+1 = y+2$
Put $y = 2$, $f(1, 2) = 4$.

41) (b) As graph is symmetrical about y -axis, we can say function is even, so $f(x) = f(-x)$.

42) (d) We see from the graph. Value of $f(x)$ in the left region is twice the value of $f(x)$ in the right region.
So, $2f(x) = f(-x)$ or $6f(x) = 3f(-x)$

43) (c) $f(-x)$ is replication of $f(x)$ about y -axis, $-f(x)$ is replication of $f(x)$ about x -axis and $-f(-x)$ is replication of $f(x)$ about y -axis followed by replication about x -axis.
Thus, given graph is of $f(x) = -f(-x)$.

44) (c) Putting the actual values in the functions, we get the required answers.

$$m(a, b, c) = -5, M(a, b, c) = 2$$

So, $[m(a, b, c) + M(a, b, c)] / 2$ is maximum.

45) (c) $m(a, b, c) = \min(a+b, c, a); -M(-a, a, -b)$
 $= -\max(0, -b, -a);$
 $m(a+b, b, c) = \min(a+2b, c, a+b)$

46) (c) $m(M(a-b, b, c), m(a+b, c, b), -M(a, b, c))$
 $= m(3, 4, -6) = -6$

47) (d) $f(1) = \frac{1}{1+1} = \frac{1}{2}$, as x is positive.

$$f^2(1) = f[f(1)] = \frac{1}{1+1/2} = \frac{2}{3};$$

$$f^3(1) = f[f^2(1)] = f\left[\frac{2}{3}\right] = \frac{3}{5};$$

$$f^4(1) = \frac{5}{8}, \text{ thus } f^1(1)f^2(1)f^3(1)\dots f^9(1) = \frac{1}{8}$$

48) (c) When x is negative, $f(x) = 1+x$

$$f(-1) = 1-1 = 0;$$

$$f^2(-1) = f[f(-1)] = f(0) = 1;$$

$$f^3(-1) = f[f^2(-1)]f(1)$$

$$= \frac{1}{1+1} = \frac{1}{2};$$

$$f^4(-1) = f[f^3(-1)]f\left(\frac{1}{2}\right) = \frac{2}{3} \text{ and } f^5(-1) = \frac{3}{5}$$

- 49) (d) Clearly, $BA \geq MB A_1$ and $MBA_2 \leq BA$, as $n_1 \geq n_1 + n_2$.

So, options (a), (b) and (c) are neglected.

$$\text{See } BA = \frac{r_1}{n_1} + \frac{r_2}{n_1} \geq \frac{r_1}{n_1} + \frac{n_2}{n_1} \max \left[0, \frac{r_2}{n_2} - \frac{r_1}{n_1} \right]$$

$$\text{because } \frac{r_2}{n_1} \geq 0 \text{ and } \frac{r_2}{n_1} \geq \left(\frac{n_2}{n_1} \times \frac{r_2}{n_2} - \frac{n_2}{n_1} \times \frac{r_1}{n_1} \right)$$

$$\text{or } \frac{r_2}{n_1} \geq \frac{r_2}{n_1} - \frac{n_2 r_1}{n_1^2}$$

So, none of the answers match.

- 50) (b) Initial $BA = 50$, BA increases as numerator increases with denominator remaining the same.

$$MB A_2 = \frac{r_1 + r_2}{n_1 + n_2} \text{ decreases as average of total runs}$$

decreases from 50, as runs scored in this inning are less than 50.

- 51) (b) Going by option elimination.

(a) will be invalid when $x + y = 0$

(b) is the correct option as both sides gives $-2|x + y|$ as the result.

(c) will be equal when $(x + y) = 0$

(d) is not necessarily equal (plug values and check)

- 52) (c) Consider option (c) as

$$-F(x, y) \cdot G(x, y) = -[-|x + y| |x + y|] = 4x^2 \text{ for } x = y$$

And $\log_2 16 = \log_2 2^4 = 4$, which gives value of option (c) as x^2 .

- 53) (b) Solve sequentially from innermost bracket to get the answer. So, answer is (b).

- 54) (d) From the graph, $F1(x) = F(x)$ for $x \in (-2, 0)$, but $F1(x) = -F(x)$ for $x \in (0, 2)$.

- 55) (d) From the graphs, $F1(x) = -F(x)$ and also $F1(x) = F(-x)$. So, both (a) and (b) are satisfied which is not given in any of the option.

- 56) (d) By observation $F1(x) = -F(x)$ and also $F1(x) = F(-x)$. So, both (a) and (b) are satisfied. Since, no option is given mark (d) as the answer.

- 57) (c) By observation $F1(x) = -F(-x)$. This can be checked by taking any value of x , say 1, 2. So, answer is (c).

$$58) (c) (2 \# 1)/(1 \Delta 2) = \frac{2+1}{2^{2+1}} = \frac{3}{8}$$

$$59) (a) \text{ Numerator} = 4 - [(10^{1.3} \Delta \log_{10} 0.1)] \\ = 4 - [10^{1.3} \Delta (-1)] \\ = 4 - 1 = 3$$

$$\text{Denominator} = 1 \nabla 2 = 2^{1+2} = 8$$

$$\text{Hence, answer} = \frac{3}{8}$$

- 60) (b) Try for (a), (c) and (d) all numerator and denominators as 1, i.e. $\frac{\text{Num}}{\text{Den}} = \frac{1}{1} = 1$

Hence, (b) is the answer.

- 61) (d) Since, $x > y > z > 0$

$$\therefore la(x, y, z) = y + z$$

$$\text{and } le = \max(x - y, y - z)$$

we cannot find the value of le . Therefore, we can't say whether $la > le$ or $le > la$.

Hence, we can't comment, as data is insufficient.

- 62) (b) $la(10, 5, 3) = 8$

$$le(8, 5, 3) = 3$$

$$ma(10, 4, 3) = \frac{1}{2} [7 + 6] = \frac{13}{2} = 6.5$$

- 63) (c) $ma(15, 10, 19) = \frac{1}{2} [19 + 5] = 12$

$$\min(10, 6) = 6$$

$$le(9, 8, 12) = 1$$

$$le(15, 6, 1) = 9$$

- 64) (d) $M(M(A(M(x, y), S(y, x)), x), A(y, x))$

$$M(M(A(6, 1), 2), A(3, 2))$$

$$M(M(7, 2), A(3, 2))$$

$$M(14, 5) = 70$$

- 65) (b) $S[M(D(A(a, b), 2), D(A(a, b), 2)),$

$$M(D(S(a, b), 2), D(S(a, b), 2))]$$

$$\Rightarrow S[M(D(a + b, 2), D(a + b, 2)), M(D(a - b, 2), D(a - b, 2))]$$

$$\Rightarrow S \left[M \left(\left(\frac{a+b}{2} \right) \left(\frac{a+b}{2} \right) \right), M \left(\frac{a-b}{2}, \frac{a-b}{2} \right) \right]$$

$$\Rightarrow S \left[\left(\frac{a+b}{2} \right)^2, \left(\frac{a-b}{2} \right)^2 \right]$$

$$= \frac{(a+b)^2 - (a-b)^2}{2^2}$$

$$= \frac{(2a)(2b)}{4} = ab$$

- 66) (a) $me(a + mo(le(a, b)),$

$$mo(a + me(mo(a), mo(b))))$$

$$\text{Given, } a = -2, b = -3$$

$$a + mo(le(a, b))$$

$$= -2 + mo(le(-2, -3))$$

$$= -2 + mo(-3)$$

$$= -2 + 3 = 1$$

$$mo(a + me(mo(a), mo(b))))$$

$$= mo(-2 + me(mo(-2), mo(-3)))$$

$$= mo(-2 + me(2, 3))$$

$$= mo(-2 + 3) = mo(1) = 1$$

$$\Rightarrow me(1, 1) = 1$$

- 67) (d) (a) $\text{mo}(\text{le}(a, b)) \geq \text{me}(\text{mo}(a), \text{mo}(b))$
 $\equiv \text{le}(a, b) > \text{me}(a, b)$ as $a, b > 0$, which is false.
 (b) $\text{mo}(\text{le}(a, b)) > \text{me}(\text{mo}(a), \text{mo}(b))$, which is again false.

It can be true only for $a = b$.

- (c) $\text{mo}(\text{le}(a, b)) < \text{le}(\text{mo}(a), \text{mo}(b))$
 or $\text{le}(a, b) < \text{le}(a, b)$, which is false.
 (d) $\text{mo}(\text{le}(a, b)) = \text{le}(\text{mo}(a), \text{mo}(b))$
 or $\text{le}(a, b) = \text{le}(a, b)$, which is true.
 68) (b) $\text{me}(a^2 - 3a, a - 3) < 0$ or $\text{me}[a(a - 3), a - 3] < 0$
Case I $a < 0$, $a^3 - 3a > a - 3$
 $\Rightarrow a(a - 3) < 0$ or $0 < a < 3$, which is not true.
Case II $0 < a < 3$, $a(a - 3) < 0$ or $0 < a < 3$, which is true.
Case III $a = 3$, $\text{me}(0, 0) < 0$ not true.
Case IV $a > 3$, $a(a - 3) < 0$ or $0 < a < 3$ not true.

Alternative method

It can also be found by putting some values of a , say
 $a = -1$ in case I.

$a = 1$ in case II and $a = 4$ in case IV.

- 69) (b) $\text{le}(a(a - 3), (a - 3)) < 0$
 Again in **case I** $a < 0$; $a - 3 < 0$ or $a < 3$
 (from last Question) **can be true**
 In **case II** $0 < a < 3$; $a - 3 < 0$ or $a < 3$ can be true
 In **case III** $a = 3$, $\text{le}(0, 0) = 0 < 0$, not true
 In **case IV** $a > 3$, $a - 3 < 0$ or $a < 3$ not true
 Hence, (b) and (c) are correct.

- 70) (c) Equating $2 + x^2 = 6 - 3x$
 $\Rightarrow x^2 + 3x - 4 = 0$
 $\Rightarrow x^2 + 4x - x - 4 = 0$
 $\Rightarrow (x + 4)(x - 1) = 0$
 $\Rightarrow x = -4$ or 1

But $x > 0$ so $x = 1$, so $\text{LHS} = \text{RHS} = 2 + 1 = 3$

It means the largest value of function

$\min(2 + x^2, 6 - 3x)$ is 3.

- 71) (b) $\text{Ma}[\text{md}(a), \text{mn}(\text{md}(b), a), \text{mn}(ab, \text{md}(ac))]$
 $\text{Ma}[|-2|, \text{mn}(|-3|, -2), \text{mn}(6, |-8|)]$
 $\text{ma}[2, \text{mn}(3, -2), \text{mn}(6, 8)]$
 $\text{Ma}[2, -2, 6] = 6$

- 72) (a) $\text{Ma}[\text{md}(a), \text{mn}(a, b)] = \text{mn}[a, \text{md}(\text{Ma}(a, b))]$
 $\text{Ma}[2, -3] = \text{mn}[-2, \text{md}(-2)]$
 $2 = \text{mn}(-2, 2)$
 $2 = -2$

Relation does not hold for $a = -2$ and $b = -3$

or $a < 0, b < 0$

- 73) (b) $\text{fog}(x) = f\{g(x)\} = f\left(\frac{x-3}{2}\right) = 2\left(\frac{x-3}{2}\right) + 3 = x$
 $\text{gof}(x) = f\{f(x)\}$
 $= g(2x + 3) = \frac{2x + 3 - 3}{2} = x$

$\therefore \text{fog}(x) = \text{gof}(x)$

- 74) (c) $f(x) = g(x - 3)$
 $2x + 3 = \frac{x - 3 - 3}{2} = \frac{x - 6}{2}$
 $\Rightarrow 4x + 6 = x - 6$
 $\Rightarrow 3x = -12 \Rightarrow x = -4$

- 75) (b) $\{gofogogof(x)\} \{fogog(x)\}$
 We have, $\text{fog}(x) = \text{gof}(x) = x$
 Therefore, above expression becomes $(x) \cdot (x) = x^2$

- 76) (c) $fo(\text{fog})o(\text{gof})(x)$
 We have, $\text{fog}(x) = \text{gof}(x) = x$
 So, given expression reduces to $f(x)$ that is $2x + 3$.

MISCELLANEOUS

- 1) Of 60 students in a class, anyone who has chosen to study Maths elects to do Physics as well. But no one does Maths and Chemistry, 16 do Physics and Chemistry. All the students do atleast one of the three subjects and the number of people who do exactly one of the three is more than the number who do more than one of the three. What are the maximum and minimum number of people who could have done Chemistry only? (2016)
- 2) Let X be the set of integers $\{9, 15, 21, 27, \dots, 375\}$. Y denotes a subset of X , such that the sum of no two elements of Y is 384. Find the maximum number of elements in Y . (2014)
 - (a) 29
 - (b) 30
 - (c) 31
 - (d) 32
- 3) A vessel is filled to its capacity with pure milk. 9 L are withdrawn from the vessel and replaced within equal amount of water. 9 L of the mixture is again withdrawn and then replaced with an equal amount of water. After these changes, the vessel contains 17.1 L of milk less than it did initially. Find the capacity of the vessel. (2014)
 - (a) 120 L
 - (b) 150 L
 - (c) 90 L
 - (d) 75 L
- 4) The amount of work in a steel plant increased by 50%. By what per cent is it necessary to increase the number of workers to complete the new amount of work in previously planned time, if the productivity of the new labour is 25% more. (2013)
 - (a) 60%
 - (b) 66.66%
 - (c) 40%
 - (d) 33.33%
- 5) A tank is connected with 15 pipes. Some of them are inlet pipes and rest work as outlets pipes. Each of the inlet pipe can fill the tank in 8 h individually, while each of those that empty the tank i.e. output pipe, can empty it in 6 h individually. If all the pipes are kept open when the tank is full, it will take exactly 6 h for the tank to empty. How many of these are inlet pipes? (2013)
 - (a) 2
 - (b) 8
 - (c) 5
 - (d) 6
- 6) A , B and C can independently do a work in 15 days, 20 days and 30 days, respectively. They work together for some time after which C leaves. A total of ₹ 18000 is paid for the work and B gets ₹ 6000 more than C . For how many days did A work? (2012)
 - (a) 2
 - (b) 4
 - (c) 6
 - (d) 8
- 7) There are two water drums in my house whose volumes are in the ratio 1 : 5. Every day the smaller drum is filled first and then the same pipe is used to fill the bigger drum. Normally by the time I return from my college, i.e. at 1 : 30 pm, the smaller drum would just be full. But today I returned a little early and started drawing water from the well with the help of a bucket, poured one-third into the smaller drum and the remaining into the bigger drum. I continued this till the smaller drum was filled. Immediately after that, I shifted the pipe into the bigger drum and went for lunch. Today if the bigger drum was filled in 12 min before its normal time, when was the smaller drum full? (2011)
 - (a) 1 : 18 pm
 - (b) 1 : 28 pm
 - (c) 1 : 26 pm
 - (d) Cannot be determined
- 8) Ram starts working on a job and works on it for 12 days and completes 40% of the work. To help him complete the work, he employs Ravi and together they work for another 12 days and the work gets completed. How much more efficient is Ram than Ravi? (2010)
 - (a) 50%
 - (b) 200%
 - (c) 60%
 - (d) 100%
- 9) A pump can be used either to fill or to empty a tank. The capacity of the tank is 3600m^3 . The emptying capacity of the pump is $10\text{m}^3/\text{min}$ higher than its filling capacity. What is the emptying capacity of the pump, if pump needs 12 more minutes to fill the tank than to empty it? (2010)
 - (a) $50\text{m}^3/\text{min}$
 - (b) $60\text{m}^3/\text{min}$
 - (c) $45\text{m}^3/\text{min}$
 - (d) $90\text{m}^3/\text{min}$

Directions (Q.Nos. 10-11) *These questions are based on the following information.*

There are three different cable channels namely Ahead, Luck and Bang. In a survey, it was found that 85% of viewers respond to Bang, 20% to Luck and 30% to Ahead. 20% of viewers respond to exactly two channels and 5% to none. (2010)

- 10) What percentage of the viewers responded to all three?
 (a) 10 (b) 12
 (c) 14 (d) None of these
- 11) Assuming 20% respond to Ahead and Bang, and 16% respond to Bang and Luck, what is the percentage of viewers who watch only Luck?
 (a) 20 (b) 10
 (c) 16 (d) None of these

Directions (Q.Nos. 12-13) *Answers the questions based on the following information.*

Five horses, Red, White, Grey, Black and Spotted participated in a race. As per the rules of the race, the persons betting on the winning horse get four times the bet amount and those betting on the horse that came in second get thrice the bet amount. Moreover, the bet amount is returned to those betting on the horse that came in third and the rest lose the bet amount. Raju bets ₹ 3000, ₹ 2000 and ₹ 1000 on Red, White and Black horses respectively and ends up with no profit and no loss. (2008)

- 12) Which of the following cannot be true?
 (a) At least two horses finished before Spotted
 (b) Red finished last
 (c) There were three horses between Black and Spotted
 (d) There were three horses between White and Black
 (e) Grey came in second
- 13) Suppose, in addition, it is known that Grey came in fourth. Then, which of the following cannot be true?
 (a) Spotted came in first (b) Red finished last
 (c) White came in second (d) Black came in second
 (e) There was one horse between Black and White

Directions (Q.Nos. 14-18) *Answer the questions based on the following information.*

An airline has a certain free luggage allowance and charges for excess luggage at a fixed rate per kg. Two passengers, Raja and Praja have 60 kg of luggage between them and are charged ₹ 1200 and ₹ 2400, respectively for excess luggage. Had the entire luggage belonged to one of them, the excess luggage charge would have been ₹ 5400. (2006)

- 14) What is the weight of Praja's luggage?
 (a) 20 kg (b) 25 kg (c) 30 kg
 (d) 35 kg (e) 40 kg
- 15) What is the free luggage allowance?
 (a) 10 kg (b) 5 kg (c) 20 kg
 (d) 30 kg (e) 25 kg
- 16) A group of 630 children is arranged in rows for a group photograph session. Each row contains three fewer children than the row in front of it. What number of rows is not possible? (2006)
 (a) 3 (b) 4 (c) 5
 (d) 6 (e) 7
- 17) A survey was conducted to 100 people to find out whether they had read recent issues of Golmal, a monthly magazine. The summarized information regarding readership in 3 months is given below
 Only September : 18; September but not August : 23; September and July : 8; September : 28; July: 48; July and August: 10; None of the three months : 24
 What is the number of surveyed people who have read exactly two consecutive issues (out of the three)? (2006)
 (a) 7 (b) 9 (c) 12
 (d) 14 (e) 17
- 18) There are 6 tasks and 6 persons. Task 1 cannot be assigned either to person 1 or to person 2; task 2 must be assigned to either person 3 or person 4. Every person is to be assigned one task. In how many ways can the assignment be done? (2006)
 (a) 144 (b) 180 (c) 192
 (d) 360 (e) 716

Directions (Q.Nos. 19-20) *Answer the questions based on the following information.*

A boy is asked to put in a basket one mango when ordered 'One', one orange when ordered 'Two', one apple when ordered 'Three' and is asked to take out from the basket one mango and an orange when ordered 'Four'. A sequence of orders is given as (2002)

1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4

- 19) How many total fruits will be in the basket at the end of the above order sequence?
 (a) 9 (b) 8
 (c) 11 (d) 10
- 20) How many total oranges were in the basket at the end of the above sequence?
 (a) 1 (b) 4
 (c) 3 (d) 2

- 21) Six persons are playing a card game. Suresh is facing Raghubir who is to the left of Ajay and to the right of Pramod. Ajay is to the left of Dheeraj. Yogendra is to the left of Pramod. If Dheeraj exchanges his seat with Yogendra and Pramod exchanges with Raghubir, who will be sitting to the left of Dheeraj? (2002)

(a) Yogendra (b) Raghubir
(c) Suresh (d) Ajay

- 22) 10 straight lines, no two of which are parallel and no three of which pass through any common point, are drawn on a plane. The total number of regions (including finite and infinite regions) into which the plane would be divided by the lines is (2002)

(a) 56 (b) 255
(c) 1024 (d) Not unique

- 23) On a straight road XY, 100 m long, five heavy stones are placed two metres apart beginning at the end X. A worker, starting at X, has to transport all the stones to Y, by carrying only one stone at a time. The minimum distance he has to travel (in metres) is (2002)

(a) 472 (b) 422
(c) 744 (d) 844

- 24) If 09/12/2001 happens to be Sunday, then 09/12/1971 would have been a (2001)

(a) Wednesday (b) Tuesday
(c) Saturday (d) Thursday

Directions (Q.Nos. 25-28) Answer the questions based on the following information.

A and B are two sets (e.g., A = mothers, B = women). The elements that could belong to both the sets (e.g., women who are mothers) is given by the set $C = A \cap B$. The elements which could belong to either A or B , or both, is indicated by the set $D = A \cup B$. A set that does not contain any elements is known as a null set, represented by ϕ (for example, if none of the women in the set B is a mother, then $C = A \cap B$ is a null set, or $C = \phi$).

Let ' V ' signify the set of all vertebrates; ' M ' the set of all mammals; ' D ' dogs; ' F ' fish; ' A ' alsatian and ' P ', a dog named Pluto. (2001)

- 25) If $P \cap A = \phi$ and $P \cup A = D$, then which of the following is true?

(a) Pluto and alsatians are dogs
(b) Pluto is an alsatian
(c) Pluto is not an alsatian
(d) D is a null set

- 26) If $Z = (P \cap D) \cup M$, then

(a) The elements of Z consist of Pluto, the dog or any other mammal
(b) Z implies any dog or mammal
(c) Z implies Pluto or any dog that is a mammal
(d) Z is a null set

- 27) If $Y = F \cap (D \cap V)$, is not a null set, it implies that

(a) all fish are vertebrates (b) all dogs are vertebrates
(c) some fish are dogs (d) None of these

- 28) Given that $X = M \cap D$ is such that $X = D$, which of the following is true?

(a) All dogs are mammals (b) Some dogs are mammals
(c) $X = \phi$ (d) All mammals are dogs

Directions (Q.Nos. 29-30) Answer the questions based on the following information.

Production pattern for number of units (in cubic feet) per day

Day	1	2	3	4	5	6	7
Number of units	150	180	120	250	160	120	150

For a truck that can carry 2000 cubic feet, hiring cost per day is ₹ 1000. Storing cost per cubic feet is ₹ 5 per day.

(1998)

- 29) If the storage cost is reduced to ₹ 0.8 per cubic feet per day, then on which day/days, the truck should be hired?

(a) 4th (b) 7th
(c) 4th and 7th (d) None of these

- 30) If all the units should be sent to the market, then on which days should the trucks be hired to minimize the cost?

(a) 2nd, 4th, 6th, 7th (b) 7th
(c) 2nd, 4th, 5th, 7th (d) None of these

Directions (Q.Nos. 31-34) Answer the questions based on the following information.

A survey of 200 people in a community who watched at least one of the three channels BBC, CNN and DD-showed that 80% of the people watched DD, 22% watched BBC and 15% watched CNN. (1997)

- 31) Out of two-thirds of the total number of basketball matches, a team has won 17 matches and lost 3 of them. What is the maximum number of matches that the team can lose and still win more than three-fourths of the total number of matches, if it is true that no match can end in a tie?

(a) 4 (b) 6 (c) 5 (d) 3

- 32) If 5% of people watched DD and CNN, 10% watched DD and BBC, then what percentage of people watched BBC and CNN only?
 (a) 2% (b) 5%
 (c) 8.5% (d) Cannot be determined
- 33) Referring to the previous question, what percentage of people watched all the three channels?
 (a) 3.5% (b) 0%
 (c) 8.5% (d) Cannot be determined
- 34) What is the maximum percentage of people who can watch all the three channels?
 (a) 12.5% (b) 8.5%
 (c) 15% (d) Data insufficient

Directions (Q.Nos. 35-36) Answer the questions based on the following information.

In a locality, there are five small cities: A, B, C, D and E. The distances of these cities from each other are as follows

$AB = 2$ km, $AC = 2$ km, $AD > 2$ km, $AE > 3$ km, $\sqrt{BC} = 2$ km; $BD = 4$ km, $BE = 3$ km, $CD = 2$ km, $CE = 3$ km, $DE > 3$ km (1996)

- 35) If a ration shop is to be set up within 2 km of each city, how many ration shops will be required?
 (a) 1 (b) 2 (c) 4 (d) 4
- 36) If a ration shop is to be set up within 3 km of each city, how many ration shops will be required?
 (a) 2 (b) 3 (c) 4 (d) 5
- 37) In a locality, two-thirds of the people have cable TV, one-fifth have VCR and one-tenth have both. What is the fraction of people having either cable TV or VCR ? (1996)
 (a) 19/30 (b) 2/3 (c) 17/30 (d) 23/30

Directions (Q.Nos. 38-39) Answer the questions based on the following information.

A salesman enters the quantity sold and the price into the computer. Both the numbers are two-digit numbers. But, by mistake, both the numbers were entered with their digits interchanged. The total sales value remained the same, i.e. ₹ 1,148, but the inventory reduced by 54. (1996)

- 38) What is the actual quantity sold?
 (a) 28 (b) 14 (c) 82 (d) 14
- 39) What is the actual price per piece?
 (a) ₹ 82 (b) ₹ 41
 (c) ₹ 6 (d) ₹ 28

- 40) Along a road lie an odd number of stones placed at intervals of 10 m. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. A man carried out the job starting with the stone in the middle, carrying stones in succession, thereby covering a distance of 4.8 km. Then, the number of stones is (1994)
 (a) 35 (b) 15
 (c) 29 (d) 31
- 41) The pendulum of a clock takes 7 s to strike 4 O'clock. How much time will it take to strike 11 O'clock? (1994)
 (a) 18 s (b) 20 s
 (c) 19.25 s (d) 23.33 s

Directions (Q.Nos. 42-44) Answer the questions based on the following information.

Ghosh Babu is staying at Ghosh Housing Society, Aghosh Colony, Dighospur, Kolkata. In Ghosh Housing Society, 6 persons read daily. The Ganashakti and 4 persons read The Anand Bazar Patrika. In his colony, there is no person who reads both. Total number of persons who read these two newspapers in Aghosh Colony and Dighospur is 52 and 200, respectively. Number of persons who read The Ganashakti in Aghosh Colony and Dighospur is 33 and 121 respectively, while the persons who read The Anand Bazar Patrika in Aghosh Colony and Dighospur are 32 and 117, respectively. (1994)

- 42) The number of persons in Aghosh Colony who read only one newspaper is
 (a) 29 (b) 19
 (c) 39 (d) 20
- 43) The number of persons in Aghosh Colony who read both the newspapers is
 (a) 13 (b) 9
 (c) 38 (d) 14
- 44) Number of persons in Dighospur who read only The Ganashakti is
 (a) 121 (b) 83
 (c) 79 (d) 127

Directions (Q.Nos. 45-46) Answer the questions based on the following information.

Eighty five children went to an amusement park where they could ride on the Merry-go-round, Roller Coaster and Ferris Wheel. It was known that 20 of them took all three rides and 55 of them took atleast two of the three rides. Each ride costs ₹ 1 and the total receipts of the amusement park were ₹ 145. (1993)

45) How many children took exactly one ride?

- (a) 5 (b) 10
(c) 15 (d) 20

46) How many children did not try any of the rides?

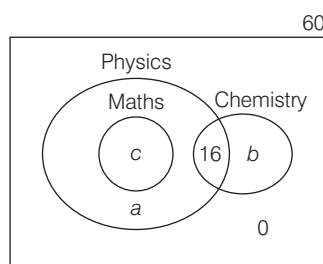
- (a) 5 (b) 10
(c) 15 (d) 20

47) Out of 100 families in the neighbourhood, 45 own radios, 75 have TVs, 25 have VCRs only 10 families have all three and each VCR owner also has a TV. If 25 families have radio only; how many have only TV ?

- (a) 30 (b) 35
(c) 40 (d) 45

HINTS & SOLUTIONS

1) The diagram would look like the one outlined here.



$$a + b + c + 16 = 60$$

$$\Rightarrow a + b + c = 44$$

The number of people who do exactly one of the three is more than the number who do more than one of the three.

$$\Rightarrow a + b > c + 16$$

We need to find the maximum and minimum possible values of b .

Let us start with the minimum.

$$\text{Let } b = 0, a + c = 44$$

$$a > c + 16.$$

We could have $a = 40, c = 4$.

So, b can be 0.

Now, thinking about the maximum value, $b = 44$, $a = c = 0$ also works.

So, minimum value = 0 and the maximum value = 44.

2) (c) X is a set of integers whose elements when arranged in ascending order form an arithmetic progression whose first term is 9 and common difference is 6. Let us say it has n elements.

$$\Rightarrow 375 = 9 + (n - 1)6$$

$$\Rightarrow 62 = n$$

In an arithmetic progression with even number of terms (say n), the sum of the k th term, from the start and k th term from the end will be the same.

Hence, maximum number of element in y is 31.

3) (c) Let the capacity of the vessel be x L.

Quantity of milk in the vessel finally

$$= x \left(\frac{x-9}{x} \right)^2 = x - 17.1$$

$$\Rightarrow x^2 - 18x + 81 = x^2 - 17.1x$$

$$\therefore x = 90$$

Hence, the capacity of vessel is 90 L.

4) (c) Let the number of men be 100.

Then, Men $\times$ Time = Work

$$100 \times 1 = 100 \text{ unit}$$

Amount of work increased by 50%.

$\therefore$ New work = 150 unit

as the planned time remains same i.e., 1

Then, men required will be 150 i.e. 50 more workers

but since new workers are 25% efficient i.e., $\frac{5}{4}$ times efficient as existing workers.

$$\therefore \text{Actual number of workers} = \frac{50}{5/4} = 40 \text{ men}$$

$$\therefore \text{Required per cent} = \frac{40}{100} \times 100 = 40\%$$

5) (b) Let there be n inlet pipes and $(15 - n)$ outlet pipes.

$$\text{Therefore, } (15 - n) \frac{1}{6} - n \times \frac{1}{8} = \frac{1}{6}$$

$$\Rightarrow \frac{15 - n}{6} - \frac{n}{8} = \frac{1}{6}$$

$$\Rightarrow \frac{60 - 4n - 3n}{24} = \frac{1}{6}$$

$$\Rightarrow -7n + 60 = \frac{24}{6}$$

$$\Rightarrow -7n = -60 + 4$$

$$\Rightarrow -7n = -56$$

$$\therefore n = 8$$

$\therefore$ Number of inlet pipes = 8

- 6) (d) Let A and B work for m days and C for n days to complete the work. Therefore,

$$\frac{m}{15} + \frac{m}{20} + \frac{n}{30} = 1 \quad \dots (i)$$

Out of the total of ₹ 18000, B gets ₹ 6000 more than C .

$$\text{i.e.} \quad \frac{m}{20} - \frac{n}{30} = \frac{6000}{18000} = \frac{1}{3} \quad \dots (ii)$$

On adding Eqs. (i) and (ii), we get

$$\frac{m}{15} + \frac{2m}{30} = \frac{4}{3}$$

$$\Rightarrow m = 8$$

- 7) (c) The 12 min saved in filling the drums is because of my contribution of few buckets of water. I poured one-third of each bucket in the smaller drum and the remaining two-third in the bigger drum i.e., t min is saved in filling the smaller drum, $2t$ min are saved in filling the bigger drum.

$$\therefore 3t = 12 \Rightarrow t = 4$$

So, 4 min are saved in filling the smaller drum. So, the smaller drum was filled 4 min earlier than its normal filling time. So, it was filled at 1 : 26 pm.

- 8) (d) Ram completes 40% of work in 12 days, i.e., another 60% of the work has to be completed by Ram and Ravi have taken 12 days to complete 60% of would.

Therefore, Ram and Ravi, working together, would have completed the work in $\frac{12}{60} \times 100 = 20$ days

As Ram completes 40% of the work in 12 days, he will take $\frac{12}{40} \times 100 = 30$ days

to complete the entire work. Working alone, we known Ram takes 30 days to complete the entire work. Let us assume that Ravi takes x days to complete the entire work, if he works alone. And together they complete the entire work in 20 days.

$$\text{Therefore, } \frac{1}{30} + \frac{1}{x} = \frac{1}{20}$$

$$\frac{1}{x} = \frac{1}{20} - \frac{1}{30} \Rightarrow \frac{1}{x} = \frac{1}{60}$$

Therefore, Ravi will take 60 days to complete the work, if he works alone.

Hence, Ram is 100% more efficient than Ravi.

- 9) (b) Let $f \text{ m}^3/\text{min}$ be the filling capacity of the pump. Therefore, the emptying capacity of the pump will be $(f + 10) \text{ m}^3/\text{min}$.

$$\text{The time taken to fill the tank} = \frac{3600}{f}$$

$$\text{The time taken to empty the tank} = \frac{3600}{f + 10}$$

We know that it takes 12 more minutes to fill the tank than to empty it.

$$\frac{3600}{f} - \frac{3600}{f + 10} = 12$$

$$\Rightarrow 3600f + 36000 - 3600f = 12(f^2 + 10f)$$

$$\Rightarrow 36000 = 12(f^2 + 10f)$$

$$\Rightarrow 3000 = f^2 + 10f$$

$$\Rightarrow f^2 + 10f - 3000 = 0$$

$$\Rightarrow (f + 60)(f - 50) = 0$$

$$\Rightarrow f = -60 \text{ or } f = 50$$

Accepting the positive value of $f = 50$

Therefore, emptying capacity of the pump
 $= 50 + 10 = 60 \text{ m}^3/\text{min}$

- 10) (a) The % of respondents who watch all 3 channels

$$= \frac{[30 + 20 + 85 - 20 - (100 - 5)]}{2} = 10$$

- 11) (d) Those watching L and B only $(= 16 - 10) = 6$, while those watching A and B only $(= 20 - 10) = 10$ Those watching L and A only $(20 - 6 - 10) = 4$ Those watching $L = 20 - (6 + 10 + 4) = 0$, which is not among the choices given.

- 12) (d) Option (a) is correct in Case I.

Option (b) is correct in Case II.

Option (c) is correct in Case II.

Option (d) is not possible in any of the cases.

Option (e) is possible in Case II.

- 13) (c) If Grey finishes in 4th position, then Cases I and II are possible.

Option (a) is possible in Case I.

Option (b) is possible in Case II.

Option (c) is not possible.

Option (d) is possible in Case I.

Option (e) is possible in Case II.

Solutions (Q. Nos. 14-15) Let luggage for Raja be x kg and free allowance be F kg.

$$\therefore \text{Luggage for Praja} = (60 - x) \text{ kg}$$

According to the information,

$$(x - F)V = 1200 \quad \dots (i)$$

$$(60 - x - F)V = 2400 \quad \dots (ii)$$

$$\text{and} \quad (60 - F)V = 5400 \quad \dots (iii)$$

$$(V = \text{rate of levy on excess luggage})$$

$$\text{Divide Eq. (ii) by Eq. (i), we get } \frac{60 - x - F}{x - F} = 2$$

$$\Rightarrow 2x - 2F = 60 - x - F$$

$$\Rightarrow 2x - F = 60 \quad \dots (iv)$$

Now, divide Eq. (iii) by Eq. (i), we get

$$\frac{60 - F}{x - F} = 4.5$$

$$\Rightarrow 60 - F = 4.5x - 4.5F$$

$$\Rightarrow 4.5x - 3.5F = 60 \quad \dots(v)$$

On solving Eqs. (iv) and (v), we get

$$x = 25 \text{ and } F = 15$$

- 14) (d) Weight of Praja's luggage = $(60 - 25) = 35$ kg

- 15) (*) As calculated above free luggage allowance,

$$F = 15 \text{ kg}$$

This is not available among given options.

- 16) (d) Let the number of students in the front row be x and number of rows be n .

Hence, the number of students in the next rows would be $(x - 3)$, $(x - 6)$, $(x - 9)$,... and so on.

If n , i.e. number of rows be 3, then number of students

$$= x + (x - 3) + (x - 6) = 630$$

$$\Rightarrow 3x = 639$$

$$\Rightarrow x = 213 \quad (\text{Thus, } n = 3 \text{ possible})$$

Likewise, if $n = 4$,

$$\text{then } x + (x - 3) + (x - 6) + (x - 9) = 630$$

$$\Rightarrow 4x - 18 = 630$$

$$\Rightarrow x = 162 \quad (\text{Thus, } n = 4 \text{ is also possible})$$

If $n = 5$, then

$$x + (x - 3) + (x - 6) + (x - 9) + (x - 12) = 630$$

$$\Rightarrow 5x - 30 = 630 \Rightarrow 5x = 660 \Rightarrow x = 132$$

(Thus, $n = 5$ is also possible)

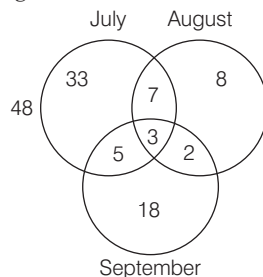
If $n = 6$, then $6x = 675$

$$x \neq \text{integer}$$

Therefore, $n = 6$ is not possible.

- 17) (b) Number of persons who read anyone of the three issues of the magazine Golmal = $(100 - 24) = 76$

Number of persons who read two consecutive issues July and August = 7



Number of persons who read two consecutive issues August and September = 2

$\therefore$ Total number of persons = $7 + 2 = 9$

- 18) (a) Task 2 can be given to two persons, i.e. (3 and 4)
Number of ways = 2

First task can be done in 3 ways by 3 persons

Third task can be done by 4 persons, i.e. in 4 ways

Similarly, for fourth, fifth and sixth tasks, number of ways are 3, 2 and 1, respectively.

$\therefore$ Total number of ways

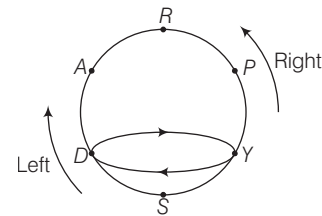
$$= 2 \times 3 \times 4 \times 3 \times 2 \times 1 = 144$$

- 19) (c) Number of fruits at the end = Number of (1's + 2's + 3's) - Number of 4's $\times 2 = 19 - 8 = 11$

- 20) (d) Number of orange at the end

$$= \text{Numbers of 2's} - \text{Number of 4's} = 6 - 4 = 2$$

- 21) (c) In a circular table, person sitting towards anti-clockwise direction of a person will be at the right hand side and the person towards anti-clockwise direction will be at the left hand side.



Hence, if Yogendra and Dheeraj exchange their seats. Person sitting to the left hand side of Dheeraj would be Suresh.

- 22) (a)
- | No of lines | 0 | 1 | 2 | 3 | 4 | 5 | 6-----56 |
|---------------|----|----|----|----|----|----|----------|
| No of regions | 1 | 2 | 4 | 7 | 11 | 16 | 22-----6 |
| | +1 | +2 | +3 | +4 | +5 | +6 | |

- 23) (d)

- 24) (a) In 30 yr from 1971 to 2001, number of odd days = $30 + (8 \text{ from leap years}) = 38$ and 38, so September 12, 1971 is Sunday - 3 days = Wednesday.

- 25) (c) $P \cdot A = \phi$; $P \cup A = D$

$P \cap A = \phi$ means no alsations are Pluto or Pluto is not an alsation where dogs are composed of alsation or Pluto or both.

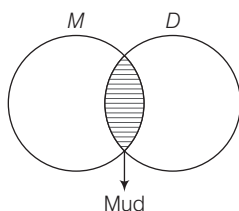
- 26) (a) $Z = (P \cdot D) \cup M$, $Z = (P \cap D) \cup M$

$P \cap D$ means Pluto, the dog.

$P \cap D \cup M$ means pluto, the dog or any other mammal.

- 27) (c) $Y = F \cap (D \cap V)$ is not a null set means some F 's are D 's and some D 's are V 's. That means some fish are dogs.

- 28) (a) The shaded region is represented by the relationship $X = M \cdot D$. Now, it is given that $M \cup D = D$.



It means that the D is a subset of M . Hence, all dogs are mammals.

- 29) (b) Cost incurred if the truck is hired on 7th day
 $= ₹ 0.8 \times (150 + 330 + 450 + 770 + 860 + 980) + 1000$
 $= ₹ 2776$. If we choose any other option, then hiring cost alone would be ₹ 2000 and addition of storing cost would increase the total cost. Hence, option (b) is economical option.

- 30) (c) From the data, given in the question it is clear that cost of storing of one day production is less than the cost of transportation. Hence, hiring a truck every day will not be economical. Hence, when the cost of storing at any day for the cumulative production till that day is more than the hiring day, all units should be transported.

If we transport all the unit on the 7 day the cost incurred would be

$$₹ 5 \times (150 + 330 + 450 + 700 + 860 + 980) + 1000 = ₹ 17350,$$

which is apparently very costly.

If we transport the units on 2nd, 4th, 6th and 7th day, then total cost incurred would be

$$₹ (150 \times 5 + 1000) + (120 \times 5 + 1000) + (160 \times 5 + 1000) + 1000 = ₹ 6150$$

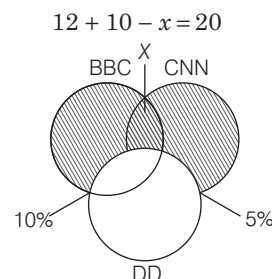
If the goods are transported on 2nd, 4th, 5th and 7th day, then total cost incurred would be

$$₹ (1750 + 1600 + 1000 + 120 \times 5 + 1000) = ₹ 5950$$

Hence, this is the most economical option.

- 31) (a) The number of matches that the team has played
 $= (17 + 3) = 20$
 Which is $\frac{2}{3}$ rd of total number of matches, hence total
 number of matches $= \frac{20 \times 3}{2} = 30$. If the team has to win
 $\frac{3}{4}$ th or more matches this team has tie win at least
 $\frac{3}{4} \times 30 = 22.5$ matches or 23. The team has already lost
 3 matches, hence maximum lose which the team can
 sustain $= (7 - 3) = 4$ matches

- 32) (a) The shaded portion represents the area which shows people who do not watch DD channel. Since 80% watch DD, hence 20% do not watch DD. Let those who watch BBC and CNN only be $x\%$, then

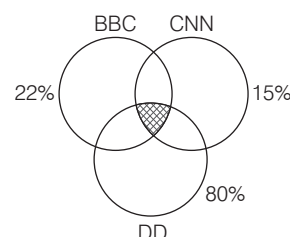


$$\Rightarrow x = 2$$

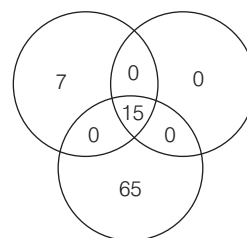
Hence, 2% watch BBC and CNN only.

- 33) (d) Since, percentage of those who watch BBC and CNN or those who watch DD only this question cannot be answered.

- 34) (c) Shaded portion shows the area which represents people who watch all the three channels. Now to calculate the maximum value we have to assume that those who watch two channels is 0% and also those who watch CNN only is also 0%.



Hence, it is clear that the maximum percentage of people who can watch all the three channels is that component (CNN) which has the least percentage of all the three. Hence, option (c) is our answer.



Solutions (Q.Nos. 35-36) Answer the questions based on the following information.

If we want to set up a shop in such a way that it is with in 2 km of each city, then we will find that one shop will be sufficient to comply this requirement as long as the distance between two cities does not exceed 4 km. Now, in the questions distance between AD , AE and DE is not known but from the data given we can infer that maximum distance between two cities can not be more than 5 km.

We know that if we connect three cities, it will form a triangle and in a Δ sum of two sides is greater than the third side. In case of cities ACD , $AC = 2$ km, $CD = 2$ km. Hence, AD shall be less than $AC + CD = 4$ km.

Again in case of cities ACE , $AC = 2$ km, $CE = 3$ km, hence AE shall be less than $AC + CE = 2 + 3 = 5$ km.

Similarly, in case of cities CDE , $CD = 2$ km, $CE = 3$ km, hence DE shall be less than $CD + CE = 2 + 3 = 5$ km.

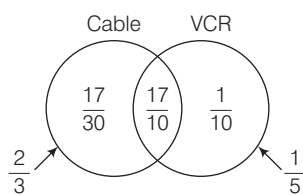
- 35) (a) In case shop is to be set up within 3 km of each city, then one shop will be required to cater to cities with a maximum distance of 6 km between them.

- 36) (a) Since, the maximum distance between two cities is 5 km and we need one shop for a distance of 8 km, hence to serve cities having distance 5 km between them one more shop will be needed.

Hence, total number of shops required is 2.

- 37) (b) Fraction of people who watch cable only

$$= \left(\frac{2}{3} - \frac{1}{10} \right) = \frac{17}{30}$$



and Fraction of people who watch VCR only

$$\left(\frac{1}{5} - \frac{1}{10} \right) = \frac{1}{10}$$

Therefore, fraction of people who watch either cable

or
$$\text{VCR} = \frac{17}{30} + \frac{1}{10} = \frac{20}{30} = \frac{2}{3}$$

Solutions (Q.Nos 38-39) In question, inventory means the stock position after sale.

Since the inventory reduced by 54, it means that quantity sold was less than that of what has been entered into the computer. Since, the difference between these is 54. Now, from the options in the question 31, we find the difference between the number and new number formed by interchanging the digits should be 54. Options (a) and (c) comply this requirement because $(82 - 28) = 54$. But as discussed earlier that actual quantity added is less than that of entered into the computer. Hence, our answer is option (a).

Now, price per piece $\times$ Quantity sold = Sales value .

$$\therefore \text{Price per piece} = \frac{1148}{28} = ₹ 41$$

- 38) (a)

- 39) (b)

- 40) (d) It is given that man travelled 4800 m to assemble stones placed on both the sides of middle stone. It means that distance travelled in assembling stones of one side will be 2400 m.

Now, distance travelled by him in bringing first stone to the middle (he starts from the middle)

$$= 10 + 10 = 20 \text{ m}$$

Distance travelled in bringing second stone to the middle = $20 + 20 = 40$

If there are n stones kept on one side, then total distance travelled in assembling n stones

$$= 20 + 40 + 60 + 80 + \dots$$

$$\Rightarrow 2400 = \frac{n}{2} [2 \times 20 + (n-1)20]$$

$$\Rightarrow n = 15$$

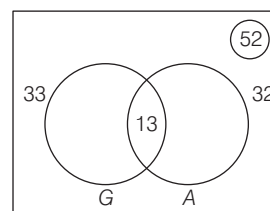
$$\therefore \text{Total number of stones} = (2n + 1) = 31$$

- 41) (d) Time interval to strike 4 O'clock is 3 because first strike takes place at 0 interval. Similarly, time interval to strike 11 O'clock is 10.

Therefore, time taken to strike 11 O'clock

$$= \frac{7 \times 10}{3} = 23.32 \text{ s}$$

- 42) (c) Number of persons who read Ganashakti only = $(33 - 13) = 20$

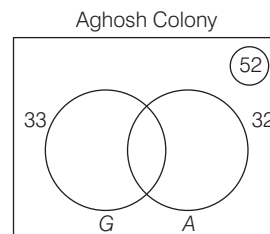


Number of persons who read Anand Bazar Patrika only

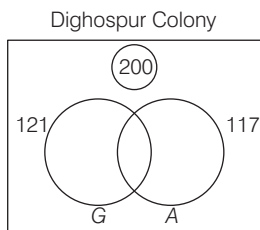
$$= (32 - 13) = 19$$

Hence, number of persons who read only one newspaper = $20 + 19 = 39$

- 43) (a) Number of persons reading both the papers in Aghosh Colony = $33 + 32 - 52 = 13$



- 44) (b) Number of persons reading both the papers in Dighospur = $117 + 121 - 200 = 38$

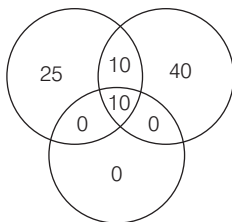


$\therefore$ Number of persons reading Ganashakti only
 $= 121 - 38 = 83$

- 45) (c) Calculated in second question.

- 46) (c) Children who took at least two of the three rides
 $= (x + y + z + 20) = 55$

Hence, children who took only two rides
 $(x + y + z) = 55 - 20 = 35$



Receipt from those who took all the three rides
 $= 20 \times 3 = ₹ 60$

Receipt from those who took only two rides

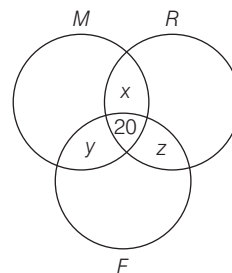
$$= 35 \times 2 = ₹ 70$$

Total money receipt from both = ₹ 130. Since, total collection was ₹ 145, therefore balance amount of ₹ 15 was collected from those who took the single ride only
 $= 15$

$\therefore$ Number of children who took one or more rides
 $= (55 + 15) = 70$

Hence, number of those who did not try a single ride
 $= 85 - 70 = 15$

- 47) (c) The following venn-diagram will help to understand the solution for this question.



Number of families having all the three = 10

Number of families having VCR = 25

It is given that each VCR owner also has TV. It means that number of families who own VCR only is 0 and number of families value own radio and VCR only is also zero.

$\therefore$ Number of families who own TV only
 $= 75 - (10 + 10 + 15) = 40$

DATA SUFFICIENCY

Direction (Q.No. 1) A question is followed by two Statements I and II. Answer the question by marking the answer using the instruction given below. (2013)

- (a) If the question can be answered by Statement I alone but cannot be answered by Statement II alone
- (b) If the question can be answered by Statement II alone but cannot be answered by Statement I alone
- (c) If question can be answered with either Statement I or Statement II
- (d) If question cannot be answered with both the statements

- 1) $y = f(x)$ is said to be an even function if $f(x) = f(-x)$. Is $y = f(x)$ an even function?

Statements

- I. Graph of $y = f(x)$ lies in only two quadrants and both these quadrant are adjacent to each other.
- II. Graph of $y = f(x)$ lies in only two quadrants and both these quadrants are opposite to each other.

Directions (Q.Nos. 2-5) Each of the following problems consists of a question and two Statements labelled I and II. You must decide whether the data given in the statements are sufficient to answer the question. Using the data, mark the appropriate option from (a) to (d) as per the following guidelines. Mark your answer as (2009)

- (a) If Statement I alone is sufficient to answer the question asked, but Statement II alone is not.
- (b) If Statement II alone is sufficient to answer the question asked, but Statement I alone is not.
- (c) If both Statements I and II together are sufficient to answer the question asked, but neither statement alone sufficient.
- (d) If Statements I and II together are not sufficient to answer the question asked and additional data is needed.

- 2) What is the area of the parallelogram PQRS in which the diagonal QS is 12 cm?

Statement I The perpendiculars from R and S to PQ are equal.

Statement II The perpendicular from P on QS is of length 8 cm.

- 3) Sneha borrowed a certain amount at compound interest and returned the amount with interest in installments. What was the amount borrowed?

Statement I The rate of interest was 10% per annum.

Statement II Each installment was ₹ 1210.

- 4) If a and b are non-negative numbers, is $(a + b)$ greater than ab ?

Statement I. $a = b$.

Statement II. $a + b$ is greater than $a^2 + b^2$.

- 5) Is the average of the largest and the smallest of four given numbers greater than the average of the four numbers?

Statement I The difference between the largest and the second largest numbers is greater than the difference between the second smallest and the smallest numbers.

Statement II The difference between the largest and the second largest numbers is less than the difference between the second largest and the second smallest numbers.

Directions (Q.Nos. 6-7) Each question is followed by two Statements A and B. Indicate your responses based on the following directives. (2008)

Mark (a) If question can be answered from A alone but not from B alone.

Mark (b) If question can be answered from B alone but not from A alone.

Mark (c) If question can be answered from A alone as well as from B alone.

Mark (d) If question can be answered from A and B together but not from any of them alone.

Mark (e) If question cannot be answered even from A and B together.

In a single elimination tournament, any player is eliminated with a single loss. The tournament is played in multiple rounds subject to the following rules

- (a) If the number of players, say n , in any round is even, then the players are grouped in to $n/2$ pairs. The players in each pair play a match against each other and the winner moves on to the next round.

- (b) If the number of players, say n , in any round is odd, then one of them is given a bye, that is, he automatically moves on to the next round. The remaining $(n - 1)$ players are grouped into $(n - 1) / 2$ pairs. The players in each pair play a match against each other and the winner moves on to the next round. No player gets more than one bye in the entire tournament.

Thus, if n is even, then $n/2$ players move on to the next round while if n is odd, then $(n + 1) / 2$ players move on to the next round. The process is continued till the final round, which obviously is played between two players. The winner in the final round is the champion of the tournament.

- 6) What is the number of matches played by the champion?
- A : The entry list for the tournament consists of 83 players.
B : The champion received one bye.
- 7) If the number of players, say n , in the first round was between 65 and 128, then what is the exact value of n ?
- A : Exactly one player received a bye in the entire tournament.
B : One player received a bye while moving on to the fourth round from the third round.

Directions (Q.Nos. 8-11) *Each question is followed by two Statements A and B. Indicate your responses based on the following directives.* (2007)

Mark 1. If the question can be answered using A alone but not using B alone.

Mark 2. If the question can be answered using B alone but not using A alone.

Mark 3. If the question can be answered using A and B together, but not using either A or B alone.

Mark 4. If the question cannot be answered even using A and B together.

- 8) Consider integers x , y and z . What is the minimum possible value of $x^2 + y^2 + z^2$?
- A : $x + y + z = 89$
B : Among x , y , z two are equal.
- (a) 1 (b) 2
(c) 3 (d) 4

- 9) Rahim plans to draw a square $JKLM$ with a point O on the side JK but is not successful. Why is Rahim unable to draw the square?

A : The length of OM is twice that of OL .

B : The length of OM is 4 cm.

- (a) 1 (b) 2
(c) 3 (d) 4

- 10) The average weight of a class of 100 students is 45 kg. The class consists of two Sections, I and II, each with 50 students. The average weight, W_I of Section I is smaller than the average weight, W_{II} , of Section II. If the heaviest student, say Deepak, of Section II is moved to Section I and the lightest student, say Poonam, of Section I is moved to Section II, then the average weights of the two sections are switched i.e., the average weight of Section I becomes W_{II} and that of Section II becomes W_I . What is the weight of Poonam?

A : $W_{II} - W_I = 1.0$

B : Moving Deepak from Section II to I (without any move from I to II) makes the average weight of the two sections equal.

- (a) 1 (b) 2 (c) 3 (d) 4

- 11) ABC Corporation is required to maintain atleast 400 kL of water at all times in its factory, in order to meet safety and regulatory requirements. ABC is considering the suitability of a spherical tank with uniform wall thickness for the purpose. The outer diameter of the tank is 10 m. Is the tank capacity adequate to meet ABC's requirements?

A : The inner diameter of the tank is atleast 8 m.

B : The tank weighs 30000 kg when empty and is made of a material with density of 3 gm/cc.

- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 12-15) *Each question is followed by two Statements A and B. Answer each question using the following instructions.* (2007)

Mark 1. If the question can be answered by using the statement A alone but not by using the statement B alone.

Mark 2. If the question can be answered by using the statement B alone but not by using the statement A alone.

Mark 3. If the question can be answered by using either of the statements alone.

Mark 4. If the question can be answered by using both the statements together but not by either of the statements alone.

Mark 5. If the question cannot be answered on the basis of the two statements.

- 12) Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank ?

A : Atul was the last rank holder.

B : Bala was not among the top two rank holders.

- (a) 1 (b) 2 (c) 3
(d) 4 (e) 5

- 13) Thirty per cent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. What is the percentage of male employees with engineering background?

A : Twenty five per cent of the employees have engineering background.

B : Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.

- (a) 1 (b) 2 (c) 3
(d) 4 (e) 5

- 14) In a football match, the half-time, Mahindra and Mahindra Club was trailing by three goals. Did it win the match?

A : In the second-half Mahindra and Mahindra Club scored four goals.

B : The opponent scored four goals in the match.

- (a) 1 (b) 2 (c) 3
(d) 4 (e) 5

- 15) In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school ?

A : Sixty per cent of the top academic performers were not athletes.

B : All the top academic performers were not necessarily athletes.

- (a) 1 (b) 2 (c) 3
(d) 4 (e) 5

Directions (Q.Nos. 16-21) Each question is followed by two Statements A and B. Answer each questions using the following instructions. (2004)

Choose 1. If the question can be answered by using one of the statements alone but not by using the other statement alone.

Choose 2. If the question can be answered by using either of the statements alone.

Choose 3. If the question can be answered by using both statements together but not by either statement alone.

Choose 4. If the question cannot be answered on the basis of the two statements.

- 16) Tarak is standing 2 steps to the left of a red mark and 3 steps to the right of a blue mark. He tosses a coin. If it comes up heads, he moves one step to the right; otherwise he moves one step to the left. He keeps doing this until he reaches one of the two marks and then he stops. At which mark does he stop?

A : He stops after 21 coin tosses.

B : He obtains three more tails than heads.

- (a) 1 (b) 2
(c) 3 (d) 4

- 17) Ravi spent less than ₹ 75 to buy one kilogram each of potato, onion and gourd. Which one of the three vegetables bought was the costliest ?

A : 2 kg potato and 1 kg gourd cost less than 1 kg potato and 2 kg gourd.

B : 1 kg potato and 2 kg onion together cost the same as 1 kg onion and 2 kg gourd.

- (a) 1 (b) 2
(c) 3 (d) 4

- 18) Four candidates for an award obtain distinct scores in a test. Each of the four casts a vote to choose the winner of the award. The candidate who gets the largest number of votes wins the award. In case of a tie in the voting process, the candidate with the highest score wins the award. Who wins the award?

A : The candidates with top three scores each vote for the top scorer amongst the other three.

B : The candidate with the lowest score votes for the player with the second highest score.

- (a) 1 (b) 2
(c) 3 (d) 4

- 19) Nandini paid for an article using currency notes of denominations ₹ 1, ₹ 2, ₹ 5 and ₹ 10 using at least one note of each denomination. The total number of five and ten rupee notes used was one more than the total number of one and two rupee notes used. What was the price of the article?

A : Nandini used a total of 13 currency notes.

B : The price of the article was a multiple of ₹ 10.

- (a) 1 (b) 2 (c) 3 (d) 4

- 20) Zakib spends 30% of his income on his children's education, 20% on recreation and 10% on healthcare. The corresponding percentages for Supriyo are 40%, 25% and 13%. Who spends more on children's education?
- A : Zakib spends more on recreation than Supriyo.
B : Supriyo spends more on healthcare than Zakib.
- (a) 1 (b) 2
(c) 3 (d) 4

- 21) In a class of 30 students, Rashmi secured the third rank among the girls, while her brother Kumar studying in the same class secured the sixth rank in the whole class. Between the two, who had a better overall rank?
- A : Kumar was among the top 25% of the boys merit list in the class in which 60% were boys.
B : There were three boys among the top five rank holders and three girls among the top ten rank holders.
- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 22-28) Answer the questions based on the following information. Each question is followed by two Statements I and II. Answer each question using the following instructions. (2002)

Choose 1. If only one of the statements can be used to answer the question not the other one.

Choose 2. If either of the statements is sufficient to answer the question.

Choose 3. If both the statements have to be used.

Choose 4. If the question cannot be answered using both the statements.

- 22) Total amount of ₹ 38500 was distributed among Praveen, Ranjan and Nitesh. How much does each get ?
- I. Praveen gets $\frac{2}{9}$ of what other two get.
II. Ranjan gets $\frac{3}{11}$ of what other two get.
- (a) 1 (b) 2
(c) 3 (d) 4
- 23) Of the 300 students who speak French, Russian or both, how many speak only French?
- I. 196 students speak both French and Russian.
II. 58 students speak Russian only.
- (a) 1 (b) 2
(c) 3 (d) 4
- 24) If the teacher adds four students to the class, can he evenly distribute the class in groups of 8 students?

- I. If 12 students are added to the class, then the teacher can divide students evenly in groups of 8.
II. Initially, the number of students is not divisible by 8.
- (a) 1 (b) 2 (c) 3 (d) 4

- 25) Is average (arithmetic mean) score of GMAT 500 ?
- I. Half of the students scored more than 500 and half less than 500.
II. Highest is 800 and lowest is 200.
- (a) 1 (b) 2 (c) 3 (d) 4

- 26) Is $x = y$?
- I. $(x + y)\left(\frac{1}{x} + \frac{1}{y}\right) = 4$ II. $(x - 50)^2 = (y - 50)^2$,
- (a) 1 (b) 2
(c) 3 (d) 4

- 27) Is $|x - 2| < 1$?
- I. $|x| < 1$ II. $|x - 1| < 2$
- (a) 1 (b) 2
(c) 3 (d) 4

- 28) There is a match between India and Korea. India is lagging behind by two goals. Last five minutes are remaining. Would India lose?
- I. In the last five minutes, Deepak Thakur scored 3 goals.
II. Korea scored 3 goals in the match.
- (a) 1 (b) 2 (c) 3 (d) 4

Directions (Q. Nos. 29-35) Answer the questions based on the following information. Each question is followed by two Statements I and II. Answer each question using the following instructions. (2001)

Choose 1. If the question can be answered by one of the statements alone and not by the other.

Choose 2. If the question can be answered by using either statement alone.

Choose 3. If the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose 4. If the question cannot be answered even by using both statements together.

- 29) Two friends, Ram and Gopal, bought apples from a wholesale dealer. How many apples did they buy?
- I. Ram bought one-half the number of apples that Gopal bought.
II. The wholesale dealer had a stock of 500 apples.
- (a) 1 (b) 2 (c) 3 (d) 4

- 30) A square is inscribed in a circle. What is the difference between the area of the circle and that of the square?

I. The diameter of the circle is $25\sqrt{2}$ cm.

II. The side of the square is 25 cm.

(a) 1 (b) 2 (c) 3 (d) 4

- 31) What will be the time for downloading software?

I. Transfer rate is 6 kilobytes per second.

II. The size of the software is 4.5 megabytes.

(a) 1 (b) 2 (c) 3 (d) 4

- 32) On a given day, a boat carried 1500 passengers across the river in twelve hours. How many round trips did it make?

I. The boat can carry two hundred passengers at any time.

II. It takes 40 min each way and 20 min of waiting time at each terminal.

(a) 1 (b) 2 (c) 3 (d) 4

- 33) What is the value of X ?

I. X and Y are unequal even integers, less than 10 and X/Y is an odd integer.

II. X and Y are even integers, each less than 10 and product of X and Y is 12.

(a) 1 (b) 2
(c) 3 (d) 4

- 34) Is country X 's GDP higher than country Y 's GDP

I. GDPs of the countries X and Y has grown over the past five years at compounded annual rates of 5% and 6% respectively.

II. Five years ago, GDP of country X was higher than that of country Y .

(a) 1 (b) 2
(c) 3 (d) 4

- 35) What are the values of m and n ?

I. n is an even integer, m is an odd integer and m is greater than n .

II. Product of m and n is 30.

(a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 36-45) Answer the questions based on the following information. Each question is followed by two Statements I and II. Answer each question using the following instructions. (2000)

Choose 1. If the question can be answered by one of the statements alone, but cannot be answered by using the other statement alone.

Choose 2. If the question can be answered by using either statement alone.

Choose 3. If the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Choose 4. If the question cannot be answered even by using both statements together.

- 36) What are the ages of two individuals, X and Y ?

I. The age difference between them is 6 yr.

II. The product of their ages is divisible by 6.

(a) 1 (b) 2
(c) 3 (d) 4

- 37) Ghosh Babu has decided to take a non-stop flight from Mumbai to No-man's-land in South America. He is scheduled to leave Mumbai at 5 am, Indian Standard Time on December 10, 2000. What is the local time at No-man's-land when he reaches there?

I. The average speed of the plane is 700 km/h,

II. The flight distance is 10,500 km.

(a) 1 (b) 2
(c) 3 (d) 4

- 38) O is the centre of two concentric circles, AE is a chord of the outer circle and it intersects the inner circle at points B and D . C is a point on the chord in between B and D . What is the value of AC/CE ?

I. $BC/CD = 1$

II. A third circle intersects the inner circle at B and D and the point C is on the line joining the centres of the third circle and the inner circle.

(a) 1 (b) 2 (c) 3 (d) 4

- 39) There are two straight lines in the x - y plane with equations

$$ax + by = c, \quad dx + ey = f$$

Do the two straight lines intersect?

I. a, b, c, d, e and f are distinct real numbers.

II. c and f are non-zero.

(a) 1 (b) 2 (c) 3 (d) 4

- 40) For any two real numbers

$a \oplus b = 1$, if both a and b are positive or both a and b are negative.

$= -1$, if one of the two numbers a and b is positive and the other negative.

What is $(2 \oplus 0) \oplus (-5 \oplus -6)$?

I. $a \oplus b$ is zero if a is zero. II. $a \oplus b = b \oplus a$

(a) 1 (b) 2
(c) 3 (d) 4

- 41) Harshad bought shares of a company on a certain day and sold them the next day. While buying and selling, he had to pay to the broker one per cent of the transaction value of the shares as brokerage. What was the profit earned by him per rupee spent on buying the shares ?

I. The sale price per share was 1.05 times that of its purchase price.

II. The number of shares purchased was 100.

- (a) 1 (b) 2
(c) 3 (d) 4

- 42) Triangle PQR has angle PRQ equal to 90° . What is the value of $PR + RQ$?

I. Diameter of the inscribed circle of the triangle PQR is equal to 10 cm.

II. Diameter of the circumscribed circle of the triangle PQR is equal to 18 cm.

- (a) 1 (b) 2
(c) 3 (d) 4

- 43) How many people are watching TV programme P ?

I. Number of people watching TV programme Q is 1,000 and number of people watching both the programmes P and Q , is 100.

II. Number of people watching either P or Q or both is 1500.

- (a) 1 (b) 2
(c) 3 (d) 4

- 44) Let X be a real number. Is the modulus of X necessarily less than 3 ?

I. $X(X + 3) < 0$

II. $X(X - 3) > 0$

- (a) 1 (b) 2
(c) 3 (d) 4

- 45) Consider three real numbers, X , Y and Z . Is Z the smallest of these numbers?

I. X is greater than atleast one of Y and Z .

II. Y is greater than atleast one of X and Z .

- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 46-55) Answer the questions based on the following information. Each question is followed by two Statements I and II. Answer each question using the following instructions. (1999)

Choose 1. If the question can be answered by anyone of the statements alone, but cannot be answered by using the other statement alone.

Choose 2. If the question can be answered by using either statement alone.

Choose 3. If the question can be answered by using both the statements together; but cannot be answered by using either statement alone.

Choose 4. If the question cannot be answered even by using both statements together.

- 46) Mr. Mendel grew 100 flowering plants from black seeds and white seeds, each seed giving rise to one plant. A plant gives flowers of only one colour. From a black seed comes a plant giving red or blue flowers. From a white seed comes a plant giving red or white flowers. How many black seeds were used by Mr. Mendel ?

I. The number of plants with white flowers was 10.

II. The number of plants with red flowers was 70.

- (a) 1 (b) 2 (c) 3 (d) 4

- 47) What is the distance x between two cities A and B in integral number of kilometres ?

I. x satisfies the equation $\log_2 x = \sqrt{x}$

II. $x \leq 10$ km

- (a) 1 (b) 2 (c) 3 (d) 4

- 48) How many students among A , B , C and D have passed the examination?

I. The following is a true statement : A and B passed the examination.

II. The following is a false statement: Atleast one among C and D has passed the examination.

- (a) 1 (b) 2 (c) 3 (d) 4

- 49) Three professors A , B and C are separately given three sets of numbers to add. They were expected to find the answers to $1 + 1$, $1 + 1 + 2$ and $1 + 1$, respectively. Their respective answers were 3, 3 and 2. How many of the professors are mathematicians?

I. A mathematician can never add two numbers correctly, but can always add three numbers correctly.

II. When a mathematician makes a mistake in a sum, the error is $+1$ or -1 .

- (a) 1 (b) 2 (c) 3 (d) 4

- 50) Find a pair of real numbers x and y that satisfy the following two equations simultaneously. It is known that the values of

$$ax + by = c, \quad dx + ey = f$$

I. $a = kd$ and $b = ke, c = kf, k \neq 0$

II. $a = b = 1, d = c = e = 2, f \neq 2c$

- (a) 1 (b) 2
(c) 3 (d) 4

- 51) There is a circle with centre C at the origin and radius r cm. Two tangents are drawn from an external point D at a distance d cm from the centre. What are the angles between each tangent and X -axis?

I. The coordinates of D are given.

II. The X -axis bisects one of the tangents.

- (a) 1 (b) 2 (c) 3 (d) 4

- 52) A line graph on a graph sheet shows the revenue for each year from 1990 through 1998 by points and joins the successive points by straight line segments. The point for revenue of 1990 is labelled A , that for 1991 as B and that for 1992 as C . What is the ratio of growth in revenue between 1991-92 and 1990-91?

I. The angle between AB and X -axis when measured with a protractor is 40° and the angle between CB and X -axis is 80° .

II. The scale of Y -axis is $1 \text{ cm} = ₹ 100$.

- (a) 1 (b) 2 (c) 3 (d) 4

- 53) Mr. X starts walking northwards along the boundary of a field, from point A on the boundary and after walking for 150 m reaches B and then walks westwards, again along the boundary, for another 100 m when he reaches C . What is the maximum distance between any pair of points on the boundary of the field?

I. The field is rectangular in shape.

II. The field is a polygon, with C as one of its vertices and A as the mid-point of a side.

- (a) 1 (b) 2
(c) 3 (d) 4

- 54) A small storage tank is spherical in shape. What is the storage volume of the tank?

I. The wall thickness of the tank is 1 cm.

II. When an empty spherical tank is immersed in a large tank filled with water, 20 L of water overflows from the large tank.

- (a) 1 (b) 2 (c) 3 (d) 4

- 55) The average weight of students in a class is 50 kg. What is the number of students in the class?

I. The heaviest and the lightest members of the class weigh 60 kg and 40 kg, respectively.

II. Exclusion of the heaviest and the lightest members from the class does not change the average weight of the students.

- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 56-67) Answer the questions based on the following information. Each question is followed by two Statements I and II. Answer the questions based on the statements. (1998)

Choose 1. If the question can be answered with the help of anyone statement alone but not by the other statement.

Choose 2. If the question can be answered with the help of either of the statements taken individually.

Choose 3. If the question can be answered with the help of both statements together.

Choose 4. If the question cannot be answered even with the help of both statements together.

- 56) A circle circumscribes a square. What is the area of the square?

I. Radius of the circle is given.

II. Length of the tangent from a point 5 cm away from the centre of the circle is given.

- (a) 1 (b) 2 (c) 3 (d) 4

- 57) There are two concentric circles C_1 and C_2 with radii r_1 and r_2 . The circles are such that C_1 fully encloses C_2 . Then, what is the radius of C_2 ?

I. The difference of their circumferences is k cm.

II. The difference of their areas is m sq cm.

- (a) 1 (b) 2 (c) 3 (d) 4

- 58) Find the value of X in terms of ' a '.

I. Arithmetic mean of X and Y is ' a ' while the geometric mean is also ' a '.

II. $\frac{X}{Y} = R$; $X - Y = D$

- (a) 1 (b) 2 (c) 3 (d) 4

- 59) There are four racks numbered 1, 2, 3, 4 and four books numbered 1, 2, 3, if any even rack has to contain an odd-number book and an odd rack contains an even number book, then what is the position of book 4?

I. Second book has been put in third rack.

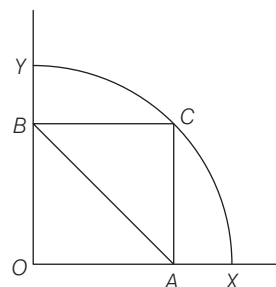
II. Third book has been put in second rack.

- (a) 1 (b) 2 (c) 3 (d) 4

- 60) There are four envelopes, E_1, E_2, E_3 and E_4 in which one was supposed to put letters L_1, L_2, L_3 and L_4 meant for persons C_1, C_2, C_3 and C_4 respectively, but by mistake the letters got jumbled up and went in wrong envelopes. Now, if C_2 is allowed to open an envelope at random, then how will he identify the envelope containing the letter for him.

- I. L_2 has been put in E_1 .
 II. The letter belonging to C_3 has gone in the correct envelope.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 61)** In a group of 150 students, find the number of girls.
- I. Each girl was given 50 paise. While each boy was given 25 paise to purchase goods totalling ₹ 49.
 II. Girls and boys were given 30 paise each to buy goods totalling ₹ 45.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 62)** What is the value of 'a' ?
- I. Ratio of a and b is 3 : 5, where b is positive.
 II. Ratio of $2a$ and b is $\frac{12}{10}$, where a is positive.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 63)** What is the price of tea?
- I. Price of coffee is ₹ 5 more than that of tea.
 II. Price of coffee was ₹ 5 less than the price of a cold drink which cost three times the price of
- (a) 1 (b) 2
 (c) 3 (d) 4
- 64)** Radha and Rani appeared in an examination. What was the total number of questions ?
- I. Radha and Rani together solved 20% of the paper.
 II. Radha alone solved $\frac{3}{4}$ th part of the paper solved by Rani.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 65)** Find $2 \otimes 3$, where $2 \otimes 3$ need not be equal to $3 \otimes 2$.
- I. $1 \otimes 2 = 3$
 II. $a \otimes b = \frac{(a+b)}{a}$ where a and b are positive.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 66)** Is n odd?
- I. n is divisible by 3, 5, 7 and 9.
 II. $0 < n < 400$
- (a) 1 (b) 2 (c) 3 (d) 4

- 67)** Find the length of AB , if
 $\angle YBC = \angle CAX = \angle YOX = 90^\circ$



- I. Radius of the arc is given.
 II. $OA = 5$
- (a) 1 (b) 2
 (c) 3 (d) 4

Directions (Q.Nos. 68-77) Answer the questions based on the following information. Each of these items has a question is followed by two Statements I and II. (1997)

Choose 1. If the question can be answered with the help of one statement alone.

Choose 2. If the question can be answered with the help of anyone statement independently.

Choose 3. If the question can be answered with the help of both statements together.

Choose 4. If the question cannot be answered even with the help of both statements together.

- 68)** After what time will the two persons Tez and Gati meet while moving around the circular track ? Both of them start at the same point and at the same time.
- I. Tez moves at a constant speed of 5 m/s, while Gati starts at a speed of 2 m/s and increases his speed by 0.5 m/s at the end of every second there after.
 II. Gati can complete one entire lap in exactly 10 s.
- (a) 1 (b) 2
 (c) 3 (d) 4
- 69)** What is the cost price of the chair?
- I. The chair and the table are sold, respectively, at profits of 15% and 20%.
 II. If the cost price of the chair is increased by 10% and that of the table is increased by 20%, the profit reduces by ₹ 20.
- (a) 1 (b) 2
 (c) 3 (d) 4

- 70) What is the area bounded by the two lines and the coordinate axes in the first quadrant?

I. The lines intersect at a point which also lies on the lines $3x - 4y = 1$ and $7x - 8y = 5$.

II. The lines are perpendicular and one of them intersects the Y-axis at an intercept of 4.

- (a) 1 (b) 2
(c) 3 (d) 4

- 71) What is the ratio of the volume of the given right circular cone to the one obtained from it?

I. The smaller cone is obtained by passing a plane parallel to the base and dividing the original height in the ratio 1 : 2.

II. The height and the base of the new cone are one-third those of the original cone.

- (a) 1 (b) 2 (c) 3 (d) 4

- 72) What is the speed of the car?

I. The speed of a car is 10 more than that of a motorcycle.

II. The motorcycle takes 2 h more than the car to cover 100 km.

- (a) 1 (b) 2 (c) 3 (d) 4

- 73) Three friends, P , Q and R , are wearing hats, either black or white. Each person can see the hats of the other two persons. What is the colour of P 's hat?

I. P says that he can see one black hat and one white hat.

II. Q says that he can see one white hat and one black hat.

- (a) 1 (b) 2 (c) 3 (d) 4

- 74) What are the values of x and y ?

I. $3x + 2y = 45$

II. $105x + 7y = 1575$

- (a) 1 (b) 2 (c) 3 (d) 47

- 75) A person is walking from Mali to Pali, which lies to its north-east. What is the distance between Mali and Pali?

I. When the person has covered $1/3$ the distance, he is 3 km east and 1 km north of Mali.

II. When the person has covered $2/3$ the distance, he is 6 km east and 2 km north of Mali.

- (a) 1 (b) 2
(c) 3 (d) 4

- 76) Is the number completely divisible by 99.

I. The number is divisible by 9 and 11 simultaneously.

II. If the digits of the number are reversed, the number is divisible by 9 and 11.

- (a) 1 (b) 2
(c) 3 (d) 4

- 77) What is the value of $a^3 + b^3$?

I. $a^2 + b^2 = 22$

II. $ab = 3$

- (a) 1 (b) 2
(c) 3 (d) 4

Directions (Q.Nos. 78-87) Answer the questions based on the following information. Each question is followed by two Statements I and II. (1996)

Choose 1. If the question cannot be answered even with the help of both the statements taken together.

Choose 2. If the question can be answered by anyone of the two statements.

Choose 3. If each statement alone is sufficient to answer the question, but not the other one (e.g. Statement I alone is required to answer the question, but not Statement II and *vice versa*.)

Choose 4. If both Statements I and II together are needed to answer the question.

- 78) What is the number of type-2 widgets produced, if the total number of widgets produced is 20,000?

I. If the production of type-1 widgets increases by 10% and that of type-2 decreases by 6%, the total production remains the same.

II. The ratio in which type-1 and type-2 widgets are produced is 2 : 1.

- (a) 1 (b) 2 (c) 3 (d) 4

- 79) How old is Sachin in 1997?

I. Sachin is 11 yr younger than Anil whose age will be a prime number in 1998.

II. Anil's age was a prime number in 1996.

- (a) 1 (b) 2 (c) 3 (d) 4

- 80) What is the total worth of Lakhiram's assets?

I. A compound interest at 10% on his assets, followed by a tax of 4% on the interest, fetches him ₹ 1,500 this year.

II. The interest is compounded once every four months.

- (a) 1 (b) 2 (c) 3 (d) 4

- 81) How many different triangles can be formed?

I. There are 16 coplanar, straight lines.

II. No two lines are parallel.

- (a) 1 (b) 2 (c) 3 (d) 4

- 82)** What is the selling price of the article?
 I. The profit on sales is 20%.
 II. The profit on each unit is 25% and the cost price is ₹ 250.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 83)** What is the cost price of the article?
 I. After selling the article, a loss of 25% on cost price is incurred.
 II. The selling price is three-fourths of the cost price.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 84)** If α and β are the roots of the equation $(ax^2 + bx + c = 0)$, then what is the value of $(\alpha^2 + \beta^2)$?
 I. $\alpha + \beta = -\left(\frac{b}{a}\right)$ II. $2\alpha\beta = \left(\frac{c}{a}\right)$
 (a) 1 (b) 2
 (c) 3 (d) 4
- 85)** If a, b and c are integers, is $(a - b + c) > (a + b - c)$?
 I. b is negative. II. c is positive.
 (a) 1 (b) 2 (c) 3 (d) 4
- 86)** What is the ratio of the two liquids A and B in the mixture finally, if these two liquids kept in three vessels are mixed together? (The containers are of equal volume). Assume container volume = volume of liquid.
 I. The ratio of liquid A to liquid B in the first and second vessels are $3 : 5, 2 : 3$, respectively.
 II. The ratio of liquid A to liquid B in vessel 3 is $4 : 3$.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 87)** A tractor travelled a distance of 5 m. What is the radius of the rear wheel?
 I. The front wheels rotates ' N ' times more than the rear wheel over this distance.
 II. The circumference of the rear wheel is ' t ' times that of the front wheel.
 (a) 1 (b) 2
 (c) 3 (d) 4

Directions (Q.Nos. 88-96) Answer the questions based on the following information. Each of these questions is followed by two Statements I and II. (1995)

Choose 1. If the question can be answered with the help of Statement I alone.

Choose 2. If the question can be answered with the help of Statement II, alone.

Choose 3. If both Statement I and Statement II are needed to answer the question.

Choose 4. If the question cannot be answered even with the help of both the statements.

- 88)** Is $x + y - z + t$ even?
 I. $x + y + t$ is even. II. t and z are odd.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 89)** What is the number x ?
 I. The LCM of x and 18 is 36.
 II. The HCF of x and 18 is 2.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 90)** What is the length of rectangle $ABCD$?
 I. Area of the rectangle is 48 sq unit.
 II. Length of the diagonal is 10 unit.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 91)** What is the first term of an arithmetic progression of positive integers?
 I. Sum of the squares of the first and the second term is 116.
 II. The fifth term is divisible by 7.
 (a) 1 (b) 2
 (c) 3 (d) 4
- 92)** What is the price of bananas?
 I. With ₹ 84, I can buy 14 bananas and 35 oranges.
 II. If price of bananas is reduced by 50%, then we can buy 48 bananas in ₹ 12.
 (a) 1 (b) 2 (c) 3 (d) 4
- 93)** What is the area of the triangle?
 I. Two sides are 41 cm each.
 II. The altitude to the third side is 9 cm long.
 (a) 1 (b) 2 (c) 3 (d) 4
- 94)** What is the profit percentage?
 I. The cost price is 80% of the selling price.
 II. The profit is ₹ 50.
 (a) 1 (b) 2 (c) 3 (d) 4
- 95)** What is the value of x , if x and y are consecutive positive even integers?
 I. $(x - y)^2 = 4$ II. $(x + y)^2 < 100$
 (a) 1 (b) 2 (c) 3 (d) 4

96) If x , y and z are real numbers, is $z - x$ even or odd?

- I. xyz is odd. II. $xy + yz + zx$ is even.
 (a) 1 (b) 2
 (c) 3 (d) 4

Directions (Q.Nos. 97-106) Answer the questions based on the following information. Each of these items has a question followed by two Statements I and II. Mark the answer (1994)

Choose 1. If the question can be answered with the help of Statement I alone.

Choose 2. If the question can be answered with the help of Statement II alone.

Choose 3. If both Statement I and Statement II are needed to answer the question.

Choose 4. If the question cannot be answered even with the help of both the statements.

97) 10 boys went to a neighbouring orchard. Each boy stole a few mangoes. What is the total number of mangoes they stole?

- I. The first boy stole 4 mangoes, the fourth boy stole 16 mangoes, the eighth boy stole 32 mangoes and the tenth boy stole 40 mangoes.
 II. The first boy stole the minimum number of mangoes and the tenth boy stole the maximum number of mangoes.
 (a) 1 (b) 2 (c) 3 (d) 4

98) What will be the total cost of creating a one-foot border of tiles along the inside edges of a room?

- I. The room is 48 ft in length and 50 ft in breadth.
 II. Every tile costs ₹ 10.
 (a) 1 (b) 2 (c) 3 (d) 4

99) Little Beau Peep lost her sheep. She could not remember how many were there. She knew she would have 400 more next year, than the number of sheep she had last year. How many sheep were there ?

- I. The number of sheep last year was 20% more than the year before that and this simple rate of increase continues to be the same for the next 10 yr.
 II. The increase is compounded annually.
 (a) 1 (b) 2
 (c) 3 (d) 4

100) Three boys had a few Coffee Bite toffees with them. The toffees with the second were 4 more than those with the first and the toffees with the third were 4 more than those with the second. How many toffees were there in all?

I. The number of toffees with each of them is a multiple of 2.

II. The first boy ate up 4 toffees from what he had and the second boy ate up 6 toffees from what he had and the third boy gave them 2 toffees each from what he had and the number of toffees remaining with each of them formed a geometric progression.

- (a) 1 (b) 2 (c) 3 (d) 4

101) Is segment PQ greater than segment RS ?

I. $PB > RE, BQ = ES$

II. B is a point on PQ , E is a point on RS .

- (a) 1 (b) 2
 (c) 3 (d) 4

102) What is the average weight of the three new team members who are recently included into the team?

I. The average weight of the team increases by 20 kg.

II. The three new men substitute earlier members whose weights are 64 kg, 75 kg and 66 kg.

- (a) 1 (b) 2 (c) 3 (d) 4

103) If the selling price were to be increased by 10%, the sales would reduce by 10%. In what ratio would the profits change?

I. The cost price remains constant.

II. The cost price increased by 10%.

- (a) 1 (b) 2
 (c) 3 (d) 4

104) If 20 sweets are distributed among some boys and girls such that each girl gets 2 sweets and each boy gets 3 sweets, what are the numbers of boys and girls ?

I. The number of girls is not more than 5.

II. If each girl gets 3 sweets and each boy gets 2 sweets, the number of sweets required for the children will still be the same.

- (a) 1 (b) 2
 (c) 3 (d) 4

105) A and B undertake a work of digging a ditch, alternately for a day each. If A can dig a ditch in ' a ' days and B can dig in ' b ' days, will the work get done faster if A begins ?

I. For a positive integer n , $n\left(\frac{1}{a} + \frac{1}{b}\right) = 1$

II. $b > a$

- (a) 1 (b) 2
 (c) 3 (d) 4

- 106)** Is the distance from the office to home less than the distance from the cinema hall to home?
- I. The time taken to travel from home to office is as much as the time taken from home to the cinema hall, both distances being covered without stopping.
- II. The road from the cinema hall to home is bad and speed reduces, as compared to that on the road from home to the office.
- (a) 1 (b) 2 (c) 3 (d) 4

Directions (Q.Nos. 107-112) *Answer the questions based on the following information. Each item has a question followed by two Statements I and II. (1993)*

Choose 1. If the question can be answered with the help of Statement I alone.

Choose 2. If the question can be answered with the help of Statement II alone.

Choose 3. If both, Statement I and Statement II are needed to answer the question.

Choose 4. If the question cannot be answered even with the help of both the Statements.

- 107)** What is the price of mangoes per kg ?
- I. Ten kg of mangoes and two dozen of oranges cost ₹ 252.
- II. Two kg of mangoes could be bought in exchange for one dozen oranges.
- (a) 1 (b) 2 (c) 3 (d) 4
- 108)** Two types of widgets, namely types A and B are produced on a machine. The number of machine hours available per week is 80. How many widgets of type A must be produced?
- I. One unit of type A widget requires 2 machine hours and one unit of type B widget requires 4 machine hours.

- II. The widget dealer wants to supply at least 10 units of type A widget per week and he would not accept less than 15 units of type B widget.
- (a) 1 (b) 2
(c) 3 (d) 4

- 109)** What are the ages of the three brothers?

I. The product of their ages is 21.

II. The sum of their ages is not divisible by 3.

- (a) 1 (b) 2
(c) 3 (d) 4

- 110)** Is the average of the largest and the smallest of four given numbers greater than the average of the four numbers?

I. The difference between the largest and the second largest numbers is greater than the difference between the second smallest and the smallest numbers.

II. The difference between the largest and the second largest numbers is less than the difference between the second largest and the second smallest numbers.

- (a) 1 (b) 2
(c) 3 (d) 4

- 111)** What are the values of 3 integers a , b and c ?

I. $ab = 8$

II. $bc = 9$

- (a) 1 (b) 2
(c) 3 (d) 4

- 112)** Given that, X and Y are non-negative. What is the value of X ?

I. $2X + 2Y \leq 40$

II. $X - 2Y \geq 20$

- (a) 1 (b) 2
(c) 3 (d) 4

HINTS & SOLUTIONS

- 1) (b) Using Statement I, nothing can be inferred about the even or odd nature of function $y = f(x)$. Using Statement II since graph lies in only two quadrants which are opposite to each other. So, it cannot be an even function as $fx \neq f(-x)$.

Hence, $y = f(x)$ is an odd function.

- 2) (b) By the problem, $QS = 12$ cm. From Statement I, we know that the perpendiculars from R and S are equal or the sides PQ and RS are equal. But the distance is not known, so the question cannot be answered.

By Statement II, if PN is perpendicular to QS and $PN = 8$ cm

$\Rightarrow$ Area of triangle

$$PQS = \left(\frac{1}{2}\right) \times 12 \times 8 = 48 \text{ sq cm}$$

$\Rightarrow$ Area of parallelogram $PQRS$

$$= 2 \times \text{Area of } PQS = 96 \text{ cm}^2$$

- 3) (c) In Statement I, the amount of installment is not given and in Statement II, the rate of interest is not given, so the question can't be answered with the help of any of the statements alone. By combining the statements, the present value of ₹ 1210 repaid at the end of second year

$$= 1210 \times \left(\frac{10}{11}\right) \times \left(\frac{10}{11}\right) = ₹ 1000$$

$\Rightarrow$ Present value of ₹ 1210 repaid at the end of the first

$$= ₹ 1210 \times \frac{10}{11} = ₹ 1100$$

$\Rightarrow$ Principal borrowed = $1000 + 1100 = ₹ 2100$

So, the question can be answered by using both statements.

- 4) (b) Statement I, $a = b = 0$, $a = b = 1$; gives different answers.
Statement II, either a or b or both are fractions between 0 and 1. Adding a fraction increases a result. Multiplying a fraction reduces it. So, Statement II holds goods.

- 5) (a) Let the four number be a , b , c and d with $a > b > c > d$.

We have to answer the statement, whether

$$\frac{(a+d)}{2} > \frac{(a+b+c+d)}{4}$$

i.e. $2a + 2d > a + b + c + d$ or $a + d > b + c$

or $a - b > c - d$

From Statement I, $a - b > c - d$ which answers the question.

- 6) (d) **Using Statement A** The question cannot be answered because we do not know the number of byes got by the champion. Hence, Statement A above is not sufficient to answer the question.

Using Statement B The question cannot be answered because we do not know the exact number of players in the tournament. Hence, Statement B alone is not sufficient to answer the question.

Now, using both the Statements A and B together

If there are 83 players, then there will be 6 rounds in the tournament and we know that the champion received only one bye, therefore the total number of matches played by the tournament will be $6 - 1 = 5$. Hence, option (d) is the correct choice.

- 7) (d) **Using Statement A** When $n = 127$, exactly one bye is given in round 1. When $n = 96$, exactly one bye is given in round 6. As n does not have a unique value, hence statement A alone is not sufficient.

Using Statement B As it is not determined that how many bye's, in total, are given we cannot determine the value of n , uniquely.

Using both the Statements A and B together

There is a unique value of $n = 120$, for which exactly 1 bye is given from the third round to the fourth round. Hence, option (d) is the correct answer.

- 8) (a) **Using A** : $x = 30$, $y = 30$, and $z = 29$ will give the minimum value.

Using B : Nothing specific can be said about the relation between x , y and z . Hence, option (a) is correct.

- 9) (a) **Using A** : $QM : OL = 2 : 1$. But if O lies on JK , maximum possible value of $\frac{OM}{OL}$ is $\frac{\sqrt{2}}{1}$

(when O lies on K)

So, Rahim is unable to draw such a square.

Using B : Nothing specific can be said about the dimensions of the figure. Hence, question can be answered using information A alone.

- 10) (c) **Using A** : $w_{II} = 45.5$ and $w_I = 44.5$

Using B : Weight of Deepak = 70 kg, this was calculated only after using Statement A. Now this is sufficient to find weight of Poonam using data given in the question. Hence, option (c) is correct option.

- 11) (b) **Using A** : Inner radius of the tank is atleast 4 m. So, volume $\frac{4}{3}\pi r^3$ where $4 < r < 10$

This volume can be greater as well as smaller than 400 for different r .

Using B : The given data gives the volume of the material of tank which can be expressed as $\frac{4}{3}\pi(10^3 - r^3)$ which will give the value of r which is unique and sufficient to judge whether the capacity is adequate. Hence, option (b) is correct choice.

- 12) (a) By using both the statements together we get the ranking of all five students as below

Dev	Ernesto	Bala	Chetan	Atul
1	2	3	4	5

- 13) (c) Statement A alone is sufficient because 10% of the female employees have engineering background, 70% of the employees are females. So, 7% of the employees are female and having engineering background.

Hence, 18% of the employees are male and having engineering background. From Statement B, we know the number of male employees having engineering background. So, the percentage of male employees having engineering background can be calculated. Hence, correct option is (c).

- 14) (c) Statement A alone is not sufficient because there is no information about the opponent. Statement B alone also not sufficient because it is not giving any information about the performance of Mahindra and Mahindra in the second half. Even we use both the statements we have two cases.

Mahindra and Mahindra	0	1
Opponent	3	4

So, in one case match is drawn and in another case it is won by Mahindra and Mahindra. Hence, correct answer choice is (c).

- 15) (a) From Statement A, it is clear that 40% of top academic performers are athletes and that is equal to 10. So, total number of academic performers can be calculated. Statement B does not provide any relevant informations. So, answer is (a).

- 16) (b)



From Statement A alone.

As the number of steps is odd, Tarak could not reach the Red mark, which is only 2 steps (i.e., even number of steps) away from Tarak. Tarak should have reached the Blue mark. Statement A alone is sufficient. From Statement B alone. As the net movement is three steps to the left side, he will reach the Blue mark.

∴ Statement B alone is sufficient.

- 17) (c) Let cost of potato be represented by, p onion by ' n ' and gourd by ' g '. From Statement A alone

$$2p + g < 1 + 2g \Rightarrow p < g$$

As we do not know anything about the cost of onion, we cannot answer the question. From Statement B alone

$$1p + 2p = 1n + 2g$$

$$\Rightarrow 1p + 1n = 2g$$

This alone is not sufficient to answer the questions.

Using both the statements,

$$\text{As } p < g \text{ and } p + n = 2g$$

$$\Rightarrow 1p + 1n = 2g$$

∴ We can answer using both the statements together.

- 18) (a) From Statement A alone

The person with the highest score votes for the person with the second highest score and the person with the second highest score votes for the person with the highest score and the person with the third highest score votes for the person with the highest score.

∴ After this voting, the person with the highest score got 2 votes and the person with the second highest score got one vote.

No information is given about the person who got the lowest score. This person can vote for any other person. The possible cases are

Case I. If this person votes for the top scorer, then the top scorer wins the award.

Case II. If this person votes for the second top scorer, then the second top scorer gets 2 votes and there is a tie between the top two scorers. If there is a tie the person with the highest score wins. i.e., the top scorer wins the award.

Case III. If this person votes for the third highest scorer, then the top scorer wins the award.

∴ Statement A alone is sufficient. From Statement B alone.

We know only about the person for which the person with lowest score voted and nothing about the persons for which the other persons voted.

∴ Statement B alone is not sufficient.

- 19) (d) Let the number of currency notes of denomination ₹ 1, ₹ 2, ₹ 5 and ₹ 10 be represented by P, Q, R , and S respectively. It is given that

$$P + Q < R + S = 13$$

Using statement A alone

$$P + Q < R + S = 13$$

$$P + Q = 6, R + S = 7$$

We cannot find the unique values of P, Q, R and S

∴ Statement A alone is not sufficient.

From Statement B alone

As we do not know any thing about the number of notes of different denominations, Statement B alone is not sufficient.

Using both the statements, we get $P + Q = 6$ and $R + S = 7$.

If $P = 2, Q = 4, R = 2$ and $S = 5$ we get the cost of the article as $2 + 8 + 10 + 50 = 70$.

If $P = 2, Q = 4, R = 4$ and $S = 3$, we get the cost of the article as $2 + 8 + 20 + 30 = 60$.

∴ The unique value of the cost of the article cannot be found.

- 20) (a) Let the incomes of Zakib and Supriyo be x and y respectively. The expenditure of Zakib and Supriyo on different heads is

	Zakib	Supriyo
Children's Education	$0.3x$	$0.4y$
Recreation	$0.2x$	$0.25y$
Healthcare	$0.1x$	$0.13y$

From Statement A alone

$$0.2x > 0.25y$$

Multiplying the inequality with 1.5, we get

$$0.3x > 0.375y$$

From this we cannot say whether $0.3x$ is greater than $0.4y$ or not.

∴ Statement A alone is not sufficient.

From Statement B alone

$$0.1x < 0.13y$$

Multiplying the inequality with 3, we get

$$0.3x < 0.39y$$

From this we can say that $0.3x$ is less than $0.4y$

∴ Statement B alone is sufficient.

- 21) (a) From Statement A alone

We only know that Kumar got one of the top four ranks among boys. As his exact rank is not known, we cannot determine who among Kumar or Rashmi got the better rank. This is because if Kumar got 1st, 2nd or 3rd rank among boys then his rank is not better than Rashmi's rank.

If Kumar got the 4th rank among boys then Kumar's rank is better than Rashmi's rank.

∴ Kumar's rank may or may not be better than Rashmi's rank.

∴ Statement A alone is not sufficient.

From Statement B alone

As we know that there are three boys among the top five rank holders there will only be two girls among the top five rank holders. So, we can say that the third ranker among girls i.e., Rashmi will get a rank lower than 6 i.e., lower than the rank of Kumar.

∴ Statement B alone is sufficient.

- 22) (c) $x + y + z = 38500$. From I, $x = \frac{2}{9}(y + z)$,

From II $y = \frac{3}{11}(x + z)$. We have three equations in three

variables, so the value of x, y and z can be known

- 23) (c) Given, $n(A \cup B) = 300$. From I, we get $n(A \cap B) = 196$. From II, we get $n(A - B) = 58$. Then, from both I and II, we get $n(B) = 300 - 196 - 58 = 46$

Hence, both the statements are required to answer the question.

- 24) (a) If $(x + 12)$ is divisible by 8 (where x is the number of original students in the class), then $(x + 4)$ will also be divisible by 4. Then, Statement I alone is sufficient to answer the question.

- 25) (d) Both the statements are not sufficient to answer the question.

- 26) (a) From Statement I alone, we find that $x = y$. Hence, Statement I alone is sufficient to answer the question.

- 27) (a) If we consider Statement I alone, then if $|x| < 1$, $|x - 2|$ is always greater than 1. But if we consider Statement II alone then if $|x - 1| < 2$ or $x < 3$, then $|x - 2|$ may be less than 1 or greater than 1 depending upon the value of x . Hence, Statement I alone is sufficient to answer the question.

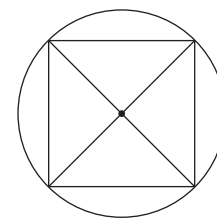
- 28) (d) Korea scored 3 goals in the match. But it is not given that how many of them were scored in the last five minutes. Hence, both the statements are not sufficient to answer the question.

- 29) (d) Even both the statements cannot give the number of apples bought by both the friends.

- 30) (b) Statement I gives the diameter of the circle, which is also equal to the diagonal of the square hence the area of square and circle as well can be calculated.

Statement II gives the side of the square, which can be used to calculate the diameter of the circle.

Hence, the area of both circle as well as square can be calculated.



- 31) (c) From both the statements together we can calculate the time required to download the software as $\frac{45 \times 10^3}{6}$ s. Hence, both the statements are required to answer the question.

32) (a) Statement I tells the capacity of the board, hence is not sufficient alone to answer the question. Since, we know that the total time taken by the boat was twelve hours and it takes 40 min time each way and 20 min waiting time at each terminal. Hence, Statement II alone is sufficient to answer the question.

33) (d) From Statement I, we know that X may be -6 or $+6$ and Y may be -2 to $+2$, as a result $\frac{X}{Y}$ may be either $+3$ or -3 depending upon the values of X and Y . From Statement II, the values of X may be $+6$ or -6 and Y may be $+2$ or -2 as a result $XY = 12$. Hence, even by using both the statements, question cannot be answered.

34) (d) From Statement II we know that GDP of country X was higher than that of country Y but difference margin is not given. Hence, nothing could be said about their present value even if the rate of growth is known. Hence, question cannot be answered even by using both the statements.

35) (c) From Statement II, we get pairs of m and n as $(2, 15)$, $(3, 10)$ and $(5, 6)$. From Statement I, we get $n = 2, 10, 6$ and $m = 3, 5, 15$. But again from Statement II $m \times n = 30$, where $m > n$. Hence, $m = 15$ and $n = 2$. Hence, both the statements are required.

36) (d) Statement I, gives $X - Y = 6$.

Statement II, gives $\frac{XY}{6} = \text{whole number}$

From I and II, we get $\frac{X(X-6)}{6}$

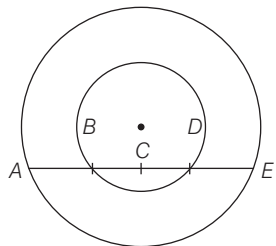
Now, $X = 12, 18, 24, 30, \dots$

Satisfy $\frac{X(X-6)}{6}$. Hence, there is no single specific value

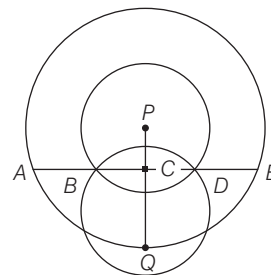
of X which satisfies the above relationship.

37) (d) Time gap between India and South America is not given. Hence, average speed of the plane given in Statement I and flight distance given in Statement II are not sufficient to calculate the local time at No-man's-land.

38) (b) If both the circles are concentric then, $AB = DE$, hence from Statement I, ratio of $\frac{AC}{CE}$ can be known.



From Statement II, we get that line joining center P, Q of the two circles divides BD in equal ratio.



Hence, from this statement alone ratio of $\frac{AC}{CE}$ can be known.

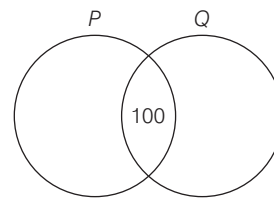
39) (d) Even if we combine both the information we cannot tell whether both the lines intersect. These lines may be parallel also depending upon the values of $a, b, c, d, \dots$

40) (c) Both the statements cannot be used alone to solve the question. However, by combining both of them we get $(2 \oplus 0) = (0 \oplus 2) = 0$ and $0 \oplus (-5 \oplus -6) = 0$

41) (a) Information given in Statement I can be used to calculate profit per rupee. Let CP be ₹ 1 per share, then effective $CP = 1.01$, $SP = 1.05$, effective $SP = 1.0395$, Profit = 0.0295 per rupee. However, Statement II alone cannot be used to answer the question.

42) (d) None of the information is sufficient to answer the question alone and in combination.

43) (c) From Statement I, we get $n(Q) = 1000$ and $n(P \cap Q) = 100$



From Statement II we get $n(P \cup Q) = 1500$.

From both Statements, I and II, we get

$$\begin{aligned} n(P) &= n(P \cup Q) - n(Q) + n(P \cap Q) \\ &= 1500 - 1000 + 100 = 600 \end{aligned}$$

44) (a) From Statement I we get the value of X between 0 and -3 . Hence, Statement I alone is sufficient. From Statement (II), we have either $X > 3$ or $X < 0$ hence this information can not give the value of $|X|$.

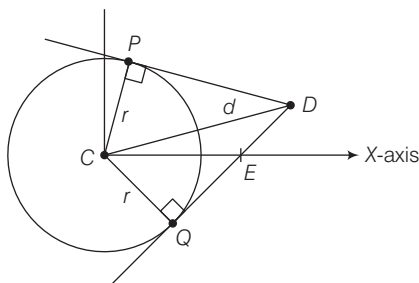
- 45) (c) From Statement I, we get either $X > Y$ or $X > Z$ or $X > Y$ and Z . From Statement II, we get either $Y > X$ or $Y > Z$ or $Y > X$ and Z . Now, if we combine these two statements we get $X > Y > Z$. Hence, we know that Z is the smallest of these numbers. Therefore, both the statements are required to answer the question.
- 46) (d) It is given that white seed grows red or white flowers and black seed grows red or blue flowers. Now, from Statement I we know that out of 100 flowering plants, 10 are white flowering plants, hence there were at least 10 white seeds, but number of black seeds used cannot be known. Using Statement II together, we still cannot find the number of black seeds used as information about the colour of remaining 20 flowers still not known.
- 47) (c) Using Statement I alone, we get two values of x as 4 and 16 which satisfy the equation $\log_2 x = \sqrt{x}$. Using Statement II simultaneously we get $x = 4$. Hence, both the statements are required to solve the question.
- 48) (c) If we use Statement I alone we do not find any information about C and D . From Statement II which is a false statement, we get information that C and D have not passed the examinations. We use both the statements together we come to know that A and B have passed the examination.
- 49) (d) None of the statements individually or in combination is sufficient to answer the question.
- 50) (a) From Statement I, first equation becomes identical to the second equation hence does not give a unique solution. From Statement II, we get

$$\begin{aligned}x + y &= c \\2x + 2y &= f\end{aligned}$$

Solving these two we get $f = 2c$ but it is given that $f \neq 2c$

Hence, set of these equations gives a unique solution.

- 51) (b) Now, in the figure PD and DQ are two tangents on the circle $PD = DQ$. From Statement I alone, coordinates of point are known, point C is the origin.



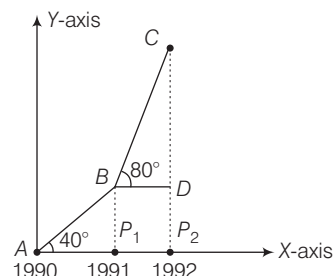
Now in $\triangle DCQ$ $\angle DQC$ is 90° CD is known, CQ is known. So, DQ can be calculated by Pythagore's theorem.

Now, coordinates of points C and D are known hence coordinates of point Q can be known by distance formula. Now, we know the coordinates of points D and Q hence its slope with X -axis can be calculated. The same method can be applied to know the slope of PD with X -axis.

From Statement II, QE is $\frac{1}{2}$ of DQ and DQ is known by pythagore's theorem. Hence in $\triangle CEQ$, CE can be calculated. Hence, slope of QE with X -axis can be calculated.

Therefore, each statement individually, is sufficient to answer the question.

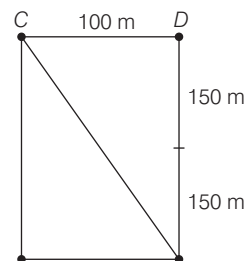
- 52) (a) Using Statement I alone, we get $AP_1 = BP_1$ and 40° and $BD = CD \tan 80^\circ$. It is clear that AP_1 and P_1P_2 or BD show that gap of one year and BP_1 and CD show the growth in 90-91 and 91-92 respectively. Therefore, AP_1 and BD will be equal. Hence, we get $BP_1 \tan 40^\circ = CD \tan 80^\circ$



$$\therefore \frac{BP_1}{CD} = \frac{\tan 80^\circ}{\tan 40^\circ}$$

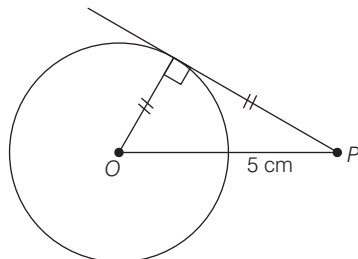
Hence, Statement I alone is sufficient to answer the question. Statement II alone does not solve the question.

- 53) (c) Though it is given in Statement I that field is rectangular in shape, yet it is still not known the position of points A and C in the rectangular field.



However, if we use the Statement II together it is known that length of one side of rectangle is 100 m and other side is 300 m and now we can calculate the maximum distance given by diagonal of the field.

- 54) (a) Thickness of the wall cannot be of any use to calculate the volume of the tank. However, we know that volume of water displaced is equal to the volume of the sphere displacing the water. Hence, from Statement II we can find the volume of the sphere.
- 55) (d) Even with both the information, the number of students in the class cannot be known.
- 56) (b) From Statement I, if we know the radius of the circle we can find the diagonal of square and hence area can



be calculated. From Statement II, if we know the length of tangent and distance of point from centre, we can calculate the radius, hence arc of the square circumscribed can be calculated.

- 57) (c) From Statement I alone and II alone we can only find out the ratio of two circles. However, using both the Statements I and II together, we get $2\pi(r_1 - r_2) = k$ and $\pi(r_1^2 - r_2^2) = m$. From these equations, we can easily find out the value of r_1 .
- 58) (a) From Statement I, we get $X + Y = 2a$ and $XY = a^2$, hence value of X in terms of a can be found. From Statement II alone we cannot find the value of X in terms of a hence not sufficient to answer the question.
- 59) (a) Book number 4 can be put in racks numbered 1 and 3. From Statement I we know that book number 2 is put in rack 3, hence book number 4 will be put in rack 1. Hence, Statement I alone is sufficient to answer the question. From Statement II we know the rack number for odd numbered book, hence alone not sufficient to answer the question.
- 60) (a) From Statement I, it is very clear that envelope E_1 contains his letter. Hence, alone sufficient. However, if we know the letter belonging to C_2 it does not allow us to find out the letter of C_2 . Hence, alone not sufficient to answer the question.
- 61) (a) It is given that $B + G = 150$. Using Statement I, we get $\frac{G}{2} + \frac{B}{4} = 49$ or $2G + B = 196$. From these equations we find Girls = 46 and Boys = 104. If we use Statement II alone, we get $0.30G + 0.36B = 45G$ or $G + B = 150$ which is identical to given equation, hence Statement II alone cannot be used to solve the equation.
- 62) (d) Both the Statements I and II alone or in combination are not sufficient to answer the question.
- 63) (c) From Statement I coffee = tea + 5. From Statement II coffee = cold drink - 5 and cold drink = $3 \times$ Tea. Using both the statements together, Tea = ₹ 5, coffee = ₹ 10 and cold drink = ₹ 15. Hence, both the statements are required to answer the question.
- 64) (d) Since, it is not given that how many questions did Radha or Rani solve in any of these statements hence even both the statements are not sufficient to answer the question.
- 65) (a) From Statement II alone, we find that $a \times b$ is defined as $\frac{a+b}{2}$ hence $2 \otimes 3 = \frac{2+3}{2} = 2.5$. Statement I alone is not sufficient to answer the question.
- 66) (c) Using Statement I alone, we get n even as well as odd because n may take any value which is the LCM of 3, 5, 7 and 9 eg 315, 630, 945, ... But if Statement (II) is used at the same time we find that $n = 315$ which is odd. Hence, both the statements are required.
- 67) (d) Even both the Statements I and II are not useful to find the length of AB .
- 68) (d) The Statement I alone is sufficient to calculate the time when two persons will meet around the circular track. But time calculated will be different in case both are moving in the same direction from the time calculated when they are moving in opposite direction. Since, no unique solution is achieved. Hence, direction should be known to find the exact time.
- 69) (d) Since, selling price of neither chair nor table is given, the cost price of chair, even using both the statements together cannot be calculated.
- 70) (a) From the two equations we get the point of intersection as (2, 3). Now, for equation $3x - 4y = 1$ if $y = 0, x = \frac{1}{3}$ and for equation $7x - 8y = 5$ if $y = 0, x = \frac{5}{7}$. Hence, we know that besides, intersecting at points (2, 3) these lines cut X-axis at a point $(\frac{1}{3}, 0)$ and $(\frac{5}{7}, 0)$, respectively. Hence, from these we can find the area bounded by the two lines and the coordinate axis. While, it cannot be solved by Statement II alone.
- 71) (b) Ratio of volume of the circular cones can be found using both the statements alone.

-

79) (a) Since range of prime numbers is not given, we cannot calculate the age of Sachin even using both the statements together.

80) (d) It is not given in Statement I that after how much period the interest is being compounded hence alone not sufficient to calculate the worth of assets. However with the help of Statement II the question can be answered.

81) (a) We cannot find the number of triangles even using both the statements together.

82) (c) With the help of Statement II alone we get the selling price = $250 \times 1.25 = ₹ 312.50$, hence alone is sufficient to answer the question. Statement I alone is not sufficient to answer the question.

83) (a) If we suppose cost price to be ₹ x . Then, from Statement I selling price = $0.75x$ and from Statement II selling price = $\frac{3}{4}x = 0.75x$ Hence, both the statements convey one and the same information and are of no use to answer the question.

84) (d) Since, we know that $(\alpha^2 + \beta^2) = (\alpha + \beta)^2 - 2\alpha\beta$ Hence, both the statements are required to solve the question.

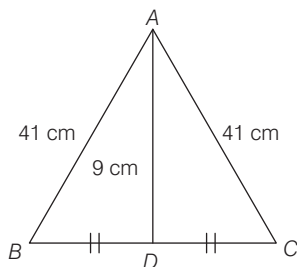
85) (d) The given equation is $(a - b + c) > (a + b - c) \Rightarrow (c - d) > (b - c)$
Now, if we use Statement I alone that b is negative, the above equations may be true as well as false depending upon the sign of c . However, if we know that c is positive, then $(a - b + c)$ is always greater than $(a + b - c)$. Hence, both the statements are required to answer the question.

86) (a) To know the ratio of two liquids A and B kept in three vessel, when mixed together, we require the quantity of liquids taken from each container for mixing, which is not given in either of statement. Hence, we cannot answer the question even with the help of both the statements taken together.

87) (a) None of the information is sufficient to answer the question as we do not know the number of rotations made by either wheel in travelling distance of 5 m.

88) (c) From I, if $(x + y + t)$ is even, then $(x + y + t) - z$ can be even or odd depending upon whether z is even or odd. However if we know that z is odd, then $(x + y + t) - z$ will always be odd. Hence, both the Statements I and II are needed to answer the question.

- 89) (c) From Statements I and II.
 $\text{LCM} \times \text{HCF} = \text{First number} \times \text{second number}.$
Hence, required number = $\frac{36 \times 2}{18} = 4$. Hence, both the statements are required.
- 90) (c) From Statement I, we get $L \times B = 48$. From Statements II we get $L^2 + B^2 = 100$. Hence, from Statements I and II we can find L (length) of the rectangle. Hence, both the statements are required to answer the question.
- 91) (a) It is given in Statement I that sum of squares of the first and second term is 116 and there exist two such numbers only 4 and 10 such that $(4)^2 + (10)^2 = 116$. Hence, question can be answered with the help of Statement I alone.
- 92) (b) From Statement II, it is very clear that the price of banana is ₹ $\frac{1}{4}$ per piece. Hence, question can be answered with the help of Statement II alone.
- 93) (c) From Statement I we know the length of AC and AB . From Statement II, we know that AD is perpendicular to BC .



- Hence, DC can be calculated by Pythagoras Theorem and once base and altitude is known, area of the triangle can be calculate. So, both the statements are required to answer the question.
- 94) (a) From Statement I = $CP = 0.8x$ and $SP = x$. Hence, profit per cent = $\frac{0.2x}{0.8x} \times 100 = 25\%$. Hence, Statement I alone is sufficient to answer the question.
- 95) (d) If we use Statement I alone, we find many sets of consecutive positive even integers complying the conditions $(x-4)^2 = 4$ e.g., (2,4), (4,6), (6,8)..... As such exact value of x cannot be ascertained. If we use Statement II, we can find the only one set of numbers (2, 4) complying condition $(x+y)^2 < 100$. But even from here we find two values of x , 2 and 4. Hence, question cannot be answered even with the help of both the statements.
- 96) (a) Statement I xyz is odd, this is possible only if all the three numbers x , y and z are odd. Hence, $(z-x)$ would be even. Therefore, Statement I alone is sufficient to answer the question.

- 97) (d) We do not have any information to find the number of mangoes stolen by other boys. Hence, we cannot find number of stolen mangoes even with the help of both the statements.
- 98) (d) Though we know the measurement of the room. But to calculate the cost of creating border we require the number of tiles required. Hence, question cannot be answered even using both the statements.
- 99) (c) We need to have both the statements to find the number of sheep.
- 100) (b) Let the number of toffees with first, second and third boy be x , $(x+4)$ and $(x+8)$, respectively. Using Statement I we do not have a unique solution because there are many multiples of 2 which x can assume. Hence, Statement I alone is not sufficient to answer the question. However, from Statement II we know that
 $(x-4+2), (x+4-6+2), (x+8-4)$ are in GP or
 $(x-2), x, (x+4)$ are in GP
 $\therefore x^2 = (x+4)(x-2) \Rightarrow x = 4$
Hence, total number of toffees are 24. Statement II alone is sufficient to answer the question.
- 101) (c) From both the statements, we get $PQ = PB + BQ$ and $RS = RE + ES$. If $BQ = ES$ and $PB > RE$, then $PQ > RS$. Hence, we need both the statements to answer the questions.
- 102) (d) To calculate the average weight of the team of three newly recruited members we require the total number of members in the team to calculate the total increase in weight of the team. Hence, the questions cannot be answered even with the help of both the statements together.
- 103) (b) Profit can be calculated as $(SP - CP) \times \text{Sale}$, hence
Original profit = $(SP - CP) \times \text{Sale}$ and new profit = $(1.1SP - CP) \times 0.9 \text{ Sale}$
Hence, from Statement I ratio of profit

$$\frac{(SP - CP) \text{ Sale}}{(1.1SP - CP) \times 0.95 \text{ Sale}}$$
From here we cannot calculate ratio of profit
However, if we use statement (II), then ratio

$$\frac{(SP - CP) \text{ Sale}}{(1.1SP - CP) \times 0.95 \text{ Sale}} = \frac{1}{1.1 \times 0.95}$$
Hence, Statement II alone is sufficient to answer the question.
- 104) (b) Given, $2G + 3B = 20$. Now, if we use Statement I that number of girls is not more than 5, then we have $G = 1, B = 6$ and $G = 4, B = 4$. Since, we cannot get a single solution from this statement it is not sufficient to answer the question. If we use Statement II $2B + 2G = 20$ we have $G = 4$ and $B = 4$. Hence, Statement II alone is sufficient to answer the question.

- 105)** (a) From Statement I $\left(\frac{1}{a} + \frac{1}{b}\right) = \frac{1}{n}$, now it is important to note here that n is an integer, hence values of a and b have to be assigned in such a way that n is an integer. It means that number of days in which the entire work is to be finished, should be an integer. Suppose if $a = 2$ and $b = 3$, then who so ever starts the work, number of days to complete the work would be same. If n is not an integer, the situation would be entirely different. Hence, Statement I alone is sufficient to answer the question.
- 106)** (c) From Statement I alone we cannot compare the distance between office to home with that of cinema hall to home because speed of both ways is not given. However in Statement II it is given that speed from cinema hall to home is less as compared to that of office to home. Hence, we conclude that distance between home to cinema hall is more.
- 107)** (c) Statement I 10 kg mangoes + 2 dozens of oranges = ₹ 252.
Statement II 2 kg mangoes = 1 dozen oranges. Hence, from these two statements 14 kg mangoes = ₹ 252 or 1 kg mangoes = ₹ 18.
- 108)** (c) From Statement I alone we cannot find the number of widgets of type A. However, if we use Statement II we find number of hours required to produce widget of A type = 20 h and hours to produce widget of B type = 60, making total hours 80.

- 109)** (d) Given, product of numbers = 21, hence numbers will be 1, 3 and 7 and their sum is also not divisible by 3. But from Statement I these numbers could be 1, 1, 21 as $1 \times 1 \times 21 = 21$ and also $(1 + 1 + 21)$ is not divisible by 3. Since, we do not arrive at a unique solution. Hence, we cannot solve the question even by using both the statements together.

- 110)** (a) Let the numbers in descending order be a, b, c and d then average of four numbers = $\frac{a + b + c + d}{4}$ and the average of largest and smallest number = $\frac{a + b}{2}$

From Statement I $a - b > c - d$, then

$$\begin{aligned} & (a + d) > (b + c) \\ \Rightarrow & (a + a + d + d) > (a + b + c + d) \\ \Rightarrow & 2(a + d) > (a + b + c + d) \\ \Rightarrow & \frac{2(a + d)}{4} > \frac{a + b + c + d}{4} \\ \text{Hence,} & \frac{(a + d)}{2} > \frac{(a + b + c + d)}{4} \end{aligned}$$

Hence, the question can be answered with the help of Statement I alone.

- 111)** (d) Values of a, b and c cannot be determined even using both the statements together.
- 112)** (d) No definite value of x can be calculated even using both the statements together.

ANALYTICAL REASONING

A cuboid of dimensions (6 cm $\times$ 4 cm $\times$ 1 cm) is painted black on both the surfaces of dimensions (4 cm $\times$ 1 cm) and red on the surfaces of dimensions (6 cm $\times$ 4 cm). Now, the block is divided into various smaller cubes of side 1 cm each. The smaller cubes so obtained are separated.

- 5) How many students have scored more than 4 points in atleast 2 electives?
(a) 4
(b) 7
(c) 2
(d) Cannot be determined
- 6) What is the minimum number of students who must have scored less than 2 points in atleast one elective?
(a) 3
(b) 4
(c) 2
(d) None of these
- 7) Elective C and elective E as merged to form a new elective N. This new elective N will be having all those students who have opted elective C and elective E and the scores of each of these electives have been taken into consideration while finding the average of elective N. What is the average score of elective N?
(a) 4
(b) 3
(c) 3.5
(d) Cannot be determined

- 8) Elective A and elective B are merged to form a new elective H. This new elective H will be having all those students who have opted elective A and elective B and the scores of each of these electives have been taken into consideration while finding the average of elective H. If none of the students of elective A and elective B are common, then what will be the average score of elective H?
- (a) 10/3 (b) 3 (c) 3.5 (d) None of these

Directions (Q. Nos. 9-12) Read the following passage and solve the questions based on it. (2016)

King Amitabh of Bollysteel organised initials to decide the groom for his daughter in two steps—The preliminary stage and the final stage. The preliminary stage comprised of a written test whereas in the final stage there was an archery competition. The archery competition consisted of five rounds wherein the contestants could score from 2 to 9 points in each round. The prince who scored the maximum points in these five rounds would be considered the winner in the overall standing and would marry the princess.

When the results of the preliminary stage were announced, it was found that only five princes – A, B, C, D and E qualified the preliminary stage and hence these were the only contestants left to complete in the final stage.

During the final stage, however, the judge who was tabulating the scores of the princes started taking sporadic short naps and so at the end, when King Amitabh asked for the score card to find out final the winner, he was presented the following table

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round
A	9		8		3
B		2	3		
C	2	9	4	8	
D	4	6		5	8
E		3			9

However, the judges has made the following observations too

- No two princes had scored equally in any round.
 - The difference between the total points scored by Prince A and Prince D was 6 points.
 - Prince B's total points were always greater than that of Prince C's total points.
 - Princes A scored an even number of points both in the 2nd and the 4th rounds.
- Each of the five princes scored greater than or equal to 24 points in the five rounds.
 - There was tie between any two princes in their overall points.
- 9) Prince D won the competition and married the Princess. Also, Prince B scored 28 points from the five rounds. Then, which of the following could be false?
- Prince C scores more points than Prince E in round 4
 - Prince A scores more points than Princes E in round 2
 - Prince B scores more points than Prince E in round 1
 - Prince D scores more than Prince A in round 3
- 10) If Prince D scores 5 points in the 3rd round and Prince C scores 4 points in the 5th round, then which of the following will definitely be false?
- Prince A is 1st in the overall standing
 - Prince E is 2nd in the overall standing
 - Prince C is 3rd in the overall standing
 - Prince D is 4th in the overall standing
- 11) If Prince E scores 2 points in the 3rd round. Then, which of the following statements is sufficient to decide the winner?
- Prince C scores the maximum possible points in the 5th round.
 - Prince D scores the maximum possible points in the 3rd round.
- Only I
 - Only II
 - I and II
 - Even I and II together are not sufficient to decided the winner
- 12) If Prince C scores 5 points in the 5th round but Prince E becomes the winner with the least possible total points, then what is the least possible points scored by Prince E in the 3rd round?
- 5
 - 6
 - 8
 - 7

Directions (Q. Nos. 13-16) Read the following passage and solve the questions based on it. (2016)

The Snehans Apartment Welfare Association offers three activities to its members skating, softball and steam bath. To avail all these facilities the association has made separate activity centres, one each for all the three activities. The following table gives the details pertaining to the number of different types of members, the capacity of each type of activity centre and the time that must be invested in the individual activities (if used)

	In time	Number of members	Skating	Softball	Steam bath
Males	7:30 am	200	90 min	75 min	20 min
Females	8:30 am	160	60 min	40 min	15 min
Children	9:00 am	220	60 min	90 min	NA
Capacity			250	120	20

All members are divided into three categories based on their sex as males, females and children. All members report at the in-time and all of them do skating first. Members are entitled to use the specialties *via*, skating, softball or steam bath according to the first-come, first-served basis and the availability of space in that particular activity centre.

e.g. All males (200) whose in-time is 7: 30 am are allowed to skate as the capacity of the skating centre is 250. When the females report at their in-time (8 : 30 am) there are only 50 places available in the skating centre. So, the rest of the 110 females wait till it becomes available.

The additional information is given as below

- (i) No body can use the softball activity centre without going through the skating centre. If a member goes to the steam bath centre, he/she will have to go to the softball activity centre as well.
 - (ii) When members report to a particular centre, it is known as the reporting time for that centre; when they are allowed to enter the centre, it is known as their entry time for that centre. The difference between the reporting time and the entry time is known as the 'waiting time' for that centre.
 - (iii) 50% of the males who skate at a given time also play at the softball activity centre. Further, 15% of the males who go to the softball centre at a given time also visit the steam bath activity centre.
 - (iv) 60% of the females who skate at a given time also play at the softball activity centre. Further, 50% of the females who go to the softball activity centre at a given time also take the steam bath.
 - (v) 50% of the children who skate at a given time also play at the softball centre. No child takes a steam bath.
 - (vi) Members are served on the first-come, first-served basis. Further, if their reporting time at a particular centre is the same, then they are entertained on the basis of their in-time.
- 13)** What is the number of children whose waiting time is 0, before entering the softball activity centre?

- 14)** What percentage of men out of the total number of men, went through all the three centres in the minimum possible time?
- 15)** What is the difference between the number of women who took the maximum time and those who took the minimum time respectively, for going through all the three centres?
- 16)** How many children are waiting at 9 am for skating?

Directions (Q. Nos. 17-20) Read the following passage and solve the questions based on it. (2015)

There are five islands A, B, C, D and E in Nicobar. Two of these have post offices, three have schools and three are accessible by bridge. Two have a population of more than 5000 each, two have a population between 2000 and 5000 each and one has a population of less than 2000. Two of these islands have electricity in addition to certain other facilities such as a school and accessibility by bridge. The island with a population of less than 2000 has a school but does not have a post office nor is it accessible by bridge while each of the islands with a population of more than 5000 has a school. Of the two islands having a population between 2000 and 5000, only one has a post office and is accessible by bridge. Island A is accessible by bridge. Island B has a population of more than 5000, island D has a school and is accessible by bridge but does not have a post office, while island E has a school but is not accessible by bridge.

- 17)** Which island has a school and a post office?
(a) A (b) B (c) C (d) D
- 18)** Which island does not have any of the facilities available to other islands?
(a) A (b) B (c) C (d) D
- 19)** Which two islands have electricity?
(a) A, B (b) B, C (c) B, D (d) C, D
- 20)** Which three islands can be accessed by bridge?
(a) A, B, D (b) A, B, E
(c) A, D, E (d) B, D, E

Directions (Q. Nos. 21-24) Read the following passage and solve the questions based on it. (2015)

Amit, Bharat, Chandan, Dinesh, Eeshwar and Ferguson are cousins. None of them are of the same age, but all of them have birthdays on the same date. The youngest of them is 17 yr old and Eeshwar, who is the eldest, is 22 yr old. Ferguson is somewhere between Bharat and Dinesh in age. Amit is elder to Bharat and Chandan is older than Dinesh.

21) Which of the following is not possible?

- (a) Dinesh is 20 yr old (b) Ferguson is 18 yr old
(c) Ferguson is 19 yr old (d) Ferguson is 20 yr old

22) If Bharat is 17 yr old, then which of the following could be the ages of Dinesh and Chandan, respectively?

- (a) 18 and 19 (b) 19 and 21
(c) 18 and 20 (d) 18 and 21

23) If two of the cousins are between Chandan and Ferguson in age, then which of the following must be true?

- (a) Amit is between Ferguson and Dinesh in age
(b) Bharat is 17 yr old
(c) Bharat is younger than Dinesh
(d) Ferguson is 18 yr old

24) If Amit is one year elder to Chandan, then the number of logically possible orders of all six cousins by increasing age is

- (a) 2 (b) 3 (c) 4 (d) 5

Directions (Q. Nos. 25-28) Read the following passage and solve the questions based on it. (2015)

Two ants start climbing a slippery wall together, from the bottom of the wall. Ant A climbs at the rate of 3 inch per minute. Ant B climbs at the rate of 4 inch per minute. However, owing to the fact that the wall is slippery, ant A slips back 1 inch for every 2 inch climbed and ant B slips back 1.5 inch for every 2 inch climbed. Besides this, ant A takes a rest of 1 min after every 2 min and ant B takes a rest of 1 min after every 3 min. (Assume that both ant A and ant B slip continuously while climbing)

25) The two ants meet each other at _____ inch.

26) If the widest gap achieved between the two ants, within the first 10 min is N inch, then what is the value of N? _____ inches

27) If ant B does not have any periods of rest, then how many times do the ants meet in the first 10 min? _____

28) When ant A reach a height of 12 inch on the wall, then ant B is _____ inch behind ant A.

Directions (Q. Nos. 29-30) Read the following information carefully and answer the questions given below. (2014)

Six persons P, Q, R, S, T and U are sitting around a circular table facing towards the centre of the table in a restaurant. They have ordered for different items

(rasgulla, strawberry, vanilla, mango, pastries and burfi) as their lunch.

They are wearing shirts of different colours, i.e. white, black, green, red, yellow and blue. Order of items for the lunch and colours of shirts are not necessarily according to the order of their names.

- I. The persons who have ordered for rasgulla, vanilla and pastries are neither in white shirt nor in black shirt.
- II. The persons who are in green and yellow shirts have neither ordered for rasgulla nor for vanilla.
- III. P is neither in white shirt nor on the immediate left of the person who has order for mango.
- IV. The only person who is between T and U eats strawberry. The person who is on the left side of the person in white shirt does not eat burfi.
- V. S has ordered for mango and the colour of his shirt is green. He is facing the person who has ordered for strawberry.
- VI. One who has ordered for rasgulla is seated opposite to the person wearing blue shirt, while the person who wear shirt of green colour is on the left of the person who has ordered for pastries.
- VII. One who has ordered for burfi is on the immediate right of the person in white shirt but on the immediate left of the person who has ordered for vanilla.
- VIII. R has not ordered for vanilla while U has not ordered for rasgulla.

29) Which of the following is not correctly matched?

- (a) P – Yellow – Pastries (b) S – Green – Mango
(c) U – Black – Burfi (d) T – Red – Strawberry

30) The colour of the shirt of the person, who ordered for vanilla, is

- (a) Blue (b) Red (c) Yellow (d) Black

Directions (Q. Nos. 31-34) Read the following information carefully and answer the questions given below. (2014)

Five friends Amol, Mandar, Piyu, Shashi and Reena attended Sagar's birthday party, where they partook of the sumptuous snacks and dinner. Each of the five friends gifted Sagar a different article – a fountain pen, a cellphone, a shirt, a jacket and an I-Pod and Sagar, in return, gifted each of them a different article – a video game, a sweater, a perfume, a calculator and a pair of sunglasses. The following is additional information about the gifts given by the friends and the gifts received from Sagar.

Amol gifted the shirt and received the video game in return. Shashi did not gift the I-Pod but received the perfume in return. Mandar did not gift an electronic item and received the calculator in return. The person who gifted the jacket received the sweater in return and Reena received the pair of sunglasses.

- 31)** Who among the following gifted the jacket?
 (a) Mandar (b) Shashi
 (c) Reena (d) None of these
- 32)** Which of the following statement is true?
 (a) Two of the friends who did not gift electronic items, received electronic items in return
 (b) Piyu gifted the jacket and Shashi gifted the I-Pod
 (c) Shashi neither gifted nor did she receive an electronic item
 (d) The person who gifted the cellphone received the calculator in return
- 33)** Which of the following is the correct combination of friend, article gifted and article received in return?
 (a) Piyu – Fountain Pen – Sunglasses
 (b) Shashi – I-Pod – Perfume
 (c) Reena – I-Pod – Sunglasses
 (d) None of the above
- 34)** Which of the following statement is false?
 (a) Only one friend whose name does not start with a vowel, received an electronic item in return
 (b) The friend whose name appears last in alphabetical order, gifted an electronic item and received a non-electronic item in return
 (c) In alphabetical order, the friend who gifted the I-Pod appears before atleast two other friends
 (d) The friend whose name in alphabetical order appears in the middle neither gifted nor received an electronic item

Directions (Q. Nos. 35-38) Study the following passage carefully and answer the questions that follow. (2014)

Dr. Goodrich, an upcoming practitioner in Hailey Street, Hartville, felt he needed more room to set up a laboratory next to his clinic. He felt he would invest his savings in buying a few microscopes and lab equipments to set-up a new laboratory. A new ceramic factory had come up in the vicinity of Hartville and many families, mainly of those employed in the factory, had taken up residence in the adjoining area.

Dr. Goodrich saw a potential increase in his clientele and wanted to cater to this new population. He felt that a small laboratory for testing blood, urine, sputum and other samples would expand his business. The only recourse would be to purchase a small cloth store adjoining his clinic owned by Mr. Terence Hill. This was a

small shop, which was already declining due to the advent of a fashionable supermarket down town. Dr. Goodrich felt that Hill would be willing to sell his store at reasonable terms and this was very important since after the setting up of his new laboratory, he would have very little capital to invest in the expansion of his clinic.

Consider each term separately in terms of the passage and mark your answer.

- (a) If the item is a major objective in making the decision; that is one of the outcomes or results sought by the decision maker
 (b) If the item is a major factor in making the decision, that is, a consideration, explicitly mentioned, in the passage, that is basic in determining the decision
 (c) If the item is minor factor in making the decision; that is a secondary consideration that affects the criteria tangentially, relating to a major factor rather than to an objective
 (d) If the item is a major assumption in making the decision; that is, a supposition or projection made by the decision maker before weighting the variables

- 35)** Increase in child and adult population in Hartville.
36) Acquisition of property for expanding clinic.
37) Cost of Hill's property.
38) State of the business of Hill's cloth store.

Directions (Q. Nos. 39-42) Refer to the data below and answer the questions that follow. (2014)

3 coloured balls yellow, green and red each are to be put in one of the three boxes numbered 1, 2 and 3 (not necessarily in the same order). 3 friends John, Jani and Janardhan make 2 statements about the arrangement of the balls in the boxes, one of which is true and the other is false.

Their statements are as follow

- I. John : The yellow ball is not in box 2 and the red ball is in box 1.
 II. Jani : The yellow ball is not in box 3 and the green ball is in box 2.
 III. Janardhan : The green ball is in box 3 and the red ball is not in box 1.

- 39)** Box 1 contains the
 (a) red ball (b) yellow ball
 (c) green ball (d) Cannot be determined
- 40)** The yellow ball is in
 (a) box 1 (b) box 2
 (c) box 3 (d) Either box 2 or box 3

- 41) In all of the friends, which one's both statements are false?

(a) Only I (b) Only II
(c) Both I and II (d) None of these

- 42) If we ignore the second statement made by Jani and consider the first statement made by him to be true, then how many possible arrangements can we have following the remaining conditions?

(a) 3 (b) 4
(c) 5 (d) None of these

Directions (Q. Nos. 43-46) Refer to the data below and answer the questions that follow. (2014)

A group of 7 people, Salman, Shahrukh, Aamir, Ranbir, Imran, Shahid and Akshay are to be arranged in a row of 7 chairs (not necessarily in the same order), such that 2 adjacent chairs are facing opposite directions but not facing each other.

Given below are some of the conditions to be followed for the seating arrangement:

- I. Akshay sits in a chair whose direction is opposite to that of Imran.
- II. None of Salman, Shahrukh or Aamir can sit adjacent to each other.
- III. Ranbir and Shahid are best friends, so they always sit together.
- IV. Imran has 4 people sitting to his right.
- V. Aamir is sitting two positions to the right of Ranbir

- 43) Which of the following can never occupy adjacent chairs?

(a) Akshya and Imran (b) Ranbir and Salman
(c) Shahrukh and Shahid (d) Aamir and Imran

- 44) If Ranbir is 3 places to the right of Imran, then who is 2 places to the left of Akshay?

(a) Salman
(b) Aamir
(c) Either Shahrukh or Salman
(d) Either Aamir or Shahrukh

- 45) If Akshay is 3 places to the left of Shahid, then who can occupy the corner positions (in any order)?

(a) Salman and Aamir
(b) Shahrukh and Salman
(c) Shahrukh and Aamir
(d) None of the above

- 46) Whose position is always fixed?

(a) Imran (b) Akshay
(c) Shahid (d) None of these

Directions (Q. Nos. 47-49) Answer the question on the basis of information given below. (2013)

A tournament was organised among five teams, Red backs, Warriors, Royals, Dare devils and Chargers. This was a round robin league tournament where each team has to play every other team exactly once. For any team, three points are awarded for a win, one point for a draw and no point for a loss.

The following table was still incomplete even after the end of tournament

Team	W	D	L	P
Red backs				7
Warriors				2
Royals				1
Dare devils				10
Chargers				7

where, W = Number of matches won
D = Number of matches drawn
L = Number of matches lost
P = Total point

- 47) Which teams did Red backs beat?

(a) Only Dare devils and Chargers
(b) Only Dare devils
(c) Only Warriors and Royals
(d) Only Warriors and Chargers

- 48) Which team/s drew the match with Warriors?

(a) Only Red backs
(b) Only Royals and Dare devils
(c) Only Dare devils and Chargers
(d) Only Chargers

- 49) Which team has the highest number of draws?

(a) Warriors (b) Red backs
(c) Royals (d) Dare devils

Directions (Q. Nos. 50-52) Read the following information carefully and answer the questions based on that. (2013)

A committee of four is to be selected from the nine eligible candidates.

The committee has the following positions General Secretary, Sports Head, Magazine Head and Treasurer.

Conditions for selection of the committee of four are

- I. Balwinder and Nishita should be selected together, but Balwinder can either be selected as Sports Head or Treasurer.

- II. If Vyoma, Nishita or Durga are to be selected, then they should always be selected as Sports Head.
- III. Swami and Durga should not be in the same committee.
- IV. Yuvan and Aiyaz should always be selected together; Aiyaz can never be selected as Treasurer.
- V. If Jia is selected, then Swami cannot be selected.
- VI. Aiyaz and Durga should be selected together.
- VII. If Aahan or Yuvan is selected, then they should be selected only as General Secretary.

50) Among the below mentioned groups, if one person is removed from the group, then which group becomes a perfect committee according to the conditions stated above?

- (a) Nishita, Yuvan, Durga, Aahan and Balwindar
(b) Vyoma, Swami, Yuvan, Aiyaz and Durga
(c) Nishita, Balwindar, Yuvan, Aiyaz and Swami
(d) Nishita, Swami, Balwindar, Aahan and Jia

51) Who among the following, if selected in the committee, will always be a magazine head?

- (a) Jia (b) Aiyaz
(c) Balwinder (d) Durga

52) Who among the nine candidates cannot be selected in any committee?

- (a) Vyoma (b) Durga
(c) Nishita (d) Balwindar

Directions (Q. Nos. 53-55) Read the following information carefully and answer the questions based on that. (2013)

Ajay, Balram, Chetak and Dhiraj are four Fashion Designers who took part in one of Madonna, Lopez, Kate and Phirangi fashion shows in four consecutive months of a year (not in that order). These shows were held in Atlanta, Beijing, Indonesia and Frankfurt (not in that order). The following information is given about the previous year fashion shows which generally start Beijing every year. No two shows were held at the same location. No two Fashion Designers participated in the same show and no one participated in more than one show.

1. Ajay did not take part in the Kate fashion show and Chetak's show, Madonna was held in the month of October.
2. Lopez, the fashion show in which Dhiraj took part was in the last month of the year. He did not go to the location starting with a vowel.
3. Ajay and Balram had common initials with the name of the respective location where their shows were held.

53) Ajay's fashion show was in which month and which country?

- (a) November, Beijing
(b) November, Frankfurt
(c) September, Frankfurt
(d) November, Atlanta

54) Balram's show was held in which month?

- (a) November (b) December
(c) October (d) September

55) Which fashion show was held in Indonesia?

- (a) Madonna (b) Kate
(c) Lopez (d) Phirangi

Directions (Q. Nos. 56-58) Read the following information carefully and answer the questions given below. (2013)

Six friends, A, B, C, D, E, and F are sitting around a round table facing towards the centre of the table in a restaurant. They have ordered for different items (Pizza, Strawberry, Vanilla, Burger, Pastries and Patties) as their lunch. They are wearing T-shirts of different colours, i.e. White, Black, Green, Red, Yellow and Blue. Order of items for the lunch and colours of T-shirts are not necessarily according to the order of their names.

- I. The persons who have ordered for Pizza, Vanilla and Pastries are neither in White T-shirt nor in Black.
- II. The persons who are in Green and Yellow T-shirts have neither ordered for Pizza nor for Vanilla.
- III. A is neither in White T-shirt nor on the immediate left of the person who has ordered the Burger.
- IV. The only person who is between E and F eats Strawberry. The person who is on the left side of the person in White T-shirt does not eat Patties.
- V. D has ordered for Burger and the colour of his T-shirt is Green. He is facing the person who has ordered for Strawberry.
- VI. One who has ordered for Pizza is seated opposite to the person wearing Blue T-shirt, while the person whose T-shirt is Green colour is on the left of the person who has ordered for Pastries.
- VII. One who has ordered for Patties is on the immediate right of the persons in White T-Shirt but on the immediate left of the person who has ordered for Vanilla.
- VIII. C has not ordered for Vanilla while F has not ordered for Pizza.

56) The only person, who is between E and D, is wearing T-shirt of the colour

- (a) Red (b) Blue (c) Black (d) Yellow

57) Which of the following is correctly matched?

- (a) A-Yellow-Burger (b) B-Red-Vanilla
(c) E-Red-Pizza (d) F-Black-Pastries

58) The colour of the T-shirt of the person, who has ordered for Patties, is

- (a) Red (b) Yellow
(c) Blue (d) Black

Directions (Q. Nos. 59-62) Read the following information carefully and answer the questions based on that. (2012)

Two teams of five each must be selected from a group of ten persons-A through J-of which A, E and G are doctors; D, H and J are lawyers; B and I are engineers; C and F are managers. It is also known that

- (i) every team must contain persons of each of the four professions.
(ii) C and H cannot be selected together.
(iii) I cannot be selected into a team with two lawyers.
(iv) J cannot be in a team with two doctors.
(v) A and D cannot be selected together.

59) If C and G are in different teams, then who are the other team members of A?

- (a) C, D, E and I (b) B, F, I and J
(c) B, C, H and J (d) F, H, I and G

60) Who among the following cannot be in the same team as I?

- (a) H (b) J
(c) C (d) F

61) Who among the following must always be in the same team as A?

- (a) D (b) B (c) H (d) J

62) If F and G are in the same team, which among the following statements is true?

- (a) B and H will in the-other team
(b) E and I must be in the same team
(c) H must be in the same team but B must in the other team
(d) C must be in the other team but D must be in the same team

Directions (Q. Nos. 63-66) Read the following information carefully and answer the questions based on that. (2012)

Two families are planning to go on a canoe trip together. The families consist of the following people: Robert and Mary Henderson and their three sons Tommy, Don and William, Jerome and Ellen Penick and their two daughters Kate and Susan.

There will be three canoes with three people in each canoe. Atleast one of the four parents must be in each canoe. Atleast one person from each family must be in each canoe.

63) If the two mothers ride together in the same canoe and the three brothers each ride in a different canoe, which of the following must be true?

- (a) Each canoe has both males and females in it
(b) One of the canoes has only females in it
(c) One of the canoes has only males in it
(d) The sisters ride in the same canoe

64) If Ellen and Susan are together in one of the canoes, which of the following could be a list of the people together in another canoe?

- (a) Dan, Jerome, Kate (b) Dan, Jerome, William
(c) Dan, Kate, Tommy (d) Jerome, Kate, Mary

65) If Jerome and Mary are together in one of the canoes, each of the following could be a list of the people together in another canoe except

- (a) Dan, Ellen, Susan (b) Ellen, Robert, Tommy
(c) Ellen, Susan, William (d) Ellen, Tommy, William

66) If each of the Henderson children rides in a different canoe, which of the following must be true?

- I. The Penick children do not ride together.
II. The Penick parents do not ride together.
III. The Henderson parents do not ride together.
(a) Only I (b) Only II (c) I and II (d) I and III

Directions (Q. Nos. 67-69) Read the following information carefully and answer the questions based on that. (2012)

Each of five people-A, B, C, D and E owns a different car among Maruti, Mercedes, Sierra, Fiat and Audi and the colours of these cars are Black, Green, Blue, White and Red, not necessarily in that order. No two cars are of the same colour. It is also known that

- (i) A's car is not Black and it is not a Mercedes.
(ii) B's car is Green and it is not a Sierra.
(iii) E's car is not White and it is not an Audi.
(iv) C's car is a Mercedes and it is not Blue.
(v) D's car is not Red and it is a Fiat.

67) If A owns a Blue Sierra, then E's car can be a

- (a) Red Maruti (b) White Maruti
(c) Black Audi (d) Red Audi

68) If A owns a White Audi, then E's car can be a

- (a) Red Maruti (b) Blue Maruti
(c) Green Audi (d) Black Sierra

69) If A's car is a Red Maruti and D's car is White, then E owns a

- (a) Black Audi (b) Blue Sierra
(c) Black Sierra (d) Blue Audi

Directions (Q. Nos. 70-72) Answer these questions on the basis of the information given below. (2011)

When Munna Bhai joined the university of South Ghatkopar for his M.S., Mr. Irani, his professor, asked him to prove his calibre in a test conducted for the entire class. The class comprised of exactly 10 students. The test contain exactly 10 multiple choice type questions. However, Munna as is always the case, managed to get the correct answer-key for all the 10 questions well before the exam. But in the exam, he wrongly marked exactly one question, on purpose, to avoid raising any suspicion. All the other nine students of the class also formed their respectively answer-keys in the following manner. They first obtained the answer-key from one or two of the students, who are called his/her jigris, who already have their answer-keys. If a student has two jigris, then he/she first compares the answer keys from both the jigris. If the key to any question from both the jigris is identical, it is copied, otherwise it is left blank. If a student has only one jigri, then he/she copies the jigri's keys into his/her copy. However, in the exam, each student intentionally replaced exactly one of the answers, other than a blank, with a wrong answer. It is known that no two students replaced the answers to the same question. When Mr. Irani finally assessed all the answer-keys, he formulated the following table, which gives the answer-keys that each of the ten students marked for the 10 questions-I through X.

Question No.	I	II	III	IV	V	VI	VII	VIII	IX	X
Student										
Arun	b	a	-	b	c	-	-	a	c	b
Chinky	a	a	-	d	c	-	-	-	c	b
Jassi	b	-	d	d	c	b	d	a	d	b
Lucky	b	a	-	d	c	b	-	b	c	b
Munna	b	a	b	d	c	b	d	a	c	b
Niran	b	a	d	d	c	b	d	a	c	b
Praveen	b	a	b	d	c	b	c	a	c	b
Rahul	b	c	d	d	c	b	d	a	c	b
Ritesh	b	a	-	d	s	b	-	-	c	b
Sastry	b	a	d	d	c	a	d	a	c	b

70) Munna is the jigri of

- (a) Sastry and Ritesh (b) Niran and Praveen
(c) Lucky and Rahul (d) Jassi and Lucky

71) Who among the following is not the jigri of any of the ten students?

- (a) Jassi (b) Praveen (c) Lucky (d) Rahul

72) Who are the jigris of Chinky?

- (a) Niran and Rahul (b) Rahul and Sastry
(c) Sastry and Lucky (d) Cannot be determined

Directions (Q. Nos. 73-75) These questions are based on the data given below. (2011)

On the eve of a special function in view of 'National Integration', seven participants- A, B, C, D, E, F and G, are to be accommodated in two rooms, each room having a capacity of four persons only. For the allocation, the following conditions must be considered.

- (i) A, a Gujarati, also speak Tamil and Bengali.
(ii) B and F are both Bengali and speak only that language.
(iii) C, a Gujarati, also speaks Tamil.
(iv) D and G are Tamilians and speak only Tamil.
(v) E, a Gujarati, also speaks Bengali.
(vi) Bengalis and Tamilians refuse to share their rooms with each other.

Further, it is necessary for each participant in a room to be able to converse with atleast one other participant in the same room, in atleast one language.

73) Which of the following combinations of participants in a room will satisfy all conditions for both the rooms?

- (a) B, C, F (b) C, D, F, G
(c) A, D, E, G (d) D, G, C, E

74) What is the total number of various combinations of room-mates possible, which satisfy all the conditions mentioned?

- (a) 2 (b) 3 (c) 4 (d) 5

75) If another participant, H, is to join the group, then he can be placed with any of the following, except

- (a) B, E and F, if H is a Bengali
(b) C, D and G, if H is a Tamilian
(c) B, E and F, if H is a Tamilian
(d) A, B and F, if H is a Gujarati

Directions (Q. Nos. 76-77) These questions are based on the data given below (2011)

Three trains-Rajdhani Express, Shatabdi Express and Taj Mahal Express travel between two stations without stopping anywhere in between. No two trains have the same starting station or the same terminating station or the same travel fare. Also, the following known about these trains.

- (i) The fare for the train which travels between Chennai and Pune is ₹ 1650.
- (ii) Taj Mahal Express runs between Delhi and Mumbai.
- (iii) Fare for the train which travels between Bengaluru and Agra is ₹ 750 less than the fare for Taj Mahal Express.
- (iv) The fare for Rajdhani Express is ₹ 150 less than the fare for Taj Mahal Express.

76) What is the fare for Shatabdi Express?

- (a) ₹ 1650
- (b) ₹ 1800
- (c) ₹ 1050
- (d) Cannot be determined

77) Which among the following statements is definitely true?

- (a) The fare for Shatabdi Express which, travels between Bengaluru and Agra is ₹ 1800
- (b) The fare for Taj Mahal Express, travels between Delhi and Mumbai is ₹ 1050
- (c) The fare for Rajdhani Express, which travels between Chennai and Pune is ₹ 1650
- (d) None of the above

Directions (Q. Nos. 78-79) These questions are based on the data given below. (2011)

In a recently held test series consisting of three matches-1st, 2nd and 3rd, five players-Sehwag, Ganguly, Tendulkar, Dravid and Laxman, are the top five scoring batsmen, not necessarily in the same order.

- (i) No two players scored the same number of runs in any match.
- (ii) Sehwag scored more runs than Ganguly in the 1st and 2nd matches.
- (iii) The player who scored the highest runs in the 3rd match scored the least runs in the 1st match.
- (iv) Dravid scored more runs than Laxman but less runs than Tendulkar in the 2nd match. Tendulkar scored more runs than Laxman in the 1st match. Laxman scored more runs than Ganguly but less than Dravid in the 3rd match.
- (v) Tendulkar scored the lowest runs in one match and in two matches his position in the decreasing order of the runs scored by the batsmen is same. He was not the top scorer in any of the three matches.

78) Among the given five players, who scored the least number of runs in the 3rd match?

- (a) Sehwag
- (b) Ganguly
- (c) Tendulkar
- (d) Cannot be determined

79) If Tendulkar scored more runs than Ganguly in the 2nd match, then who is the second highest scorer in the 1st match?

- (a) Sehwag
- (b) Laxman
- (c) Dravid
- (d) None of these

Directions (Q. Nos. 80-81) These questions are based on the following data. (2011)

Consider the following operators defined below

$x @ y$: gives the positive difference of x and y .

$x \$ y$: gives the sum of the squares of x and y .

$x \pounds y$: gives the positive difference of the squares of x and y .

$x \& y$: gives the product of x and y .

Also, $x, y \in R$ and $x \neq y$. The other standard algebraic operations are unchanged.

80) Given that $x @ y = x - y$, then find $(x \$ y) + (x \pounds y)$.

- (a) $2x^2$
- (b) $2y^2$
- (c) $2(x^2 + y^2)$
- (d) Cannot be determined

81) The expression $[(x \pounds y) + (x @ y)]^2 - 2(x \& y)$ will be equal to

- (a) $x \pounds y$
- (b) $x \$ y$
- (c) $(x \pounds y)(x @ y)$
- (d) Cannot be determined

Directions (Q. Nos. 82-85) Answer the questions on the basis of the information given below. (2009)

Ten persons namely, Litesh, Pawan, Nitu, Parul, Dinesh, Sheema, Anil, Dharam, Dolly and Sheela go for a magic show and they all sit on a single row of seats numbered 1 to 10. There are three couples in the group. Each couple has only one child, the child always sits next to its mother. A family (father, mother and child) always sit together. Sheela, Dolly, Parul and Sheema are females whereas Litesh, Pawan, Nitu, Dinesh and Dharam are males.

1. Dinesh sits on seat number 6 which is immediately next to Nitu's mother's seat.
2. Sheela sits on a seat whose number is both a perfect square and a perfect cube.
3. Dharam is Dolly's father and they both sit on prime numbered seats.
4. Litesh, the bachelor sits next to Pawan.
5. The children are Nitu, Dolly and Dinesh.

82) Who is Dinesh's mother, if the person sitting two places away from the person sitting immediately next to Nitu is Parul?

- (a) Sheema
- (b) Sheela
- (c) Parul
- (d) Can't be determined

83) Who is sitting five places to the left of the person who is sitting two places to the left of Dharam's wife?

- (a) Litesh (b) Pawan
(c) Nitu (d) Can't be determined

84) What is Anil's seat number?

- (a) 4 (b) 5 (c) 9 (d) 10

85) Who is sitting to the immediate right of Litesh?

- (Use data from pervious questions, if necessary)
(a) Dolly (b) Dharam (c) Pawan (d) No body

Directions (Q. Nos. 86-88) Answer the following questions based on the statements given below. (2008)

- (i) There are three houses on each side of the road.
- (ii) These six houses are labeled as P, Q, R, S, T and U.
- (iii) The houses are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
- (iv) The houses are of different heights.
- (v) T, the tallest house, is exactly opposite to the Red coloured house.
- (vi) The shortest house is exactly opposite to the Green coloured house.
- (vii) U, the Orange coloured house, is located between P and S.
- (viii) R, the Yellow coloured house, is exactly opposite to P.
- (ix) Q, the Green coloured house, is exactly opposite to U.
- (x) P, the White coloured house, is taller than R, but shorter than S and Q.

86) What is the colour of the house diagonally opposite to the Yellow coloured house?

- (a) White (b) Blue (c) Green
(d) Red (e) None of these

87) Which is the second tallest house?

- (a) P (b) S (c) Q
(d) R (e) Cannot be determined

88) What is the colour of the tallest house?

- (a) Red (b) Blue (c) Green
(d) Yellow (e) None of these

Directions (Q. Nos. 89-92) Answer the following questions based on the information given below. (2008)

In a sports event, six teams (A, B, C, D, E and F) are competing against each other. Matches are scheduled in two stages. Each team plays three matches in Stage-I and two matches in Stage-II. No team plays against the same team more than once in the event. No ties are permitted in any of the matches. The observations after the completion of Stage-I and Stage-II are as given below.

Stage-I

- One team won all the three matches.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost atleast one match.
- F did not play against the top team of

Stage-II

- The leader of Stage-I lost the next two matches.
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both matches.
- One more team lost both matches in Stage-II.

89) The two teams that defeated the leader of Stage-I are

- (a) F and D (b) E and F (c) B and D
(d) E and D (e) C and D

90) The only team(s) that won both matches in Stage-II is (are)

- (a) B (b) E and F (c) A, E and F
(d) B, E and F (e) B and F

91) The teams that won exactly two matches in the event are

- (a) A, D and F (b) D and E (c) E and F
(d) D, E and F (e) D and F

92) The team(s) with the most wins in the event is (are)

- (a) A (b) A and C (c) F
(d) E (e) B and E

Directions (Q. Nos. 93-95) Answer the following questions based on the information given below. (2008)

Abdul, Bikram and Chetan are three professional traders who trade in shares of company XYZ Ltd. Abdul follows the strategy of buying at the opening of the day at 10 am and selling the whole lot at the close of the day at 3 pm. Bikram follows the strategy of buying at hourly intervals: 10 am, 11 am, 12 noon, 1 pm and 2 pm, and selling the whole lot at the close of the day. Further, he buys an equal number of shares in each purchase. Chetan follows a similar pattern as Bikram but his strategy is somewhat different. Chetan's total investment amount is divided equally among his purchases. The profit or loss made by each investor is the difference between the sale value at the close of the day less the investment in purchase. The "return" for each investor is defined as the ratio of the profit or loss to the investment amount expressed as a percentage.

93) On a day of fluctuating market prices, the share price of XYZ Ltd. ends with a gain, i.e. it is higher at the close of the day compared to the opening value. Which trader got the maximum return on that day?

- (a) Bikram (b) Chetan
(c) Abdul (d) Bikram or Chetan
(e) Cannot be determined

94) Which one of the following statements is always true?

- (a) Abdul will not be the one with the minimum return
(b) Return for Chetan will be higher than that of Bikram
(c) Return for Bikram will be higher than that of Chetan
(d) Return for Chetan cannot be higher than that of Abdul
(e) None of the above

95) On a "boom" day the share price of XYZ Ltd. keeps rising throughout the day and peaks at the close of the day. Which trader got the minimum return on that day?

- (a) Bikram (b) Chetan
(c) Abdul (d) Abdul or Chetan
(e) Cannot be determined

Directions (Q. Nos. 96-97) Answer the following questions based on the information given below. (2008)

One day, two other traders, Dane and Emily joined Abdul, Bikram and Chetan for trading in the shares of XYZ Ltd. Dane followed a strategy of buying equal numbers of shares at 10 am, 11 am and 12 noon and selling the same numbers at 1 pm, 2 pm and 3 pm. Emily, on the other hand, followed the strategy of buying shares using all her money at 10 am and selling all of them at 12 noon and again 'buying the shares for all the money at 1 pm and again selling all of them at the close of the day at 3 pm. At the close of the day the following was observed

- (i) Abdul lost money in the transactions.
(ii) Both Dane and Emily made profits.
(iii) There was an increase in share price during the closing hour compared to the price at 2 pm.
(iv) Share price at 12 noon was lower than the opening price.

96) Share price was at its highest at

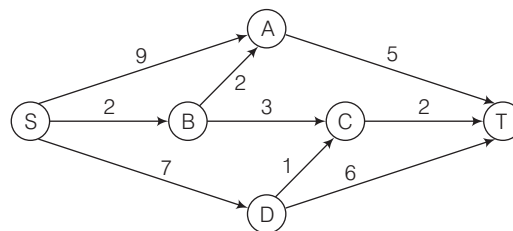
- (a) 10 am
(b) 11 am
(c) 12 noon
(d) 1 pm
(e) Cannot be determined

97) Which of the following is necessarily false?

- (a) Share price was at its lowest at 2 pm
(b) Share price was at its lowest at 11 am
(c) Share price at 1 pm was higher than the share price at 2 pm
(d) Share price at 1 pm was higher than the share price at 12 noon
(e) None of the above

Directions (Q. Nos. 98-102) Answer the questions based on the following information. (2006)

A significant amount of traffic flows from point S to point T in the one-way street network shown below. Points A, B, C and D are junctions in the network and the arrows mark the direction of traffic flow. The fuel cost in rupees for travelling along a street is indicated by the number adjacent to the arrow representing the street.



Motorists travelling from point S to point T would obviously take the route for which the total cost of travelling is the minimum. If two or more routes have the same least travel cost, then motorists are indifferent between them. Hence, the traffic gets evenly distributed among all the least cost routes.

The government can control the flow of traffic only by levying appropriate toll at each junction. e.g., if a motorist takes the route S-A-T (using junction A alone), then the total cost of travel would be ₹ 14. (i.e., ₹ 9 + ₹ 5) plus the toll charged at junction A.

98) If the government wants to ensure that all motorists travelling from S to T pay the same amount (fuel costs and toll combined) regardless of the route they choose and the street from B to C is under repairs (and hence unusable), then a feasible set of toll charged (in rupees) at junctions A, B, C and D respectively to achieve this goal is

- (a) 2, 5, 3, 2 (b) 0, 5, 3, 1 (c) 1, 5, 3, 2
(d) 2, 3, 5, 1 (e) 1, 3, 5, 1

99) If the government wants to ensure that the traffic at S gets evenly distributed along streets from S to A, from S to B and from S to D, then a feasible set of toll charged (in rupees) at junctions A, B, C and D, respectively to achieve this goal is

- (a) 0, 5, 4, 1 (b) 0, 5, 2, 2
(c) 1, 5, 3, 3 (d) 1, 5, 3, 2
(e) 0, 4, 3, 2

- 100)** If the government wants to ensure that no traffic flows on the street from D to T, while equal amount of traffic flows through junctions A and C, then a feasible set of toll charged (in ₹) at junctions A, B, C and D respectively to achieve this goal is
- (a) 1, 5, 3, 3 (b) 1, 4, 4, 3
(c) 1, 5, 4, 2 (d) 0, 5, 2, 3
(e) 0, 5, 2, 2
- 101)** If the government wants to ensure that all routes from S to T get the same amount of traffic, then a feasible set of toll charged (in ₹) at junctions A, B, C and D respectively to achieve this goal is
- (a) 0, 5, 2, 2 (b) 0, 5, 4, 1
(c) 1, 5, 3, 3 (d) 1, 5, 3, 2
(e) 1, 5, 4, 2
- 102)** The government wants to devise a toll policy such that the total cost to the commuters per trip is minimised. The policy should also ensure that not more than 70% of the total traffic passes through junction B. The cost incurred by the commuter travelling from point S to point T under this policy will be
- (a) ₹ 7 (b) ₹ 9 (c) ₹ 14
(d) ₹ 10 (e) ₹ 13

Directions (Q. Nos. 103-107) Answer the questions based on the following information. (2006)

K, L, M, N, P, Q, R, S, U and W are the only ten members in a department. There is a proposal to form a team from within the members of the department, subject to the following conditions

1. A team must include exactly one among P, R and S.
2. A team must include either M or Q, but not both.
3. If a team includes K, then it must also include L and vice-versa.
4. If a team includes one among S, U and W, then it must also include the other two.
5. L and N cannot be members of the same team.
6. L and U cannot be members of the same team.

The size of a team is defined as the number of members in the team.

- 103)** What would be the size of the largest possible team?
- (a) 8 (b) 7
(c) 6 (d) 5
(e) Cannot be determined
- 104)** What could be the size of a team that includes K?
- (a) 2 or 3 (b) 2 or 4
(c) 3 or 4 (d) Only 2
(e) Only 4

- 105)** In how many ways a team can be constituted so that the team includes N?
- (a) 2 (b) 3 (c) 4
(d) 5 (e) 6
- 106)** Who cannot be a member of a team of size 3?
- (a) L (b) M
(c) N (d) P
(e) Q
- 107)** Who can be a member of a team of size 5?
- (a) K (b) L
(c) M (d) P
(e) R

Directions (Q. Nos. 108-112) Answer the questions based on the following information. (2006)

Mathematicians are assigned a number called Erdos number (named after the famous mathematician, Paul Erdos). Only Paul Erdos himself has an Erdos number of zero. Any mathematician who has written a research paper with Erdos has an Erdos number of 1. For other mathematicians, the calculation of his/her Erdos number is illustrated below.

Suppose that a mathematicians, X has co-authored papers with several other mathematicians. From among them, mathematician Y has the smallest Erdos number. Let the Erdos number of Y be y . Then, X has an Erdos number of $y + 1$. Hence, any mathematician with no co-authorship chain connected to Erdos has an Erdos number of infinity.

In a seven day long mini-conference organised in memory of Paul Erdos, a close group of eight mathematicians, call them A, B, C, D, E, F, G and H, discussed some research problems. At the beginning of the conference, A was the only participant who had an infinite Erdos number. Nobody had an Erdos number less than that of F.

On the third day of the conference F co-authored a paper jointly with A and C. This reduced the average Erdos number of the group of eight mathematicians to 3. The Erdos number of B, D, E, G and H remained unchanged with the writing of this paper. Further; no other co-authorship among any three members would have reduced the average Erdos number of the group of eight to as low as 3.

At the end of the third day, five members of this group had identical Erdos number while the other three had Erdos numbers distinct from each other.

On the fifth day, E co-authored a paper with F which reduced the group's average Erdos number by 0.5. The Erdos numbers of the remaining six were unchanged with the writing of this paper.

No other paper was written during the conference.

108) The Erdos number of C at the end of the conference was

- (a) 1 (b) 2 (c) 3
(d) 4 (e) 5

109) How many participants had the same Erdos number at the beginning of the conference ?

- (a) 2 (b) 3 (c) 4
(d) 5 (e) Cannot be determined

110) The Erdos number of E at the beginning of the conference was

- (a) 2 (b) 5 (c) 6
(d) 7 (e) 8

111) How many participants in the conference did not change their Erdos number during the conference

- (a) 2 (b) 3 (c) 4
(d) 5 (e) Cannot be determined

112) The person having the largest Erdos number at the end of the conference must have had Erdos number (at that time)

- (a) 5 (b) 7 (c) 9
(d) 14 (e) 15

Directions (Q. Nos. 113-117) Answer the questions based on the following information. (2006)

Two traders, Chetan and Michael, were involved in the buying and selling of MCS shares over five trading days. At the beginning of the first day, the MCS share was priced at ₹ 100, while at the end of the fifth day it was priced at ₹ 110. At the end of each day, the MCS share price either went up by ₹ 10, or else, it came down by ₹ 10. Both Chetan and Michael took buying and selling decisions at the end of each trading day. The beginning price of MCS share on a given day was the same as the ending price of the previous day. Chetan and Michael started with the same number of shares and amount of cash and had enough of both. Below are some additional facts about how Chetan and Michael traded over the five trading days.

Each day if the price went up, Chetan sold 10 shares of MCS at the closing price. On the other hand, each day if the price went down, he bought 10 shares at the closing price. If on any day, the closing price was above ₹ 110, then Michael sold 10 shares of MCS, while if it was below ₹ 90, he bought 10 shares, all at the closing price.

113) If Chetan sold 10 shares of MCS on three consecutive days, while Michael sold 10 shares only once during the five days, what was the price of MCS at the end of day 3?

- (a) ₹ 90 (b) ₹ 100 (c) ₹ 110
(d) ₹ 120 (e) ₹ 130

114) What could have been the maximum possible increase in combined cash balance of Chetan and Michael at the end of the fifth day?

- (a) ₹ 3700 (b) ₹ 4000 (c) ₹ 4700
(d) ₹ 5000 (e) ₹ 6000

115) If Michael ended up with 20 more shares than Chetan at the end of day 5, what was the price of the share at the end of day 3?

- (a) ₹ 90 (b) ₹ 100 (c) ₹ 110
(d) ₹ 120 (e) ₹ 130

116) If Michael ended up with ₹ 100 less cash than Chetan at the end of day 5, what was the difference in the number of shares possessed by Michael and Chetan (at the end of day 5)?

- (a) Michael had 10 less shares than Chetan
(b) Michael had 10 more shares than Chetan
(c) Chetan had 10 more shares than Michael
(d) Chetan had 20 more shares than Michael
(e) Both had the same number of shares

117) If Chetan ended up with ₹ 1300 more cash than Michael at the end of day 5, what was the price of MCS share at the end of day 4?

- (a) ₹ 90 (b) ₹ 100 (c) ₹ 110
(d) ₹ 120 (e) Not uniquely determinable

Directions (Q. Nos. 118-121) Answer the questions based on the following information. (2004)

A study was conducted to ascertain the relative importance that employees in five different countries assigned to five different traits in their Chief Executive Officers. The traits were compassion (C), decisiveness (D), negotiation skills (N), public visibility (P) and Vision (V). The level of dissimilarity between two countries is the maximum difference in the ranks allotted by the two countries to any of the five traits. The following table indicates the rank order of the five traits for each country.

Rank	Country				
	India	China	Japan	Malaysia	Thailand
1	C	N	D	V	V
2	P	C	N	D	C
3	N	P	C	P	N
4	V	D	V	C	P
5	D	V	P	N	D

118) Which amongst the following countries is most dissimilar to India?

- (a) China (b) Japan
(c) Malaysia (d) Thailand

- 119)** Which of the following pairs of countries are most dissimilar?
 (a) China and Japan (b) India and China
 (c) Malaysia and Japan (d) Thailand and Japan
- 120)** Three of the following four pairs of countries have identical levels of dissimilarity. Which pair is the odd one out?
 (a) Malaysia and China (b) China and Thailand
 (c) Thailand and Japan (d) Japan and Malaysia
- 121)** Which of the following countries is least dissimilar to India?
 (a) China (b) Japan
 (c) Malaysia (d) Thailand

Directions (Q. Nos. 122-125) Answer the questions based on the following information. (2004)

Prof. Singh has been tracking the number of visitors to his homepage. His service provider has provided him with the following data on the country of origin of the visitors and the university they belong to

Number of visitors				
Day				
Country	1	2	3	
Canada	2	0	0	
Netherland	1	1	0	
India	1	2	0	
UK	2	0	2	
USA	1	0	1	

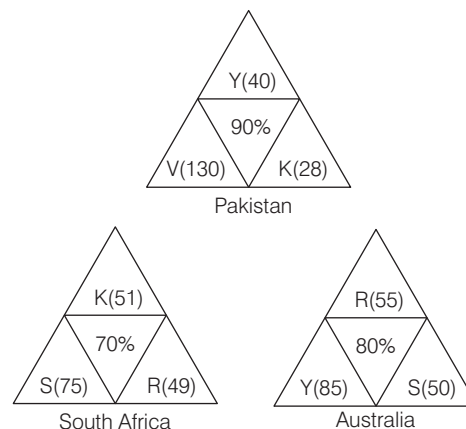
Number of visitors				
DAY				
UNIVERSITY	1	2	3	
University 1	1	0	0	
University 2	2	0	0	
University 3	0	1	0	
University 4	0	0	2	
University 5	1	0	0	
University 6	1	0	1	
University 7	2	0	0	
University 8	0	2	0	

- 122)** University 1 can belong to
 (a) UK (b) Canada
 (c) Netherland (d) USA

- 123)** To which country does University 5 belong?
 (a) India or Netherland but not USA
 (b) India or USA but not Netherland
 (c) Netherland or USA but not India
 (d) India or USA but not UK
- 124)** Which among the listed countries can possibly host three of the eight listed universities?
 (a) None
 (b) Only UK
 (c) Only India
 (d) Both India and UK
- 125)** Visitors from how many universities from UK visited Prof. Singh's homepage in the three days?
 (a) 1 (b) 2
 (c) 3 (d) 4

Directions (Q. Nos. 126-129) Answer the questions based on the following information. (2004)

Coach John sat with the score cards of Indian players from the 3 games in a one-day cricket tournament where the same set of players played for India and all the major batsmen got out. John summarised the batting performance through three diagrmdams, one for each game. In each diagram, the three outer triangles communicate the number of runs scored by the three tops scorers from India, where K, R, S, V and Y represent Kaif, Rahul, Saurav, Virender and Yuvraj, respectively. The middle triangle in each diagram denotes the percentage of total score that was scored by the top three Indian scorers in that game. No two players score the same number of runs in the same game. John also calculated two batting indices for each player based on his scores in the tournament; the R-index of a batsman is the difference between his highest and lowest scores in the 3 games while the M-index is the middle number; if his scores are arranged in a non-increasing order.



126) Among the players mentioned, who can have the lowest R -index from the tournament?

- (a) Only Kaif, Rahul or Yuvraj
- (b) Only Kaif or Rahul
- (c) Only Kaif or Yuvraj
- (d) Only Kaif

127) How many players among those listed definitely scored less than Yuvraj in the tournament?

- (a) 0
- (b) 1
- (c) 2
- (d) More than 2

128) Which of the players had the best M -index from the tournament?

- (a) Rahul
- (b) Saurav
- (c) Virender
- (d) Yuvraj

129) For how many Indian players is it possible to calculate the exact M -index ?

- (a) 0
- (b) 1
- (c) 2
- (d) More than 2

Directions (Q. Nos. 130-133) Answer the questions based on the following information. (2004)

Twenty one participants from four continents (Africa, Americas, Australasia and Europe) attended a United Nations conference. Each participant was an expert in one of four fields, labour; health, population studies and refugee relocation. The following five facts about the participants are given.

- A. The number of labour experts in the camp was exactly half the number of experts in each of the three other categories.
- B. Africa did not send any labour expert. Otherwise, every continent, including Africa, sent atleast one expert for each category.
- C. None of the continents sent more than three experts in any category.
- D. If there had been one less Australasian expert, then the Americas would have had twice as many experts as each of the other continents.
- E. Mike and Alfanzo are leading experts of population studies who attended the conference. They are from Australasia.

130) If Ramos is the alone American expert in population studies, which of the following is not true about the number of experts in the conference from the continents?

- (a) There is one expert in health from Africa
- (b) There is one expert in refugee relocation from Africa
- (c) There are two experts in health from the Americas
- (d) There are three experts in refugee relocation from the Americas

131) Alex, an American expert in refugee relocation, was the first keynote speaker in the conference. What can be inferred about the number of American experts in refugee relocation in the conference, excluding Alex?

- (i) Atleast one
- (ii) Atmost two
- (a) Only (i) and not (ii)
- (b) Only (ii) and not (i)
- (c) Both (i) and (ii)
- (d) Neither (i) nor (ii)

132) Which of the following numbers cannot be determined from the information given ?

- (a) Number of labour experts from the Americas
- (b) Number of health experts from Europe
- (c) Number of health experts from Australasia
- (d) Number of experts in refugee relocation from Africa

133) Which of the following combinations is not possible?

- (a) 2 experts in population studies from the Americas and 2 health experts from Africa attended the conference
- (b) 2 experts in population studies from the Americas and 1 health expert from Africa attended the conference
- (c) 3 experts in refugee relocation from the Americas and 1 health expert from Africa attended the conference
- (d) Africa and America each had 1 expert in population studies attending the conference

Directions (Q. Nos. 134-137) Answer the questions based on the following information. (2004)

The year was 2006. All six teams in Pool A of World Cup hockey, play each other exactly once. Each win earns a team three points, a draw earns one point and a loss earns zero point. The two teams with the highest points qualify for the semifinals. In case of a tie, the team with the highest goal difference (Goal For - Goals Against) qualifies.

In the opening match, Spain lost to Germany. After the second round (after each team played two matches), the pool table looked as shown below.

Pool A

Teams	Games Played	Won	Drawn	Lost	Goals For	Goals Against	Points
Germany	2	2	0	0	3	1	6
Argentina	2	2	0	0	2	0	6
Spain	2	1	0	1	5	2	3
Pakistan	2	1	0	1	2	1	3
New Zealand	2	0	0	2	1	6	0
South Africa	2	0	0	2	1	4	0

In the third round, Spain played Pakistan, Argentina played Germany and New Zealand played South Africa. All the third round matches were drawn. The following are some results from the fourth and fifth round matches.

- (i) Spain won both the fourth and fifth round matches.
- (ii) Both Argentina and Germany won their fifth round matches by 3 goals to 0.
- (iii) Pakistan won both the fourth and fifth round matches by 1 goal to 0.

134) Which one of the following statements is true about matches played in the first two rounds?

- (a) Pakistan beat South Africa by 2 goals to 1
- (b) Argentina beat Pakistan by 1 goal to 0
- (c) Germany beat Pakistan by 2 goals to 1
- (d) Germany beat Spain by 2 goals to 1

135) Which one of the following statements is true about matches played in the first two rounds?

- (a) Germany beat New Zealand by 1 goal to 0
- (b) Spain beat New Zealand by 4 goals to 0
- (c) Spain beat South Africa by 2 goals to 0
- (d) Germany beat South Africa by 2 goals to 1

136) Which team finished at the top of the pool after five rounds of matches?

- (a) Argentina
- (b) Germany
- (c) Spain
- (d) Cannot be determined

137) If Pakistan qualified as one of the two teams from Pool A, which was the other team that qualified?

- (a) Argentina
- (b) Germany
- (c) Spain
- (d) Cannot be determined

138) In a coastal village, every year floods destroy exactly half of the huts. After the flood water recedes, twice the number of huts destroyed are rebuilt. The floods occurred consecutively in the last three years namely 2001, 2002 and 2003. If floods are again expected in 2004, the number of huts expected to be destroyed is (2003)

- (a) Less than the number of huts existing at the beginning of 2001
- (b) Less than the total number of huts destroyed by floods in 2001 and 2003
- (c) Less than the total number of huts destroyed by floods in 2002 and 2003
- (d) More than the total number of huts build in 2001 and 2002

Directions (Q. Nos. 139-141) Answer the questions based on the following information. (2003)

A string of three English letters is formed as per the following rules

- (i) The first letter is any vowel.
- (ii) The second letter is m , n or p .
- (iii) If the second letter is m , then the third letter is any vowel which is different from the first letter.
- (iv) If the second letter is n , then the third letter is e or u .
- (v) If the second letter is p , then the third letter is the same as the first letter.

139) How many strings of letters can possibly be formed using the above rules?

- (a) 40
- (b) 45
- (c) 30
- (d) 35

140) How many strings of letters can possibly be formed using the above rules such that the third letter of the string is (v)?

- (a) 8
- (b) 9
- (c) 10
- (d) 11

141) There are 12 towns grouped into four zones with three towns per zone. It is intended to connect the towns with telephone lines such that every two towns are connected with three direct lines if they belong to the same zone and with only one direct line otherwise. How many direct telephone lines are required?

- (a) 72
- (b) 90
- (c) 96
- (d) 144

Directions (Q. Nos. 142-144) Answer the questions based on the following information. (2003)

The seven basis symbols in a certain numeral system and their respective values are as follows

$I = 1$, $V = 5$, $X = 10$, $L = 50$, $C = 100$, $D = 500$ and $M = 1000$

In general, the symbols in the numeral system are read from left to right, starting with the symbol representing the largest value; the same symbol cannot occur continuously more than three times; the value of the numeral is the sum of the values of the symbols. e.g., $XXVII = 10 + 10 + 5 + 1 + 1 = 27$. An exception to the left-to-right reading occurs when a symbol is followed immediately by a symbol of greater value; then, the smaller value is subtracted from the large. e.g.,

$$XLVI = (50 - 10) + 5 + 1 = 46$$

142) The value of the numeral $MDCCLXXXVII$ is

- (a) 1687
- (b) 1787
- (c) 1887
- (d) 1987

143) The value of the numeral $MCMXCIX$ is

- (a) 1999
- (b) 1899
- (c) 1989
- (d) 1889

144) Which of the following can represent the numeral for 1995 ?

- (i) $MCMLXXV$
- (ii) $MCMXCV$
- (iii) MVD
- (iv) MVM
- (a) (i) and (ii)
- (b) (iii) and (iv)
- (c) (ii) and (iv)
- (d) Only (iv)

Directions (Q. Nos. 145-149) *Each question is followed by two Statements A and B. Answer each question using the following instructions.* (2003)

Choose 1. If the question can be answered by using Statement A alone but not by using B alone.

Choose 2. If the question can be answered by using Statement B alone but not by using A alone.

Choose 3. If the question can be answered by using either statement alone.

Choose 4. If the question can be answered by using both the Statements together but not by either statement.

- 145)** In a cricket match the 'man of the match' award is given to the player scoring the highest number of runs. In case of tie, the player (out of those locked in the tie) who has taken the higher number of catches is chosen. Even thereafter if there is a tie, the player (out of those locked in the tie) who has dropped fewer catches is selected. Aakash, Biplab and Chirag who were contenders for the award dropped atleast one catch each. Biplab dropped 2 catches more than Aakash did, secured 50 and took 2 catches. Chirag got two chances to catch and dropped both. Who was the 'man of the match'?

A. Chirag made 15 runs less than both Aakash and Biplab.

B. The catches dropped by Biplab are 1 more than the catches taken by Aakash.

- (a) 1 (b) 2
(c) 3 (d) 4

- 146)** Four friends, A, B, C and D got the top four ranks in a competitive examination, but A did not get the first, B did not get the second, C did not get the third and D did not get the fourth rank. Who secured which rank ?

A. Neither A nor D were among the first 2.

B. Neither B nor C was third or fourth.

- (a) 1 (b) 2
(c) 3 (d) 4

- 147)** The members of a local club contributed equally to pay ₹ 600 towards a donator. How much did each one pay?

A. If there had been five fewer members, each one would have paid an additional ₹10.

B. There were atleast 20 members in the club and each one paid on more than ₹ 30.

- (a) 1 (b) 2
(c) 3 (d) 4

- 148)** A family has only one kid. The father says "after 'n' years, my age will be 4 times the age of my kid." The mother says "after 'n' years, my age will be 3 times that of my kid." What will be the combined ages of the parents after 'n' years ?

A. The age difference between the parents is 10 yr.

B. After 'n' years, the kid is going to be twice as old as she is now.

- (a) 1 (b) 2 (c) 3 (d) 4

- 149)** Seventy per cent of the employees in a multinational corporation have VCD players, 75 per cent have microwave ovens, 80 per cent have ACs and 85 per cent have washing machines. Atleast what percentage of employees has all four gadgets ?

- (a) 15 (b) 5 (c) 10
(d) Cannot be determined

Directions (Q. Nos. 150-153) *Answer the questions based on the following information.* (2003)

Four families decided to attend the marriage ceremony of one of their colleagues. One family has no kids, while the others have atleast one kid each. Each family with kids has atleast one kid attending the marriage. Given below is some information about the families and who reached when to attend the marriage.

The family with 2 kids came just before the family with no kids.

Shanthi who does not have any kids reached just before Sridevi's family.

Sunil and his wife reached last with their only kid.

Anil is not the husband of Joya.

Anil and Raj are fathers.

Sridevi's and Anita's daughters go to the same school.

Joya came before Shanthi and met Anita when she reached the venue.

Raman stays the farthest from the venue.

Raj said his son could not come because of his exams.

- 150)** Which woman arrive third?

- (a) Shanthi (b) Sridevi
(c) Anita (d) Joya

- 151)** Name the correct pair of husband and wife.

- (a) Raj and Shanthi (b) Sunil and Sridevi
(c) Anil and Sridevi (d) Raj and Anita

- 152)** Of the following pairs, whose daughters go to the same school?

- (a) Anil and Raman (b) Sunil and Raman
(c) Sunil and Anil (d) Raj and Anil

153) Whose family is known to have more than one kid for certain?

- (a) Ramans's (b) Raj's
(c) Anil's (d) Sunil's

Directions (Q. Nos. 154-158) *Answer the questions based on the following information.* (2003)

Recently, the answers of a test held nationwide were leaked to a group of unscrupulous people. The investigative agency has arrested the mastermind and nine other people A, B, C, D, E, F, G, H and I in this matter. Interrogating them, the following facts have been obtained regarding their operation. Initially the mastermind obtains the correct answer-key. All the others create their answer-key from one or two people who already possess the same. These people are called his/her 'sources'. If the person has two sources, then he/she compares the answer-keys obtained for both sources. If the key to a question from both sources is identical, it is copied, otherwise it is left blank. If the person has only one source, he/she copies the source's answers into his/her copy. Finally, each person compulsorily replaces one of the answers (not a blank one) with a wrong answer in his/ her answer key. The paper contained 200 questions; so the investigative agency has ruled out the possibility of two or more of them introducing wrong answers to the same question. The investigative agency has a copy of the correct answer key and has tabulated the following data, These data represent question numbers.

Name	Wrong Answer(s)	Blank Answer(s)
A	46	—
B	96	469025
C	2756	174690
D	17	—
E	4690	—
F	1446	9290
G	25	—
H	4692	—
I	27	172690

154) Which one among the following must have two sources?

- (a) A (b) B (c) C (d) D

155) How many people (excluding the mastermind) needed to make answer keys before C could make his answer-key?

- (a) 2 (b) 3 (c) 4 (d) 5

156) Both G and H were sources to

- (a) F (b) B
(c) A (d) None of these

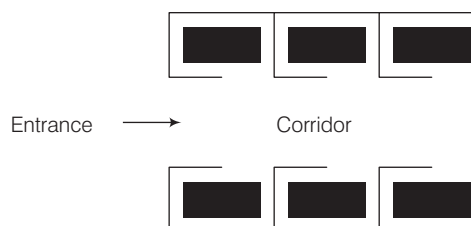
157) Which of the following statements is true?

- (a) C introduced the wrong answer to question 27
(b) E introduced the wrong answer to question 46
(c) F introduced the wrong answer to question 14
(d) H introduced the wrong answer to question 46

158) Which of the following two groups of people has identical sources?

- I. A, D and G II. E and H
(a) Only I
(b) Only II
(c) Neither I nor II
(d) Both I and III

Directions (Q. Nos. 159-162) *Answer the questions based on the following information.* (2003)



The plan above shows an office block for six officers, A, B, C, D, E and F. Both Band C occupy offices to the right of corridor (as one enters the office block) and A occupies an office to the left of the corridor. E and F occupy offices on opposite sides of the corridor but their offices do not face each other. The offices of C and D face each other. E does not have a corner office. F's office is further down the corridor than A's, but on the same side.

159) If E sits in his office and faces the corridor, whose office is to his left?

- (a) A (b) B
(c) C (d) D

160) Whose office faces A's office?

- (a) B (b) C
(c) D (d) E

161) Who is/are F's neighbour(s)?

- (a) A only (b) A and D
(c) C only (d) B and C

162) D was heard telling someone to go further down the corridor the last office on the right. To whose room was he trying to direct that person?

- (a) A (b) B
(c) C (d) F

Directions (Q. Nos. 163-166) *Answer the questions based on the following information.* (2003)

Seven faculty members at a management institute frequent a lounge for strong coffee and conversation. On being asked about their visit to the lounge last Friday we got the following responses.

JC, I came in first and the next two persons to enter were SS and SM. When I left the lounge, JP and VR were present in the lounge, DG left with me.

JP When I entered the lounge with VR, JC was sitting there. There was someone else, but I cannot remember who it was.

SM, I went to the lounge for a short while and met JC, SS and DG in the lounge on that day. SS I left immediately after SM left.

DG, I met JC, SS, JP and VR during my first visit to the lounge. I went back to my office with JC. When I went to the lounge the second time, JP and VR were there.

PK I had some urgent work, so I did not sit in the lounge that day, but just collected my coffee and left JP and DG were the only people in the lounge while I was there.

VR no comments.

163) Based on the responses, which of the two JP or DG, entered the lounge first?

- (a) JP (b) DG
(c) Both entered together (d) Cannot be deduced

164) Who was sitting with JC when JP entered the lounge?

- (a) SS (b) SM
(c) DG (d) PK

165) How many of the seven members did VR meet on Friday in the lounge?

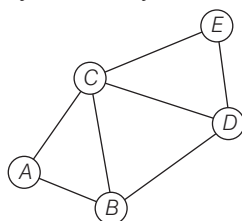
- (a) 2 (b) 3 (c) 4 (d) 5

166) Who were the last two faculty members to leave the lounge?

- (a) JC and DG (b) PK and DG
(c) JP and PK (d) JP and DG

Directions (Q. Nos. 167-168) *Answer the questions based on the following information.* (2003)

Shown below is a layout of major streets in a city.



Two days (Thursday and Friday) and left for campaigning before a major election and the city administration has received requests from five political parties for taking out their processions along the following routes.

- Congress : A-C-D-E
BJP : A-B-D-E
SP : A-B-C-E
BSP : B-C-E
CPM : A-C-D

Street B-D cannot be used for a political procession on Thursday due to a religious procession. The district administration has a policy of not allowing more than one procession to pass along the same street on the same day. However, the administration must allow all parties to take out their procession during these two days.

167) Congress procession can be allowed

- (a) Only on Thursday (b) Only on Friday
(c) On either day
(d) Only if the religious procession is cancelled

168) Which of the following is not true?

- (a) Congress and SP can take out their processions on the same day
(b) The CPM procession cannot be allowed on Thursday
(c) The BJP procession can only take place on Friday
(d) Congress and BSP can take out their processions on the same day

169) At a village mela, the following six nautankis (plays) are scheduled as shown in the table below (2002)

No.	Nautanki	Duration	Show Times
1.	Sati-Savitri	1h	9:00 am and 2:00 pm
2.	Joru ka Ghulam	1h	10:30 am and 11:30 am
3.	Sundar Kand	30 min	10:00 am and 11:00 am
4.	Veer Abhimanyu	1h	10:00 am and 11:00 am
5.	Reshma aur Shera	1h	9:30 am, 12:00 noon and 2:00 pm
6.	Jhansi ki Rani	30 min	11:00 am and 1:30 pm

You wish to see all the six nautankis. Further, you wish to ensure that you get a lunch break from 12 : 30 pm to 1 : 30 pm. Which of the following ways can you do this?

- (a) Sati-Savitri is viewed first; Sundar Kand is viewed third and Jhansi ki Rani is viewed last
(b) Sati-Savitri is viewed last; Veer Abhimanyu is viewed third and Reshma aur Shera is viewed first
(c) Sati-Savitri is viewed first; Sundar Kand is viewed third and Joru ka Ghulam is viewed fourth
(d) Veer Abhimanyu is viewed third; Reshma aur Shera is viewed fourth and Jhansi ki Rani is viewed fifth

- 170)** Three travellers are sitting around a fire and are about to eat a meal. One of them has five small loaves of bread, the second has three small loaves of bread. The third has no food, but has eight coins. He offers to pay for some bread. They agree to share the eight loaves equally among the three travellers and the third traveller will pay eight coins for his share of the eight loaves. All loaves were of the same size. The second traveller (who had three loaves) suggests that he be paid three coins and that the first traveller be paid five coins. The first traveller says that he should get more than five coins. How much the first traveller should get? (2002)
- (a) 5 (b) 7
(c) 1 (d) None of these

Directions (Q. Nos. 171-173) *Answer the following questions based on the passage below.* (2001)

A group of three or four has to be selected from seven persons. Among the seven are two women: Fiza and Kavita and five men: Ram, Shyam, David, Peter and Rahim. Ram would not like to be in the group if Shyam is also selected. Shyam and Rahim want to be selected together in the group. Kavita would like to be in the group only if David is also there. David, if selected, would not like Peter in the group. Ram would like to be in the group only if Peter is also there. David insists that Fiza be selected in case he is there in the group.

- 171)** Which of the following is a feasible group of three?
- (a) David, Ram, Rahim
(b) Peter, Shyam, Rahim
(c) Kavita, David, Shyam
(d) Fiza, David, Ram
- 172)** Which of the following is a feasible group of four?
- (a) Ram, Peter, Fiza, Rahim
(b) Shyam, Rahim, Kavita, David
(c) Shyam, Rahim, Fiza, David
(d) Fiza, David, Ram, Peter
- 173)** Which of the following statements is true?
- (a) Kavita and Ram can be part of a group of four
(b) A group of four can have two women
(c) A group of four can have all four men
(d) None of the above
- 174)** On her walk through the park, Hamsa collected 50 coloured leaves, all either maple or oak. She sorted them by category when she got home and found the following (2001)
- A. The number of red oak leaves with spots is even and positive.

- B. The number of red oak leaves without any spot equals the number of red maple leaves without spots.
- C. All non-red oak leaves have spots and there are five times as many of them as there are red spotted oak leaves.
- D. There are no spotted maple leaves that are not red.
- E. There are exactly 6 red spotted maple leaves.
- F. There are exactly 22 maple leaves that are neither spotted nor red.

How **many** oak leaves did she collect?

- (a) 22 (b) 17 (c) 25 (d) 18

- 175)** Eight people carrying food baskets are going for a picnic on motorcycles. Their names are A, B, C, D, E, F, G and H. They have four motorcycles, M_1 , M_2 , M_3 and M_4 among them. They also have four food baskets O, P, Q and R of different sizes and shapes and each can be carried only on motorcycles M_1 , M_2 , M_3 or M_4 respectively.

No more than two persons can travel on a motorcycle and no more than one basket can be carried on a motorcycle. There are two husband-wife pairs in this group of eight people and each pair will ride on a motorcycle together, C cannot travel with A or B. E cannot travel with B or F. G cannot travel with F or H or D. The husband-wife pairs must carry baskets O and P. Q is with A and P is with D. F travels on M_1 and E travels on M_2 motorcycles. G is with Q and B cannot go with R. Who is travelling with H? (2001)

- (a) A (b) B
(c) C (d) D

- 176)** In a family gathering, there are two males who are grandfathers and four males who are fathers. In the same gathering, there are two females who are grandmothers and four females who are mothers. There is atleast one grandson or a granddaughter present in this gathering.
- There are two husband-wife pairs in this group. These can either be a grandfather and a grandmother, or a father and a mother. The single grandfather (whose wife is not present) has two grandsons and a son present. The single grandmother (whose husband is not present) has two granddaughters and a daughter present. A grandfather or a grandmother present with their spouses does not have any grandson or granddaughter present. What is the minimum number of people present in this gathering? (2001)
- (a) 10 (b) 12 (c) 14 (d) 16

- 177) I have a total of ₹ 1000. Item A costs ₹ 110, item B costs ₹ 90, item C costs ₹ 70, item D costs ₹ 40 and item E costs ₹ 45. For every item D that I purchase, I must also buy two of item B. For every item A, I must buy one of item C. For every item E, I must also buy two of item D and one of item B. For every item purchased I earn 1000 points and for every rupee not spent I earn a penalty of 1500 points. My objective is to maximise the points I earn. What is the number of items that I must purchase to maximise my points ? (2001)

(a) 13 (b) 14 (c) 15 (d) 16

- 178) Four friends Ashok, Bashir, Chirag and Deepak are out shopping. Ashok has less money than three times the amount that Bashir has. Chirag has more money than Bashir. Deepak has an amount equal to the difference of amounts with Bashir and Chirag. Ashok has three times the money with Deepak. They each have to buy at least one shirt, or one shawl, or one sweater, or one jacket that are priced ₹ 200, ₹ 400, ₹ 600 and ₹ 1000 a piece, respectively. Chirag borrows ₹ 300 from Ashok and buys a jacket. Bashir buys a sweater after borrowing ₹ 100 from Ashok and is left with no money. Ashok buys three shirts. What is the costliest item that Deepak could buy with his own money ? (2001)

(a) A shirt (b) A shawl (c) A sweater (d) A jacket

- 179) In a "keep-fit" gymnasium class, there are fifteen females enrolled in a weight-loss program. They all have been grouped in anyone of the five weight-groups W_1, W_2, W_3, W_4 or W_5 . One instructor is assigned to one weight-group only. Sonali, Shalini, Shubhra and Shahira belong to the same weight-group. Sonali and Rupa are in one weight-group, Rulpali and Renuka are also in one weight-group. Rupa, Radha, Renuka, Ruchika and Ritu belong to different weight-groups. Somya cannot be with Ritu and Tara cannot be with Radha. Komal cannot be with Radha, Somya, or Ritu. Shahira is in W_1 and Somya is in W_4 with Ruchika. Sweta and Jyotika cannot be with Rupali, but are in a weight-group with total membership of four. No weight-group can have more than five or less than one member. Amita, Babita, Chandrika, Deepika and Elina are instructors of weight-groups with membership sizes 5, 4, 3, 2 and 1, respectively. Who is the instructor of Radha ? (2001)

(a) Babita (b) Elina
(c) Chandrika (d) Deepika

- 180) A king has unflinching loyalty from eight of his minister M_1 to M_8 , but he has to select only four to make a cabinet committee. He decides to choose these four such that each selected person shares a liking with atleast one of the other three selected. The selected persons must also hate atleast one of the likings of any of the other three persons selected. (2001)

M_1 likes fishing and smoking, but hates gambling,

M_2 likes smoking and drinking, but hates fishing,

M_3 likes gambling, but hates smoking,

M_4 likes mountaineering, but hates drinking,

M_5 likes drinking, but hates smoking and mountaineering,

M_6 likes fishing, but hates smoking and mountaineering,

M_7 likes gambling and mountaineering, but hates fishing and

M_8 likes smoking and gambling, but hates mountaineering.

Who are the four people selected by the king?

(a) M_1, M_2, M_5, M_6 (b) M_3, M_4, M_5, M_6
(c) M_4, M_5, M_6, M_8 (d) M_1, M_2, M_4, M_7

Directions (Q.Nos. 181-182) Answer the questions based on the following information. (2001)

Elle is three times older than Yogesh. Zaheer is half the age of Wahida. Yogesh is older than Zaheer.

- 181) Which of the following can be inferred?

(a) Yogesh is older than Wahida
(b) Elle is older than Wahida
(c) Elle may be younger than Wahida
(d) None of the above

- 182) Which of the following information will be sufficient to estimate Elle's age?

(a) Zaheer is 10 yr old
(b) Both Yogesh and Wahida are older than Zaheer by the same number of years
(c) Both a and b above
(d) None of the above

- 183) While Balbir had his back turned, a dog ran into his butcher shop, snatched a piece of meat off the counter and ran out. Balbir was mad when he realised what had happened. He asked three other shopkeepers, who had seen the dog, to describe it. The shopkeepers really didn't want to help Balbir. So each of them made a statement which contained one truth and one lie.

- A. Shopkeeper number 1 said: "The dog had black hair and a long tail."
- B. Shopkeeper number 2 said: "The dog had a short tail and wore a collar."
- C. Shopkeeper number 3 said: "The dog had white hair and no collar."

Based on the above statements, which of the following could be a correct description? (2001)

- (a) The dog had white hair, short tail and no collar
- (b) The dog had white hair, long tail and a collar
- (c) The dog had black hair, long tail and a collar
- (d) The dog had black hair, long tail and no collar

- 184)** The Bannerjees, the Sharmas and the Pattabhiramans each have a tradition of eating Sunday lunch as a family. Each family serves a special meal at a certain time of day. Each family has a particular set of chinaware used only for this meal. Use the clues below to answer the following question.

- A. The Sharma family eats at noon.
- B. The family that serves fried brinjal uses blue chinaware.
- C. The Bannerjee family eats at 2 O'clock.
- D. The family that serves sambar does not use red chinaware.
- E. The family that eats at 1 O'clock serves fried brinjal.
- F. The Pattabhiraman family does not use white chinaware.
- G. The family that eats last likes makkai-ki-roti, Which one of the following statements is true?

- (a) The Bannerjees eat makkai-ki-roti at 2 O'clock, the Sharmas eat fried brinjal at 12 O'clock and the Pattabhiramans eat sambar from red chinaware
- (b) The Sharmas eat sambar served in white chinaware, the Pattabhiramans eat fried brinjal at 1 O'clock and the Bannerjees eat makkai-ki-roti served in blue chinaware
- (c) The Sharmas eat sambar at noon, the Pattabhiramans eat fried brinjal served in blue chinaware and the Bannerjees eat makkai-ki-roti served in red chinaware
- (d) The Bannerjees eat makkai-ki-roti served in white chinaware, the Sharmas eat fried brinjal at 12 O'clock and the Pattabhiramans eat sambar from red chinaware

- 185)** Mrs. Ranga has three children and has difficulty remembering their ages and the months of their birth. The clues below may help her remembers.

- A. The boy, who was born in June, is 7 yr old.
- B. One of the children is 4 yr old, but it is not Anshuman.
- C. Vaibhav is older than Suprita.
- D. One of the children was born in September, but it was not Vaibhav.
- E. Suprita's birthday is in April.
- F. The youngest child is only 2 yr old.

Based on the above clues, which one of the following statements is true ? (2001)

- (a) Vaibhav is the oldest, followed by Anshuman who was born in September and the youngest is Suprita who was born in April
- (b) Anshuman is the oldest being born in June, followed by Suprita who is 4 yr old and the youngest is Vaibhav who is 2 yr old
- (c) Vaibhav is the oldest being 7 yr old, followed by Suprita who was born in April and the youngest is Anshuman who was born in September
- (d) Suprita is the oldest who was born in April, followed by Vaibhav who was born in June and Anshuman who was born in September

Directions (Q. Nos. 186-190) Answer the questions based on the following information. (2000)

Sixteen teams have been invited to participate in the ABC Gold Cup cricket tournament. The tournament was conducted in two stages. In the first stage, the teams are divided into two groups. Each group consists of eight teams, with each team playing every other team in its group exactly once. At the end of the first stage, the top four teams from each group advance to the second stage while the rest are eliminated. The second stage comprised several rounds. A round involves one match for each team. The winner of a match in a round advances to the next round, while the loser is eliminated. The team that remains undefeated in the second stage is declared the winner and claims the Gold Cup.

The tournament rules are such that each match results in a winner and a loser with no possibility of a tie. In the first stage, a team earns one point for each win and no points for a loss. At the end of the first stage, teams in each group are ranked on the basis of total points to determine the qualifiers advancing to the next stage. Ties are resolved by a series of complex tie-breaking rules so that exactly four teams from each group advance to the next stage.

- 186)** What is the total number of matches played in the tournament?

- (a) 28
- (b) 55
- (c) 63
- (d) 35

- 187)** The minimum number of wins needed for a team in the first stage to guarantee its advancement to the next stage is
(a) 5 (b) 6 (c) 7 (d) 4
- 188)** What is the highest number of wins for a team in the first stage inspite of which it would be eliminated at the end of first stage?
(a) 1 (b) 2 (c) 3 (d) 4
- 189)** What is the number of rounds in the second stage of the tournament?
(a) 1 (b) 2 (c) 3 (d) 4
- 190)** Which of the following statements is true?
(a) The winner will have more wins than any other team in the tournament
(b) At the end of the first stage, no team eliminated from the tournament will have more wins than any of the teams qualifying for the second stage
(c) It is possible that the winner will have the same number of wins in the entire tournament as a team eliminated at the end of the first stage
(d) The number of teams with exactly one win in the second stage of the tournament is

Directions (Q. Nos. 191-193) Answer the questions based on the following information. (1999)

Recently, Ghosh Babu spent his winter vacation on Kya-kya Island. During the vacation, he visited the local casino where he came across a new card game. Two players, using a normal deck of 52 playing cards, play this game. One player is called the 'dealer' and the other is called the 'player'. First, the player picks a card at random from the deck. This is called the base card. The amount in rupees equal to the face value of the base card is called the base amount. The face values of ace, king, queen and jack are ten. For other cards the face value is the number on the card. Once the 'player' picks a card from the deck, the 'dealer' pays him the base amount. Then, the dealer picks a card from the deck and this card is called the top card. If the top card is of the same suit as the base card, the 'player' pays twice the base amount to the 'dealer'. If the top card is of the same colour as the base card (but not the same suit), then the 'player' pays the base amount to the 'dealer'. If the top card happens to be of a different colour than the base card, the 'dealer' pays the base amount to the 'player'.

Ghosh Babu played the game four times. First time he picked eight of clubs and the 'dealer' picked queen of clubs. Second time, he picked ten of hearts and the 'dealer' picked two of spades. Next time, Ghosh Babu picked six of diamonds and the 'dealer' picked ace of hearts. Lastly, he picked eight of spades and the 'dealer' picked jack of spades. Answer the following questions based on these four games.

- 191)** If Ghosh Babu stopped playing the game when his gain would be maximised, the gain in ₹ would have been
(a) 12 (b) 20 (c) 16 (d) 4
- 192)** If the final amount of money that Ghosh Babu had with him was ₹ 100, what was the initial amount he had with him?
(a) 120 (b) 8 (c) 4 (d) 96
- 193)** The initial money Ghosh Babu had (before the beginning of the game sessions) was ₹ X . At no point did he have to borrow any money. What is the minimum possible value of X ?
(a) 16 (b) 8
(c) 100 (d) 24

Directions (Q. Nos. 194-197) Answer the questions based on the following information. (1998)

A, B, C and D are to be seated in a row. But C and D cannot be together. Also B cannot be at the third place.

- 194)** Which of the following must be false?
(a) A is at the first place
(b) A is at the second place
(c) A is at the third place
(d) A is at the fourth place
- 195)** If A is not at the third place, then C has which of the following option?
(a) The first place only
(b) The third place only
(c) The first and third place only
(d) Any of the places
- 196)** If A and B are together, then which of the following must be necessarily true?
(a) C is not at the first place
(b) A is at the third place
(c) D is at the first place
(d) C is at the first place
- 197)** P, Q, R and S are four statements. Relation between these statements is as follows
A. If P is true, then Q must be true.
B. If Q is true, then R must be true.
C. If S is true, then either Q is false or R is false.
Which of the following must be true?
(a) If P is true, then S is false
(b) If S is false, then Q must be true
(c) If Q is true, then P must be true
(d) If R is true, then Q must be true

Directions (Q. Nos. 198-201) *Answer the questions based on the following information.* (1998)

Mr. Bankatlal acted as a judge for the beauty contest. There were four participants, viz. Ms. Andhra Pradesh, Ms. Uttar Pradesh, Ms. West Bengal and Ms. Maharashtra, Mrs. Bankatlal, who was very anxious about the result asked him about it as soon as he was back home. Mr. Bankatlal just told that the one who was wearing the yellow saree won the contest. When Mrs. Bankatlal pressed for further details, he elaborated as follows

- A. All of them were sitting in a row.
- B. All of them wore sarees of different colours, viz. green, yellow, white, red.
- C. There was only one runner-up and she was sitting beside Ms. Maharashtra.
- D. The runner-up was wearing the green saree.
- E. Ms. West Bengal was not sitting at the ends and was not the runner up.
- F. The winner and the runner-up are not sitting adjacent to each other.
- G. Ms. Maharashtra was wearing white saree.
- H. Ms. Andhra Pradesh was not wearing the green saree.
- I. Participants wearing yellow saree and white saree were at the ends.

198) Who wore the red saree?

- (a) Ms. Andhra Pradesh
- (b) Ms. West Bengal
- (c) Ms. Uttar Pradesh
- (d) Ms. Maharashtra

199) Ms. West Bengal was sitting adjacent to

- (a) Ms. Andhra Pradesh and Ms. Maharashtra
- (b) MS. Uttar Pradesh and Ms. Maharashtra
- (c) Ms. Andhra Pradesh and Ms. Uttar Pradesh
- (d) Ms. Uttar Pradesh only

200) Which saree was worn by Ms. Andhra Pradesh?

- (a) Yellow (b) Red (c) Green (d) White

201) Who was the runner-up?

- (a) Ms. Andhra Pradesh
- (b) Ms. West Bengal
- (c) Ms. Uttar Pradesh
- (d) Ms. Maharashtra

Directions (Q. Nos. 202-205) *Answer the questions based on the following information.* (1995)

Four sisters-Suvarna, Tara, Uma and Vibha are playing a game such that the loser doubles the money of each of the other players from her share. They played four games and each sister lost one game in alphabetical order. At the end of fourth game, each sister had ₹ 32.

202) How many rupees did Suvarna start with?

- (a) ₹ 60 (b) ₹ 34 (c) ₹ 66 (d) ₹ 28

203) Who started with the lowest amount?

- (a) Suvarna (b) Tara (c) Uma (d) Vibha

204) Who started with the highest amount?

- (a) Suvarna (b) Tara (c) Uma (d) Vibha

205) What was the amount with Uma at the end of the second round?

- (a) 36 (b) 72
- (c) 16 (d) None of these

Directions (Q. Nos. 206-209) *Answer the questions based on the following information.* (1994)

A, B, C, D, E, F and G are brothers. Two brothers had an argument and A said to B, "You are as old as C was when I was twice as old as D and will be as old as E was when he was as old as C is now." B said to A, "You may be older than E" but G is as old as I was when you were as old as G is and D will be as old as F was when F will be as old as G is."

206) Who is the eldest brother?

- (a) A (b) E
- (c) C (d) Cannot be determined

207) Who is the youngest brother?

- (a) B (b) D
- (c) F (d) Cannot be determined

208) Which two are probably twins?

- (a) D and G
- (b) E and C
- (c) A and B
- (d) Cannot be determined

209) Which of the following is false?

- (a) G has four elder brothers
- (b) A is older than G but younger than E
- (c) B has three elder brothers
- (d) There is a pair of twins among the brothers

Directions (Q. Nos. 210-212) *Answer the questions based on the following information.* (1994)

Five of India's leading models are posing for a photograph promoting 'Y' know, world peace and understanding. But then Rakesh Shreshtha, the photographer; is having a tough time getting them to stand in a straight line, because Aishwarya refuses to stand next to Sushmita for Sushmita has said something about her in a leading gossip magazine. Rachel and Anu want to stand together because they are 'such good friends, Y'know'. Manpreet on the other hand cannot get

along well with Rachel, because there is some talk about Rachel scheming to get a contract already awarded to Manpreet. Anu believes her friendly astrologer who has asked her to stand at the extreme right for all group photographs. Finally, Rakesh managed to pacify the girls and got a beautiful picture of five girls smiling in a straight line, promoting world peace.

210) If Aishwarya is standing to the extreme left, who is standing in the middle?

- (a) Manpreet (b) Sushmita
(c) Rachel (d) Cannot say

211) If Aishwarya stands to the extreme left, who stands second from left?

- (a) Cannot say (b) Sushmita
(c) Rachel (d) Manpreet

212) If Anu's astrologer tells her to stand second from left and Aishwarya decides to stand second from right, then who is standing on the extreme right?

- (a) Rachel (b) Sushmita
(c) Cannot say (d) Manpreet

Directions (Q. Nos. 213-216) Answer the questions based on the following information. (1994)

A leading socialite decided to organise a dinner and invited a few of her friends. Only the host and the hostess were sitting at the opposite ends of a rectangular table, with three persons along each side. The prerequisite for the seating arrangement was that each person must be seated such that atleast on one side it has a person of opposite sex. Maqbool is opposite of Shobha, who is not the hostess. Ratan has a woman on his right and is sitting opposite of a woman. Monisha is sitting to the hostess's right, next to Dhirubhai. One person is seated between Madhuri and Urmila, who is not the hostess. The men were Maqbool Ratan, Dhirubhai and Jackie, while the women were Madhuri, Urmila, Shobha and Monisha.

213) The eighth person present, Jackie, must be

- I. the host
II. seated to shobha's right.
III. seated opposite of Urmila

- (a) Only I (b) Only III
(c) I and II (d) II and III

214) Which of the following persons is definitely not seated next to a person of the same sex?

- (a) Maqbool (b) Madhuri
(c) Jackie (d) Shobha

215) If Ratan would have exchanged seats with a person four places to his left, which of the following would have been true after the exchange?

I. No one was seated between two persons of the opposite sex (e.g., no man was seated between two women.)

II. One side of the table consisted entirely of persons of the same sex.

III. Either the host or the hostess changed their seats.

- (a) Only I (b) Only II
(c) I and II (d) II and III

216) If each person is placed directly opposite of her spouse, which of the following pairs must be married?

- (a) Ratan and Monisha
(b) Madhuri and Dhirubhai
(c) Urmila and Jackie
(d) Ratan and Madhuri

217) John bought five mangoes and ten oranges together for forty rupees. Subsequently, he returned one mango and got two oranges in exchange. The price of an orange would be (1993)

- (a) 1 (b) 2 (c) 3 (d) 4

218) Amar, Akbar and Anthony came from the same public school in the Himalayas. Every boy in that school either fishes for trout or plays frisbee. All fishermen like snow, while no frisbee player likes rain. Amar dislikes whatever Akbar likes and likes whatever Akbar dislikes. Akbar likes rain and snow. Anthony likes whatever the other two like. Who is a fisherman but not a frisbee player? (1993)

- (a) Amar (b) Akbar
(c) Anthony (d) None of these

Directions (Q. Nos. 219-222) Answer the questions based on the following information. (1993)

"Kya-Kya" is an island in the South Pacific. The inhabitants of 'Kya-Kya' always answer any question with two sentences. One of which is always true and the other always false.

219) You are walking on a road and come to a fork. You ask the inhabitants Ram, Laxman and Lila, "Which road will take me to the village?"

Ram says, "I never speak to strangers, I am new to these parts".

Laxman says, "I am married to Lila. Take the left road."

Lila says, "I am married to Ram. He is not new to this place."

Which of the following is true?

- (a) Left road takes you to the village
- (b) Right road takes you to the village
- (c) Lila is married to Laxman
- (d) None of the above

- 220)** You find that your boat is stolen. You question three inhabitants of the island and they reply as follows

John says, "I didn't do it. Mathew didn't do it."

Mathew says, "I didn't do it. Krishna didn't do it."

Krishna says, "I didn't do it. I don't know who did it."

Who stole your boat?

- (a) John
- (b) Mathew
- (c) Krishna
- (d) None of them

- 221)** You want to speak to the chief of the village. You question three inhabitants, Amar, Bobby and Charles. Only Bobby is wearing red shirt.

A. Amar says, "I am not Bobby's son. The chief wears a red shirt."

B. Bobby says, "I am Amar's father, Charles is the chief."

C. Charles says, "The chief is one among us. I am the chief."

Who is the chief?

- (a) Amar
- (b) Bobby
- (c) Charles
- (d) None of them

- 222)** There is only one pilot on the island. You interview three men-Koik, Lony and Mirna. You also notice that Koik is wearing a cap.

A. Mirna says, "Lony's father is the pilot. Lony is not the priest's son."

B. Koik says, "I am the priest. On this island, only priests can wear caps."

C. Lony says, "I am the priest's son. Koik is not the priest."

Which of the following is true?

- (a) Lony is not Koik's son
- (b) Koik is the pilot
- (c) Mirna is the pilot
- (d) Lony is the priest

Directions (Q. Nos. 223-226) Read the text and the statements carefully and answer the questions. (1993)

Four people of different nationalities live on the same side of a street in four houses each of different colour. Each person has a different , favourite drink. The following additional information is also known

- A. The Englishman lives in the red house.
- B. The Italian drinks tea.
- C. The Norwegian lives in the first house on the left.
- D. In the second house from the right they drink milk.
- E. The Norwegian lives adjacent to the blue house.
- F. The Spaniard drinks fruit juice.
- G. Tea is drunk in the blue house.
- H. The white house is to the right of the red house.
- I. Coca is drunk in the yellow house.

- 223)** Milk is drunk by

- (a) Norwegian
- (b) Englishman
- (c) Italian
- (d) None of them

- 224)** The Norwegian drinks

- (a) milk
- (b) coca
- (c) tea
- (d) fruit juice

- 225)** The colour of the Norwegian's house is

- (a) yellow
- (b) white
- (c) blue
- (d) red

- 226)** Which of the following is not true?

- (a) Milk is drunk in the red house
- (b) Italian lives in the blue house
- (c) The Spaniard lives in a corner house
- (d) The Italian lives next to the Spaniard

HINTS & SOLUTIONS

- 1) (a) All the sixteen cubes there on the boundary of this block will have atleast sides painted.
- 2) (d) Twenty four smaller cubes will be formed.
- 3) (d) A total of twenty cubes will be left, if cubes with black as well as green colours are removed.
- 4) (b) All the four cubes present on the corners will have four surfaces painted and two surfaces unpainted.
- 5) (d) We cannot find a definitely answer to this question because the solution give rise to multiple overlapping.
- 6) (c) Looking at the elective D, total number of points scored = 4 points and the number of students = 3. Since, the range of the points obtained is 1-2, hence the maximum 2 points can be obtained by only one students and remaining two students are getting one mark each.
- 7) (d) In this question, atleast one student is going to be overlapped. And without knowing the score of this student (or other overlapped students if any), we cannot find the average score of elective N. Hence, cannot be determined.
- 8) (a) Total points obtained by the students of elective

$$A = 21$$

Total points obtained by the students of elective $B = 9$

Total points obtained by the students of elective

$$A + B = 30$$

Total number of students = 9

$$\text{Hence, required average} = \frac{30}{9} = \frac{10}{3}$$

- 9) (c) If Prince D wins the competition and married the princess and Prince B scores 28 points from the given 5 rounds, then the table will be as given below

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
A	9	4	8	2	3	26
B	7	2	3	9	7	28
C	2	9	4	8		
D	4	6	9	5	8	32
E		3			9	

If A has scored even points in the 2nd and the 4th rounds and the score of D should be 32 (i.e. 6 more than A). And in this case D has to score 9 points in the 3rd round.

Options (a), (b) and (d) will definitely be true for all cases. Only option (c) could be false.

- 10) (c)

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
A	9	8	8	6	3	34
B	7	2	3	9	7	29
C	2	9	4	8	4	27
D	4	6	5	5	8	28
E		3			9	

Since, the total points scored by D are 28; so A will score a total of 34 points. So, he must have scored 8 points in the 2nd round and 6 points in the 4th round. Also, Prince C has scored a total of 27 points. Hence, Prince B must score 29 points (as there are no ties) so B scores 8, 9, 7 points respectively from the 1st, 4th and the 5th rounds. As it can be clearly seen from the table that C is fourth or fifth even though we do not know about E's score.

- 11) (b) According to Statement I, Prince C can score a maximum of 5 points in the 5th round which make his total points 28. As Prince B can score a maximum of 29 points and C's score is always less than B's score we get table as given below

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
A	9		8	6		
B	8	2	3	9	7	29
C	2	9	4	8	5	28
D	4	6		5	8	
E		3	2		9	

According to Statement II, D scores the maximum possible point which is 9 in the 3rd round. Then, his total will be 32. Also, E can score a maximum of 28 points if he scores 7 points each in the 1st and the 4th rounds. A cannot score 38 points as to score 18 more points is impossible. So, D will always be the winner with a total of 32 points.

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
A	9		8		3	26
B	8	2	3	9	7	29 (max)
C	2	9	4	8	4	28 (max)
D	4	6	9	5	8	32
E	7	3	2	7	9	28

Hence, Statement II alone is sufficient to answer the question.

12) (d)

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
A	9		8		3	26
B	8	2	3	9	7	29 (max)
C	2	9	4	8	5	28 (max)
D	4	6		5	8	32
E	7	3		7	9	

The minimum score required by E to win is 33 points. When Prince C scores 5 points in the 5th round, then the total points scored by him are 28. So, Prince B must score more than 28 points. But taking into consideration the given table, Prince B can score a maximum of 29 points if he scores 8, 9, 7 points in the 1st, 4th and the 5th rounds, respectively. But, one among D and A will atleast score 32. And E can score a maximum (for the 3rd round to be minimum) of 7 points each in the 1st and the 4th rounds. So, the least possible points scored by Prince E in the 3rd round = $33 - (7 + 3 + 7 + 9) = 7$, which makes his total score as 33.

Solutions (Q. Nos. 13-16) Activity and time of all males, females and kids shown in the table given below

	N1	Skating			N2	Softball			N3	Steam bath		
		In time	Entry	Exit		In time	Entry	Exit		In time	Entry	Exit
Males	200	7 : 30	7 : 30	9 : 00	100	9 : 00	9 : 00	10 : 15	20	10 : 15	10 : 15	10 : 35
									5	10 : 15	10 : 35	10 : 55
	50	8 : 30	8 : 30	9 : 30	20	9 : 30	9 : 30	10 : 10				
					10	9 : 30	10 : 10	10 : 50	10	10 : 10	10 : 10	10 : 25
Females					10	10 : 00	10 : 00	10 : 50	5	10 : 50	10 : 50	11 : 05
	110	8 : 30	9 : 00	10 : 00					5	10 : 50	10 : 50	11 : 05
					56	10 : 00	10 : 15	10 : 55				
									20	10 : 55	10 : 55	11 : 10
									8	10 : 55	11 : 05	11 : 20
Kids		9 : 00	9 : 30	10 : 00	44	10 : 00	10 : 15	11 : 45				
	90				1	10 : 00	10 : 50	12 : 20				
	50	9 : 00	9 : 30	10 : 30	19	10 : 30	10 : 50	12 : 20				
					6	10 : 30	10 : 55	12 : 25				
	80	9 : 00	10 : 00	11 : 00	40	11 : 00	11 : 00	12 : 30				

13) For 40 children (at the bottom of the table) the waiting time is zero.

14) A total of 20 males go through all the three centres in the minimum possible time. At 7:30 am, they enter the centre and at 10 : 35 am they exit from the steam bath centre.
Hence, 10% of the males took the minimum possible time.

15) A total of 10 women took the minimum time (at 8 : 30 am they enter and at 10 : 25 am they exit from the steam bath centre). Similarly 8 females took the maximum time (at 8:30 am they entered whereas at 11:20 am they exit from the steam bath centre). So, the difference between the maximum and the minimum is $10 - 8 = 2$.

16) At 9 : 00 am all the males will be out of the skating centre and the only people inside the centres will be females. The total number of females inside the skating activity centre at 9 : 00 am = 160.
Hence, 90 more members can be accommodated inside. So, $(220 - 90) = 130$ children will be waiting.

Solutions (Q. Nos. 17-20) *On the basis of given information, the arrangement is as follows*

Islands	Post office	School	Accessibility by bridge	Electricity	Population		
A	✓	•			>5000	2000 to 5000	<2000
B	✓	✓	✓	✓	✓		•
C						✓	
D		✓	✓	✓	✓		
E		✓					✓
Total		✓	✓	2	2	2	1

17) (b) From the table that island B has a school and a post office.

18) (c) From the table that island C does not have any of the facilities available to other Islands.

19) (c) From the table that islands B and D have electricity.

20) (a) From the table that islands A, B and D can be accessed by bridge.

Solutions (Q. Nos. 21-24) Eeshwar is the eldest; Amit > Bharat; Chandan > Dinesh and Dinesh < Ferguson < Bharat or Bharat < Ferguson < Dinesh

Now, the following possible arrangement can be attained

	22	21	20	19	18	17
1	Eeshwar	Amit	Bharat	Ferguson	Chandan	Dinesh
2	Eeshwar	Amit	Bharat	Chandan	Ferguson	Dinesh
3	Eeshwar	Amit	Chandan	Bharat	Ferguson	Dinesh
4	Eeshwar	Chandan	Amit	Bharat	Ferguson	Dinesh
5	Eeshwar	Chandan	Dinesh	Ferguson	Amit	Bharat
6	Eeshwar	Chandan	Dinesh	Amit	Ferguson	Bharat
7	Eeshwar	Chandan	Amit	Dinesh	Ferguson	Bharat
8	Eeshwar	Amit	Chandan	Dinesh	Ferguson	Bharat

21) (d) From the above arrangement, we see that Dinesh can be 20 yr of age [(5), (6)], Ferguson can be 18 yr old [(2), (3), (4), (6), (7), (8)] and Ferguson can also be 19 yr old [(1), (5)]. However, Ferguson can never be 20 yr old. Hence, option (d) is correct.

22) (b) If Bharat is 17 yr old, then possible arrangements are (5), (6), (7) and (8).
From the options, we can see that the only possible answer is (b).

23) (d) There are two cousins between Chandan and Ferguson in age reference [(4), (6) and (7)]. In all the cases, we have Ferguson's age as 18 yr.

24) (a) Amit is one year elder than Chandan in only two arrangements (3) and (8). Hence, option (a) is correct.

Solutions (Q. Nos. 25-28) *As per the question the following data is available to us*

Ant A climbs 3 inch/min; ant B climbs 4 inch/min; ant A slips back 1 inch for every 2 inch climbed; ant B slips back 1.5 inch for every 2 inch climbed.

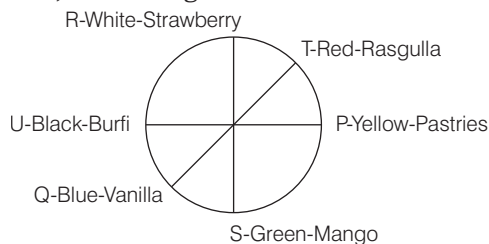
Ant A takes a rest break of 1 min after every 2 min.
Ant B takes a rest break of 1 min after every 3 min.

After minutes				
	1	2	3	4
	5	6	7	8
	9	10	11	12
Ant A	2"	3"	3"	5"
	6"	6"	8"	9"
	9"	11"	12"	12"
Ant B	1"	2"	3"	3"
	4"	5"	6"	6"
	7"	8"	9"	9"

After minutes				
	1	2	3	4
	5	6	7	8
	9	10	11	12
Ant A	2"	3"	3"	5"
	6"	6"	8"	9"
	9"	11"	12"	12"
Ant B	1"	2"	3"	4"
	5"	6"	7"	8"
	9"	10"	11"	12"

- 25) From the above table, it is clear that the ants meet each other at 3 inch.
- 26) The widest gap between the two ants within first 10 min is 3 inch.
- 27) If ant B does not have any period at rest, then both the ants meet 3 times in first 10 min.
- 28) When ant A reaches a height of 12 inch on the wall, then ant B is 3 inch behind ant A.

Solutions (Q. Nos. 29-30) *On the basis of given information, the arrangement as below.*



- 29) (d) Clearly, the person T eats rasgulla.
- 30) (a) Clearly, Q ordered for vanilla and wears blue colour shirt.

Solutions (Q. Nos. 31-34)

We know that Amol, Shashi, Mandar and Reena received the video game, perfume, calculator and sunglasses,

respectively. This means that Piyu received the sweater and we can then conclude that she gifted the jacket.

Since, Mandar did not gift an electronic item, he could have gifted the fountain pen, the shirt or the jacket. But we know that, the shirt and the jacket were gifted by Amol and Piyu, respectively. So, Mandar must have gifted the fountain pen.

We still need to figure out who gifted the cellphone and the I-Pod. Since, we know that Shashi did not gift the I-pod, Reena must have gifted the I-Pod and Shashi must have gifted the cellphone. We can now match the friend's name with the gift given and the gift received as given in the table below.

Friends	Gifted to Sagar	Return gifts from Sagar
Amol	Shirt	Video game
Mandar	Fountain pen	Calculator
Piyu	Jacket	Sweater
Shashi	Cellphone	Perfume
Reena	I-Pod	Pair of sunglasses

- 31) (d) Piyu gifted the jacket.
- 32) (a) Amol and Mandar gifted the shirt and the fountain pen respectively (non-electronic items) and received the video game and the calculator, respectively (electronic items).
- 33) (c) Reena gifted the I-Pod and received the pair of sunglasses in return.
- 34) (c) Only Amol and Mandar received electronic items. So, option (a) is true. Shashi gifted the cellphone and received the perfume. So, option (b) is true. Reena gifted the I-Pod and in alphabetical order, she would not appear second last. So, option (c) is not true. In alphabetical order, Piyu appears in the middle and she gifted the jacket and received the sweater in return. So, option (d) is true.

Solutions (Q. Nos. 35-38) *In such questions, it is best to analyse the case without looking at the questions asked. Here is a sample of such an analysis.*

What is our objective To buy the neighbouring cloth store.

Major factors Purchase price, the spending on repairs or modifications

(Don't bother too much about minor factors, whatever is not major is minor).

Major assumptions Our patients would not want to go to outside labs for their tests.

The patient population around the clinic will continue to reside there.

- 35) (d) From our list, we understand that it is one of the assumptions as he saw a potential increase in his clientele and wanted to cater to this new population.
- 36) (a) If we check with our list, we see that this is an assumption, since we have no clear way of forecasting or controlling this fact, yet it is still important.
- 37) (b) Checking from our list, this is indeed the purpose of this case. Hence, it is a major factor.
- 38) (c) The state of the business does not matter, since the key factor is whether Hill wants to sell or not. Therefore, it is minor factor.

Solutions (Q. Nos. 39-42)

If we consider first statement made by John to be false, then the yellow ball is in box 2. Therefore, his second statement is true and the red ball is in box 1. Also, since the yellow ball is in box 2, Jani's first statement is true and so his second statement has to be false. So, the green ball is in box 3. Following this arrangement, we can see that Janardhan's first statement is true and second statement is false, which satisfies our required condition. So, red in box 1, yellow in box 2 and green in box 3 is one probable arrangement.

Now, if we consider the first statement made by John to be true, then yellow ball can be in box 1 or box 3 and the red ball is in box 2 or box 3. This makes Janardhan's second statement true and first statement false, which means that the green ball is in box 2 or box 3. So, the possible combinations are

	Combination 1	Combination 2
Box 1	Yellow	Yellow
Box 2	Red	Green
Box 3	Green	Red

However, for combination 1 both of Janardhan's statements are true and for combination 2, both of Jani's statements are true, which is not possible. So, the only possible combination is

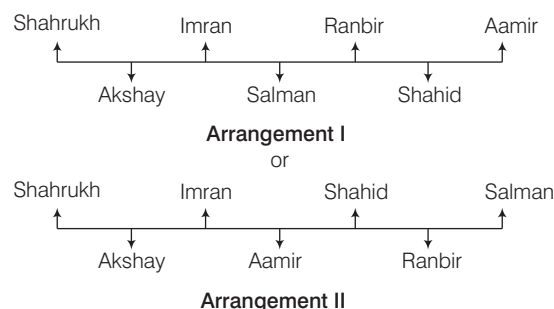
Box 1	Red
Box 2	Yellow
Box 3	Green

- 39) (a) Box 1 contains the red ball.
- 40) (b) Yellow ball is in box 2.
- 41) (c) If we consider all three friend's statement, we will see that Jani's both statements are false.
- 42) (d) If we consider the first statement made by Jani to be true, then the yellow ball is in box 1 or box 2. Now, if we consider John's first statement to be false, which mean yellow ball is in box 2 and red ball is in box 1 and green ball is in box 3, which makes

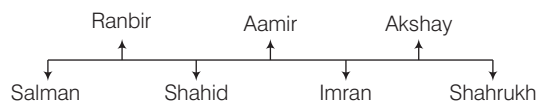
Janardhan's first statement true and second false. So, this can be one of the combinations.

Now, if we consider John's first statement to be true, which means that yellow ball is in box 1 and red ball is in box 2 or box 3. This makes Janardhan's second statement true and so green ball is in box 2 and red ball in box 3, which is the second combination. So, there are 2 possible combinations. Hence, option (d) is correct.

Solutions (Q. Nos. 43-46) *On the basis of given information, there can be many arrangements. Two of them are given below*



- 43) (c) From the all possible arrangement, we can find that Shahrukh and Shahid can never occupy adjacent chair as Shahid is always between Aamir and Ranbir.
- 44) (b) If Ranbir is 3 places to the right of Imran, then arrangement II will follow. Thus, Aamir will be 2 places to the left of Akshay.
- 45) (b) If Akshay is 3 places to the left of Shahid, Shahrukh and Salman can occupy the corner positions.
- 46) (d) None of the persons has fixed position. If you have confusion with the position of Imran, consider the following arrangement.



Solutions (Q. Nos.47-49) *The table can be completed as*

Teams	W	D	L	P
Red backs	2	1	1	7
Warriors	0	2	2	2
Royals	0	1	3	1
Dare devils	3	1	0	10
Chargers	2	1	1	7

So, from above table,

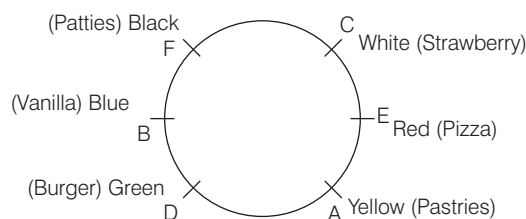
- 47) (c) Red backs have won two matches, and Dare devils haven't lost a match so option (a) and (b) are ruled out warriors and Royals have lost 2 or more matches so. Red backs have beaten Warriors and Royals.
- 48) (b) Warriors drew two matches which can be with Royals and Dare devils as they lost to Red backs.
- 49) (a) Warriors has the highest number of draws.
- 50) (d) It is given that Yuvan and Aiyaz should be selected together and Nishita and Durga cannot represent the same committee (because both have to be Sports Head). Hence, option (a) cannot be the right answer.
Vyoma and Durga cannot represent the same committee and also Swami and Durga cannot represent the same committee but Durga, Aiyaz and Yuvan should always be in the same committee. Hence, we cannot remove a single person from option (b) or option (c) to form a committee, so both the options are incorrect.
In option (d), we can remove either Swami or Jia to form a perfect committee that satisfies all the requirements. Hence, option (d) is the correct answer.
- 51) (b) Only three committees can be formed which satisfy all the given conditions.
1. Nishita – Sports Head, Balwindar – Treasurer, Swami – Magazine Head, Aahan – General Secretary.
2. Nishita – Sports Head, Balwindar – Treasurer, Jia – Magazine Head, Aahan – General Secretary.
3. Durga – Sports Head, Jia – Treasurer, Aiyaz – Magazine Head, Yuvan – General Secretary.
Among all the three committees, Aiyaz and Swami are always the Magazine Heads whenever they are selected. Since, Swami is not in the options, the correct answer is Aiyaz.
- 52) (a) As explained in the solution for the previous question we can form only three committees that satisfy all the given conditions. The candidate Vyoma is not present in any of the three committees.

Solutions (Q. Nos. 53-55) *Following table can be drawn from the given information.*

	Ajay	Balram	Chetak	Dhiraj	Month
Madonna	✗	✗	✓	✗	October
Lopez	✗	✗	✗	✓	December
Kate	✗	✓	✗	✗	September
Phirangi	✓	✗	✗	✗	November
Country	Atlanta	Beijing	Indonesia	Frankfurt	

- 53) (d) From the table, Ajay's fashion show was held in Atlanta in the month of November.
- 54) (d) From the table, Balram's show was held in September.
- 55) (a) From the table, the Madonna show was held in Indonesia.

Solutions (Q. Nos. 56-58) *From the given information, following pairs and arrangement is formed*



- 56) (d) Clearly, A is between E and D who is wearing T-shirt of Yellow colour.
- 57) (c) Clearly, E - Red - Pizza is a correctly matched pair.
- 58) (d) Clearly, F has ordered Patties and is wearing Black T-shirt.

Solutions (Q. Nos. 59-62) Given that,

A, E, G	Doctors
D, H, J	Lawyers
B, I	Engineers
C, F	Managers

Every team must have persons of each of the professions.

∴ One team will have one manager, one engineer, two lawyers and one doctor and the other team will have one manager, one engineer, one lawyer and two doctors.

J cannot be in a team with two doctors, so he must be in team with two lawyers.

∴ The other lawyer with him can be D or H.

∴ I will be in the other team and B will be in the same team.

H	DJ
I	B
or	
D	HJ
I	B

Now, A and D cannot be together and C and H cannot be together. The following cases are possible

A, G/E	E/G	Doctor
H	DJ	Lawyer
I	B	Engineer
F	C	Manager
or		
EG	A	Doctor
D	HJ	Lawyer
I	B	Engineer
C	F	Manager

59) (d) C and G are in different teams, hence the other team members of A must be H, G, I and F.

60) (b) I and J cannot be in the same team.

61) (c) H must be in the same team as A.

62) (c) Of the given statements, only option (c) is true.

Solutions (Q. Nos. 63-66) We follow the following convention

M Mother, S Sister

B Brother, F Father

63) (a) The mothers are in one canoe.

The fathers are in two different canoes. Also, the brothers are in three different canoes.

∴ There has to be one sister each with the fathers.

∴ The three canoes have MMB, FBS and FBS.

∴ Statement I is true.

64) **53.** (b) Ellen and Susan are from one family. Since, atleast one person from each family must be in each canoe, Kate and Jerome are not together and are in the remaining two canoes.

∴ Options (a) and (d) are eliminated. Option (c) is eliminated as there is no parent. Option (b) satisfies all the conditions.

65) (b) Jerome and Mary are parents and are in one canoe.

∴ Robert and Ellen are not together and are in different canoes.

∴ Option (b) is not possible.

66) (d) Only children cannot ride together.

∴ Statement I is true. The Penick parents can ride together with one Henderson boy. In each of the other two boats, there will be one Henderson parent, one Penick sister and one Henderson boy.

∴ Statement II is false. The Henderson parents cannot ride together as their canoe will then have no Penick member.

∴ Statement III is true.

Solutions (Q. Nos. 67-69) From statements 1, 2, 3, 4 and 5, we can fill up the following

	A	B	C	D	E
Car			Mercedes	Fiat	
Colour		Green			

We have used all the information given and hence we can now start answering the questions.

67) (a) If A owns a Blue Sierra, then B owns Audi (because E cannot own Audi) and hence E owns a Maruti. Similarly, if A's car is Blue, then E's car will be Red or Black. Hence, E will have Red Maruti or Black Maruti.

68) (d) If A owns White Audi, then E will own Sierra (because B cannot own a Sierra). Only choice (d) has Sierra. (also note that if A owns a White car, then the colour of E's car can be Blue, Red or Black).

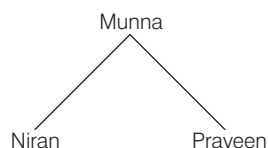
69) (b) If A's car is Maruti, then E can own only a Sierra. If A's car is red and D's while, then E can own only a Blue car (because C's car cannot be Blue). Hence, E has a Blue Sierra.

Solutions (Q. Nos. 70-72)

The persons who copied from Munna cannot leave any blanks in their answer choices.

∴ The persons that copied from Munna must be among Niran, Praveen, Rahul and Sastry.

The persons who copied from Munna must have only one different answer compared to Munna, but Rahul has different answer for questions III and IV, when compared to Munna. Similarly, Sastry also has two different answers compared to Munna, hence Niran and Praveen are the only persons copied from Munna.



If we compare the answer choices marked by all the person for I question, only Chinky marked a different answer. Hence, we can conclude that no body has copied the answer key from Chinky.

Similar, is the case for Arun for IV question, Ritesh for V question and Jassi for IX question.

∴ No body copied answer choices from Arun, Chinky, Ritesh or Jassi, Praveen introduced a wrong answer choice 'C', for IX question but none of Rahul, Sastry, Jassi has left it blank or marked it as C. ∴ These persons did not copy from Praveen' and they also did not copy from a person who copied from Praveen. So all the three of them either copied from Niran or from a person, who copied from Niran.

If we compare answer choices of Rahul and Niran, only one choice is different.

Jassi left the II question as blank, which is marked by all other persons as 'A' except Rahul, who marked it as 'C'.

∴ Jassi copied from Rahul and one other questions are matched for that two person.

∴ The two persons must be Niran and Rahul. Lucky left only two questions as blank, which means the answer choice of all the other questions marked by both the persons is same. This happened only for Niran and Praveen.

Chinky and Arun should have Sastry as one of the persons they copied from as in other case they would have not left VII question blank, Chinky left VIII question blank,

∴ The other person that he has copied from must be Lucky.

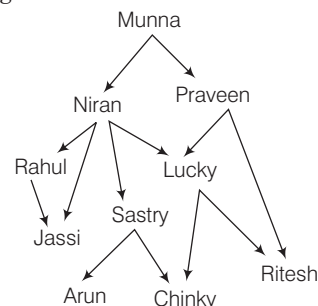
Arun left IX question blank,

∴ He should have copied from (Sastry and Praveen) or (Sastry and Lucky) i.e. questions.

∴ If he copies from Sastry and Lucky, he could not have marked 'a' for question X.

∴ So, he copied from Sastry and Praveen.

∴ The final diagram is as follows



70) (b) Munna is the Jigri of Niran and Praveen.

71) (a) No body has Jassi as Jigri.

72) (c) Chinky has Sastry and Lucky as Jigris.

Solutions (Q. Nos. 73-75)

From the given conditions, from (a) to (e), we can formulate a table as given below, which describes the persons speaking a particular language. Any name enclosed within a circle suggests that the mother-tongue of the person is the same as the heading.

Gujarati	Tamil	Bengali
A	A	A
C	C	B
	D	F
E	G	E

I. It is worth while to remember that Bengalis and Tamilians refuse to share room.

II. Also, each participant in a room must be able to converse with atleast one other participant in the same room, in any language.

73) (d) Verify each choice as per the given table and rules

(i) and (ii) given above

(1) B, C, F : B and F speak only Bengali and C does not, thus C cannot converse with any of them. Hence, incorrect.

(2) C, D, F G : Although C, D and G can converse with each other but none of these can converse with F, who speaks only Bengali. Hence, incorrect.

(3) A, D, E, G : It is not possible, since B, C, F who will have to be in the other room is already shown to be not possible in Choice (a).

(4) D, G, C, E : C can speak to D and G in Tamil and to E in Gujarat. This is a possible combination where B, F, A are in the other room and room and they can all speak in Bengali.

- 74) (c) Various combinations are as below (G-Gujarati; T-Tamil; B-Bengali)

Room 1			
	Gujarati	Tamil	Bengali
(i)	A	D, G	—
(ii)	A	—	B, F
(iii)	A, C	D, G	—
(iv)	A, E	—	B, F
Room 2			
	Gujarati	Tamil	Bengali
	C, E	—	B, F
	C, E	D, G	—
	E	—	B, F
	C	D, G	—

- 75) (c) H cannot (total number of arrangement = 4) be placed with B, E and F (as per choice (c)), because H is a Tamilian and B, F are Bengalis, which violates condition F.

Solutions (Q. Nos. 76-77) *The following information is given*

- (i) Chennai → Pune = ₹ 1650
 (ii) Taj Mahal Express = Delhi → Mumbai
 (iii) Bengaluru → Agra = (Taj Mahal Express) fare
 $- 750 = x - 750$
 (iv) (Rajdhani Express) fare = (Taj Mahal Express) fare
 $- 150 = x - 150$

From the above information, we have the following table

Train	From	To	Fare
Rajdhani Express	Chennai	Pune	1650
Shatabadi Express	Bengaluru	Agra	$x - 750 = 1050$
Taj Mahal Express	Delhi	Mumbai	x

Also, from (i), $x - 150 = 1650$

$$\Rightarrow x = 1800$$

Hence, respective fares are

$$\begin{aligned} \text{Radhani Express} &= ₹ 1650 \\ \text{Shatabadi Express} &= ₹ 1050 \\ \text{Taj Mahal Express} &= ₹ 1800 \end{aligned}$$

- 76) (c) The fare for Shatabadi Express is ₹ 1050.

- 77) (c) From the above table.

Solutions (Q. Nos. 78-79)

It is given that in the three test matches, Sehwag, Ganguly, Tendulkar, Dravid and Laxman are the top five scoring batsmen, not necessarily in the same order.

From (i), we get no two players scored the same number of runs in any match.

From (ii), we get

$$\text{Sehwag} > \text{Ganguly} : \text{1st match}$$

$$\text{Sehwag} > \text{Ganguly} : \text{2nd match}$$

$$\text{Ganguly} > \text{Sehwag} : \text{3rd match}$$

From (iii), we get

The player who scored highest runs in the 3rd match scored the least in the 1st match.

From (iv), we get

$$\text{Tendulkar} > \text{Dravid} > \text{Laxman} \text{ in the 2nd match}$$

$$\text{Tendulkar} > \text{Laxman} \text{ is the 1st match}$$

$$\text{Dravid} > \text{Laxman} > \text{Ganguly} \text{ in the 3rd match.}$$

From (v), we get

Tendulkar scored least in one match. In two matches has position in the decreasing order of the runs scored by him is the same.

i.e. if Tendulkar is the second highest scorer in the 1st match then he will also be the 2nd highest scorer in either the 2nd match or in the 3rd match.

Tendulkar is not the top scorer in any match.

- 78) (c) From (ii) and (iv), we get Dravid > Laxman > Ganguly > Sehwag and Tendulkar is not the top scorer in any match. Hence, Dravid is the top scorer and the least scorer in the 3rd and in the 1st matches respectively.

In the 2nd match Tendulkar > Dravid. Hence, Tendulkar cannot be the least scorer in the 2nd match.

So, Tendulkar is the least score in the 3rd match.

- 79) (d) With the above given information, Tendulkar will be either the 2nd highest scorer in the 2nd and the 3rd highest scorer in the 2nd on the 3rd matches. In the 2nd match, Tendulkar > Dravid > Laxman

It is also given Tendulkar > Ganguly in the 2nd match and Tendulkar is not the highest scorer, Tendulkar will be the 2nd highest scorer in both the 1st and in the 2nd matches (since his position in the decreasing order of the runs scored by him is the same).

Solutions (Q. Nos. 80-81)

- 80) (d) Given $x @ y = x - y$

$$\Rightarrow \text{the positive difference of } x \text{ and } y \text{ is } x - y$$

$$\Rightarrow x > y$$

but still we cannot conclude anything about the positive difference of the squares of x and y , since say $x = 1$ and $y = -3$.

$\Rightarrow x @ y = x - y$ and $x \& y = y^2 - x^2$ but if $x = 3$ and $y = 1$ then $x \& y = x^2 - y^2$.

$\therefore$ We cannot find the value of the given expression.

81) (b) Given $\left[\frac{(x^2 \sim y^2)}{(x \sim y)} \right]^2 - 2xy$

Where, $a \sim b \Rightarrow$ positive difference of a and b

$\Rightarrow \left[\frac{\pm (x^2 - y^2)}{(x - y)} \right]^2 = 2xy$

$\Rightarrow (x + y)^2 - 2xy = x^2 + y^2 = x \$ y$

Solutions (Q. Nos. 82-85)

There are 10 persons including 3 couples and 3 children. Everyone except Litesh and the 3 children are married. From (1), Dinesh sits on seat numbered 6 and Nitu's mother on seats numbered 5 or 7. If Nitu's mother sits on seat numbered 5, then Nitu and his father must be sitting on seats numbered 4 and 3 respectively, which is not possible. Hence, Nitu, his mother and his father sit on seats numbered 8, 7 and 9, respectively. Dinesh's mother and father sit on seats numbered 5 and 4, respectively. Hence, the only bachelor, Litesh sits on seat numbered 10 and Pawan sits on seat numbered 9 (from 4), hence he is Nitu's father. From (2), Sheela sits on seat numbered 1. Her child and husband sit on 2 and 3. From (3), Dharam and Dolly sit on seats numbered 3 and 2, respectively. And, Anil, the married person sits on seat numbered 4. Thus, we get the sitting arrangement, as follows

Sheela	Dolly	Dharam	Anil	Parul/ Sheema	Dinesh
1	2	3	4	5	6
M	C	F	F	M	C
			Sheema/ Parul	Nitu	Pawan
			7	8	9
			M	C	F
			Litesh		
			10		

82) (d) Nitu's mother (Sheema/Parul) sit immediately next to Nitu.

$\therefore$ The person sitting two places away from the person sitting immediately next to Nitu could be Sheema or Parul.

83) (c) Dharam's wife is Sheela. The person sitting 5 places to the left of the person who is sitting 2 places to the left of Sheela; is the person sitting 7 places to the left of Sheela; is Nitu. Since, there is no one to the left side of Sheela, in the arrangement shown, the arrangement must be from reverse.

84) (a) Anil sits on seat numbered 4.

85) (c) From question 84, the arrangement is from right to left, Pawan is sitting to the immediate right of Litesh.

Solutions (Q. Nos. 86-88) This is the easiest type of questions of Analytical Reasoning (Sitting Arrangement + Comparison of Ranks) From the information given in the question we can easily prepare a table deciding the colour of each house.

Truth Table

Colour/ House	R	B	G	O	Y	W
P	×	×	×	×	×	✓
Q	×	×	✓	×	×	×
R	×	×	×	×	✓	×
S	✓	×	×	×	×	×
T	×	✓	×	×	×	×
U	×	×	×	✓	×	×

$\Rightarrow$ P — White , Q — Green , R — Yellow , S — Red
T — Blue , U — orange

The second step is to arrange the houses on either sides of Road. In deciding the arrangement of houses information (vii) can be used first which decides two possibilities as follows

I $\rightarrow$ [P] [U] [S] II $\rightarrow$ [S] [U] [P]

Now, since, we know the colour of each houses the other informations can easily be used to decide the final arrangement as below

T	Q	R	OR	R	Q	T
Blue	Green	Yellow		Yellow	Green	Blue
Red	Orange	White		White	Orange	Red
S	U	P		P	U	S

And last, the arrangement of houses in descending orders of their heights

T	S	Q	P	R	U
T	Q	S	P	R	U

86) (d) S (Red) is diagonally opposite to R (Yellow).

87) (e) The second tallest house is either S or Q.

88) (b) T is the tallest house and its colour is Blue.

Solutions (Q. Nos. 89-92)

Stage I

Because A, B, D and E won atleast one match, hence C and F lost all the three matches .

Because B, D and E lost atleast one match, A won all the three matches in Stage I, there are a total of nine matches and a total of nine wins.

$\therefore$ B, D and E won two matches each.

Since, A (the top team of Stage I) did not play against F, A played a match against B, a match against C.

∴ The ninth match is between B and E

So, the positions of nine matches that have taken place are as follows.

	I	II	III	IV	V	VI	VII	VIII	IX
WON	A	B	A	D	E	A	D	E	B
LOST	D	E	B	C	C	C	F	F	F

Stage II

As each team played a total of five matches, the matches take place between the two teams as

(A E), (A F), (B C), (B D), (E D) and (C F)

It is given that in stage II, three teams lost all the two matches.

It is also given A lost the two matches.

∴ Each of E and F won the two matches.

This implies that C and D lost the two matches.

Therefore, B also won the two matches.

89) (b) E and F defeated A (the top team in Stage I)

90) (d) Only B, E and F won the matches in stage II.

91) (e) D and F won exactly two matches in the event.

92) (e) B and E won four matches each which is the highest.

Solutions (Q. Nos. 93-95) The trading pattern followed by each of the three traders is as follows

Abdul	
Buy	Sell
10 am	3 pm
Bikram	
Buy	Sell
10 am	3pm
11 am	
12 noon	
1 pm, 2pm	
Chetan	
By	Sell
10 am	3pm
11 am	
12 noon	
1 pm, 2pm	

93) (e) The profits of Bikram and Chetan depend upon the share prices at which they bought. Since, we do not know what are the share prices during different times of the day we cannot draw any conclusions.

94) (e) As Abdul buys all his shares at a single point of time, whereas each of the other two persons buy once every hour. As the direction of movement of share price is not given, we cannot compare the returns of Abdul with any other two persons. But if we compare the buying strategies of Bikram and Chetan as follows

Bikram : Bikram buys the same number of share every time, irrespective of the price.

Chetan : Chetan spends the same amount of every time, his buying depends on the price of share. The more the price of share, the less the number of shares he buys. As his strategy is based on the prices, whenever the prices are changing, Chetan's returns will be more than that of Bikram. But if there is no change in the price of share. The returns of Bikram and Chetan will be the same.

Hence, no conclusions can be made.

95) (a) As the prices are rising continuously the earlier a person invests. The more profit it would be. Abdul invested in the beginning only and hence received maximum return.

Between Bikram and Chetan, Chetan always invested the same amount but Bikram invested more and more amount towards the end. Hence, Bikram got the minimum return.

Solutions (Q. Nos. 96-97) Let the prices of shares at different timings be as follows

Time	10 am	11 am	12 noon	1 pm	2 pm	3 pm
Price	a	b	c	d	e	f

Now, the additional information given is as follows

The number of shares bought by Abdul at 10 am is the same as the number of shares he sold at 3 pm. Also, it is given that Abdul lost money. Hence, ignoring the actual number of shares that he bought/sold, we can conclude that the share price at 3 pm must be less than that at 10 am.

$$\Rightarrow a > f$$

Similarly, the number of shares bought/sold by Emily in each instance is the same and it is given that she made a profit. Hence, we conclude that

$$(c + f) > (a + d)$$

Likewise for Done, $(d + e + f) > (a + b + c)$

It is known that the price increased from 2 pm to 3 pm.

$$\Rightarrow e < f$$

It is given that price at 12 noon was lower than the opening price.

$$\Rightarrow c < a$$

From Eqs. (i) and (ii), we conclude that $c > d$

From Eqs. (i), (iii) and (vi), we conclude that $e > b$

Hence, $a > f > e > b$ and $a > c > d$

It is therefore clear that a is the highest.

96) (a) The share price was at its highest at 10 am.

97) (a) and (d) as $e > b$ option (a) is definitely false and as $d < c$ option (d) is also definitely false.

98) (b) It is given in the question that path BC is under repair, hence, available paths to reach from S to T are SBAT, SAT, SDCT and SDT. Now, using options, we find that option (b) gives the same cost of travel from S to T.

$$A = 0, B = 5, C = 3, D = 1$$

$$SBAT = 2 + 5 + 2 + 0 + 5 = ₹ 14$$

$$SAT = 9 + 0 + 5 = ₹ 14$$

$$SDCT = 7 + 1 + 1 + 3 + 2 = ₹ 14$$

$$SDT = 7 + 1 + 6 = ₹ 14$$

99) (d) Traffic among the different paths will be evenly distributed if the cost of travel (fuel cost plus toll charges) is same through all the given routes. Option (d) gives the cost of travel through all the routes as same.

$$A = 1, B = 5, C = 3, D = 2$$

$$S \rightarrow A : SAT = 9 + 1 + 5 = ₹ 15$$

$$S \rightarrow B : SBAT = 2 + 5 + 2 + 1 + 5 = ₹ 15$$

$$SBCT = 2 + 5 + 3 + 2 = ₹ 15$$

$$S \rightarrow D : SDCT = 7 + 2 + 1 + 3 + 2 = ₹ 15$$

$$SDT = 7 + 2 + 6 = ₹ 15$$

100) (e) Traffic from D to T is restricted, hence available rotates through A and C are SAT, SBAT, SBCT, SDCT. Option(e) gives the same cost of travel.

$$SAT = 9 + 0 + 5 = ₹ 14$$

$$SBAT = 2 + 5 + 2 + 0 + 5 = ₹ 14$$

$$SBCT = 2 + 5 + 3 + 2 + 2 = ₹ 14$$

$$SDCT = 7 + 2 + 1 + 2 + 2 = ₹ 14$$

101) (d) For option (d), we have

$$A = 1, B = 5, C = 3, D = 2$$

$$SAT = 9 + 1 + 5 = ₹ 15$$

$$SBAT = 2 + 5 + 2 + 1 + 5 = ₹ 15$$

$$SDCT = 7 + 2 + 1 + 3 + 2 = ₹ 15$$

$$SBCT = 2 + 5 + 3 + 3 + 2 = ₹ 15$$

102) (c) Option (a) is ruled out because cost incurred from S to T will be ₹ 7 only through SBCT assuming toll charges as $B = 0$ and $C = 0$, but in this case all traffic will be move through junction B.

Option (b) is ruled out because cost incurred from S to T will be ₹ 9 when toll at $B = 0$ and $C = 2$. In this case, also all traffic will be diverted through junction B.

Using option (c), we find that if toll charges at $B = 3$ and $C = 0$, then travel cost from S to T through B will be ₹ 10.

$$SBCT = 2 + 3 + 3 + 0 + 2 = ₹ 10$$

and the same cost will be incurred through

$$SDCT = 7 + 0 + 1 + 0 + 2 = ₹ 10$$

Since, ₹ 10 is the least, hence, options (d) and (e) are ruled out.

103) (d) To from the largest team find, from the compliance of condition (4), we get three members of the team as SUW. At the same time condition (1) is complied. Following condition (2) take either M or Q, let us take M and select one more member N because L cannot be chosen as it does not combine with N and U. Hence, the team members are SUWMN.

104) (e) If a team which includes K is to be selected, then we cannot take any of SUW because conditions (3), (5) and (6) are violated. Now, let us start with condition (3), then two members of the team are KL. Following condition (1), take one out of PR (U cannot be taken as mentioned earlier). Let us take P. Now, as per condition (2), take one out of MQ say M. Then, the size of the team is KLPM.

105) (e) If a team includes N, it cannot include L and therefore not even K (from statements 5 and 3). According to condition (1), one out of PRS to be included and as per condition (2), one out of MQ is to be selected.

So, following cases are possible

$$PQN, RQN, PMN, RMN$$

If 'S' is selected, then we have following groupings

$$SUWMN, SUWQN$$

Hence, the total number of possible casea are $4 + 2 = 6$.

106) (a) We can form a team of size 3 by taking any member out of M, N, P, Q. But, L cannot be a part of the team of size 3, because of the following reasons. From conditions (1) and (2); one of P, R, S and one of M, Q are to be selected. But from statement (3), (K, L) are always together. Hence, L cannot be included in a team of 3 members.

107) (e) From Statement I : One of P, R, S has to be selected to make a team of S. 'S' will be selected (leaving P and R).

Now, if 'S' is chosen, 'V' has to be chosen (condition 4). If U is chosen, 'L' cannot be chosen (condition 5). Further, 'K' cannot be chosen (condition 3). From condition (2) M or Q has to be chosen.

Solutions (Q. Nos. 108-112) As only Paul Erdos was having an Erdos number of zero, so the minimum Erdos number among A, B, C, D, E, F, G, H should be 1 or greater than one. At the end of the third day, F co-authored a paper with A and C. F had the minimum Erdos number among the 8 people. So if F's Erdos number is y , then A and C's Erdos number should change to $(y + 1)$ after third day. As A and C decreased the average by maximum possible extent, it means C had the second highest Erdos number among all eight, as A had an Erdos number of infinity. Suppose Erdos numbers of A, B, C, D, E, F, G, H are $y + 1, b, y + 1, c, d, e, y, g, h$, respectively at the end of the third day.

Therefore,

$$(y + 1 + b + y + 1 + c + d + e + y + g + h) = 24 = 3 \times 8$$

or $3y + 2 + b + c + d + g + h = 24$

When E co-authored with F, the average Erdos number reduced again, it means, E's Erdos number was not the same as A and C initially. As at the end of third day, 5 people had same Erdos number, they should be A, C and any 3 out of B, D, G, H. Suppose those 3 people are B, D and G.

$$\text{Then, } (3y + 2 + y + 1 + y + 1 + h) = 24$$

$$\text{or } 6y + h + e = 19$$

On the fifth day, E co-authored a paper with F and hence Erdos number of E changed to $(y + 1)$. Also, the average decreased by 0.5, meaning that means the total decreased by $8 \times 0.5 = 4$

$$\text{Therefore, } e - (y + 1) = 4 \Rightarrow e - y = 5$$

$$7y + h = 14$$

Substituting the value of e in Eq. (i), we get

$$6y + h + (5 + y) = 19$$

$$7y + h = 14$$

Only possible value of $y = 1$ as h cannot be zero.

So, after 3rd round Erdos number of A, C, E, F were 2, 2, 2, 1 respectively.

108) (b) The Erdos number of C at the end of the conference was 2.

109) (b) As at the end of 3rd round 5 people were having same Erdos number. A and C changed their Erdos number after co-authoring with F. So, the other 3 would have same Erdos number in the beginning.

110) (e) After co-authoring with F, E was having Erdos number of 2, which was 4 less than initial Erdos number of E. So answer is $2 + 4 = 6$

111) (d) Only A, C, E changed their Erdos numbers, rest of the 5 did not change their Erdos numbers.

112) (b) At the end of the conference 6 people including E were having an Erdos number of 2 and F was having 1 as Erdos number.

$$\text{So, 8th person was having an Erdos number of } [20 - (2 \times 6 + 1)] = 7$$

113) (e) It is given in the question that Chetan sold 10 shares when price of share went up by ₹ 10 and Michael sold 10 shares when closing price was above ₹ 110. Then, according to the given conditions, the arrangement of opening and closing prices of MCS shares are as below.

Ist	IIInd	IIIrd	IVth	Vth
100 90	90 100	100 110	110 120	120 110

114) (d) The order of share prices when both of them could have maximum possible increase in combined cash balance is as follows

Ist	IIInd	IIIrd	IVth	Vth
100 110	110 110	120 130	130 120	120 110

$$\begin{aligned} \text{Therefore, cash with chetan at the end of 5th day} &= 10 \times 110 + 10 \times 120 + 10 \times 130 - 10 \times 120 - 10 \times 110 \\ &= ₹ 1300 \end{aligned}$$

and with that of Michael

$$\begin{aligned} &= 10 \times 120 + 10 \times 130 + 10 \times 120 \\ &= 1200 + 1200 + 1300 \\ &= ₹ 3700 \end{aligned}$$

Hence, combined increase in chash

$$\begin{aligned} &= 1300 + 3700 \\ &= ₹ 5000 \end{aligned}$$

115) (a)

Ist	IIInd	IIIrd	IVth	Vth
100 90	90 80	80 90	90 100	100 110

Assume that initial number of shares with Chetan and Michael is x .

According the above schedule Chetan buys 10 shares on Ist and IIInd days and sells shares of IIIrd, IVth and Vth days.

$$\therefore \text{Total shares with the Chetan} = (x - 10)$$

Michael buys shares only on second day.

$$\therefore \text{Total shares with Michael is } (x + 10).$$

$\therefore$ Michael had 20 shares more than Chetan.

Hence, price at the end of third day is ₹ 90.

116) (e)

Ist	IIInd	IIIrd	IVth	Vth
100 90	90 100	100 110	110 120	120 110

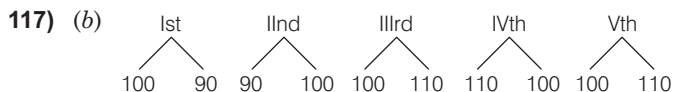
Let initial amount with Chetan and Michael is ₹ y .

Then, total money with Chetan

$$= y - 900 + 1000 + 1100 + 1200 - 1100 = y + 1300$$

Total money with Michael = $y + 1200$

Therefore, difference between Chetan and Michael is ₹ 100 and number of shares with Michael and Chetan is the same.



Let original money with Chetan and Michael be ₹ y .

Then, money with Chetan at the end of 5th day

$$= y - 900 + 1000 + 1100 - 1000 + 1100$$

$$= y + 1300$$

Money with Michael = y

Therefore, Chetan ended up with ₹ 1300 more cash than Michael.

Hence, at the end of the 4th day the price of share is ₹ 100.

Solutions (Q.Nos. 118-121)

Level of Dissimilarity = Maximum difference in ranks allotted to any two countries on any of the five traits.
e.g., dissimilarity between India and China

Trait	India's Rank	China's Rank	Difference
C	1	2	1
P	2	3	1
N	3	1	2
V	4	5	1
D	5	4	1

From the above table the maximum difference is 2.

∴ The dissimilarity level between India and China is 2.

118) (b) From above calculations, the highest level of dissimilarity is 4 which is for Japan.

119) (d) The level of dissimilarity between China and Japan is for the parameter $D(4 - 1) = 3$
India and China is for the parameter $N(3 - 1) = 2$
Malaysia and Japan is for the parameter $V(4 - 1) = 3$
Thailand and Japan is for the parameter $D(5 - 1) = 4$

120) (d) The level of dissimilarity between Malaysia and China is for the parameter $N(5 - 1) = 2$
China and Thailand is for the parameter $D(5 - 1) = 4$
Thailand and Japan is for the parameter $D(5 - 1) = 4$
Japan and Malaysia is for the parameter $V(4 - 1) = 3$

121) (a) Calculating the level of dissimilarity for India Vs remaining countries

China: For the parameter $N(3 - 1) = 2$

Japan: For the parameter $D(5 - 1) = 4$

Malaysia: For the parameter $C(4 - 1) = 3$

Thailand: For the parameter $V(4 - 1) = 3$

∴ The least level of dissimilarity is 2 which is for China.

Solutions (Q. Nos. 122-125) Looking at the data, on day 3 there were “2 visitors” from UK and “1 visitor” from USA.

Also, on day 3, 2 visitors were from University 4.

∴ University 4 is located in UK.

Similarly, University 6 is in USA.

Likewise, on Day 2 there were

(i) 2 visitors from India

(ii) 2 visitors from university 8

From (i) and (ii), University 8 is located in India

Also, on Day 2

(iii) 1 visitor was from Netherland

(iv) 1 visitor was from University 3

From (iii) and (iv) University 3 is located in Netherlands.

The total number of visitors from USA on day 1 is 1 and on day 3 is also (1). From the above, we have observed that University 6 belongs to USA. The number of visitors from University 6 on day 1 is also 1.

∴ No other university belongs to USA.

The total number of visitors from UK on day 1 is (2) We have already observed that University 4 belongs to UK. But from University 4, the number of visitors on day 1 is 0, which means that from among University 2 and University 7, one belongs to UK and the other belongs to Canada (which has 2 visitors on day 1). The total number of visitors from India on day 1 is 1.

Between University 1 and University 5, one belongs to India and the other should belong to Netherland which also has only 1 visitor on day (1). From the above explanation we deduce the following table. Hence,

University	Country
University 1	India / Netherlands
University 2	Canada/UK
University 3	Netherland
University 4	UK
University 5	India/Netherlands
University 6	USA
University 7	Canada/UK
University 8	India

- 122)** (c) From the above table.
- 123)** (a) From the above table.
- 124)** (a) From the above table, it is clear that none of the countries has hosted three universities.
- 125)** (b) The universities that belong to UK are
 (1) University 4 (2) One of University 2 and University 7.
 $\therefore$ Number of university from UK is 2.

Solutions (Q. Nos. 126-129) R -index = Highest score – Lowest score

M –Middle number when scores are arranged in non-increasing order.

Against Pakistan, total score of the top three batsmen = $Y + V + K = 40 + 130 + 28 = 198$

As 198 is 90% of the total score, total score = $\frac{100}{90} \times 198 = 220$.

This means that the runs scored by the rest of the batsmen = $220 - 198 = 22$.

By similar reasoning, we get the following table

	Pakistan	South Africa	Australia	Total	R -index	M -index (Taking highest and lowest possible values)
K	28	51	(≤ 48)	79 to 127	23 to 51	28 (for 51, 28, 0 to 28) 29 to 48 (for 51, 29 to 48, 28)
R	(≤ 22)	49	55	104 to 147	33 to 55	49 (for 75, 50, 0 to 22)
S	(≤ 22)	75	50	125 to 147	53 to 75	50 (for 75, 50, 0 to 22)
V	130	(≤ 48)	(≤ 48)	130 to 226	82 to 130	1 to 48 (for 130, 0 to 48, 0 to 48)
Y	40	(≤ 48)	87	127 to 176	47 to 87	41 to 48 (for 87, 41 to 48, 40) 40 (for 87, 40, 0 to 40)
Total (3 Batsman)	198 (90%)	175 (70%)	192 (80%)			
Total Score	220	250	240			
Total (Rest of the Batsmen)	22 (10%)	75 (30%)	48(20%)			

- 126)** (a) Only Kaif, Rahul or Yuvraj can have the lowest R -index from the tournament, as each of them stands a chance of getting the R -index less than or equal to 51.
- 127)** (b) As can be observed from the table, the total score of Rahul ranges from 104 to 126, whereas Yuvraj's score ranges from 127 to 176.
 $\therefore$ Rahul definitely scored less than Yuvraj. The others may or may not score less than Yuvraj.
- 128)** (b) As it can be observed from the table, Sourav's M -index happens to be the best (i.e. SO).
- 129)** (c) From the table, we find that it is possible to calculate the exact M -index only for Rahul and Sourav.

Solutions (Q. Nos. 130-133) It is given that the number of labour experts is half the number of experts in each of the other categories. Let the number of labour experts be x .

$$x + 2x + 2x + 2x = 21 \Rightarrow x = 3$$

$\therefore$ Number of labour experts = 3

and number of experts in each of the other categories = 6

Given that if there had been one less Australasian experts, then the Americans would have had twice as many experts as each of the other continents.

Let the number of Americans be $2y$. $2y + y + (y + 1) + y = 21$

So, number of Americans = 8

Number of Australasians = $4 + 1 = 5$

Number of Africans = 4

Number of Europeans = 4

It is also given that except Africa in labour category, every continent sent atleast one expert in each category.

	Labour	Health	Pop.Studies	Refugee	
Africa (4)	0	1/2	1/2	1/2	4
Americas (8)	1	3/2	2/1	3/2	8
Australasia (5)	1	1	2	1	5
Europe (4)	1	1	1	1	4
	3	6	6	6	

- 130)** (c) If the Americas had 1 expert in population studies, the remaining Americans should be distributed in 2 remaining fields, i.e. $3 + 3$. Hence, the number of health experts from Americas cannot be 2.
- 131)** (c) It is given that Alex is one of the American experts in refugee relocation. From the table, there can be 1 more or 2 more American experts in the same category.
- 132)** (d) Number of labour experts from the Americas = 1
 Number of health experts from Europe = 1
 Number of health experts from Australia = 1
 Number of experts in refugee relocation from Africa = $2/1$
- 133)** (d) From the given choices, the statements in the first three choices are possible from the given table. The statement in choice (d) i.e. Africa and the Americas had 1 expert each in population studies attending the conference is not possible as in this case the total number of experts in population studies is 5. i.e. 2 from Australia, 1 from Africa, 1 from Europe and 1 from the Americas.
 $\therefore$ This is not possible.

Solutions (Q. Nos. 134-135) For the data given in the table.

It is possible to find the exact results of all the first six matches. Here, the number of goals for and goals against (given in the table) are used along with the number of wins/losses of each team.

- (i) Given that Spain lost to Germany.
- (ii) Argentina's total goal position is 2-0 (in its favour) and number of wins is 2. Hence, the only possibility is that it won both its matches, $1 - 0$ and $1 - 0$.
- (iii) Germany's total goal position is 3 - 1 (in its favour) and number of wins is 2. Hence, the only possibility is that it won both its matches, $2 - 1$ and $1 - 0$. Hence, Spain which scored a total of 5 goals and scored not more than 1 goal against Germany, must have scored atleast 4 goals in its second match and won it.
- (iv) Now, considering the only teams against which Spain could have won its match by atleast 4 goals (i.e. Pakistan, New Zealand and South Africa) Pakistan and South Africa are not possibilities. This is because (a) Pakistan has only 1 goal against it and (b) South Africa has only 4 goals against it and it lost two matches. So if Spain scored 4 goals against it, then the other team that won against South Africa should have scored 0 goals, which is not possible. Hence, Spain won against New Zealand. Spain won the match with a score of $5 - 1$ or $4 - 0$. Since, New Zealand's total goal tally is $1 - 6$ New Zealand lost its other match with a score of $0 - 1$ or $1 - 2$.
- (v) Pakistan's total goal position is 2 - 1 (in its favour) and number of wins is 1. Hence, the only possibility is that it lost one match $0 - 1$ and won the other $2 - 0$. Pakistan could have won against South Africa. New Zealand or Spain. But Spain lost to Germany and won against New Zealand. So both of Spain's matches are accounted for. Also, as New Zealand could not have lost its other match with a score of $0 - 2$, the only team against which Pakistan could have won is South Africa and it must have won this match $2 - 0$.

Therefore, South Africa lost its other match 1 – 2 (since its total goal position is 1 – 4, against it) and this could have been lost to either Germany or Argentina. But since Argentina won both its matches 1 – 0 and 1 – 0, it must have been Germany that won against South Africa.

(vi) Now the only countries that won against New Zealand are Argentina and Spain. But from (ii) we know that Argentina won both its matches 1 – 0 and 1 – 0 therefore, New Zealand lost its other match to Spain 1 – 5 (since its total goal position is 1 – 6, against it).

(vii) Now the only possibility is that Argentina won its other match, over Pakistan 1 – 0.

Thus, the results of the first six matches are as tabulated.

Winner (W)	Germany	Germany	Argentina	Argentina	Pakistan	Spain
Loser (L)	Spain	South Africa	Pakistan	New Zealand	South Africa	New Zealand
Score (W– L)	1– 0	2– 0	1– 0	1– 0	2– 0	5– 1

134) (b) Of the given statements, Argentina beat Pakistan by 1 goal to 0 is true.

135) (d) Of the given statements, Germany beat South Africa by 2 goals to 1 is true.

Solutions (Q. Nos. 136-137) In order to be able to solve the given data for further information its is necessary to closely observe the definition/meaning of the term “round”, as used in the question. There are two possible interpretations as given below:

- Each round is a definite set of 3 matches, played by six different teams. Thus, at the end of every round, every team would have played an equal number of matches. Thus, the total of 15 matches in the tournament, (i.e., $6C_2/2$) are conducted in 5 rounds of 3 matches each, in that chronological order.
- Each round is a team-specific concept. In other words, the fourth match of South Africa could possibly be against the fifth match of Spain. Hence, in a single match we have South Africa playing its fourth round but Spain playing its fifth round.

From the information given in the directions along with the table, it is possible to infer the following about the possible interpretations (either the first or the second) of “round”.

The statement “After the second round (after each team played two matches), ...” seems to suggest that the first interpretation is correct.

Also, the statements (a) and (c) given below refer to “the fourth and fifth round matches” even when the term “round” is not defined.

The statement (b) mentions “their fifth round” suggests that the second interpretation, i.e. “round” is a team specific concept, is correct.

Finally, due to the following two reasons, we feel that the second interpretation is what was intended by the CAT Examiner.

- It is not clearly mentioned that after each round all the teams would have played an equal number of matches.
- The data given in statements (a), (b) and (c) will become inconsistent with the rest of the information, if the first interpretation is considered. (The statements together given four winners in round five, but the first interpretation allows for at most three winners only, i.e. only three matches, in a single round) .

The two questions Q. 199 and Q. 200 are now solved under this interpretation of the term “round”.

Third round matches All the three third round matches are draws and the goal difference in each is 0.

Results of third round matches (The 7th, 8th and 9th matches)

Match between	Result	Goal difference of each team
Argentina-Germany	Draw	0
Spain - Pakistan	Draw	0
New Zealand - South Africa	Draw	0

Fourth and fifth round matches (The 10th match through the 15th match)

Of the total six matches, the winners are Spain in two matches, Pakistan in two matches, Argentina in one match and Germany in one match.

The losers are South Africa in two matches, New Zealand in two matches, Germany in one match and Argentina in one match.

Results of these six matches

Winner (w)	Spain	Spain	Pakistan	Pakistan	Germany	Argentina
Loser (L)						
Score (W – L)			1 – 0	1 – 0	3 – 0	3 – 0

Germany has already played with Spain and Argentina.

∴ It lost its game against Pakistan and it already played with South Africa.

∴ It won its game against New Zealand.

Argentina already played with Germany and Pakistan.

∴ It lost its game against Spain and it already played with New Zealand.

∴ It won its game against South Africa. Spain already played against New Zealand in the first round.

∴ It won the other game (in fourth and fifth rounds) against South Africa.

Pakistan won the other game against New Zealand.

The results of fourth and fifth rounds are

Winner (W)	Spain	Spain	Pakistan	Pakistan	Germany	Argentina
Loser	South Africa	Argentina	Germany	New Zealand	New Zealand	South Africa
Score	?	?	1 – 0	1 – 0	3 – 0	3 – 0

Number of wins, losses and draws of different teams after all the rounds

Teams	Wins against	Losses Against	Draws against	Number of wins	Number of losses	Number of draws
Germany	Spain, New Zealand, South Africa	Pakistan	Argentina	3	1	1
Argentina	Pakistan, New Zealand, South Africa	Spain	Germany	3	1	1
Spain	Argentina, New Zealand, South Africa	Germany	Pakistan	3	1	1
Pakistan	Germany, New Zealand, South Africa	Argentina	Spain	3	1	1
New Zealand	—	Argentina, Spain, Germany, Pakistan	New Zealand	0	4	1
South Africa	—	Argentina, Spain, Germany, Pakistan,	South Africa	0	4	1

As all the four teams-Germany, Spain, Argentina and Pakistan-scored equal number of wins and draws and each of these four teams will have a total of $3 \times 3 + 1 \times 0 + 1 \times 1 = 10$ points. Hence, we have to calculate the goal difference of each team to find the order of the teams for qualifying them.

Note There are two matches whose effect on the goal differences of the teams involved is not known. They are

(1) Spain wins over South Africa.

(2) Spain wins over Argentina.

$\therefore$ Goal differences of different teams are

(i) Germany

Against	Spain	South Africa	Argentina	Pakistan	New Zealand
Result	win	win	draw	loss	win
Score	1–0	2–1	—	0–1	3–0
Goal difference	+1	+1	+0	+1	+3

The goal difference for Germany is $+1 + 1 + 0 - 1 + 3 = +4$

(ii) Pakistan

Against	Argentina	South Africa	Spain	Germany	New Zealand
Result	loss	win	draw	win	win
Score	0–1	2–0	—	1–0	1–0
Goal difference	–1	+2	+0	+1	+0

The goal difference for Pakistan is $-1 + 2 + 0 + 1 + 0 = +3$

(iii) Argentina

Against	Pakistan	New Zealand	Germany	Spain	South Africa
Result	win	win	draw	loss	Win
Score	1–0	1–0	—	—	3–0
Goal difference	+1	+1	+0	at most –1	+3

The goal difference for Argentina is $+1 + 1 + 0 + (\text{at most } -1) + 3$

(iv) Spain

Against	Germany	New Zealand	Pakistan	South Africa	Argentina
Result	loss	win	draw	win	win
Score	0–1	5–1	—	—	—
Goal difference	–1	+4	+0	atleast +1	atleast +1

The goal difference for Spain is $-1 + 4 + 0 + (\text{atleast } +1) + (\text{atleast } +1) = \text{atleast } +5$

Spain	atleast + 5
Germany	+4
Argentina	at most +4
Pakistan	+3

136) (c) The team that finished at the top of the pool at the end of the tournament is Spain with the highest goal difference (i.e., atleast +5).

137) (c) As the goal difference for Pakistan is less when compared to that of both Germany and Spain, it is not possible for Pakistan to qualify as one of the two teams. Hence, as the question talks of a situation that is not possible, we think that this question should be ignored.

Note However, if the CAT Examiners, for any reason, do not reconsider this question, it is possible that they will consider choice (c) (i.e. Spain) to be the correct answer. This is since, anyone who does not work out the complete results of all the 15 matches could possibly come to the conclusion that the goal difference of Spain is more than that of Pakistan. Hence, it could be concluded that Pakistan qualifying means that Spain also qualified. But however Germany also has a higher goal difference than Pakistan.

138) (c)

Year	Huts destroyed	Huts rebuilt	Total
2001	$\frac{n}{2}$	n	$n + \frac{n}{2} = \frac{3n}{2}$
2002	$\frac{3n}{4}$	$\frac{3n}{2}$	$\frac{3n}{4} + \frac{3n}{2} = \frac{9n}{4}$
2003	$\frac{9n}{8}$	$\frac{9n}{4}$	$\frac{9n}{8} + \frac{9n}{4} = \frac{27n}{8}$
2004	$\frac{27n}{16}$		

From the table it is clear that $\frac{27}{16}n$ is less than the total number of huts destroyed by flood in 2002 and 2003, i.e. $\frac{15}{8}n$. $\frac{5}{4} \overline{M} \overline{4} = 20$

139) (d) $\frac{5}{5} \overline{n} \overline{2} = 10$. So, the required is $20 + 10 + 5 = 35$.

$$\frac{5}{4} \overline{P} \overline{1} = 5$$

$$\frac{4}{4} \overline{M} \overline{e} = 4$$

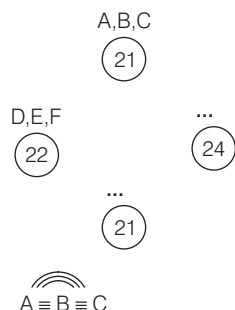
140) (c) $\frac{e}{e} \overline{n} \overline{e} = 5$ So the required results is $4 + 5 + 1 = 10$.

$$\frac{e}{e} \overline{P} \overline{e} = 1$$

141) (b) Thus every zone will have $3 + 3 + 3 = 9$ lines internally for the three towns. So total = 36 lines for 4 zones ($9 \times 4 = 36$).

Now suppose we talk of town A connecting to town of other zones. Then, it will have to connect to 9 towns. So 9 lines. Same for the other two town in the same zones. So, there will be 27 lines. Similarly towns of zone 2 will connect two 6 other towns So $6 + 6 + 6 = 18$ and finally 9 lines for zone 3.

Total lines will be $36 + 27 + 18 + 9 = 90$.



142) (b) Given numeral = MDCCLXXXVII

$$= 1000 + 500 + 100 + 100 + 50 + 10 + 10 + 10 + 5 + 1 + 1 = 1787$$

143) (a) Given numeral = MCMXCIX

$$= 1000 + (1000 - 100) + (100 - 10) + (10 - 1) = 1000 + 900 + 90 + 9 = 1999.$$

144) (c) a. MCMLXXV

$$= 1000 + (1000 - 100) + 50 + 10 + 10 + 5 = 1000 + 900 + 50 + 25 = 1975$$

b. MCMXCV

$$= 1000 + (1000 - 100) + (100 - 10) + 5 = 1000 + 900 + 90 + 5 = 1995$$

c. MVD = $(1000 - 5) + 500$

$$= 995 + 500 = 1495$$

d. MVM = $(1000 - 5) + 1000$

$$= 995 + 1000 = 1995$$

145) (d) **Statement A** gives that Aakash and Biplab both score 50 runs but no information about number of catches taken by Aakash.

Statement B individually states nothing about the runs scored by Aakash and Chirag. Therefore, nothing can be concluded by A individually or B individually.

On combining both the statements, we have Aakash as the "man of the match."

146) (c) **Statement A** B C D A

If A cannot come at 1st or 2nd and D also cannot come at 1st, 2nd and 4th, then D has to come at 3rd position. Now, at the 2nd position, nor can A come, nor B, nor D

∴ C comes at 2nd position. Now, at 1st position B will come and at the 4th position, A will come. Hence A, individually is sufficient.

Statement B B C D A

B has to come on 1st position and A has to come on 4th position as none of B, C and D can come on 4th position. C will come at 2nd and D at the 3rd position.

Therefore, both statements are individually sufficient to answer the questions.

147) (a) **Statement A** The equation that can be formed is $600/(x-5) - 600/x = 10$. We can solve this to get the final answer.

Statement B Statement B does not provide sufficient data to solve the problem as actual members in the club are not stated.

148) (a) According to the problem, we have

Let the ages of father, mother and son be F, M and S respectively.

$(F + n) = 4(S + n)$ and $(M + n) = 3(S + n)$. Solving these equations we get, $F - M = S + n$

Statement A It gives that $F - M = 10$. Thus, $S + n = 10$
The combined ages of father and mother after n years will be $F + M + 2n$.

Thus answer = $7 \times (10) = 70$ yr.

Statement B $S + n = 2S \Rightarrow S = n$.

This statement does not give any conclusive answer. So, only Statement A alone is enough to get the correct answer.

- 149)** (c) 70% have VCD Players $\Rightarrow$ 30% do not have VCD Players.

75% have microwave ovens $\Rightarrow$ 25% do not have microwave ovens.

80% have ACs $\Rightarrow$ 20% do not have ACs

85% have washing machines $\Rightarrow$ 15% do not have washing machines.

This information confirms that $(30 + 25 + 15 + 20)90\%$ of employees do not have atleast 1 gadget. So, minimum percentage of employees who has all four gadgets = $100 - 90 = 10\%$.

Solutions (Q. Nos. 150-153) On analysing the given information, we get the following table

Husband	Wife
Anil	Anita
Raj	Joya
Raman	Shanthi
Sunil	Srividevi

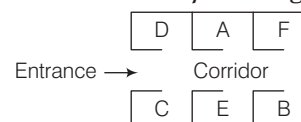
Their order of arrival is Anil and Anita, Raj and joya, Raman and Shanthi, Sunil and Sridevi. Hence, answer to these questions can be easily obtained.

- 150)** (a)
151) (b)
152) (c)
153) (b)
154) (b)
155) (c) Before C could mark the answers, D, E (source from where C gets its blank answers) and I (source where C gets Q. 118 wrong) must have prepared their answer keys. For E to prepare its answer key, it must have the data from A. Thus 4 people must have made their answer keys before C could make it.
156) (d) G got Q. 118 wrong and none of the other 9 people got the same wrong and similarly for H. Thus, G and H were sources to none of the nine.

- 157)** (c) C got Q. 147 wrong (118 wrong obtained from I), E got Q. 181 wrong (137 obtained from A), H got Q. 183 wrong (46 obtained from A). Thus the only answer has to be (c).

- 158)** (d) E and H both got Q. 137 wrong (181 and 183 were the compulsory wrong that they had to make). Thus they both should have had the same sources. A, D and G had just one wrong question each and had no blank answers. Therefore, these should also have had the same source.

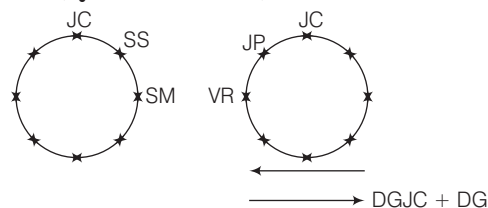
Solutions (Q. Nos. 159-162) After analysing the given information, we can draw the following diagram:



So, answer to all these questions can be easily obtained.

- 159)** (c)
160) (d)
161) (a)
162) (b)

Solutions (Q. Nos. 163-166)



- 163)** (b) JC was the first to enter followed by SS and SM. Then, SM and SS left the lounge and JP, VR enter the lounge. Now, JC and DG left the lounge together and DG came back and met PK. So, DG was the first to enter between JP or DG.
164) (c) Similarly from above DG was sitting when NP entered.
165) (b) VR met with DG, and JC and JP and the last two faculties to leave the lounge are JP and DG.
166) (d)

Solutions (Q. Nos. 167-168) After analysing the given information, we can allot days for the parties as follows

Congress	Thursday
BJP	Friday
SP	Thursday
BSP	Friday
CPM	Friday

Therefore, answer to these questions can be obtained easily.

167) (a)

168) (d)

169) (c) Sati-Savitri starts at the earliest. Hence, it is to be viewed first.

1. **Sati-Savitri** 9:00 am to 10:00 am

2. **Veer Abhimanyu** 10:00 am to 11:00 am

3. **Jhansi ki Rani / Sundar Kand** 11:00 am to 11:30 am

4. **Joru ka Ghulam** 11:30 am to 12:30 pm

Lunch break is from 12:30 pm to 1:30 pm

At 1:30 pm, he can take the show of only Jhansi ki Rani, so it cannot be viewed at 3rd.

5. **Jhansi ki Rani** 1:30 pm to 2:30 pm

6. **Reshma aur Shera** 2:00 pm to 3:00 pm

Hence, option (c) gives the best order.

170) (b) If 8 loaves are equally distributed, then each one of them would get $\left(\frac{8}{3}\right)$ loaves. Third traveller has to

pay an amount equivalent to the share he gets from first and second traveller.

First traveller has given $\left(5 - \frac{8}{3}\right) = \frac{7}{3}$ loaves and this

share is equal to 7 coins

$$\left(\therefore \frac{8}{3} \text{ loaves} = 8 \text{ coins}\right)$$

171) (b) Option (a) David, Ram, Rahim-Violates condition-David insists that Fiza be selected in case he is selected.

Option (d) Fiza, David, Ram-Violates the condition-Ram would like to be in the group only if Peter is there.

Option (c) Kavita, David, Shyam-Violates the condition same as above.

Option (b) does not violate any of the conditions hence is the answer.

172) (c) Option (a) is not correct as Shyam and Rahim should be together.

Option (b) is not correct as David should be with Fiza.

Option (d) is not correct as David should not be with Peter.

Hence, option (c) is the answer as it satisfies all the conditions.

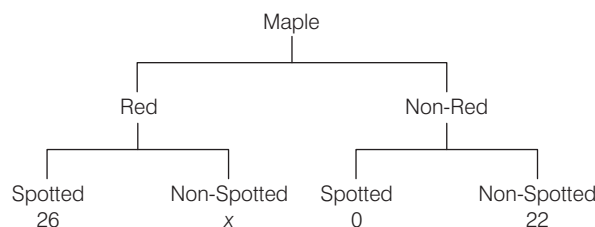
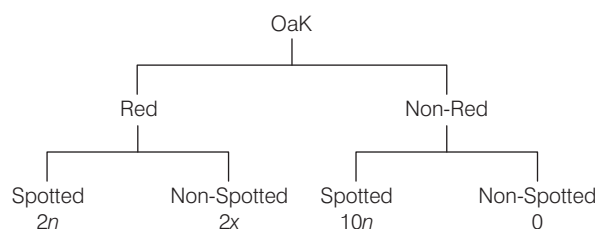
173) (d) Option (a) is not correct: Kavita goes with David and David does not combine with Peter whereas Ram needs Peter to be there in the group. Hence, this combination is not possible.

Option (b) is not correct: Fiza and Kavita cannot be together because the third person in the group will definitely be David. But the combination of three

Fiza, Kavita, David cannot be combined with any of the remaining four persons.

Option (c) is not correct: Ram can not go with Shyam and David with Peter. Hence, none of the options is correct.

174) (b) Each type of leave is divided into two sections red and non-red and these two sections are further subdivided into spotted and non-spotted. Let the number of red oak leaves be $2n$, where n is any natural number, then the following chart represents the information given in the question.



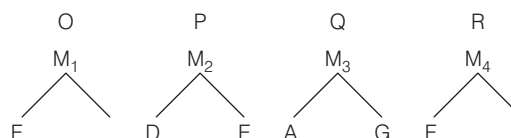
Given, $2n + x + 104 + 0 + 6 + x + 0 + 22 = 50$

$\Rightarrow 12n + 2x = 22$ or $6n + x = 11$

The above relationship is valid only if $n = 1$ and $x = 5$

Hence, number of oak leaves are $2 \times 1 + 5 + 10 \times 1 = 17$

175) (c) Baskets, O, P, Q and R will be carried on motorcycles M_1 , M_2 , M_3 and M_4 , respectively.



On the basis of the information given in the question we can complete the table as shown above. Now, we need pairing with F and combination for M_4 . Now, remaining persons are B, C and H. It is given in the last line that B cannot go with R, hence B will go with ° and combine with F.

Therefore, remaining two C and H will go on M_4 with R.

176) (b) To calculate the minimum number of family members we have to calculate how many (minimum persons) establish the relationship given in the question. Therefore, we have 2 grandfathers, 4 fathers, 2 grandmothers and 4 mothers. Hence, there are 12 minimum number of family members.

177) (b) Following table illustrates the purchase combination

Sr.	Purchase Combination	Money spent	Number of items	Maximum amount on this purchase	Maximum item on this purchase	Money left	(Thousand) points Earned
I.	(1D+ 2B)	₹ 220	3	$220 \times 4 = 880$	12	120	-168
II.	(1A+ 1C)	₹ 180	2	$180 \times 5 = 900$	10	100	-140
III.	(1E+ 2D+ 1B)	₹ 215	4	$215 \times 4 = 860$	16	140	-194

On the basis of above table, we find that to maximise the points, there should be minimum amount of money left. Please note that we can go with the combination of the above serials to maximise points like

Sr.	Combination	Money spent	Item purchased	Points earned
IV	$2 \times I + 3 \times II$	980	12	-18
V	$2 \times I + 2 \times III$	890	14	-151
VI	$2 \times III + 3 \times II$	970	14	-31

Hence, combination IV earns the maximum points. Hence, items to be purchased to maximise the sale would be 12, but it is not available in options. Hence, next option available is VI, when money spent is ₹ 970.

178) (b) Let us analyse the information given in the question and rearrange so as to conclude result.

I.	Chirage borrows ₹ 300 from Ashok	
II.	Bashir borrows ₹ 100 from Ashok.	$3 \times 200 + 300 + 100 = ₹ 100$
III.	Ashok buys three shirts	It means that Ashok Should have atleast ₹ 100
IV.	Bashir buys a sweater after borrowing ₹ 100 from Ashok and is left with no money	$100 + 400 = ₹ 500$ It means Bashir should have ₹ 500
V.	Ashok has less money than three times the amount that Bashir has	Hence, Ashok should have an amount $\geq 1000 < 1500$
VI	Ashok has three times the money with Deepak.	Hence, Ashok's amount should be ₹ 1000 and above but less than ₹ 1500, then Deepak should have maximum ₹ 400.

Hence, the costliest item that Deepak could buy with his own money is Shawl.

179) (b)

Wt. Groups	W_1	W_4			
Instructors	Anita	Babita	Chandrika	Deepika	Elina
Number of Members	5	4	3	2	1
Name fo Members	Sonali Shalini Shubhra Sahira Rupa	Ruchika Somya Sweta Jyotika	Renuka Rupali Komal	Ritu Tara	Radha

On the basis of the information given in the question, the members belonging to the same weight group can be classified as above. On the basis of the table, it is clear that Radha belongs to the weight group comprising only single member.

Hence, Elina is the instructor of Radha.

180) (d)

	Fishing	Smoking	Drinking	Gambling	Moun-taineering
M ₁	✓	✓		✗	
M ₂	✗	✓	✓		
M ₃		✗		✓	
M ₄			✗		✓
M ₅		✗	✓		✗
M ₆	✓	✗			✗
M ₇	✗			✓	✓
M ₈		✓		✓	✗

Sing (✓) denotes liking and sign (✗) denotes disliking.

Now, there are two different conditions which have to be satisfied with for any group of four persons to be selected.

Condition I : Each selected person should share a liking with atleast one of the other three selected.

Condition II : The selected person must also hate atleast one of the likings of any of the other three selected.

Let us know check each option to test its validity in the light of the information extracted in the table and above conditions.

Option (a) : Condition II is not complied. M₁ dislikes gambling which is not liked by any of the three persons.

Option (b) : Condition I is not complied. Liking of every member is different.

Option (c) : Condition I is not complied.

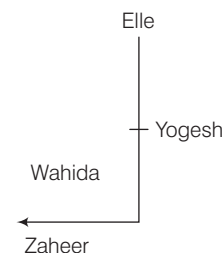
Option (d) : Both the conditions are satisfied. Hence, is our answer.

181) (b) Elle = 3 × Yogesh, Wahida = 2 × Zaheer

It is further given that Yogesh > Zaheer

On the basis of above information we can draw the order of their age as under

Yogesh is older than Zaheer, it means that Yogesh may be and may not be older than Wahida. But since Elle is 3 times older than Yogesh, it means in any case whether Yogesh > Wahida or Yogesh < Wahid. Elle is older than Wahida.



182) (c) From (1) Zaheer is 10 yr old means Wahida is 20 yr old. From (2) Yogesh and Wahida are older than Zaheer by same number of years. This means Yogesh is 20 yr old and Elle $20 \times 3 = 60$ yr old.

Hence, both the Statements (a) and (b) are required to find the age of Elle.

183) (b) The best way to solve this question is to consider the first half of the first statement to be true and relate it with the second and third. If the information derived runs contradictory at any stage, try again considering the second half of the statement to be true.

Now, **from statement I** suppose the dog had black hair, then it will have short tail. Now, correlate and test its validity with second statement.

From second statement : If dog had short tail, then it will have no collar.

From third statement : If dog had no collar it will have black hair.

Hence, on the basis of above combinations we can say that the dog had black hair, short tail and no collar. But none of the options gives this combination.

Again, assume the second half of the first statement to be true then we will find that.

Statement I : If the dog had a long tail, it will have white hair.

Statement II : If it had long tail, it will wear a collar.

Statement III : If it wears a collar, it will have white hair.

On the basis of these combinations we find that the dog had, white hair, long tail and a collar. Hence, option (b) is our answer.

- 184) (c) On the basis of the information given in the question we can find matching of family with lunch time and meal with the type of crockery as under

Family	Time		
	12:00	1:00	2:00
Sharma	✓	✗	✗
Bannerjee	✗	✗	✓
Patta	✓	✗	✗

Recipe	Type of crockery		
	Blue	White	Red
Brinjal	✓	✗	✗
Sambar	✗	✓	✗
Makkai	✗	✗	✓

Now, on the basis of above matching we conclude that family that eats at 10 o'clock serves fried brinjal, hence Pattabhiraman serves fried brinjal.

The family that eats last like makkai-ki-roti, so Bannerjee like makka-ki-roti, hence Sharma eats with sambar. Thus the matching of family with timing, recipe and crockery is given by

Sharma	12 : 00	Sambar	White
Pattabhiraman	1 : 00	Brinjal	Blue
Bannerjee	2 : 00	Makka	Red

- 185) (c) On the basis of information given, it is clear that there are three children namely Vaibhav, Suprita and Anshuman. From (D) and (E) it is clear that Suprita was born in April, Anshuman in September and Vaibhav in June.

From (A) we conclude that Vaibhav is 7 yr old.

From (B), (C) and (F), it is very clear that Suprita is 4 yr old and Anshuman is the youngest one with age 2 yr.

Hence, option (c) reflects the correct information.

- 186) (c) There will be eight teams in each group. Each team in a group will play with every other team. Hence, total number of matches will be $\frac{7 \times 8}{2} = 28$ in one group. Hence, in both the groups, there will be 56 matches. This is for the first stage game.

Again, there are 8 teams in knockout rounds from which one winner emerges or 7 losers are identified. Hence, 7 more matches will be played. So, total number of matches played = $(56 + 7) = 63$

- 187) (b) The following table shows the maximum number of matches won under extreme conditions. Sign (✓) denotes win sign (✗) denotes defeat and sign (*) denotes a combination of team with itself (no match can be played).

Team	A	B	C	D	E	F	G	H
A	*	✓	✓	✓	✓	✓	✗	✗
B	✗	*	✓	✓	✓	✓	✓	✗
C	✗	✗	*	✓	✓	✓	✓	✓
D	✗	✗	✗	*				
E	✗	✗	✗		*			
F	✗	✗	✗			*		
G	✓	✗	✗	✓	✓	✓	*	✓
H	✓	✓	✗	✓	✓	✓	✗	*

From the table, we find the each of A, B, C, G and H can win 5 matches, hence it cannot be decided that which team will qualify for the final. Therefore, the minimum number of wins that can assume a place in the second stage is 6.

188) (d) The highest number of wins for a team is 4.

189) (c) Since, there are 8 teams, there would be 7 matches in 3 rounds.

190) (c) On the basis of the information, option (c) is the only true statement.

Solutions (Q. Nos. 191-193) The information given in the question can be presented in the tabular form as under

Game Round	Dealer's Account		Player's Account	
	Result of game	Result after game	Result of game	Result after game
I	$+8 - 16 = -8$	-8	$-8 + 16$	8
II	$+10 + 10 = 20$	$-8 + 20 = 12$	$-10 - 10 = -20$	$+8 - 20 = -12$
III	$+6 - 6 = 0$	$12 + 0 = 12$	$-6 + 6 = 0$	$-12 + 0 = -10$
IV	$+8 - 16 = -8$	$12 - 8 = 4$	$-8 + 16 = 8$	$-12 + 6 = -6$

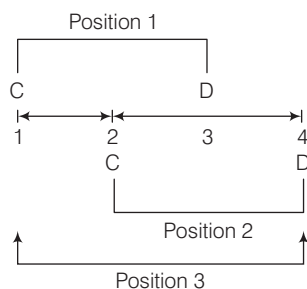
191) (a) The maximum gain of Ghosh Babu is ₹ 12 which is same after second and third round of game.

192) (b) It is very clear from the table that net result of the game of Ghosh Babu's account is (-ve) only after first round. Hence, minimum amount of money which he should have should be ₹ 8.

193) (d) Let initial amount of money which he had with him be ₹ X. Then,

$$X - 8 + 20 - 8 = 100 \Rightarrow X + 4 = 100 \text{ or } X = ₹ 96.$$

Solutions (Q. Nos. 194-197) On the basis of the information given in the questions, we find that C and D can take three positions as shown in the diagram following the restriction that C and D can not be together.



194) (a) There is only one position i.e., position (2) where A can occupy first place. But it is not possible because as per restriction B cannot occupy third position.

195) (c) If A is not at the third place, then there are two places, place first and place third which can be occupied by C. In other place it will be violation of condition that B cannot be at third place.

196) (b) There is only one position where A and B are together that A and B occupy second and third place. B cannot be at third place as per restriction. Hence, A has to be at third place.

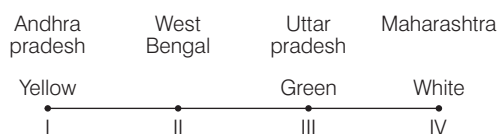
197) (a) If P is true, then both Q and R have to be true. For S to be true, either Q or R must be false. Hence, if P is true, S cannot be true.

Solutions (Q. Nos. 198-201) Line given on the adjacent side represents the row, with four positions marked by I, II, III and IV where four participants are sitting. Let us now classify and analyse the information given in the question and arrange them in the row.



From information (I), it is clear that participants wearing yellow and white sarees occupy positions I and IV respectively. From information (A) it is clear that Maharashtra wears white saree.

From information (C), it is clear that runner up occupies IIIrd position and information (D) suggests that she wears green saree.



From (E) we find that West Bengal cannot be at either 1st place as it is one of the ends or IIIrd place as it is occupied by runner up, hence the only place left is II nd.

From information (H), Andhra Pradesh was not wearing green saree, hence she occupies position Ist and remaining position IIIrd is occupied by Ms. Uttar Pradesh.

The only colour left is red, hence West Bengal was wearing red colour saree.

198) (b) Ms. West Bengal wore the red saree.

199) (c) Ms. West Bengal was sitting Ms. Andhra Pradesh and Ms. Uttar Pradesh.

200) (a) Ms. Andhra Pradesh wore Yellow saree.

201) (c) Ms. Uttar Pradesh was the runner up.

Solutions (Q. Nos. 202-205) As each of the players has ₹ 32 each after the end of the game. It means that all the three players except Vibha who lost the last game, had ₹ 16 each at the third game. And it is Vibha who had doubled the money of these players. Hence, the money which Vibha had after third round

$$₹(32 + 16 + 16 + 16) =$$

₹ 80. And likewise we can find the money with each player at the end of every round.

	Suvarna	Tara	Uma	Vibha
Beginning	66	34	18	10
After Ist round	4	68	36	20
After IInd round	8	8	72	40
After IIIInd round	16	16	16	80
After IVth round	32	32	32	32

202) (c) Suvarna started with ₹ 66.

203) (d) It was Vibha who started with the lowest amount, i.e. ₹ 10.

204) (a) It was Suvarna who started with the highest amount, i.e. ₹ 66.

205) (b) At the end of second round, Uma had ₹ 72 with her.

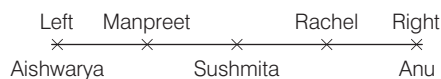
206) (b) E is the eldest brother.

207) (b) D is the youngest brother.

208) (c) A and B could be the twins.

209) (c) Option (c) that B has three elder brothers is the false statement.

210) (b) According to the conditions given in the question all the models can be arranged in the standing position as under. It is there clear that if Aishwarya is standing to the extreme left, then Susmita will occupy central position.



211) (d) The sitting arrangement is same as in previous question. Hence, Manpreet will occupy second position from the left.

212) (d) Rachel will occupy the right position under the following standing arrangement.



213) (c) From the information given in the question, it is clear Jackie is the host and is sitting to Sobha's right.

214) (d) Shobha is sitting next to Jakie and Dhirubhai. So, she is the only person who is not seated next to a person of the same sex.

215) (a) If Ratan would have exchanged seat with a person four places to his left, i.e. Sobha then option (I) will follow.

216) (a) From the options given only Ratan and Monisha are sitting opposite to each other, hence they must be married.

217) (b) $5M + 100 = 40$
 $\Rightarrow 1M + 2O = 8$

Now, $1M = 20$. Therefore, $2O + 2O = 8 \Rightarrow O = 2$
Hence, the price of an orange would be ₹ 2.

218) (b) Akbar is a fisherman but not frisbee player.

219) (c) "Lila is married to Laxman" is the correct statement.

220) (b) Let us assume first part of the first statement to be true, then second part will be false. If we relate these results with second and then third statements assuming one part to be true and other false. Then, we will find that answer is Mathew.

On the contrary if we assume first half of the first statement to be false and second to be true, then there will be two answers John and Krishna, which cannot be true. Hence, the correct answer is Mathew.

221) (b) It is clear that Bobby is the chief. All other options goes contrary to the information.

222) (b) Option (b) is the only correct statement .

Solutions (Q. Nos. 223-226) Information given in the question can be classified and presented in the table as below

House order From left	(a)	(b)	(c)	(d)
Nationality	Norw.	Ital.	Engl.	Spain.
Colour	Yellow	Blue	Red	White
Drink	Coca	Tea	Milk	Fruit Juice

223) (b) Milk is drunk by Englishman.

224) (b) Norwegian drink coca.

225) (a) The colour of Norwegian house is yellow.

226) (d) Clearly, option (d) gives the wrong information .

CHAPTER FOURTEEN

LOGICAL REASONING

Directions (Q. Nos. 1-10) *Each question has a set of four statements. Each statement has three segments. Choose the alternative where the third segment in the statement can be logically deduced using both the preceding two, but not just from one of them. (1999)*

- 1) A. No cowboys laugh. Some who laugh are sphinxes. Some sphinxes are not cowboys.
B. All ghosts are florescent. Some ghosts do not sing. Some singers are not florescent.
C. Cricketers indulge in swearing. Those who swear are hanged. Some who are hanged are not cricketers.
D. Some crazy people are pianists. All crazy people are whistlers. Some whistlers are pianists.
(a) A and B (b) C only (c) A and D (d) D only
- 2) A. All good people are knights. All warriors are good people : All knights are warriors.
B. No footballers are ministers. All footballers are tough. Some ministers are players.
C. All pizzas are snacks. Some meals are pizzas. Some meals are snacks.
D. Some barkers are musk deer. All barkers are sloth bears. Some sloth bears are musk deer.
(a) C and D (b) B and C
(c) A only (d) C only
- 3) A. Dinosaurs are prehistoric creatures. Water-buffaloes are not dinosaurs. Water-buffaloes are not prehistoric creatures.
B. All politicians are frank. No frank people are crocodiles. No crocodiles are politicians.
C. No diamond is quartz. No opal is quartz. Diamonds are opals.
D. All monkeys like bananas. Some GI Joes like bananas. Some GI Joes are monkeys.
(a) C only (b) B only (c) A and D (d) B and C
- 4) A. All earthquakes cause havoc. Some landslides cause havoc. Some earthquakes cause landslides.
B. All glass things are transparent. Some curios are glass things. Some curios are transparent.
C. All clay objects are brittle. All XY are clay objects. Some XY are brittle.
D. No criminal is a patriot. Ram is not a patriot. Ram is a criminal.
(a) D only (b) B only
(c) C and B (d) A only
- 5) A. MD is an actor. Some actors are pretty. MD is pretty.
B. Some men are cops. All cops are brave. Some brave people are cops.
C. All actors are brave. Some men are cops. Some men are brave.
D. All actors are pretty; MD is not an actor; MD is not pretty.
(a) D only (b) C only (c) A only (d) B and C
- 6) A. All IIMs are in India. No BIMs are in India. No IIMs are BIMs.
B. All IIMs are in India. No BIMs are in India. No BIMs are IIMs.
C. Some IIMs are not in India. Some BIMs are not in India. Some IIMs are BIMs.
D. Some IIMs are not in India. BIMs are not in India. Some BIMs are IIMs.
(a) A and B (b) C and D
(c) A only (d) B only
- 7) A. Citizens of Yes Islands speak only the truth. Citizens of Yes Islands are young people. Young people speak only the truth.
B. Citizens of Yes Islands speak only the truth. Some Yes Islands are in Atlantic. Some citizens of Yes Islands are in the Atlantic.

- C. Citizens of Yes Islands speak only the truth.
Some young people are citizens of Yes Islands.
Some young people speak only the truth.
- D. Some people speak only the truth. Some citizens of Yes Islands speak only the truth. Some people who speak only the truth are citizens of Yes Islands.

(a) A only (b) B only
(c) C only (d) D only

- 8) A. All mammals are viviparous. Some fish are viviparous. Some fish are mammals.
B. All birds are oviparous. Some fish are not oviparous. Some fish are birds.
C. No mammals is oviparous. Some creatures are oviparous and some are not. Some creatures are not mammals.
D. Some creatures are mammals. Some creatures are viviparous. Some mammals are viviparous.
- (a) A only (b) B only
(c) C only (d) D only
- 9) A. Many singers are not writers. All poets are singers. Some poets are not writers.
B. Giants climb beanstalks. Some chicken do not climb beanstalks. Some chicken are not giants.
C. All explorers live in snowdrifts. Some penguins live in snowdrifts. Some penguins are explorers.
D. Amar is taller than Akbar. Anthony is shorter than Amar. Akbar is shorter than Anthony.
- (a) A only (b) B only
(c) B and C (d) D only

- 10) A. A few farmers are rocket scientists. Some rocket scientists catch snakes. A few farmers catch snakes.
B. Poonam is a kangaroo. Some kangaroos are made of teak. Poonam is made of teak.
C. No bulls eat grass. All matadors eat grass. No matadors are bulls.
D. Some skunks drive Cadillacs. All skunks are polar bears. Some polar bears drive Cadillacs.
- (a) B only (b) A and C
(c) C only (d) C and D

Directions (Q. Nos. 11-14) *Each question has a main statement followed by four statements labelled A, B, C and D. Choose the ordered pair of statements where the first statement implies the second and the two statements are logically consistent with the main statement.* (1999)

- 11) Either the orangutan is not angry, or he frowns upon the world.
A. The orangutan frowns upon the world.
B. The orangutan is not angry.
C. The orangutan does not frown upon the world.
D. The orangutan is angry.

(a) CB only (b) DA only
(c) AB only (d) CB and DA

- 12) Either Ravana is a demon, or he is a hero
A. Ravana is a hero.
B. Ravana is a demon.
C. Ravana is not a demon.
D. Ravana is not a hero.

(a) CD only (b) BA only
(c) CD and BA (d) DB and CA

- 13) Whenever Rajeev uses the internet, he dreams about spiders.

A. Rajeev did not dream about spiders.
B. Rajeev used the Internet.
C. Rajeev dream about spiders.
D. Rajeev did not use the Internet.

(a) AD (b) DC (c) CB (d) DA

- 14) If I talk to my professors, then I do not need to take a pill for headache.

A. I talked to my professors.
B. I did not need to take a pill for headache.
C. I needed to take a pill for headache.
D. I did not talk to my professors.

(a) AB only (b) DC only (c) CD only (d) AB and CD

Directions (Q. Nos. 15-24) *Each question consists of five statements followed by options consisting of three statements put together in a specific order. Choose the option which indicates a valid argument, that is, where the third statement is a conclusion drawn from the preceding two statements.* (1999)

Examples

- A. All the cigarettes are hazardous to health.
B. Brand X is a cigarette.
C. Brand X is a hazardous to health.

ABC is a valid option, where Statement C can be concluded from statements A and B.

- 15) A. All software companies employ knowledge workers.
B. Tara Tech employees knowledge workers.

- C. Tara Tech is a software company.
 D. Some software companies employ knowledge workers.
 E. Tara Tech employees only knowledge workers.
 (a) ABC (b) ACB (c) CDB (d) ACE
- 16) A. Traffic congestion increases carbon monoxide in the environment.
 B. Increase in carbon monoxide is hazardous to health.
 C. Traffic congestion is hazardous to health.
 D. Some traffic congestion does not cause increased carbon monoxide.
 E. Some traffic congestion is not hazardous to health.
 (a) CBA (b) BDE (c) CDE (d) BAC
- 17) A. Apples are not sweets.
 B. Some apples are sweet.
 C. All sweets are tasty.
 D. Some apples are not tasty.
 E. No apple is tasty.
 (a) CEA (b) BDC (c) CBD (d) EAC
- 18) A. Some towns in India are polluted.
 B. All polluted towns should be destroyed.
 C. Town Meghana should be destroyed.
 D. Town Meghana is polluted.
 E. Some towns in India should be destroyed.
 (a) BDE (b) BAE (c) ADE (d) CDB
- 19) A. No patriot is a criminal.
 B. Bundledas is not a criminal.
 C. Bundledas is a patriot.
 D. Bogusdas is not a patriot.
 E. Bogausdas is a criminal.
 (a) ACB (b) ABC (c) ADE (d) ABE
- 20) A. Ant eaters like ants.
 B. Boys are anteaters.
 C. Balaram is an anteater.
 D. Balaram likes ants.
 E. Balaram may eat ants.
 (a) DCA (b) ADC
 (c) ABE (d) ACD
- 21) A. All actors are handsome
 B. Some actors are popular
 C. Ram is handsome
 D. Ram is a popular actor
- E. Some popular people are handsome
 (a) ACD (b) ABE
 (c) DCA (d) EDC
- 22) A. Modern industry is technology-driven.
 B. BTI is a modern industry.
 C. BTI is technology-driven.
 D. BTI may be technology-driven.
 E. Technology-driven industry is modern.
 (a) ABC (b) ABD (c) BCA (d) EBC
- 23) A. All Golmal islanders are blue-coloured people.
 B. Some smart people are not blue-coloured people.
 C. Some babies are blue-coloured.
 D. Some babies are smart.
 E. Some smart people are not Golman islanders.
 (a) BCD (b) BE
 (d) CBD (d) None of these
- 24) A. MBAs are in great demand.
 B. Ram and Sita are in great demand.
 C. Ram is in great demand.
 D. Sita is in great demand.
 E. Ram and Sita are MBAs.
 (a) ABE (d) ECD (c) AEB (d) EBA
- Directions (Q. Nos. 25-28) Each question contains four arguments of three sentences each. Choose the set in which the third statement is a logically conclusion of the first two. (1998)**
- 25) A. Some Xs are Ps. Some Ps are Ys. Some Xs are Ys.
 B. All Sonas are bright. Some bright crazy. Some Sonas are crazy.
 C. No faith is strong. Only strong have biceps. No faith has biceps.
 D. All men are weak. Some weak are strong. Something are weak.
 (a) A and D (b) C only
 (c) D only (d) None of these
- 26) A. Some icicles are cycles. All cycles are men. Some icicles are men.
 B. All girls have teeth. No teeth are yellow. No girls are yellow.
 C. No hand is foot. Some feet are heads. Some hands are heads.
 D. Every man has a wife. All wives are devoted. No devoted has a husband.
 (a) A, B and C (b) A and B
 (c) C and B (d) A, B, C and D

- 27) A. No, sun is not white. All moon is sun. All moon is white.
 B. All windows are open. No open space is allocated. All window is closed space.
 C. No German can fire. All Americans bombard. Both, Germans are Americans can fight.
 D. No X is Z. No Z is Y. No X is Y.
 (a) A only (b) B only
 (c) C only (d) D only

- 28) A. All Ts are squares. All squares are rectangular. All Ts are rectangular.
 B. Some fat are elongated. Some elongated things are huge. Some fat are huge.
 C. Idiots are bumbler. Bumbler fumble. Idiots fumble.
 D. Water is good for health. Health food are rare. Water is rare.
 (a) D only (b) C only
 (c) Both A and C (d) All of these

Directions (Q. Nos. 29-33) In each questions, the main statement is followed by four sentences. Select the pair of sentences that relate logically to the given statement. (1998)

- 29) Either Sita is sick or she is careless.
 A. Sita is not sick.
 B. Sita is not careless.
 C. Sita is sick.
 D. Sita is careless.
 (a) AB (b) AD
 (c) BA (d) DA
- 30) Ram gets a swollen nose whenever he eats hamburgers.
 A. Ram gets a swollen nose.
 B. Ram does not eat hamburgers.
 C. Ram does not get a swollen nose.
 D. Ram eats hamburgers.
 (a) AB (b) DC
 (c) AC (d) BC
- 31) Either the employees have no confidence in the management or they are hostile by nature.
 A. They are hostile by nature.
 B. They are not hostile by nature.
 C. They have confidence in the management.
 D. They have no confidence in the management.
 (a) BA (b) CB
 (c) DA (d) BD

- 32) Whenever Ram reads late into the night, his father beats him up.
 A. His father does not beat Ram.
 B. Ram reads late into the night.
 C. Ram reads early in the morning.
 D. Ram's father beats him in the morning.
 (a) CD (b) BD
 (c) AB (d) None of these

- 33) All irresponsible parents shout if their children do not cavort.
 A. All irresponsible parents do not shout.
 B. Children cavort.
 C. Children do not cavort.
 D. All irresponsible parents shout.
 (a) AB (b) BA
 (c) CA (d) All of these

Directions (Q. Nos. 34-37) In each of the following sentences the main statement is followed by four sentences each. Select a pair of sentences that relate logically with the given statement. (1997)

- 34) Either Sam is ill; or he is drunk.
 A. Sam is ill.
 B. Sam is not ill.
 C. Sam is drunk.
 D. Sam is not drunk.
 (a) AB (b) DA (c) AC (d) CD
- 35) Whenever Ram hears of a tragedy, he loses sleep.
 A. Ram heard of a tragedy.
 B. Ram did not hear of a tragedy.
 C. Ram lost sleep.
 D. Ram did not lose sleep.
 (a) CA (b) BD (c) DB (d) AD
- 36) Either the train is late; or it has derailed.
 A. The train is late.
 B. The train is not late.
 C. The train is derailed.
 D. The train is not derailed.
 (a) AB (b) DB (c) CA (d) BC
- 37) When I read a horror story, I have a nightmare.
 A. I read a story.
 B. I did not read a horror story.
 C. I did not have a nightmare.
 D. I had a nightmare.
 (a) CB (b) AD (c) BC (d) AC

Directions (Q. Nos. 38-42) *Each of the following questions contains six statements followed by four sets of combinations of three. You have to choose that set in which the third statement logically follows from the first two.* (1997)

- 38)** A. No bird is viviparous.
B. All mammals are viviparous.
C. Bats are viviparous.
D. No bat is a bird.
E. No bird is a mammal.
F. All bats are mammals.
(a) ADC (b) ABE
(c) FBA (d) AFC
- 39)** A. No mother is a nurse.
B. Some nurses like to work.
C. No woman is a prude.
D. Some prude are nurses.
E. Some nurse are women.
F. All women like to work.
(a) ABE (b) CED
(c) FEB (d) BEF
- 40)** A. Oranges are sweet.
B. All oranges are apples.
C. Some sweets are apples.
D. Some oranges are apples.
E. All sweets are sour.
F. Some apples are sour.
(a) DAC (b) CDA
(c) BCA (d) EFC
- 41)** A. Zens are Marutis.
B. Zens are fragile.
C. Marutis are fragile.
D. Opels are fragile.
E. Marutis are Opels.
F. Opels are stable.
(a) ACB (b) FED (c) CEA (d) ABC
- 42)** A. Dogs sleep in the open.
B. Sheep sleep in doors.
C. Dogs are like sheep.
D. All indoors are sheep.
E. Some dogs are not sheep.
F. Some open are not sheep.
(a) AFE (b) DCA
(c) ABE (d) None of these

Directions (Q. Nos. 43-51) *Given below are six statements followed by sets of three. You are to mark the option in which the statements are most logically related.* (1996)

- 43)** A. Some pins are made of tin.
B. All tin in made of copper.
C. All copper is used for pins.
D. Some tin is copper.
E. Some pins are used for tin.
F. Some copper is used for tin.
(a) ABC (b) CEF
(c) CDA (d) ABE
- 44)** A. An ostrich lays eggs.
B. All birds lay eggs.
C. Some birds can fly.
D. An ostrich cannot fly.
E. An ostrich is a bird.
F. An ostrich cannot swim.
(a) BEA (b) ABE
(c) DEC (d) ECB
- 45)** A. Some paper is wood.
B. All wood is good.
C. All that is good is wood.
D. All wood is paper.
E. All paper is good.
F. Some paper is good
(a) BED (b) BDF
(c) FAB (d) FBA
- 46)** A. All bricks are tricks.
B. Some tricks are shrieks.
C. Some that are shrieks are bricks.
D. Some tricks are not bricks.
E. All tricks are shrieks.
F. No tricks are shrieks.
(a) EAC (b) BCD
(c) ABC (d) EDC
- 47)** A. Some sand is band.
B. All sandal is band.
C. All band is sand.
D. No sand is sandal.
E. No band is sand.
F. Some band is sandal.
(a) BCA (b) AFE
(c) DEC (d) CEA

- 48) A. No wife is a life.
 B. All life is strife.
 C. Some wife is strife.
 D. All that is wife is life.
 E. All wife is strife.
 F. No wife is strife.
 (a) BEF (b) FCB (c) ABF (d) BDE

- 49) A. Some crows are flies.
 B. Some flies are mosquitoes.
 C. All mosquitoes are flies.
 D. Some owls are flies.
 E. All owls are mosquitoes.
 F. Some mosquitoes are not owls.
 (a) ABC (b) CEF (c) ADE (d) EDB

- 50) A. Six is five.
 B. Five is not four.
 C. Some five is ten.
 D. Some six is twelve.
 E. Some twelve is five.
 F. Some ten in for.
 (a) ADE (b) ABC (c) AEF (d) EDC

- 51) A. Poor girls want to marry rich boys.
 B. Rich girls want to marry rich boys.
 C. Poor girls want to marry poor girls.
 D. Rich boys want to marry rich girls.
 E. Poor girls want to marry rich girls.
 F. Rich boys want to marry poor girls.
 (a) ADE (b) ABC (c) BCD (d) DEF

Directions (Q. Nos. 52-56) Each of the questions contains six statements followed by four sets of combinations of three. You have to choose that set in which the statements are logically related. (1995)

- 52) A. Some bubbles are not dubbles.
 B. Some dubbles are not bubbles.
 C. None who is rubbles is dubbles.
 D. All dubbles are rubbles.
 E. Some dubbles are bubbles.
 F. Some who are rubbles are not bubbles.
 (a) ACF (b) DEF
 (c) ABC (d) BDF

- 53) A. Some men are bad.
 B. All men are sad.
 C. All bad things are men.
 D. All bad things are sad.

- E. Some sad things are men.
 F. Some sad things are bad.
 (a) AFE (b) BCF
 (c) BDA (d) BCE

- 54) A. All Toms are bright.
 B. No bright Toms are Dicks.
 C. Some Toms are Dicks.
 D. Some Dicks are bright.
 E. No Tom is a Dick.
 F. No Dick is a Tom.
 (a) ABC (b) BEF (c) ABF (d) CDA

- 55) A. All witches are nasty.
 B. Some devils are nasty.
 C. All witches are devils.
 D. All devils are nasty.
 E. Some nasty are devils.
 F. No witch is nasty.
 (a) BCD (b) CDA (c) DEC (d) FEC

- 56) A. No tingo is a bingo.
 B. All jingoes are bingos.
 C. No jingo is a tingo.
 D. Some jingoes are not tingoos.
 E. Some tingoos are jingoes.
 F. Some bingos are not tingoos.
 (a) ABC (b) ACB (c) DFA (d) BDA

Directions (Q. Nos. 57-66) Each question contains six statements followed by four sets of combinations of three. Choose the set in which the combinations are logically related. (1994)

- 57) A. All vegetarians eat meat.
 B. All those who eat meat are not vegetarians.
 C. All those who eat meat are herbivorous.
 D. All vegetarians are carnivorous.
 E. All those who eat meat are carnivorous.
 F. Vegetarians are herbivorous.
 (a) BCE (b) ABE
 (c) ACD (d) ACF

- 58) A. All roses have thorns.
 B. All roses have nectar.
 C. All plants with nectar have thorns.
 D. All shrubs have roses.
 E. All shrubs have nectar.
 F. Some roses have thorns.
 (a) BEF (b) BCF
 (c) BDE (d) ACF

- 59) A. No spring is a season.
B. Some seasons are springs.
C. Some seasons are autumns.
D. No seasons are autumns.
E. Some springs are not autumns.
F. All springs are autumns.
(a) DFA (b) BEF (c) CEB (d) DEB
- 60) A. All falcons fly high.
B. All falcons are blind.
C. All falcons are birds.
D. All birds are yellow.
E. All birds are thirsty.
F. All falcons are yellow.
(a) ABC (b) CDF (c) DEF (d) BCA
- 61) A. No wires are hooks.
B. Some springs are hooks.
C. All springs are wires.
D. Some hooks are not wires.
E. No hook is a spring.
F. All wires are springs.
(a) AED (b) BCF (c) BEF (d) ACE
- 62) A. Some abra are dabra.
B. All abra are cabra.
C. All dabra are abra.
D. All dabra are not abra.
E. Some cabra are abra.
F. Some cabra are dabra.
(a) AEF (b) BCF (c) ABD (d) BCE
- 63) A. No plane is a chain.
B. All manes are chains.
C. No mane is a plane.
D. Some manes are not planes.
E. Some planes are manes.
F. Some chains are not planes.
(a) ACD (b) ADF (c) ABC (d) CDF
- 64) A. All dolls are nice.
B. All toys are nice.
C. All toys are dolls.
D. Some toys are nice.
E. Some nice are dolls.
F. No doll is nice.
(a) CDE (b) CEF (c) ACD (d) BEF

- 65) A. Some buildings are not skyscrapers.
B. Some skyscrapers are not buildings.
C. No structure is a sky scrapper.
D. All skyscrapers are structures.
E. Some skyscrapers are buildings.
F. Some structures are not buildings.
(a) ACE (b) BDF
(c) FDA (d) ACF
- 66) A. All bins are buckets.
B. No bucket is a basket.
C. No bin is a basket.
D. Some baskets are buckets.
E. Some bins are baskets.
F. No basket is a bin.
(a) BDE (b) ACB
(c) CDF (d) ABF

Directions (Q. Nos. 67-76) From the alternatives, choose the one which correctly classifies the four sentences as a (1994)

F : Fact : If it relates to a known matter of direct observation, or an existing reality or something known to be true.

J : Judgement : If it is an opinion or estimate or anticipation of common sense or intention.

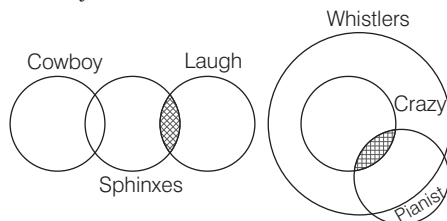
I : Inference : If it is a logical conclusion or deduction about something based on the knowledge of facts.

- 67) A. If India has embarked on the liberalisation route, she cannot afford to go back.
B. Under these circumstances, being an active supporter of WTO policies will be a good idea.
C. The WTO is a truly global organisation aiming at freer trade.
D. Many member countries have already drafted plans to simplify tariff structures.
(a) FJFI (b) IFJF
(c) IJFF (d) IFIF
- 68) A. The minister definitely took the wrong step.
B. Under the circumstances, he had many other alternative.
C. The prime minister is embarrassed due to the minister's decision.
D. If he has put the government in jeopardy, the minister must resign.
(a) JFFI (b) IFJI
(c) FFJI (d) IFIJ

- 69) A. The ideal solution will be to advertise aggressively.
 B. One brand is already popular amongst the youth.
 C. Reducing prices will mean trouble as our revenues are already dwindling.
 D. The correct solution will be to consolidate by aggressive marketing.
 (a) JFIJ (b) FJJI (c) JFFI (d) LJFJ
 (a) LJFF (c) JJIF
- 70) A. If democracy is to survive, the people must develop a sense of consumerism.
 B. Consumerism has helped improve the quality of goods in certain countries.
 C. The protected environment in our country is helping the local manufactures.
 D. The quality of goods suffers if the manufacturers take undue advantage of this.
 (a) IJFJ (b) JFJI (c) IJJF (d) IFJJ
- 71) A. Unless the banks agree to a deferment of the interest, we cannot show profits this year.
 B. This would not have happened had we adopted a stricter credit scheme.
 C. The revenues so far cover only the cost and salaries.
 D. Let us learn a lesson : we cannot make profits without complete control over credit.
 (a) IJJF (b) IJFI
 (c) FJIF (d) FJFI
- 72) A. Qualities cannot be injected into one's personality.
 B. They are completely dependent on the genetic configuration that one inherits.
 C. Hence changing our inherent traits is impossible as the genes are unalterable.
 D. The least one can do is to try and subdue the 'bad qualities'.
 (a) FIJI (b) JFFI
 (c) JFIJ (d) JIFI
- 73) A. Everything is purposeless.
 B. Nothing before and after the existence.
 C. Man is a part of the purposeless universe; hence man is also purposeless.
 D. There is only one way of adding purpose to this universe: union with Him.
 (a) JFIJ (b) FJJI (c) JFFI (d) LJFJ
- 74) A. Everyday social life is impossible without interpersonal relationships.
 B. The root of many misunderstandings has been cited in poor relations among individuals.
 C. Assuming the above to be true, social life will be much better if people understand the importance of good interpersonal relations.
 D. A study reveals that interpersonal relations and hence life in general can be improved with a little effort on the part of individuals.
 (a) FJJI (b) JFIF (c) FIFJ (d) IFFJ
- 75) A. The prices of electronic goods are falling.
 B. Since we have substantial reductions in import duties, this is obvious.
 C. The trend is bound to continue in the near future.
 D. But the turnover of the electronic industry is still rising, because the consumers are increasing at a rapid rate.
 (a) IFJF (b) FJII (c) FIJF (d) JIFF
- 76) A. In the past, it appears, wealth distribution and not wealth creation has dominated the economic policy.
 B. Clearly, the government has not bothered to eradicate poverty.
 C. Today's liberalisation is far from the hitherto Nehruvian socialism.
 D. Results are evident in the form of a boom in the manufacturing sector output and turnover of all industries.
 (a) FJIF (b) FIFJ (c) IJIF (d) JIFF

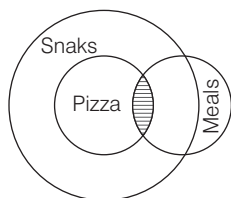
HINTS & SOLUTIONS

- 1) (c) In Statement A it is given that no cowboys laugh and some who laugh are sphinxes. Hence, it is clear that same sphinxes which are common to laugh are not cowboys.

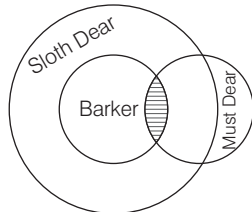


From the figure it is clear that some crazy will be pianist.

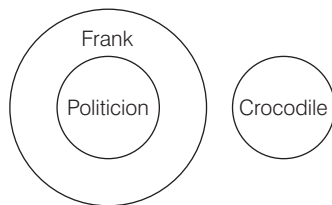
- 2) (a)



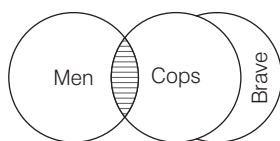
It is therefore clear that some meals are snaks.
It is clear that some barkers are must dear.



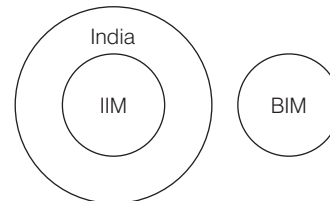
- 3) (b) It is very clear if no frank people are crocodiles, then no crocodiles will be politicians.



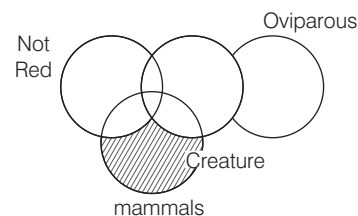
- 4) (c) Clearly, Statements C and B follows.
5) (b) Shaded region common to all the three circles show our conclusion "Some brave people are cops".



- 6) (a) From the figure it is very clear that IIM and BIM do not have any association with each other.



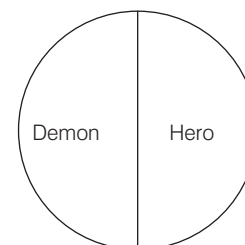
- 7) (c) It is clear that some young people who are citizens of yes islands will speak only truth.
8) (c) From the figure it is definitely true that atleast the shaded region is not related with creature. Hence, some creatures are not mammals.



- 9) (b)
10) (d) From option c it is concluded that "No metadors are bulls". And from option d it is clear that "Some polar bears drive cadillacs."
11) (d) Option (d) CB and DA follow from the statement.
12) (d) If the statement is of the type—Either A or B, then conclusion will always be of the nature. If not A then B.

OR

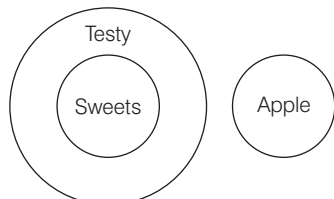
If not B then A.



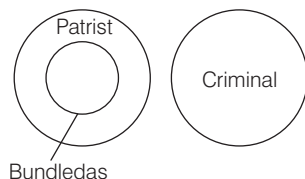
In the question it is given that either Ravana is a demon or he is a hero. It means, (if) Ravana is not a hero (then) Ravana is a demon and (if) Ravana is not a demon (then) Ravana is a hero. Hence, DB and CA follow.

- 13) (c)
14) (d)

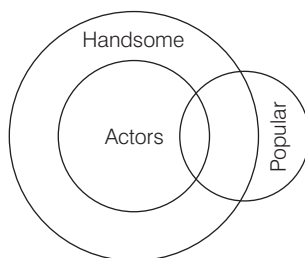
- 15) (b) All software companies employ knowledge workers. Tara Tec is a software company. It clearly means that Tara Tec employees knowledge workers.
- 16) (d) C is the conclusion of Statements B and A.
- 17) (a) From the figure it is very clear that apples are not sweets .



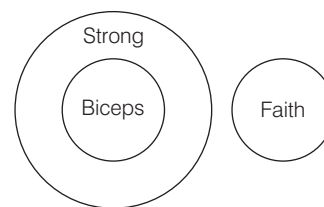
- 18) (b) It is very clear that since some town in India are polluted therefore some towns in India should be destroyed.
- 19) (a) Since, bundelas is a subset of Patriot, hence bundelas is not criminal. Hence, B is the conclusion drawn from Statements A and C.



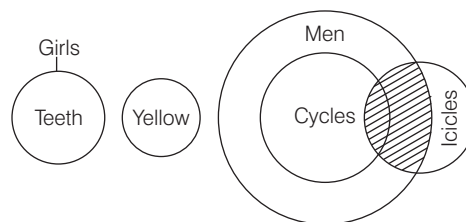
- 20) (a) Clearly, Statement A is the direct inference drawn from Statements D and C.
- 21) (b) From the figure it is clear that some popular are handsome.



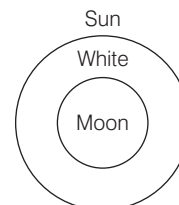
- 22) (a) Modern industry is technology driven BTI is a modern industry. Hence, BTI is technology driven.
- 23) (b) E is the inference drawn from Statements B and E.
- 24) (c) Clearly, B is the direct conclusion drawn from Statements A and E.
- 25) (b) From the statements strong and faith do not have any association, hence faith and biceps will have no relation at all.



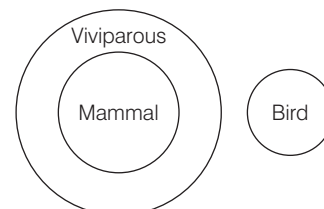
- 26) (b) From the figure it is clear that "Some icicles are men." It is clear that girls and yellow will not have any association.



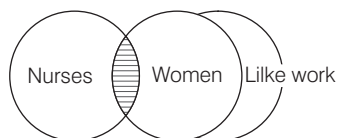
- 27) (a) Since, white is a subset of sun. Hence, all moon which is already a subset of sun will be white.



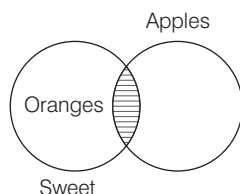
- 28) (c) Both Statements A and C are correct.
- 29) (b) Either A or B means if not B then A and vice-versa. Hence, either sita is sick or she is careless implies (if) Sita is not sick (then) she is careless.
- 30) (d) None of the option follows.
- 31) (b)
- 32) (d)
- 33) (a) Rule same as for "Either A or B".
- 34) (a) Clearly AB is the correct choice.
- 35) (a) Clearly option (a) follows from the statement.
- 36) (d) Either A or B implies if not A then B.
- 37) (a) If A then B implies if not A then not B.
- 38) (b) Since, no bird is viviparous, hence no bird is mammal.



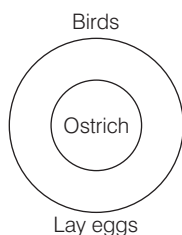
- 39) (c) Shaded portion shows the nurses who like to work.



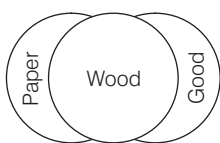
- 40) (a) Shaded portion shows that some sweets are apples.



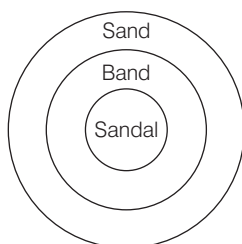
- 41) (a) Since, zens are marutis, hence zens are fragile.
 42) (d) None of the options follows.
 43) (c) All copper is used for pins and some tin is copper implies that some pins are tin OR some pins are made of tins.
 44) (a) It is clear from Statements B and E that ostrich lays eggs.



- 45) (b) From the figure it is very clear that wood is common to paper and good, hence conclusion some paper is good is correct.

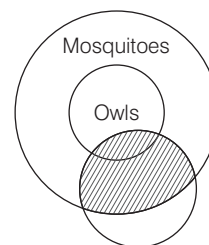


- 46) (a) C is the conclusion drawn from statements A and C.
 47) (a) From the figure, it is clear that "Some sand is band."

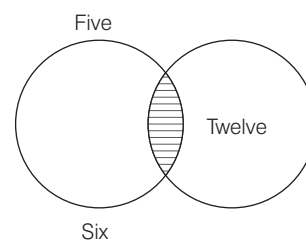


- 48) (d) All life is strife and all that is wife is life clearly implies that all wife is strife.

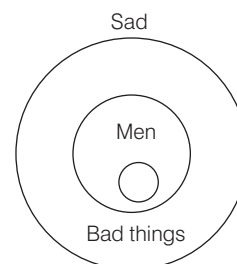
- 49) (d) From the figure it is clear that "Some flies are mosquitoes."



- 50) (a) Since, five is six, hence some twelve is five.



- 51) (a) E is the conclusion drawn from Statements A and D.
 52) (d) BDF is the right combination, where F follows from B and D.
 53) (b) Clearly, bad things is a subset of men and sad as well hence it implies that some sad things are bad.



- 54) (c) Conclusion F follows from Statements B and F.
 55) (b) Clearly, witches is a sub set of Devil and Devil is a subset of nasty which implies that witches are nasty.



- 56) (a) C follows from A and B.

- 57) (d)
 58) (c)
 59) (a)
 60) (b)
 61) (d)
 62) (b)
 63) (c)
 64) (a)
 65) (b)
 66) (d)
 67) (c) Both CD are facts as they relate to a known matter of direct observation. A is an inference and B a judgement.
- 68) (a) A is a judgement, B and C are facts and D is the inference.
 69) (a) Statements A and D is an anticipation of a decisions hence is a judgement. Statement B is a fact because it is a categorical and definite.
 Statement C gives a conclusion if the prices are reduced, hence is an inference.
 70) (b) Clearly statement A and C are judgements. B is a fact and D an inference.
 71) (d) Option (d) is the correct combination.
 72) (c)
 73) (a)
 74) (b)
 75) (c)
 76) (d)

CHAPTER FIFTEEN

DATA INTERPRETATION

Directio(Q. Nos. 1-4) *Study the table below to answer the questions given below.*

(2016)

The following table shows the profits (in ₹ lakh) earned by 5 shops A, B, C, D and E during 2007-2012.

Shops	Years					
	2007	2008	2009	2010	2011	2012
A	4	6	8	7	5	10
B	3	5	6	4	7	8
C	9	11	8	7	10	12
D	5	4	6	3	7	3
E	6	7	5	5	4	8

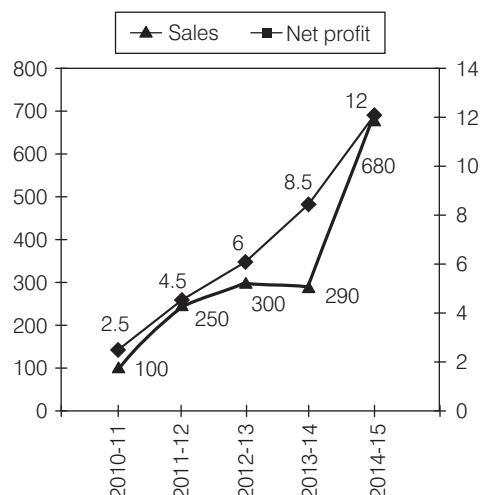
Income = Profit + Investment

- 1) By what per cent is the profit earned by A in 2012 more than that in 2008?
(a) 40% (b) 66.6%
(c) 266% (d) 160%
- 2) Consider the percentage change in profit for A, B, D and E for the pair of years 2007 and 2008, 2007 and 2011 and 2007 and 2011, respectively. Which shop has the maximum percentage change in profits for the years mentioned?
(a) A (b) B
(c) D (d) E
- 3) What should be the income of D in 2009 so that its profit per cent is 30%?
(a) ₹ 14 lakh (b) ₹ 20 lakh
(c) ₹ 26 lakh (d) ₹ 11 lakh
- 4) To earn a profit of 20% by each of C and E, what is the ratio of investments made by them in 2008?
(a) 7 : 11 (b) 1 : 5
(c) 5 : 1 (d) 11 : 7

Directions (Q. Nos. 5-8) *Refer to the following chart and solve the questions based on it.*

(2016)

The figure below represents the sales and net profit (in ₹ crore) of IVP Ltd. for five years from 2010-11 to 2014-15. During this period, the sales increased from ₹ 100 crore to ₹ 680 crore. Correspondingly, the net profit increased from ₹ 2.5 crore to ₹ 12 crore. (Net profit is defined as the excess of sales over total costs)



- 5) The highest percentage growth in sales, relative to the previous year occurred in
 - (a) 2011-12
 - (b) 2012-13
 - (c) 2013-14
 - (d) 2014-15
- 6) The highest percentage growth in net profit, relative to the previous year, was achieved in
 - (a) 2014-15
 - (b) 2013-14
 - (c) 2012-13
 - (d) 2011-12
- 7) Defining profitability as the ratio of net profit to sales, IVP Ltd. recorded the highest profitability in
 - (a) 2014-15
 - (b) 2013-14
 - (c) 2010-11
 - (d) 2012-13
- 8) With profitability as defined in question 7, it can be concluded that
 - (a) Profitability is non-decreasing during the five years from 2010-11 to 2014-15
 - (b) Profitability is non-increasing during the five years from 2010-11 to 2014-15
 - (c) Profitability remains constant during the five years from 2010-11 to 2014-15
 - (d) None of the above

Directions (Q. Nos. 9-12) Study the table below to answer these questions.

(2016)

The following table shows the quantities of minerals exported from India to six different countries A, B, C, D, E and F (in '000 tonne) in the year 2010.

Country → Item ↓	A	B	C	D	E	F
Iron ore	18	12	25	11	32	5
Coal	12	38	22	6	29	42
Silver	14	18	26	3	48	23
Copper	23	12	20	2	2	16
Gold	2	4	8	1	3	10

- 9) If the second largest importing country increases its off-take of all the minerals, taken together, from India and is at par with the largest importer, its share of the total exports of minerals from India would be how much per cent?
- 10) If India were to ban the export of Gold altogether, by what approximate percentage should the export of the rest of the minerals increase so that the total quantity of minerals exported remains the same?

- 11) Eighteen per cent of country E's total requirement of iron ore is being met by imports from India. Next year, its total requirement of iron ore is expected to fall by 22% and only 12% of the revised requirement will be imported from India. Assuming all other exports to country E by India remain at the same levels, what would be its total percentage drop in quantity of exports to E?
- 12) If international demand for coal from India rises by 12%, that of Iron ore by 8% and Copper by 15%, by how much per cent will total exports from India rise, assuming export of Gold and Silver remain at the same level?

Directions (Q. Nos. 13-16) *Answer the questions on the basis of the information given below.* (2016)

Mindworkzz Centre for Management studies has three branches in India, i.e. at Patna, Lucknow, and Jamshedpur. The number of faculty members in each centre may vary depending upon the intake capacity of students. The following information was obtained from reliable sources:

- (i) At times, a specialist of a subject of one city may visit a centre at another city to teach for a few days. Each faculty teaches at at least one city and may or may not teach at another city.
- (ii) Some of the faculty members are teaching exactly two centres and the number for various possible combinations is in the ratio of 1 : 2 : 3, respectively (in the same order of the centre mentioned above).
- (iii) 10 faculty members teaching at the Patna centre are also teaching at a minimum of one other centre.
- (iv) 24 Faculty members teach at the Patna centre.
- (v) The number of faculty members in Lucknow alone is twice the number of those who visit all the three cities to teach their respective specialisations.
- (vi) Number of faculty members teaching at Jamshedpur centre alone is four more than the number of faculty members teaching at all three centres.
- (vii) Number of faculty members in Patna alone is four less than thrice the number of those who visit all the three cities to teach.

Additional Information (Q. Nos. 15-16) Due to over burden on faculty members it was decided by the mindworkzz mangement that every faculty could teach at the most two centre and a minimum of one centre. Hence, any faculty who was associated with all the three cities had his duties withdrawn from exactly one of the centre (randomly or as decided by the management) and reinstated with responsibilities of two centre only. The number of teachers withdrawn from Lucknow centre are two less than the number that are withdrawn from the Patna centre which again is two less than the number withdrawn from the Jamshedpur centre.

- 13) Based upon the information given above, how many total faculty members are employed at Mindworkzz?
- (a) 43 (b) 44 (c) 45 (d) None of these
- 14) Which of the following additional information will enable us to find the exact number of faculty members involved in each centre?
- I. Six faculty members teach at all the three centre.
 II. Twenty one teachers work at Lucknow centre.
 III. Twenty one teachers work at Jamshedpur centre.
- (a) I and II (b) I and III (c) II and III (d) I, II and III
- 15) Which of the following statements is/are definitely false?
- (a) Number of faculty members working at Patna centre is less than 15
 (b) Number of faculty members working at Jamshedpur centre is more than 23
 (c) Both of the above
 (d) None of the above
- 16) In addition to the previous question, some new faculty members were inducted into the AMS team. They were distributed across the three centres in such a fashion that after the distribution, the number of faculty members at all three centres became identical. What is the minimum number of faculty members required to satisfy the given condition?
- (a) 4 (b) 3 (c) 2 (d) None of these

Directions (Q. Nos. 17-19) *Answer the questions based on the following information.*

The table below presents data on percentage population covered by drinking water and sanitation facilities in selected Asian Countries. (2015)

Population covered by drinking water and sanitation facilities (Percentage coverage)

	Drinking water			Sanitation facilities		
	Urban	Rural	Total	Urban	Rural	Total
India	85	79	81	70	14	29
Bangladesh	99	96	97	79	44	48
China	97	56	67	74	7	24
Pakistan	82	69	74	77	22	47
Philippines	92	80	86	88	66	77
Indonesia	79	54	62	73	40	51
Sri Lanka	88	52	57	68	62	63
Nepal	88	60	63	58	12	18

Source World Resources 1998-99, p. 251, UNDP, UNEP and World Bank

Country A is said to dominate B or $A > B$, if A has higher percentage in total coverage for both drinking water and sanitation facilities and B is said to be dominated by A or $B < A$. A country is said to be on the coverage frontier, if no other country dominates it. Similarly, country is not on the coverage frontier, if it is dominated by atleast one other country.

17) What are the countries on the coverage frontier?

- (a) India and China (b) Sri Lanka and Indonesia
(c) Philippines and Bangladesh (d) Nepal and Pakistan

18) Which of the following statements are true?

1. India > Pakistan and India > Indonesia 2. India > China and India > Nepal
3. Sri Lanka > China 4. China > Nepal
(a) 1 and 3 (b) 2 and 4 (c) 1, 2 and 3 (d) 2, 3 and 4

19) Using only the data presented under 'sanitation facilities' columns, it can be concluded that rural population in India, as a for percentage of its total population is approximately

- (a) 76 (b) 70 (c) 73 (d) Cannot be determined

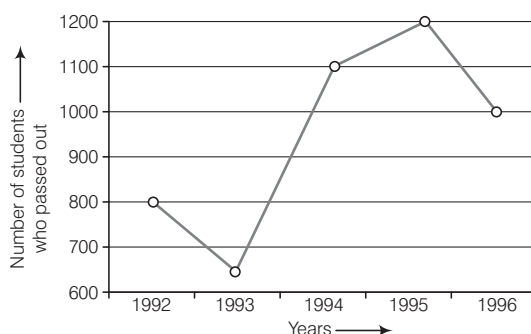
Directions (Q. Nos. 20-24) *Answer the questions based on the following information.*

(2015)

The first table gives the percentage of students in MBA class, who sought employment in the areas of finance, marketing and software. The second table gives the average starting salaries of the students per month, (rupees in thousand) in these areas. The third table gives the number of students who passed out in each year.

	Finance	Marketing	Software	Others
1992	22	36	19	23
1993	17	48	23	12
1994	23	43	21	13
1995	19	37	16	28
1996	32	32	20	16

	Finance	Marketing	Software
1992	5450	5170	5290
1993	6380	6390	6440
1994	7550	7630	7050
1995	8920	8960	7760
1996	9810	10220	8640

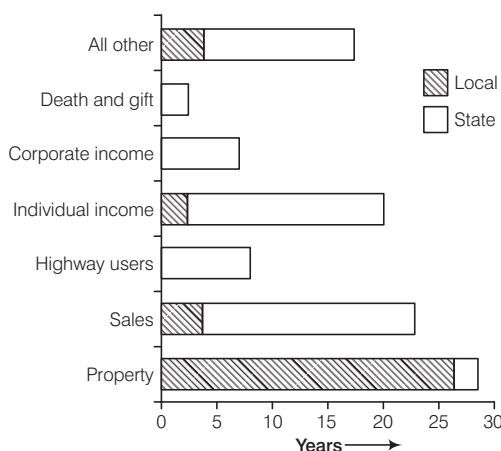


- 20) The number of students who get jobs in finance is less than the students getting marketing jobs in the 5 years, by
 (a) 826 (b) 650 (c) 750 (d) 548
- 21) What is the percentage increase in the average salary of finance from 1992 to 1996?
 (a) 60% (b) 32% (c) 96% (d) 80%
- 22) The average annual rate at which the initial salary offered in software increases is
 (a) 21% (b) 33% (c) 15.9% (d) 65%
- 23) What is the average monthly salary offered to a management graduate in 1993?
 (a) ₹ 6403 (b) ₹ 6330 (c) ₹ 6333 (d) Cannot be determined
- 24) In 1994, students seeking jobs in finance earned more than those opting for software (per annum)
 (a) ₹ 43 lakh (b) ₹ 33.8 lakh (c) ₹ 28.41 lakh (d) ₹ 38.8 lakh

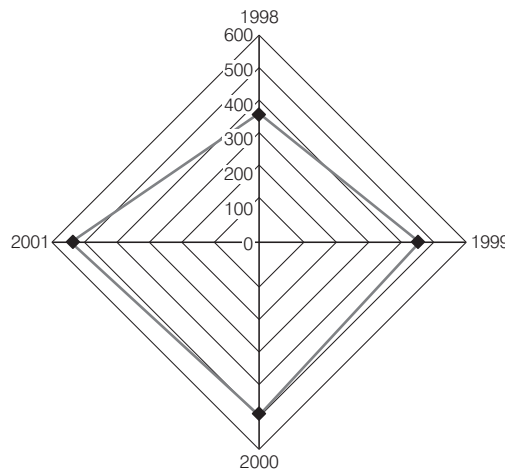
Directions (Q. Nos. 25-26) Refer to the charts below and answer the questions that follow.

(2015)

Chart given below presents the sources of local and state tax revenues for the year 2001 as a percentage of the total tax revenues.



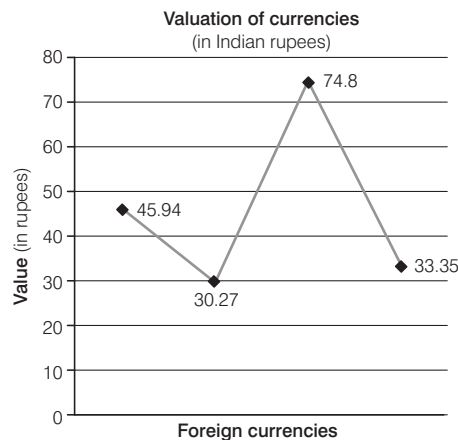
The diagram shown below represents the combined state and local tax revenue (in \$ mn).



- 25) Find the difference between the tax revenue generated from individual income at local and state levels in 2001.
\$ _____ mn.
- 26) If revenue distribution in 2000 was same as in 2001 and tax from highway users was collected for the first time, then what was the percentage increase in tax revenue from source other than highway users in 2000 over the previous year? _____ %.

Directions (Q. Nos. 27-28) Go through the chart below and answer the questions based on it.

(2015)



Above given four currencies represents the following

US Dollar, Singapore Dollar, UK Pound and Euro Following is the order of their valuations

UK Pound > US Dollar > Euro > Singapore Dollar

- 27) A person wants to buy an article worth 65 Singapore Dollars. If Singapore Dollar loses 2% with respect to the above given exchange rates, then how many US dollars must be spend? _____ US dollars.
- 28) A person wants to buy 800 barrels of oil. The payment can be made either in US Dollars or in Euros. If the payment is made in Euros, then it would be 47 Euros per barrel while if one pays in US Dollars, the rate would be 29 US Dollars per barrel. How much money will he save, if he goes for the cheaper deal? _____ US Dollars.

Directions (Q. Nos. 29-32) Answer the questions based on the following information.

(2015)

Venkat, a stockbroker, invested a part of his money in the stock of four companies..... A, B, C and D. Each of these companies belonged to different industries, viz. Cement, Information Technology (IT), Auto and Steel, in no particular order. At the time of investment, the price of each stock was ₹100. Venkat purchased only one stock of each of these companies. He was expecting returns of 20%, 10%, 30% and 40% from the stock of companies A, B, C and D, respectively. Returns are defined as the change in the value of the stock after one year, expressed as a percentage of the initial value. During the year, two of these companies announced extraordinarily good results. One of these two companies belonged to the Cement or the IT industry, while the other one belonged to either the Steel or the Auto industry. As a result, the returns on the stocks of these two companies were higher than the initially expected returns. For the company belonging to the Cement or the IT industry with extraordinarily good results, the returns were twice that of the initially expected returns. For the company belonging to the Steel or the Auto Industry, the returns on announcement of extraordinarily good results were only one and a half times that of the initially expected returns. For the remaining two companies, which did not announce extraordinarily good results, the returns realised during the year were the same as initially expected.

29) What is the minimum average return Venkat would have earned during the year?

- (a) 30% (b) $31\frac{1}{4}\%$ (c) $32\frac{1}{2}\%$ (d) Cannot be determined

30) If Venkat earned a 35% return on average during the year, then which of these statements would necessarily be true?

- I. Company A belonged either to Auto or to Steel Industry.
 II. Company B did not announce extraordinarily good results.
 III. Company A announced extraordinarily good results.
 IV. Company D did not announce extraordinarily good results.
 (a) I and II (b) II and III (c) III and IV (d) II and IV

31) If Venkat earned a 38.75% return on average during the year, then which of these statement(s) would necessarily be true?

- I. Company C belonged either to Auto or to Steel Industry.
 II. Company D belonged either to Auto or to Steel Industry.
 III. Company A announced extraordinarily good results.
 IV. Company B did not announce extraordinarily good results.
 (a) I and II (b) II and III (c) I and IV (d) II and IV

32) If Company C belonged to the Cement or the IT industry and did announce extraordinarily good results, then which of these statement(s) would necessarily be true?

- I. Venkat earned not more than 36.25% return on average.
 II. Venkat earned not less than 33.75% return on average.
 III. If Venkat earned 33.75% return on average, then Company A announced extraordinarily good results.
 IV. If Venkat earned 33.75% return on average, then Company B belonged either to Auto or to Steel Industry.
 (a) I and II (b) II and IV (c) II and III (d) III and IV

Directions (Q. Nos. 33-36) Refer to the following table and answer the questions given below.

(2014)

Foreign investment approved 1996-2000 (in \$ million)

Years	1996	1997	1998	1999	2000
Developed	1215.09	1909.43	2246.82	6777.08	5554.58
Developing	138.15	658.04	538.36	2953.74	2540.48
Former socialist	5.07	4.52	33.88	37.63	3.95
Total	1358.31	2571.99	2819.06	9768.45	8099.01

Foreign investment approved 1996-2000 Countrywise (in \$ million)

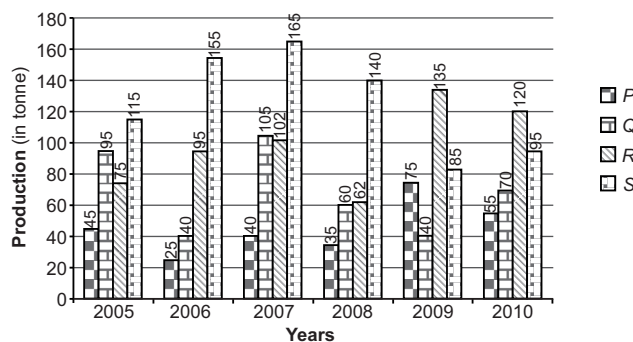
Years	1996	1997	1998	1999	2000
USA	475.15	1135.29	1111.78	2175.46	2838.32
UK	45.40	258.22	414.08	532.24	430.55
Japan	235.45	84.42	127.78	466.98	420.07
Switzerland	266.13	139.97	15.39	95.44	45.09
Others	336.18	954.09	1150.03	6498.32	4364.98
Total	1358.31	2571.99	2819.06	9768.44	8099.01

- 33) What percentage of the total foreign investment in 2000 was approved by developed countries?
 (a) 75% (b) 80% (c) 69% (d) 79%
- 34) From the table, USA can be categorised as
 (a) developed country (b) developing country (c) former socialist (d) None of these
- 35) In the total approvals, the share of UK has grown over the given period by
 (a) 5% (b) 20% (c) 15% (d) 2%
- 36) Which of the following statements is/are true about USA?
 I. Largest approver of the foreign investment for two years.
 II. Contributions as percentage of the total has been steadily increasing.
 III. Contribution as a percentage of the total has remained the same from 1996 to 2000.
 (a) Only I (b) I and II (c) I and III (d) All of these

Directions (Q. Nos. 37-40) Answer the questions based on the following graph.

(2014)

Following bar graph shows the production (in tonnes) of four products P, Q, R and S by a company from the years 2005 to 2010



- 37) In which year the annual growth rate of total production (of all products) is highest?
 (a) 2006 (b) 2007 (c) 2008 (d) 2010
- 38) If the stability of the production during 2005 to 2010 is defined as $\frac{\text{Average production}}{\text{Maximum production} - \text{Minimum production}}$, then which product is most stable?
 (a) P (b) Q (c) R (d) S

- 39) If four products P, Q, R and S shown in the graph are sold at price of ₹ 9, 4, 13 and 3, respectively during 2005-2010, then the total revenue of all the products is lowest in which year?
 (a) 2006 (b) 2007 (c) 2008 (d) 2010
- 40) Individual revenue of P, Q, R and S for the entire period (2005-2010) is calculated based on the price of ₹ 9, 4, 13 and 3, respectively. Which product fetches the lowest revenue?
 (a) P (b) Q (c) R (d) S

Directions (Q. Nos. 41-44) Answer the questions based on the following information.

(2014)

A professor keeps data on students tabulated by performance and sex of the student. The data is kept on a computer disk but unfortunately some of it is lost because of a virus. Only the following could be recovered.

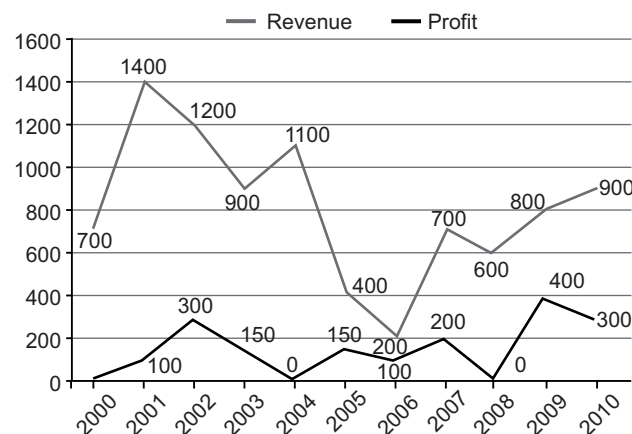
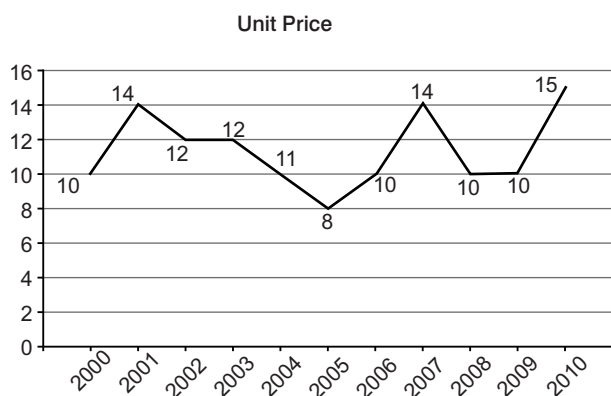
Sex	Performance			Total
	Average	Good	Excellent	
Male	—	—	10	—
Female	—	—	—	32
Total	—	30	—	—

Panic buttons were pressed but on avaiil. An expert committee was formed, which decided that the following facts were self-evident. Half the students were either excellent or good. 40% of the students were females. One third of the male students were average.

- 41) How many students are both female and excellent?
 (a) 0 (b) 8 (c) 16 (d) 32
- 42) What is the proportion of good male students?
 (a) 0 (b) 0.73 (c) 0.4 (d) 1.0
- 43) How many students are both male and good?
 (a) 10 (b) 16 (c) 22 (d) 48
- 44) Among average students, what is the ratio of male to female?
 (a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Directions (Q. Nos. 45-48) Answer the questions based on the following two graphs, assuming that there is no fixed cost component and all the units produced are sold in the same year.

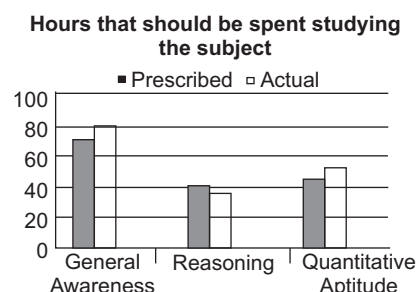
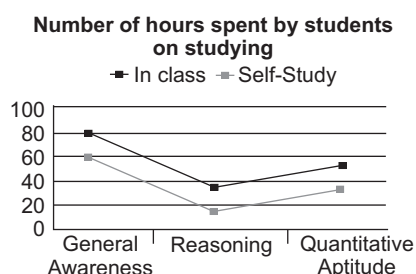
(2014)



- 45) In which year per unit cost is highest?
 (a) 2002 (b) 2001 (c) 2005 (d) 2007
- 46) What is the approximate average quantity sold during the period 2000-2010?
 (a) 64 units (b) 70 units (c) 77 units (d) 81 units
- 47) If the price per unit decrease by 20% during 2000-2004 and cost per unit increase by 20% during 2005-2010, then during how many number of years there is a loss?
 (a) 3 yr (b) 4 yr (c) 5 yr (d) 7 yr
- 48) If volatility of a variable during 2000-2010 is defined as $\frac{\text{Maximum value} - \text{Minimum value}}{\text{Average value}}$, then which of the following is true?
 (a) Price per unit has highest volatility (b) Cost per unit has highest volatility
 (c) Total profit has highest volatility (d) Revenue has highest volatility

Directions (Q. Nos. 49-51) Read the following data carefully and answer the questions given below. (2013)

The following graphs shows the distribution of numbers of hours required for studying various subjects for preparation of MBA entrance exam.



Self-study is done always outside the class. All the values are the multiples of 5.

- 49) Which of the following gives as many hours as those spent on studying Quantitative Aptitude?
 (a) Self-study—General Awareness (b) In class—Reasoning and Quantitative Aptitude
 (c) Self-study—General Awareness and Reasoning (d) In class—General Awareness and Reasoning
- 50) What percentage of hours spent on learning in class?
 (a) 32% (b) 45% (c) 65% (d) 80%
- 51) The total number of hours spent on learning the subjects self-study is nearest to which of the following
 (a) the prescribed hours for General Awareness
 (b) class rooms hours spent on General Awareness
 (c) the sum of the prescribed and Actual hours spent on Quantitative Aptitude
 (d) the total hours spent on Reasoning

Directions (Q. Nos. 52-54) Read the information carefully and answer the questions follow that. (2012)

A cricket tournament had three teams - India, Australia and Sri Lanka taking part in it. The format of the tournament was such that in the preliminary stage each of these teams, would play the other teams four times.

Four points are awarded for a win and in case a team beats another team by a huge margin, it is given a bonus point in addition to the four points. At the end of the preliminary stage, the top two teams, in terms of the points scored, reaches the finals. No match in the tournament ends in a tie and if two teams end up with the same number of points at the end of the preliminary stage, the team with the better net run rate is placed higher.

- 52) If India reached the finals, then what is the minimum number of points it would have scored in the preliminary stage?
 (a) 8 (b) 10 (c) 12 (d) 16
- 53) If Sri Lanka was eliminated in the preliminary stage, then what is the maximum number of points it could have scored?
 (a) 12 (b) 14 (c) 16 (d) 20
- 54) If Australia had the highest number of points at the end of the preliminary stage, then atleast how many points did it have?
 (a) 16 (b) 17 (c) 18 (d) 20

Directions (Q. Nos. 55-56) *These questions are based on the following data.*

(2011)

One morning, Govind Lal the owner of the local petrol bunk, was adulterating the petrol with kerosene. He had two identical tanks-the first was full of pure petrol while the second was empty. First he transferred an arbitrary amount of petrol from the first tank into the second and then replaced the petrol removed from the first tank with kerosene. He then repeated this process one more time but this time he ensured that by the end of the process the second tank was exactly full.

- 55) Which of the following can be the concentration of petrol in the second tank?
 (a) 50% (b) 60% (c) $66\frac{2}{3}\%$ (d) 80%
- 56) If the concentration of petrol in the second tank is 75% and the cost price of kerosene is half that of petrol, then what is Govind Lal's net profit percentage on selling the contents of the second tank given that he claims to sell the petrol at a profit of 25%?
 (a) $42\frac{6}{7}\%$ (b) $66\frac{2}{3}\%$ (c) $83\frac{1}{3}\%$ (d) 100%

Directions (Q. Nos. 57-59) *Study the following table and answer the questions that follows.*

(2011)

Disbursement of Loans by Various Banks from 1982 to 1986 (in ₹ crore)

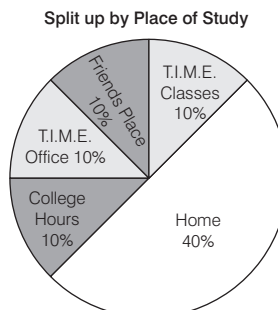
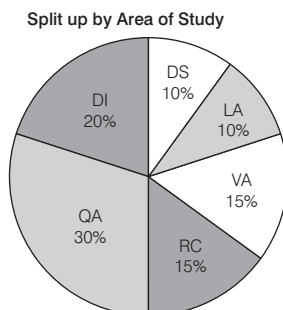
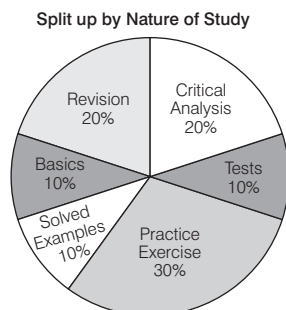
Banks	1982	1983	1984	1985	1986
A	18	23	45	30	70
B	27	33	18	41	37
C	29	29	22	17	11
D	31	16	28	32	43
E	13	19	27	34	42
Total	118	120	140	154	203

- 57) In which year did the average disbursement of loans record the highest percentage increase over that of the previous year?
 (a) 1984 (b) 1986 (c) 1985 (d) 1983
- 58) In which year and for which bank was the percentage contribution to the total value of loans disbursed for that year the lowest?
 (a) C, 1986 (b) B, 1984 (c) C, 1985 (d) A, 1985
- 59) For a certain scheme, the qualification is that a bank should have consistently achieved a minimum of 20% of the total disbursement of all banks for each of the last four years. Which of the banks qualify as on the year 1986?
 (a) A (b) B (c) C (d) None of these

Directions (Q. Nos. 60-62) Answer these questions on the basis of the information given below.

(2011)

Each of the following pie charts gives the percentage split up of the total time spent by a certain student towards preparation of CAT 2005.



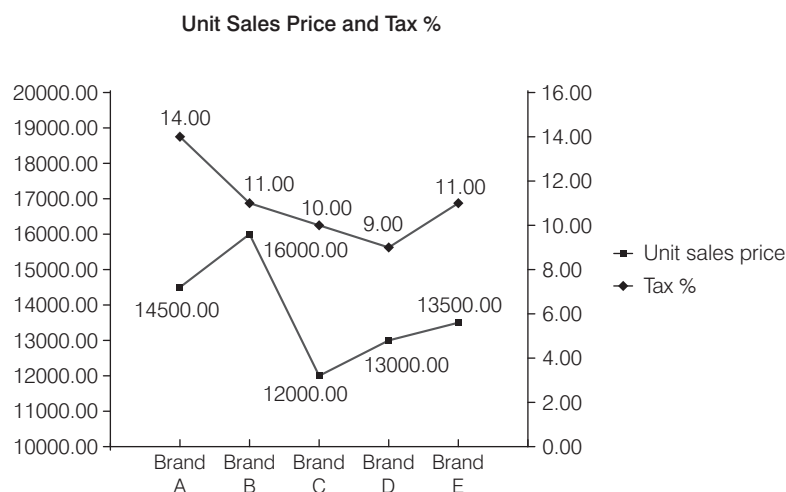
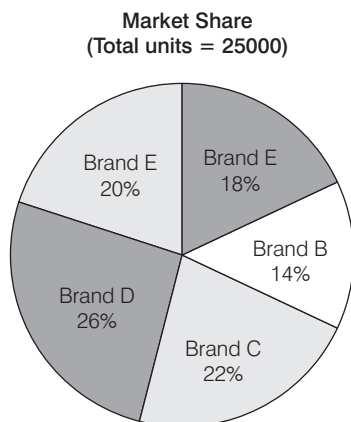
- 60) If atleast 5% of the time spent on each area of study was spent on solved examples of that area, then the time spent on solved examples in any area of study, as percentage of the total time spent on that area of study, is at most.
- (a) $21\frac{1}{6}\%$ (b) 30% (c) $38\frac{1}{3}\%$ (d) 55%
- 61) The number of areas of study for which the critical analysis was done at friends' place alone is at most.
- (a) 2 (b) 3 (c) 5 (d) 6
- 62) At the most what percentage of total time was spent on test taken in VA and LA?
- (a) 10% (b) 20% (c) $66\frac{2}{3}\%$ (d) 100%

Directions (Q. Nos. 63-67) Read the graph carefully and answer the questions that follow.

(2010)

One of the graph below represent the market share of five different brands of bikes sold in a particular city. The total number of bikes sold was 25000.

The other one shows the unit sales price and the Tax the brand is subjected to. Tax is calculated on the sales price.



- 63) What is the difference in number of units sold by the most popular brand and the second most popular brand?
- (a) 800 (b) 1000 (c) 1200 (d) 1400

- 64) Which brand earned the maximum revenue before tax?
 (a) A (b) B (c) C (d) D
- 65) Which brand earned the maximum revenue after tax?
 (a) A (b) B (c) C (d) D
- 66) Whenever Amit sings, Bharat gets a headache and Chandu complains. If Chandu is not complaining, which of the following statements must be true?
 (a) Amit is singing and Bharat has a headache
 (b) Bharat has a headache but Amit is not necessarily singing
 (c) Amit is singing, but Bharat does not necessarily have a headache
 (d) Amit is not singing
- 67) Atul will eat the apple if Bhanu does not cook. Based only on the information above, which of the following must be true?
 (a) Atul will not eat the apple if Bhanu cooks (b) If Atul did not eat the apple, Bhanu did cook
 (c) If Atul eats the apple, then Bhanu did not cook (d) If Bhanu does not cook, Atul will not eat the apple

Directions (Q. Nos. 68-70) Answer the questions on the basis of the information given below. (2010)

Table A below provides data about ages of children in a school. For the age given in the first column, the second column gives the number of children not exceeding that age. e.g. First entry indicates that there are 9 children aged 4 years or less. Tables B and C provide data on the heights and weights respectively of the same group of children in a similar format. Assuming that an older child is always taller and weights respectively of the same group of children in a similar format. Assuming that an older child is always taller and weighs more than a younger child.

Table A		Table B		Table C	
Age (year)	Number	Height (cm)	Number	Weight (kg)	Number
4	9	115	6	30	8
5	12	120	11	32	13
6	22	125	24	34	17
7	35	130	36	36	28
8	42	135	45	38	33
9	48	140	53	40	46
10	60	145	62	42	54
11	69	150	75	44	67
12	77	155	81	46	79
13	86	160	93	48	91
14	100	165	100	50	100

- 68) What is the number of children of age 9 years or less whose height exceed 135 cm?
 (a) 48 (b) 45 (c) 3 (d) Cannot be determined
- 69) How many children of age more than 10 years are taller than 150 cm and do not weigh more than 48 kg?
 (a) 16 (b) 40 (c) 9 (d) Cannot be determined
- 70) Among the children older then 6 years but not exceeding 12 years, how many weigh more than 38 kg?
 (a) 34 (b) 52 (c) 44 (d) Cannot be determined

Directions (Q. Nos. 71-74) *Answer the questions on the basis of the information given below.*

(2010)

A study was conducted to ascertain the relative importance that employees in five different countries assigned to five different traits in their chief executive officers. The traits were compassion (C), decisiveness (D), negotiation skills (N), public visibility (P) and vision (V). The level of dissimilarity between two countries to any of the five traits. The following table indicates rank order of the five traits. The following table indicates the rank order of the five traits for each country.

Rank	Country				
	India	China	Japan	Malaysia	Thailand
1	C	N	D	V	V
2	P	C	N	D	C
3	N	P	C	P	N
4	V	D	V	C	P
5	D	V	P	N	D

71) Which of the following countries is least dissimilar to India?

- (a) China (b) Japan (c) Malaysia (d) Thailand

72) Which amongst the following countries are most dissimilar?

- (a) China (b) Japan (c) Malaysia (d) Thailand

73) Which of the following pairs of countries is most dissimilar to India?

- (a) China and Japan (b) India and China (c) Malaysia and Japan (d) Thailand and Japan

74) Three of the following four pairs of countries have identical levels of dissimilarity. Which pair is the odd one out?

- (a) Malaysia and China (b) China and Thailand (c) Thailand and Japan (d) Japan and Malaysia

Directions (Q. Nos. 75-77) *Answer the questions on the basis of the information given below.*

(2010)

Spam that enters our electronic mailboxes can be classified under several spam heads. The following table shows the distribution of such spam world wide over time. The total number of spam e-mails received during December 2002 was larger than the number received in June 2003. The total number of spam e-mails received during September 2002 was larger than the number received in March 2003. The figures in the table represent the percentage of all spam e-mails received during that period, falling into those respective categories.

Category	Sep 2002	Dec 2002	Mar 2003	Jun 2003
Adult	38	33	19	17
Financial	25	30	37	45
Health	11	19	5	18
Internet	5	3	10	6
Products	3	7	10	11
Scams	5	6	11	2
Others	13	2	8	1

75) In which category was the percentage of spam e-mails increasing but at a decreasing rate?

- (a) Financial (b) Scams (c) Products (d) None of these

76) In the health category, the number of spam e-mails received in December 2002 as compared to June 2003 was

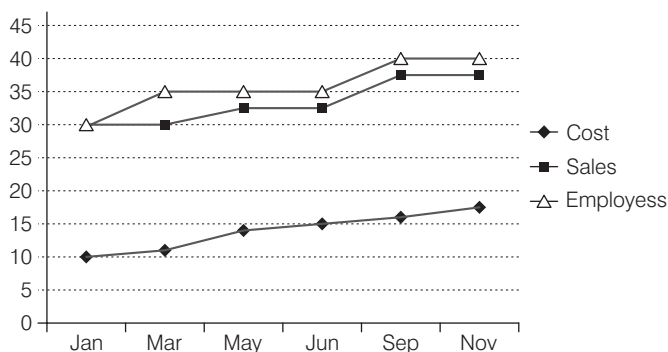
- (a) larger (b) smaller
(c) equal (d) Cannot be determined

77) In the financial category, the number of spam e-mails received in September 2002 as compared to March 2003 was

- (a) larger (b) smaller
(c) equal (d) Cannot be determined

Directions (Q. Nos. 78-82) Refer to the following graph and answer the questions.

(2010)



78) Which month has the highest profit per employee?

- (a) September (b) July
(c) January (d) March

79) Which month records the highest profit

- (a) September (b) July
(c) March (d) May

80) In which month is the percentage increases in sales over the sales two months before, the highest?

- (a) March (b) September
(c) July (d) May

81) In which month is the total increase in the cost highest as compared to the cost two months ago?

- (a) March (b) September
(c) July (d) May

82) Assuming that no employee left the job, how many more people did the company take on in the given period?

- (a) 4600 (b) 5100
(c) 5800 (d) 6400

Directions (Q. Nos. 83-84) Study the table carefully and answer the following questions.

(2009)

Number of washing machines and refrigerator manufactured by a company

	2005	2006	2007	2008	2009
Washing machine	14400	20500	12800	16400	18600
Refrigerator	12800	24700	19200	20200	14900

83) Approximately what was the percentage decrease in number of refrigerators manufactured in 2007 from 2006?

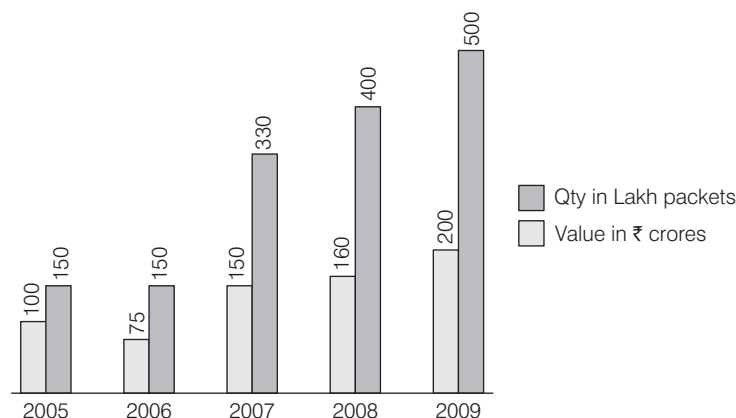
- (a) 22 (b) 26
(c) 28 (d) 30

84) What was the difference in the total number of washing machines and refrigerators manufactured in 2006 to the total number of washing machines and refrigerators manufactured in 2008?

- (a) 6800 (b) 5600
(c) 8600 (d) 8200

Directions (Q. Nos. 85-89) *Study the graph carefully and answer the following questions.*

(2009)

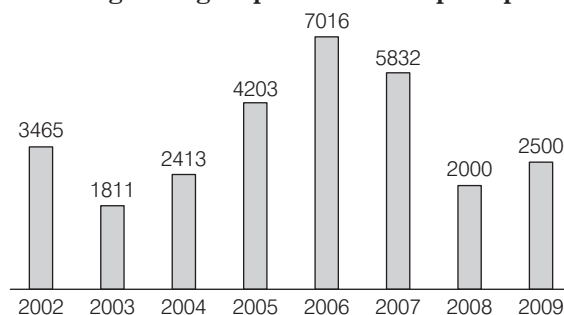


- 85)** In which year the value per packet was minimum?
 (a) 2005 (b) 2006 (c) 2007 (d) 2008
- 86)** What was the difference between the packets exported in 2007 and 2008?
 (a) 10 (b) 1000 (c) 100000 (d) 1000000
- 87)** What was the approximate per cent increase in export value from 2005-2009?
 (a) 350 (b) 330 (c) 43 (d) None of these
- 88)** What was the percentage drop in export quantity from 2005-2006?
 (a) 75 (b) 25 (c) 50 (d) None of these
- 89)** If in the year 2008, the packets were exported at the same rate per packet as that in 2007, what was value in crores of rupees of export in 2008?
 (a) 400 (b) 352 (c) 375 (d) 360

Directions (Q. Nos. 90-94) *Study the graph carefully and answer the following questions.*

(2009)

Data regarding import of Auto Spare parts



- 90)** In which year did the import register highest increase over its preceeding year?
 (a) 2004 (b) 2005 (c) 2006 (d) 2009
- 91)** The import in 2007 was approximately how many times that of the year 2003?
 (a) 0.31 (b) 1.68 (c) 2.41 (d) 3.22
- 92)** What is the ratio of the years which have above average import to those which have below average imports?
 (a) 5 : 3 (b) 8 : 3 (c) 3 : 8 (d) None of these

93) The increase in imports in 2009 was what per cent of the import in 2008?

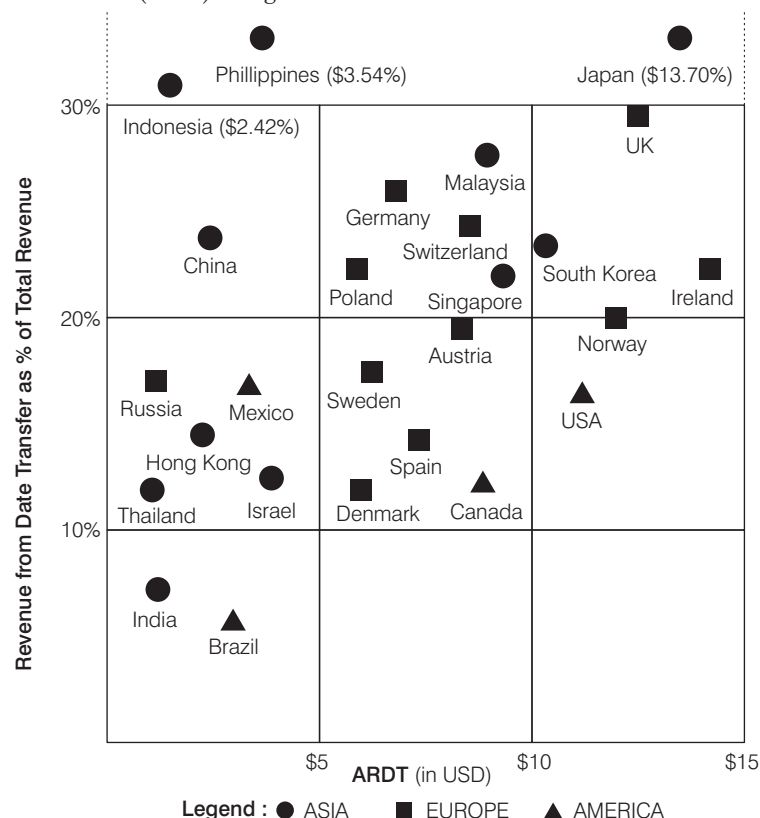
- (a) 25 (b) 5 (c) 125 (d) 80

94) The import in 2005 is approximately what per cent of the average import for the given years?

- (a) 125 (b) 115 (c) 190 (d) 85

Directions (Q. Nos. 95-97) Answer the following questions based on the information given below. (2008)

Telecom operators get revenue from transfer of data and voice. Average revenue received from transfer of each unit of data is known as ARDT. In the diagram below, the revenue received from data transfer as percentage of total revenue received and the ARDT in US Dollars (USD) are given for various countries.



95) It was found that the volume of data transfer in India is the same as that of Singapore. Then which of the following statements is true?

- (a) Total revenue is the same in both countries (b) Total revenue in India is about 2 times that of Singapore
(c) Total revenue in India is about 4 times that of Singapore (d) Total revenue in Singapore is about 2 times that of India
(e) Total revenue in Singapore is about 4 times that of India

96) It is expected that by 2010, revenue from data transfer as a percentage of total revenue will triple for India and double for Sweden. Assume that in 2010, the total revenue in India is twice that of Sweden and that the volume of data transfer is the same in both the countries. What is the percentage increase of ARDT in India if there is no change in ARDT in Sweden?

- (a) 400% (b) 550% (c) 800% (d) 950%
(e) Cannot be determined

97) If the total revenue received is the same for the pairs of countries listed in the choices below, choose the pair that has approximately the same volume of data transfer

- (a) Philippines and Austria (b) Canada and Poland (c) Germany and USA (d) UK and Spain
(e) Denmark and Mexico

Directions (Q. Nos. 98-100) *Answer the following questions based on the information given below.* (2008)

For admission to various affiliated colleges, a university conducts a written test with four different sections, each with a maximum of 50 marks. The following table gives the aggregate as well as the sectional cut-off marks fixed by six different colleges affiliated to the university. A student will get admission only if he/she gets marks greater than or equal to the cut-off marks in each of the sections and his/her aggregate marks are atleast equal to the aggregate cut-off marks as specified by the college.

	Sectional Cut-off Marks				Aggregate Cut-off Marks
	Section A	Section B	Section C	Section D	
College 1	42	42	42		176
College 2		45	45		175
College 3			46		171
College 4	43			45	178
College 5	45		43		180
College 6		41		44	176

98) Bhama got calls from all colleges. What could be the minimum aggregate marks obtained by her?

- (a) 180 (b) 181 (c) 196 (d) 176
(e) 184

99) Charlie got calls from two colleges. What could be the minimum marks obtained by him in a section?

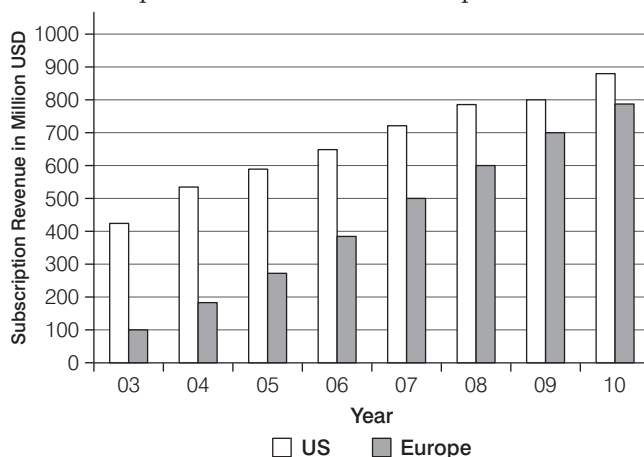
- (a) 0 (b) 21 (c) 25 (d) 35
(e) 41

100) Aditya did not get a call from even a single college. What could be the maximum aggregate marks obtained by him ?

- (a) 181 (b) 176 (c) 184 (d) 196
(e) 190

Directions (Q. Nos. 101-104) *Answer the following questions based on the information given below.* (2008)

The bar chart below shows the revenue received, in million US Dollars (USD), from subscribers to a particular Internet service. The data covers the period 2003 to 2007 for the United States (US) and Europe. The bar chart also shows the estimated revenues from subscription to this service for the period 2008 to 2010.



- 101)** The difference between the estimated subscription in Europe in 2008 and what it would have been if it were computed using the percentage growth rate of 2007 (over 2006), is closest to
 (a) 50 (b) 80 (c) 20 (d) 10
 (e) 0
- 102)** In 2003, sixty per cent of subscribers in Europe were men. Given that women subscribers increase at the rate of 10% per annum and men at the rate of 5% per annum, what is the approximate percentage growth of subscribers between 2003 and 2010 in Europe? The subscription prices are volatile and may change each year.
 (a) 62 (b) 15 (c) 78 (d) 84
 (e) 50
- 103)** Consider the annual per cent change in the gap between subscription revenues in the US and Europe. What is the year in which, the absolute value of this change is the highest?
 (a) 03-04 (b) 05-06 (c) 06-07 (d) 08-09
 (e) 09-10
- 104)** While the subscription in Europe has been growing steadily towards that of the US, the growth rate in Europe seems to be declining. Which of the following is closest to the per cent change in growth rate of 2007 (over 2006) relative to the growth rate of 2005 (over 2004)?
 (a) 17 (b) 20 (c) 35 (d) 60
 (e) 100

Directions (Q. Nos. 105-107) Answer the following questions based on the information given below. (2008)

There are 100 employees in an organisation across five departments. The following table gives the department-wise distribution of average age, average basic pay and allowances. The gross pay of an employee is the sum of his/her basic pay and allowances.

Department	Number of Employees	Average Age (Years)	Average Basic Pay (₹)	Allowances (per cent of Basic Pay)
HR	5	45	5000	70
Marketing	30	35	6000	80
Finance	20	30	6500	60
Business Development	35	42	7500	75
Maintenance	10	35	5500	50

There are limited numbers of employees considered for transfer/promotion across departments. Whenever a person is transferred/promoted from a department of lower average age to a department of higher average age, he/she will get an additional allowance of 10% of basic pay over and above his/her current allowance. There will not be any change in pay structure if a person is transferred/promoted from a department with higher average age to a department with lower average age.

Questions below are independent of each other.

- 105)** What is the approximate percentage change in the average gross pay of the HR department due to transfer of a 40 yr old person with basic pay of ₹ 8000 from the Marketing department?
 (a) 9% (b) 11% (c) 13% (d) 15%
 (e) 17%
- 106)** There was a mutual transfer of an employee between Marketing and Finance departments and transfer of one employee from Marketing to HR. As a result, the average age of Finance department increased by one year and that of Marketing department remained the same. What is the new average age of HR department?
 (a) 30 (b) 35 (c) 40 (d) 45
 (e) Cannot be determined

- 107)** If two employees (each with a basic pay of ₹ 6000) are transferred from Maintenance department to HR department and one person (with a basic pay of ₹ 8000) was transferred from Marketing department of HR department, what will be the percentage change in average basic pay of HR department?

(a) 10.5% (b) 12.5% (c) 15% (d) 30%
(e) 40%

Directions (Q. Nos. 108-111) Answer the questions based on the following information.

(2007)

The following table shows the break-up of actual costs incurred by a company in last 5 yr (year 2002 to year 2006) to produce a particular product

	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006
Volume of production and sale (unit)	1000	900	1100	1200	1200
Costs (₹)					
Material	50000	45100	55200	59900	60000
Labour	20000	18000	22100	24150	24000
Consumables	2000	2200	1800	1600	1400
Rent of building	1000	1000	1100	1100	1200
Rates and taxes	400	400	400	400	400
Repair and maintenance expenses	800	820	780	790	800
Operating cost of machines	30000	27000	33500	36020	36000
Selling and marketing expenses	5750	5800	5800	5750	5800

The production capacity of the company is 2000 unit. The selling price for the year 2006 was ₹ 125 per unit. Some costs change almost in direct proportion to the change in volume of production, while others do not follow any obvious pattern of change with respect to the volume of production and hence are considered fixed. Using the information provided for the year 2006 as the basis for projecting the figures for the year 2007, answer the following questions

- 108)** What is the approximate cost per unit in rupees, if the company produces and sells 1400 unit in the year 2007 ?
(a) 104 (b) 107 (c) 110 (d) 115
(e) 116
- 109)** What is the minimum number of unit that the company needs to produce and sell to avoid any loss?
(a) 313 (b) 350 (c) 384 (d) 747
(e) 928
- 110)** Given that the company cannot sell more than 1700 unit and it will have to reduce the price by ₹ 5 for all unit, if it wants to sell more than 1400 unit, what is the maximum profit, in rupees, that the company can earn?
(a) 25400 (b) 24400 (c) 31400 (d) 32900
(e) 32000
- 111)** If the company reduces the price by 5%, it can produce and sell as many unit as it desires. How many unit the company should produce to maximize its profit?
(a) 1400 (b) 1600 (c) 1800 (d) 1900
(e) 2000

Directions (Q. Nos. 112-115) *Answer the questions based on the following information.*

(2007)

The proportion of male students and the proportion of vegetarian students in a school are given below. The school has a total of 800 students, 80% of whom are in the Secondary Section and rest equally divided between Class 11 and 12.

	Male (M)	Vegetarian (V)
Class 12	0.60	
Class 11	0.55	0.50
Secondary Section		0.55
Total	0.475	0.53

- 112)** What is the percentage of vegetarian students in Class 12?
 (a) 40 (b) 45 (c) 50 (d) 55
 (e) 60
- 113)** In Class 12, twenty five per cent of the vegetarians are male, What is the difference between the number of female vegetarians and male non vegetarians?
 (a) Less than 8 (b) 10 (c) 12 (d) 14
 (e) 16
- 114)** What is the percentage of male students in the secondary section?
 (a) 40 (b) 45 (c) 50 (d) 55
 (e) 60
- 115)** In the secondary section, 50% of the students are vegetarian males. Which of the following statements is correct?
 (a) Except vegetarian males, all other groups have same number of students.
 (b) Except non-vegetarian males, all other groups have same number of students.
 (c) Except vegetarian females, all other groups have same number of students.
 (d) Except non-vegetarian females, all other groups have same number of students.
 (e) All of the above groups have the same number of students.

Directions (Q. Nos. 116-119) *Answer the questions based on the following information.*

(2007)

The table below shows the comparative costs, in US Dollars, of major surgeries in USA and a select few Asian countries.

Procedure	Comparative Costs in USA and some Asian countries (in US Dollars)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	130000	10000	11000	18500	9000
Heart Valve Replacement	160000	9000	10000	12500	9000
Angioplasty	57000	11000	13000	13000	11000
Hip Replacement	43000	9000	12000	12000	10000
Hysterectomy	20000	3000	4500	6000	3000
Knee Replacement	40000	8500	10000	13000	8000
Spinal Fusion	62000	5500	7000	9000	6000

The equivalent of one US Dollar in the local currencies is given below

1 US Dollar equivalent		
India	40.928	Rupees
Malaysia	3.51	Ringits
Thailand	32.89	Bahts
Singapore	1.53	US Dollar

A consulting firm found that the quality of the health services were not the same in all the countries above. A poor quality of a surgery may have significant repercussions in future, resulting in more cost in correcting mistakes. The cost of poor quality of surgery is given in the table below

Procedure	Comparative cost of poor quality in USA and some Asian countries (in US Dollars 000)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	0	3	3	2	4
heart Valve Replacement	0	5	4	5	5
Angioplasty	0	5	5	4	6
Hip Replacement	0	7	5	5	8
Hysterectomy	0	5	6	5	4
Knee Replacement	0	9	6	4	4
Spinal Fusion	0	5	6	5	6

- 116)** A US citizen is hurt in an accident and requires an angioplasty, hip replacement and a knee replacement. Cost of foreign travel and stay is not a consideration Since, the government will take care of it. Which country will result in the cheapest package, taking cost of poor quality into account?
- (a) India (b) Thailand (c) Malaysia (d) Singapore
(e) USA
- 117)** Approximately, what difference in amount in Bahts will it make to Thai citizen if she were to get a hysterectomy doen in India instead of in her native country, taking into account the cost of poor quality? It costs 7500 Bahts for one-way travel between Thailand and India.
- (a) 23500 (b) 40500 (c) 57500 (d) 67500
(e) 75000
- 118)** Taking the cost of poor quality into account, which country/countries will be the most expensive for knee replacement?
- (a) India (b) Thailand (c) Malaysia (d) Singapore
(e) India and Singapore
- 119)** The rupee value increases to ₹ 35 for a US Dollar and all other things including quality, remain the same. What is the approximate difference in cost, in US Dollars, between Singapore and India for a Spinal Fusion, taking this change into account?
- (a) 700 (b) 2500 (c) 4500 (d) 8000
(e) No difference

Directions (Q. Nos. 120-124) *Answer the questions based on the following information*

(2007)

A low cost airline company connects ten Indian cities, A to J. The table below gives the distance between a pair of airports and the corresponding price charged by the company. Travel is permitted only from a departure airport to an arrival airport. The customers do not travel by a route where they have to stop at more than two intermediate airports.

Sector No.	Airport of Departure	Airport of Arrival	Distance between the Airports (km)	Price (₹)
1	A	B	560	670
2	A	C	790	1350
3	A	D	850	1250
4	A	E	1245	1600
5	A	F	1345	1700
6	A	G	1350	2450
7	A	H	1950	1850
8	B	C	1650	2000
9	B	H	1750	1900
10	B	I	2100	2450
11	B	J	2300	2275
12	C	D	460	450
13	C	F	410	430
14	C	G	910	1100
15	D	E	540	590
16	D	F	625	700
17	D	G	640	750
18	D	H	950	1250
19	D	J	1650	2450
20	E	F	1250	1700
21	E	G	970	1150
22	E	H	850	875
23	F	G	900	1050
24	F	I	875	950
25	F	J	970	1150
26	G	I	510	550
27	G	J	830	890
28	H	I	790	970
29	H	J	400	425
30	I	J	460	540

- 120)** What is the lowest price, in rupees, a passenger has to pay for travelling by the shortest route from A to J?
 (a) 2275 (b) 2850 (c) 2890 (d) 2930
 (e) 3340
- 121)** The company plans to introduce a direct flight between A and J. The market research results indicate that all its existing passengers travelling between A and J will use this direct flight if it is priced 5% below the minimum price that they pay at present. What should the company charge approximately, in rupees, for this direct flight?
 (a) 1991 (b) 2161 (c) 2707 (d) 2745
 (e) 2783
- 122)** If the airports C, D and H are closed down owing to security reasons, what would be the minimum price, in rupees, to be paid by a passenger travelling from A to J?
 (a) 2275 (b) 2615 (c) 2850 (d) 2945
 (e) 3190
- 123)** If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometer that the company incurs in flying from A to J?
 (a) 0.77 (b) 0.88 (c) 0.99 (d) 1.06
 (e) 1.08
- 124)** If the prices include a margin of 15% over the total cost that the company incurs, which among the following is the distance to be covered in flying from A to J that minimises the total cost per kilometer for the company?
 (a) 2170 (b) 2180 (c) 2315 (d) 2350
 (e) 2390

Directions (Q. Nos. 125-128) Answer the questions based on the following information.

(2007)

A health-drink company's in R & D department is trying to make various diet formulations which can be used for certain specific purposes. It is considering a choice of 5 alternative ingredients (O, P, Q, R and S) which can be used in different proportions in the formulations. The table below gives the composition of these ingredients. The cost per unit of each of these ingredients is

O : 150, P : 50, Q : 200, R : 500, S : 100.

Ingredient	Composition			
	Carbohydrate%	Protein %	Fat %	Minerals %
O	50	30	10	10
P	80	20	0	0
Q	10	30	50	10
R	5	50	40	5
S	45	50	0	5

- 125)** Which among the following is the formulation having the lowest cost per unit for a diet having 10% fat and at least 30% protein? The diet has to be formed by mixing two ingredients.
 (a) P and Q (b) P and S (c) P and R (d) Q and S
 (e) R and S
- 126)** In what proportion P, Q and S should be mixed to make a diet having at least 60% carbohydrate at the lowest per unit cost?
 (a) 2 : 1 : 3 (b) 4 : 1 : 2
 (c) 2 : 1 : 4 (d) 3 : 1 : 2
 (e) 4 : 1 : 1

127) The company is planning to launch a balanced diet required for growth needs of adolescent children. This diet must contain atleast 30% each of carbohydrate and protein, no more than 25% fat and atleast 5% minerals. Which one of the following combinations of equally mixed ingredients is feasible ?

- (a) O and P (b) R and S (c) P and S (d) Q and R
(e) O and S

128) For a recuperating patient, the doctor recommended a diet containing 10% minerals and atleast 30% proteins. In how many different ways can we prepare this diet by mixing atleast two ingredients?

- (a) One (b) Two (c) Three (d) Four
(e) None of these

Directions (Q. Nos. 129-133) Answer the questions based on the following information.

(2006)

In a Class X Board examination ten papers are distributed over five Groups-PCB, Mathematics, Social Science, Vernacular and English. Each of the ten papers is evaluated out of 100. The final score of a student is calculated in the following manner. First, the group scores are obtained by averaging marks in the papers within the Group. The final score is the simple average of the group scores. The data for the top ten students are presented below. (Dipan's score in English Paper II has been intentionally removed in the table.)

Name of the student	PCB Group			Mathematics Group	Social Science Group		Vernacular Group		English Group		Final Score
	Phy.	Chem.	Bio.		Hist.	Geo	Paper I	Paper II	Paper I	Paper II	
Ayesha (G)	98	96	97	98	95	93	94	96	96	98	96.2
Ram (B)	97	99	95	97	95	96	94	94	96	98	96.1
Dipan (B)	98	98	98	95	96	95	96	94	96	?	96.0
Sagnik (B)	97	98	99	96	96	98	94	97	92	94	95.9
Sanjiv (B)	95	96	97	98	97	96	92	93	95	96	95.7
Shreya (G)	96	89	85	100	97	98	94	95	96	95	95.5
Joseph (B)	90	94	98	100	94	97	90	92	94	95	95.0
Agni (B)	96	99	96	99	95	96	82	93	92	93	94.3
Pritam (B)	98	98	95	98	83	95	90	93	94	94	93.9
Tirna (G)	96	98	97	99	85	94	92	91	87	96	93.7

Note B or G against the name of a student respectively indicates whether the student is a boy or a girl.

129) How much did Dipan get in English Paper II ?

- (a) 94 (b) 96.5 (c) 97 (d) 98
(e) 99

130) Students who obtained Group Scores of atleast 95 in every group are eligible to apply for a prize. Among those who are eligible, the student obtaining the highest Group Score in Social Science Group is awarded this prize. The prize was awarded to

- (a) Shreya (b) Ram (c) Ayesha (d) Dipan
(e) no one from the top ten

- 131)** Each of the ten students was allowed to improve his/her score in exactly one paper of choice with the objective of maximising his/her final score. Everyone scored 100 in the paper in which he or she chose to improve. After that, the topper among the ten students was
 (a) Ram (b) Agni (c) Pritam (d) Ayesha
 (e) Dipan
- 132)** Among the top ten students, how many boys scored atleast 95 in atleast one paper from each of the groups?
 (a) 1 (b) 2
 (c) 3 (d) 4
 (e) 5
- 133)** Had Joseph, Agni, Pritam and Tima each obtained Group Score of 100 in the Social Science Group, then their standing in decreasing order of final score would be
 (a) Pritam, Joseph, Tirna, Agni (b) Joseph, Tirna, Agni, Pritam
 (c) Pritam, Agni, Tirna, Joseph (d) Joseph, Tirna, Pritam, Agni
 (e) Pritam, Tirna, Agni, Joseph

Directions (Q. Nos. 134-136) Answer the questions based on the following information.

(2005)

The table below reports annual statistics related to rice production in select states of India for a particular year.

State	Total Area (in million hectares)	% of Area Under Rice cultivation	Production (in million tons)	Population (in millions)
Himachal Pradesh	6	20	1.2	6
Kerala	4	60	4.8	32
Rajasthan	34	20	6.8	56
Bihar	10	60	12	83
Karnataka	19	50	19	53
Haryana	4	80	19.2	21
West Bengal	9	80	21.6	80
Gujarat	20	60	24	51
Punjab	5	80	24	24
Madhya Pradesh	31	40	24.8	60
Tamilnadu	13	70	27.3	62
Maharashtra	31	50	48	97
Uttar Pradesh	24	70	67.2	166
Andhra Pradesh	28	80	112	76

- 134)** An intensive rice producing state is defined as one whose annual rice production per million of population is atleast 400000 tons. How many states are intensive rice producing states ?
 (a) 5 (b) 6
 (c) 7 (d) 8
- 135)** Which two states account for the highest productivity of rice (tons produced per hectare of rice cultivation)?
 (a) Haryana and Punjab (b) Punjab and Andhra Pradesh
 (c) Andhra Pradesh and Haryana (d) Uttar Pradesh and Haryana
- 136)** How many states have a per capita production of rice (defined as total rice production divided by its population) greater than Gujarat?
 (a) 3 (b) 4
 (c) 5 (d) 6

Directions (Q. Nos. 137-139) *Answer the questions based on the following information.*

(2005)

The table below reports the gender, designation and age-group of the employees in an organisation. It also provides information on their commitment to projects coming up in the months of January (Jan), February (Feb), March (Mar) and April (Apr), as well as their interest in attending workshops on : Business Opportunities (BO), Communication Skills (CS) and E-Governance (EG).

S.No.	Name	Gender	Designation	Age group	Committed to projects during	Interested in workshop on
1	Anshul	M	Mgr	Y	Jan, Mar	CS,EG
2	Bushkant	M	Dir	I	Feb, Mar	BO,EG
3	Charu	F	Mgr	I	Jan, Feb	BO, CS
4	Dinesh	M	Exe	O	Jan, Apr	BO,
5	Eashwaran	M	Dir	O	Feb, Apr	BO
6	Fatima	F	Mgr	Y	Jan, Mar	BO,CS
7	Gayatri	F	Exe	Y	Feb, Mar	EG
8	Hari	M	Mgr	I	Feb, Mar	BO, CS, EG
9	Indira	F	Dir	O	Feb, Apr	BO,EG
10	John	M	Dir	Y	Jan, Mar	BO
11	Kalindi	F	Exe	I	Jan, Mar	BO, CS, EG
12	Lavanya	F	Mgr	O	Feb, Apr	CS,EG
13	Mandeep	M	Mgr	O	Mar, Apr	BO,EG
14	Nandlal	M	Dir	I	Jan, Feb	BO,EG
15	Parul	F	Exe	Y	Feb, Apr	CS,EG
16	Rahul	M	Mgr	Y	Mar, Apr	CS,EG
17	Sunita	F	Dir	Y	Jan, Feb	BO,EG
18	Urvashi	F	Exe	I	Feb, Mar	EG
19	Yamini	F	Mgr	O	Mar, Apr	CS,EG
20	Zeena	F	Exe	Y	Jan, Mar	BO,CS,EG

M = Male, F = Female; Exe = Executive, Mgr = Manager, Dir = Director, Y = Young, I = In-between, O = Old

For each workshop, exactly four employees are to be sent, of which atleast two should be Females and atleast one should be Young. No employee can be sent to a workshop in which he/she is not interested in. An employee cannot attend the workshop on

- Communication Skills, if he/she is committed to internal projects in the month of January;
- Business Opportunities, if he/she is committed to internal projects in the month of February;
- E-governance, if he/she is committed to internal projects in the month of March.

- 137) How many Executives (Exe) cannot attend more than one workshop?
 (a) 2 (b) 3 (c) 15 (d) 16

- 138) Which set of employees cannot attend any of the workshops?

- (a) Anshul, Charu, Eashwaran and Lavanya
 (b) Anshul, Bushkant, Gayatri and Urvashi
 (c) Charu, Urvashi, Bushkant and Mandeep
 (d) Anshul, Gayatri, Eashwaran and Mandeep

- 139) Assuming that Parul and Hari are attending the workshop on Communication Skills (CS), then which of the following employees can possibly attend the CS workshop?

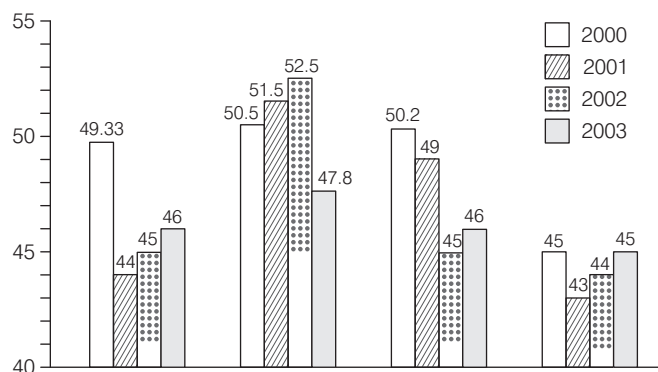
- (a) Rahul and Yamini (b) Dinesh and Lavanya
 (c) Anshul and Yamini (d) Fatima and Zeena

Directions (Q. Nos. 140-143) Answer the questions based on the following information.

(2005)

A management institute was established on January 1, 2000 with 3, 4, 5 and 6 faculty members in the Marketing, Organisational Behaviour (OB), Finance and Operations Management (OM) areas respectively, to start with. No faculty member retired or joined the institute in the first three months of the year 2000. In the next 4yr, the institute recruited one faculty member in each of the four areas.

All these new faculty members, who joined the institute subsequently over the year, were 25 yr old at the time of their joining the institute. All of them joined the institute on April 1. During these 4 yr, one of the faculty members retired at the age of 60. The following diagram gives the area-wise average age (in terms of number of completed year) of faculty members as on April 1 to 2000, 2001, 2002 and 2003.



- 140) From which area did the faculty member retire?

- (a) Finance (b) Marketing
 (c) OB (d) OM

- 141) In which year did the new faculty member join the Finance area?

- (a) 2000 (b) 2001
 (c) 2002 (d) 2003

- 142) What was the age of the new faculty member, who joined the OM area, as on April 1, 2003?

- (a) 25 (b) 26
 (c) 27 (d) 28

- 143) Professors Naresh and Devesh, two faculty members in the marketing area, who have been with the Institute, since its inception, share a birthday, which falls on 20th November. One was born in 1947 and the other one in 1950. On 1 April 2005, what was the age of the third faculty member, who has been in the same area, since inception?

- (a) 47 (b) 50
 (c) 51 (d) 52

Directions (Q. Nos. 144-147) *Answer the questions based on the following information.*

(2005)

The table below presents the revenue (in million rupees) of four firms in three states. These firms, Honest Ltd., Aggressive Ltd., Truthful Ltd. and Profitable Ltd. are disguised in the table as A, B, C and D, in no particular order.

States	Firm A	Firm B	Firm C	Firm D
UP	49	82	80	55
Bihar	69	72	70	65
MP	72	63	72	65

Further, it is known that

In the state of MP, Truthful Ltd. has the highest market share.

Aggressive Ltd.'s aggregate revenue differs from Honest Ltd.'s by ₹ 5 million.

144) What can be said regarding the following two statements?

Statement I Profitable Ltd. has the lowest share in MP market.

Statement II Honest Ltd.'s total revenue is more than Profitable Ltd.

- (a) If Statement I is true, then Statement II is necessarily true
- (b) If Statement I is true, then Statement II is necessarily false
- (c) Both Statement I and Statement II are true
- (d) Neither Statement I nor Statement II is true

145) What can be said regarding the following two statements?

Statement I Honest Ltd. has the highest share in the UP market.

Statement II Aggressive Ltd. has the highest share in the Bihar market.

- (a) Both statements could be true
- (b) Atleast one of the statements must be true
- (c) Atmost one of the statements is true
- (d) None of the above

146) What can be said regarding the following two statements?

Statement I Aggressive Ltd's lowest revenues are from MP.

Statement II Honest Ltd's lowest revenues are from Bihar.

- (a) If Statement II is true, then Statement I is necessarily false
- (b) If Statement I is false, then Statement II is necessarily true
- (c) If Statement I is true, then Statement II is necessarily true
- (d) None of the above

147) If Profitable Ltd.'s lowest revenue is from UP, then which of the following is true?

- (a) Truthful Ltd.'s lowest revenues are from MP
- (b) Truthful Ltd.'s lowest revenues are from Bihar
- (c) Truthful Ltd.'s lowest revenues are from UP
- (d) No definite conclusion is possible

Directions (Q. Nos. 148-151) *Answer the questions based on the following information.*

(2005)

In the table below is the listing of players, seeded from highest (# 1) to lowest (# 32), who are due to play in an Association of Tennis Players (ATP) tournament for women. This tournament has four knockout rounds before the final, i.e. first round, second round, quarterfinals and semi-finals. In the first round, the highest seeded player plays the lowest seeded player (seed # 32) which is designated match No. 1 of first round; the 2nd seeded player plays the 31st seeded player which is designated match No. 2 of the first round and so on. Thus, for instance, match No.16 to first round is to be played between 16th seeded player and the 17th seeded player. In the second round, the winner of match No. 1 of first round plays the winner of match No. 16 of first round and is designated match No.1 of second round. Similarly, the winner of match No.2 of first round plays the winner of match No.15 of first round and is

designated match No. 2 of second round. Thus, for instance, match No. 8 of the second round is to be played between the winner of match No. 8 of first round and the winner of match No. 9 of first round. The same pattern is followed for later rounds as well.

Seed #	Name of Player	Seed #	Name of Player
1	Maria Sharapova	17	Jelena Jankovic
2	Lindsav Davenport	18	Ana Ivanovic
3	Amelie Mauresmo	19	Vera Zvonareva
4	Kim Clijsters	20	Elena Likhovtseva
5	Svetlana Kuznetsova	21	Daniela Hantuchova
6	Elena Dementieva	22	Dinara Safina
7	Justine Henin	23	Silvia Farina Elia
8	Serena Williams	24	Tatiana Golovin
9	Nadia Petrova	25	Shinobu Asagoe
10	Venus Williams	26	Francesca Schiavone
11	Patty Schnyder	27	Nicole Pietrangeli
12	Mary Pierce	28	Gisela Dulko
13	Anastasia Myskina	29	Flavia Pennetta
14	Alicia Molik	30	Anna Chakvetadze
15	Nathalie Dechy	31	Ai Sugiyama
16	Elena Bovina	32	Anna-lena Groenefeld

- 148)** If there are no upsets (a lower seeded player beating a higher seeded player) in the first round and only match Nos. 6, 7 and 8 of the second round result in upsets, then who would meet Lindsay Davenport in quarter finals, in case Davenport reaches quarter finals?
- (a) Justine Henin (b) Nadia Petrova
(c) Patty Schnyder (d) Venus Williams
- 149)** If, in the first round, all even numbered matches (and none of the odd numbered ones) result in upsets and there are no upsets in the second round, then who could be the lowest seeded player facing Maria Sharapova in semi-finals?
- (a) Anastasia Myskina (b) Flavia Pennetta
(c) Nadia Petrova (d) Svetlana Kuznetsova
- 150)** If Elena Dementieva and Serena Williams lose in the second round, while Justine Henin and Nadia Petrova make it to the semi-finals, then who would play Maria Sharapova in the quarterfinals, in the event Sharapova reaches quarter finals?
- (a) Dinara Safina (b) Justine Henin
(c) Nadia Petrova (d) Patty Schnyder
- 151)** If the top eight seeds make it to the quarterfinals, then who, amongst the players listed below, would definitely not play against Maria Sharapova in the final, in case Sharapova reaches the final?
- (a) Amelie Mauresmo (b) Elena Dementieva
(c) Kim Clijsters (d) Lindsay Davenport

Directions (Q. Nos. 152-155) *Answer the questions based on the following information.*

(2005)

Help Distress (HD) is an NGO involved in providing assistance to people suffering from natural disasters. Currently it has 37 volunteers. They are involved in three projects: Tsunami Relief (TR) in Tamil Nadu, Flood Relief (FR) in Maharashtra and Earthquake Relief (ER) in Gujarat. Each volunteer working with Help Distress has to be involved in atleast one relief work project.

- A Maximum number of volunteers are involed in the FR project. Among them, the number of volunteers involved in FR project alone is equal to the volunteers having additional involvement in the ER project.
- The number of volunteers involved in the ER project alone is double the number of volunteers involved in all the three projects.
- 17 volunteers are involved in the TR project.
- The number of volunteers involved in the TR project alone is one less than the number of volunteers involved in ER project alone.
- Ten volunteers involved in the TR project are also involved in atleast one more project.

152) Based on the information given above, the minimum number of volunteers involved in both FR and TR projects, but not in the ER project is

- (a) 1 (b) 3 (c) 4 (d) 5

153) Which of the following additional information would enable to find the exact number of volunteers involved in various projects?

- (a) Twenty volunteers are involved in FR
(b) Four volunteers are involved in all the three projects
(c) Twenty three volunteers are involved in exactly one project
(d) No need for any additional information

154) After some time, the volunteers who were involved in all the three projects were asked to withdraw from one project. As a result, one of the volunteers opted out of the TR project and one opted out of the ER project, while the remaining ones involved in all the three projects opted out of the FR project. Which of the following statements, then necessarily follows?

- (a) The lowest number of volunteers is Now, in TR project
(b) More volunteers are, now in FR project as compared to ER project
(c) More volunteers are, now in TR project as compared to ER project
(d) None of the above

155) After the withdrawal of volunteers, as indicated in Question 81, some new volunteers joined the NGO. Each one of them was allotted only one project in manner such that, the number of volunteers working in one project alone for each of the three projects became identical. At that point, it was also found that the number of volunteers involved in FR and ER projects was the same as the number of volunteers involved in TR and ER projects. Which of the projects, now has the highest number of volunteers?

- (a) ER (b) FR (c) TR (d) Cannot be determined

Directions (Q. Nos. 156-159) *Answer the questions based on the following information.*

(2005)

The year is 2089. Beijing, London, New York and Paris are in contention to host the 2096 Olympics. The eventual winner is determined through several rounds of voting by members of the IOC with each member representing a different city. All the four cities in contention are also represented in IOC.

In any round of voting, the city receiving the lowest number of votes in that round gets eliminated. The survivor after the last round of voting gets to host the event.

A member is allowed to cast votes for atmost two different cities in all rounds of voting combined. (Hence, a member becomes ineligible to cast a vote in a given round if both the city(s) he voted for in earlier rounds are out of contention in that round of voting.)

A member is also ineligible to cast a vote, in a round if the city(s) he represents is in contention in that round of voting.

As long as the member is eligible (s), he must vote and vote for only one candidate city in any round of voting. The following incomplete table shows the information on cities that received the maximum and minimum votes in different rounds, the number of votes cast in their favour and the total votes that were cast in those rounds.

Round	Total Votes Cast	Maximum votes cast		Eliminated	
		City	No. of votes	City	No. of votes
1		London	30	New York	12
2	83	Pairs	20	Beijing	21
3	75				

It is also known that

All those who voted for London and Paris in round 1, continued to vote for the same cities in subsequent rounds as long as these cities were in contention. 75% of those who voted for Beijing in round 1, voted for Beijing in round 2 as well.

- Those who voted for New York in round 1, voted either for Beijing or Paris in round 2.
- The difference in votes cast for the two contending cities in the last round was 1.
- 50% of those who voted for Beijing in round 1, voted for Paris in round 3.

156) What is the number of votes cast for Paris in round 1?

- (a) 16 (b) 18 (c) 22 (d) 24

157) What percentage of members from among those who voted for Beijing in round 2 and were eligible to vote in round 3, voted for London?

- (a) 33.33 (b) 38.10 (c) 50 (d) 66.67

158) Which of the following statements must be true?

- A. IOC member from New York must have voted for Paris in round 2.
B. IOC member from Beijing voted for London in round 3.

- (a) Only A (b) Only B (c) Both A and B (d) Neither A nor B

159) What percentage of members from among those who voted for New York in round 1, voted for Beijing in round 2?

- (a) 33.33 (b) 50 (c) 66.67 (d) 75

Directions (Q. Nos. 160-163) Answer the questions based on the following information. (2005)

Venkat, a stockbroker, invested a part of his money in the stock of four companies A, B, C and D. Each of these companies belonged to different industries, viz., Cement, Information Technology (IT), Auto and Steel, in no particular order. At the time of investment, the price of each stock was ₹ 100. Venkat purchased only one stock of each of these companies. He was expecting returns of 20%, 10%, 30% and 40% from the stock of companies A, B, C and D, respectively. Returns are defined as the change in the value of the stock after one year, expressed as a percentage of the initial value. During the year, two of these companies announced extraordinarily good results. One of these two companies belonged to the Cement or the IT industry, while the other one belonged to either the Steel or the Auto industry. As a result, the returns on the stocks of these two companies were higher than the initially expected returns. For the company belonging to the Cement or the IT industry with extraordinarily good results, the returns were twice that of the initially expected returns. For the company belonging to the Steel or the Auto industry, the returns on announcement of extraordinarily good results were only one and a half times that of the initially expected returns. For the remaining two companies, which did not announce extraordinarily good results, the returns realised during the year were the same as initially expected.

- 160)** What is the minimum average return Venkat would have earned during the year?
 (a) 30% (b) $31\frac{1}{4}\%$ (c) $32\frac{1}{2}\%$ (d) Cannot be determined
- 161)** If Venkat earned a 35% return on average during the year, then which of these statements would necessarily be true ?
 I. Company A belonged either to Auto or to Steel Industry.
 II. Company B did not announce extraordinarily good results.
 III. Company A announced extraordinarily good results.
 IV. Company D did not announce extraordinarily good results.
 (a) I and II (b) II and III (c) III and IV (d) II and IV
- 162)** If Venkat earned a 38.75% return on average during the year, then which of these statement(s) would necessarily be true ?
 I. Company C belonged either to Auto or to Steel Industry.
 II. Company D belonged either to Auto or to Steel Industry.
 III. Company A announced extraordinarily good results.
 IV. Company B did not announce extraordinarily good results.
 (a) I and II (b) II and III (c) I and IV (d) II and IV
- 163)** If Company C belonged to the Cement or the IT industry and did announce extraordinarily good results, then which of these statement(s) would necessarily be true ?
 I. Venkat earned not more than 36.25% return on average.
 II. Venkat earned not less than 33.75% return on average.
 III. If Venkat earned 33.75% return on average, Company A announced extraordinarily good results.
 IV. If Venkat earned 33.75% return on average, Company B belonged either to Auto or to Steel Industry.
 (a) I and II (b) II and IV (c) II and III (d) III and IV

Directions (Q. Nos. 164-167) Answer the questions based on the following information.

(2004)

The Dean's office recently scanned student results into the central computer system. When their character reading software cannot read something, it leaves that space blank. The scanner output reads as follows

Name	Finance	Marketing	Statistics	Strategy	Operations	GPA
Aparna		B	F			1.4
Bikas	D	D	F	F		
Chandra		D	A	F	F	2.4
Deepak	A	B		D	D	3.2
Fazal	D	F	B		D	2.4
Gowri	C	C	A		B	3.8
Hari		B	A		D	2.8
Ismet			B		A	
Jagdeep	A	A	B		C	3.8
Kunal	F		A	F	F	1.8
Leena	B	A		B	F	3.2
Manab			A	B	B	
Nisha	A	D	B	A	F	3.6

Name	Finance	Marketing	Statistics	Strategy	Operations	GPA
Osman	C		B	B	A	4.6
Preeti	F	D		D		3.2
Rahul	A	C	A		F	4.2
Sameer		C	F	B		
Tara	B					2.4
Utkarsh			F	C	A	3.0
Vipul	A		C	C	F	2.4

In the grading system, A, B, C, D and F grades fetch 6, 4, 3, 2 and 0 grade points, respectively. The Grade Point Average (GPA) is the arithmetic mean of the grade points obtained in the five subjects. For example Nisha's GPA is $(6 + 2 + 4 + 6 + 0) / 5 = 3.6$

Some additional facts are also known about the students' grades. These are

- (a) Vipul obtained the same grade in Marketing as Aparna obtained in Finance and Strategy.
- (b) Fazal obtained the same grade in Strategy as Utkarsh did in Marketing.
- (c) Tara received the same grade in exactly three courses.

164) In Operations, Tara could have received the same grade as

- (a) Ismet
- (b) Hari
- (c) Jagdeep
- (d) Manab

165) What grade did Preeti obtain in Statistics?

- (a) A
- (b) B
- (c) C
- (d) D

166) In Strategy, Gowri's grade point was higher than that obtained by

- (a) Fazal
- (b) Hari
- (c) Nisha
- (d) Rahul

167) What grade did Utkarsh obtain in Finance?

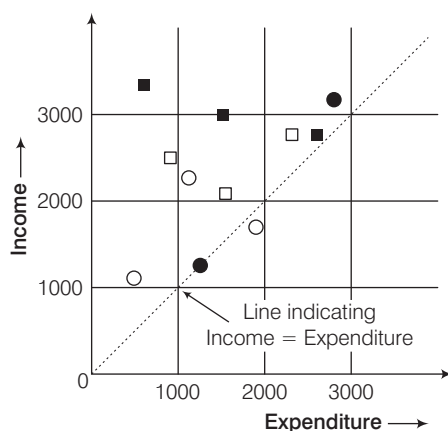
- (a) B
- (b) C
- (c) D
- (d) F

Directions (Q. Nos. 168-171) *Answer the questions based on the following information.*

(2004)

The data points in the figure below represent monthly income and expenditure data of individual members of the Ahuja family ($\square$), the Bose family ($\blacksquare$), the Coomar family ($\circ$) and the Dubey family ($\bullet$). For these questions savings is defined as.

$$\text{Savings} = \text{Income} - \text{Expenditure}$$



168) Which family has the highest average expenditure?

- (a) Ahuja (b) Bose (c) Coomar (d) Dubey

169) Which family has the lowest average income?

- (a) Ahuja (b) Bose (c) Coomar (d) Dubey

170) Which family has the lowest average savings?

- (a) Ahuja (b) Bose (c) Coomar (d) Dubey

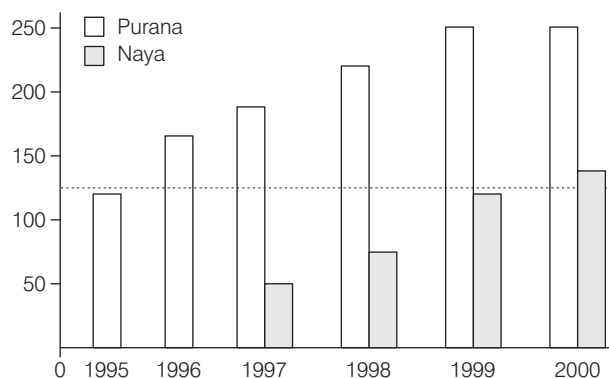
171) The highest amount of savings accrues to a member of which family?

- (a) Ahuja (b) Bose (c) Coomar (d) Dubey

Directions (Q. Nos. 172-175) Answer the questions based on the following information.

(2003)

Purana and Naya are two brands of kitchen mixer-grinders available in the local market. Purana is an old brand that was introduced in 1990, while Naya was introduced in 1997. For both these brands, 20% of the mixer-grinders bought in a particular year are disposed off as junk exactly 2 yr later. It is known that 10 Purana mixer-grinders were disposed off in 1997. The following figures show the number of Purana and Naya mixer-grinders in operation from 1995 to 2000, as at the end of the year.



172) How many Naya mixer-grinders were disposed off by the end of 2000 ?

- (a) 10 (b) 16
(c) 22 (d) Cannot be determined from the data

173) How many Naya mixer-grinders were purchased in 1999 ?

- (a) 44 (b) 50 (c) 55 (d) 64

174) How many Purana mixer-grinders were disposed off in 2000 ?

- (a) 0 (b) 5
(c) 6 (d) Cannot be determined from the data

175) How many Purana mixer-grinders were purchased in 1999 ?

- (a) 20 (b) 23
(c) 50 (d) Cannot be determined from the data

Directions (Q. Nos. 176-179) Answer the questions based on the following table.

(2003)

Below is a table that lists countries region-wise. Each region-wise list is stored, first by birth rate and then alphabetically by the name of the country. We now, wish to merge the region-wise list into one consolidated list and provide overall rankings to each country based first on birth rate and then on death rate. Thus, if some countries have the same birth rate, then the country with a lower death rate will be ranked higher. Further, countries have identical birth and death rates will get the same rank. e.g., If two countries are tied for the third position, then both will be given rank 3, while the next country (in the ordered list) will be ranked 5.

Rank	Country	Birth Rate	Death Rate	Region
1.	South Africa	36	12	Africa
2.	Egypt	39	13	Africa
3.	Cameroon	42	22	Africa
4.	Mozambique	45	18	Africa
5.	Zaire	45	18	Africa
6.	Ghana	46	14	Africa
7.	Angola	47	23	Africa
8.	Madagascar	47	22	Africa
9.	Morocco	47	16	Africa
10.	Tanzania	47	17	Africa
11.	Ethiopia	45	23	Africa
12.	Ivory coast	43	23	Africa
13.	Rhodesia	48	14	Africa
14.	Uganda	48	17	Africa
15.	Nigeria	49	22	Africa
16.	Saudi Arabia	49	19	Africa
17.	Sudan	49	17	Africa
18.	Algeria	50	16	Africa
19.	Kenya	50	14	Africa
20.	Uppw Volta	50	28	Africa
1.	Japan	16	6	Asia
2.	Korea (ROK)	26	6	Asia
3.	Sri Lanka	26	9	Asia
4.	Taiwan	26	5	Asia
5.	Malaysia	30	6	Asia
6.	China	31	11	Asia
7.	Thailand	34	10	Asia
8.	Turkey	34	12	Asia
9.	India	36	15	Asia
10.	Burma	38	15	Asia
11.	Iran	42	12	Asia
12.	Vicuiam	42	17	Asia
13.	Korea (DPRK)	43	12	Asia

Rank	Country	Birth Rate	Death Rate	Region
14.	Pakistan	44	14	Asia
15.	Nepal	46	20	Asia
16.	Bangladesh	47	19	Asia
17.	Syria	47	14	Asia
18.	Iraq	48	14	Asia
19.	Afghanistan	52	30	Asia

Rank	Country	Birth Rate	Death Rate	Region
1.	Germany (FRG)	10	12	Europe
2.	Austria	12	13	Europe
3.	Belgium	12	12	Europe
4.	Germany (DRG) ,	12	14	Europe
5.	Sweden	12	11	Europe
6.	Switzerland	12	9	Europe
7.	UK	12	12	Europe
8.	Netherlands	13	8	Europe
9.	France	14	11	Europe
10.	Italy	14	10	Europe
11.	Greece	16	9	Europe
12.	Bulgaria	17	10	Europe
13.	Hungary	18	12	Europe
14.	Spain	18	8	Europe
15.	USSR	18	9	Europe
16.	Yugoslavia	18	8	Europe
17.	Czech. Rep.	19	11	Europe
18.	Portugal	19	10	Europe
19.	Romania	19	10	Europe
20.	Poland	20	9	Europe
1.	USA	15	9	N. America
2.	Canada	16	7	N. America
3.	Cuba	20	6	N. America
4.	Mexico	40	7	N. America
1.	Australia	16	8	Pacific
2.	Philippines	34	10	Pacific
3.	Indonesia	38	16	Pacific
1.	Argentina	22	10	S. America

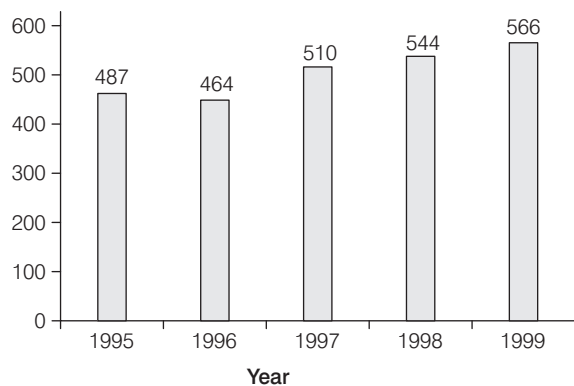
Rank	Country	Birth Rate	Death Rate	Region
2.	Chile	22	7	S.America
3.	Colombia	34	10	S. America
4.	Brazil	36	10	S.America
5.	Venezuela	36	6	S. America
6.	Guatemala	40	14	S. America
7.	Peru	40	13	S. America
8.	Ecuador	42	11	S. America

- 176)** In the consolidated list. What would be the overall rank of the Philippines?
 (a) 32 (b) 33
 (c) 34 (d) 35
- 177)** In the consolidated list, how many countries would rank below Spain and above Taiwan?
 (a) 9 (b) 8
 (c) 7 (d) 6
- 178)** In the consolidated list, which country ranks 37th?
 (a) South Africa (b) Brazil
 (c) Turkey (d) Venezuela
- 179)** In the consolidated list, how many countries in Asia will rank lower than every country in South America, but higher than atleast one country in Africa?
 (a) 8 (b) 7
 (c) 6 (d) 5

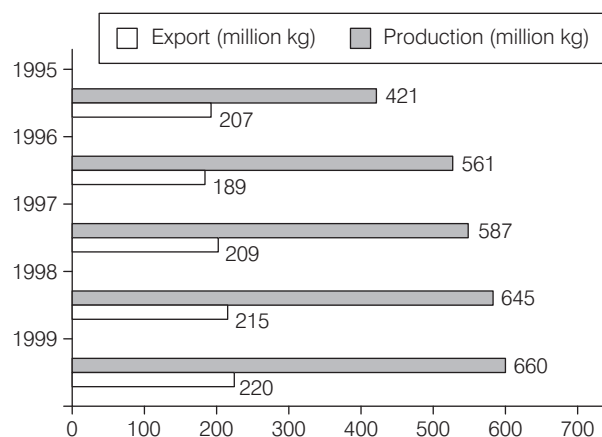
Directions (Q. Nos. 180-182) Answer the questions based on the following charts.

(2003)

Per Capita Availability of Tea 9 gm in Chaidesh



Production and Export of Tea (Chaidesh)



Note Availability is defined as production less export.

- 180)** In which year during the period 1996-1999 was Chaidesh's export of tea, as a proportion of tea produced, the highest?
 (a) 1996 (b) 1997
 (c) 1998 (d) 1999
- 181)** In which of the following year was the population of Chaidesh the lowest?
 (a) 1995 (b) 1996
 (c) 1997 (d) 1999

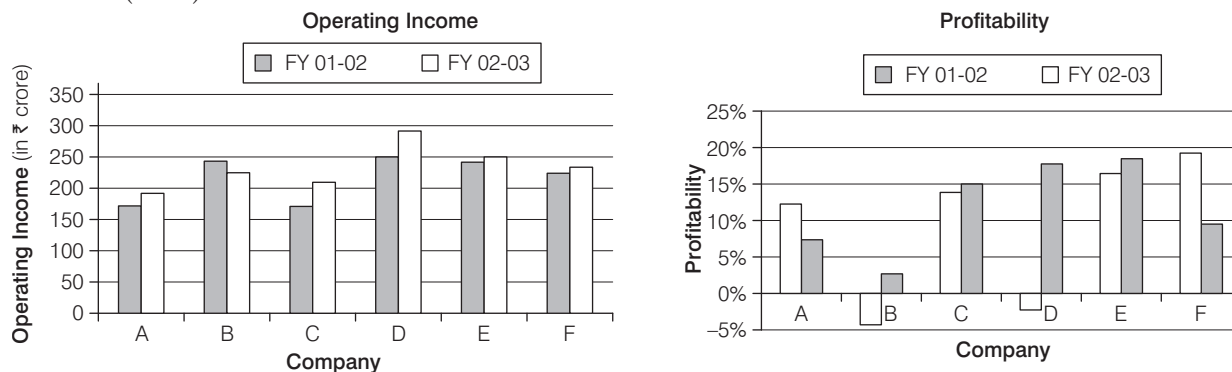
- 182)** The area under tea cultivation continuously decreased in all 4 yr from 1996 to 1999, by 10%, 7%, 4% and 1% respectively. In which year was tea productivity (production per unit of area) the highest?

(a) 1999 (b) 1998 (c) 1997 (d) 1996

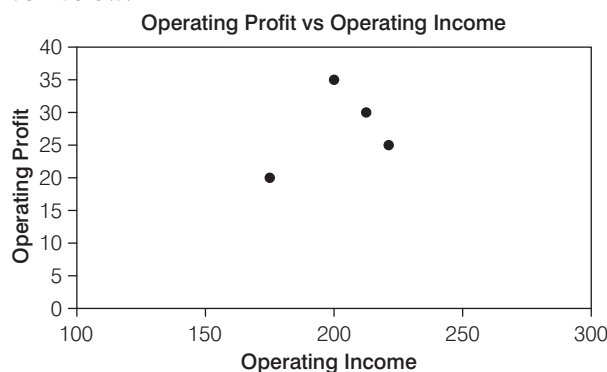
Directions (Q. Nos. 183-186) Answer the questions based on the following charts.

(2003)

The profitability of a company is defined as the ratio of its operating profit to its operating income, typically expressed in percentage. The following two charts show the operating income as well as the profitability of six companies in the Financial Years (F.Y.s) 2001-02 and 2002-03.

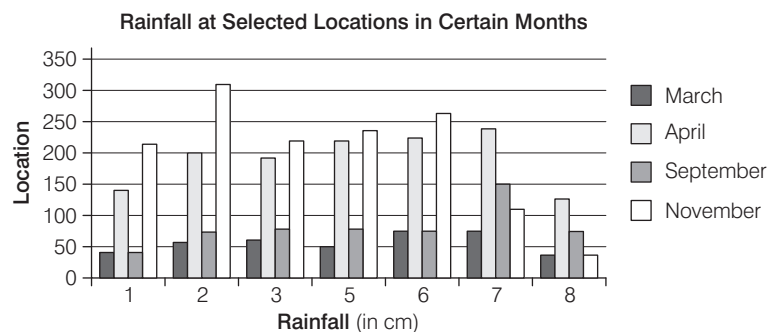


The operating profits of four of these companies are plotted against their respective operating income figures for the F.Y. 2002-03, in the third chart given below.



- 183)** What is the approximate average operating profit, in F.Y. 2001-2002, of the two companies excluded from the third chart?
- (a) -7.5 crore (b) 3.5 crore (c) 25 crore (d) Cannot be determined
- 184)** Which company recorded the highest operating profit in F.Y. 2002-03 ?
- (a) A (b) C (c) E (d) F
- 185)** Which of the following statements is NOT true?
- (a) The company with the third lowest profitability in F.Y. 2002-02 has the lowest operating income in F.Y. 2002-03.
- (b) The company with the highest operating income in the two financial year combined has the lowest operating profit in F.Y.
- (c) Companies with a higher operating income in F.Y. 2002-02 than in F.Y. 2002-03 have higher profitability in F.Y. 2002-03 than in F.Y. 2001-02.
- (d) Companies with profitability between 10% and 20% in F.Y. 2001-02 also have operating incomes between 150 crore and 200 crore in F.Y. 2002-03. (2003)
- 186)** The average operating profit in F.Y. 2002-03, of companies with profitability exceeding 10% in F.Y. 2002-03, is approximately
- (a) 17.5 crore (b) 25 crore (c) 27.5 crore (d) 32.5 crore

Directions (Q. Nos. 187-188) *Answer the questions on the basis of the data presented in the figure below. (2003)*



187) Which of the following statements is correct?

- (a) November rainfall exceeds 100 cm in each location
- (b) September rainfall exceeds 50 cm in each location
- (c) March rainfall is lower than September rainfall in each location
- (d) None of the above

188) Locations 6 and 7 differ from all the rest because only in these two locations,

- (a) April rainfall exceeds March rainfall
- (b) Peak rainfall occurs in April
- (c) November rainfall is lower than March rainfall
- (d) April rainfall is less than 20 cm

Directions (Q. Nos. 189-191) *Answer the questions based on the following information. (2003)*

In a Decathlon, the events are 100 m, 400 m, 100 m hurdles, 1500 m, High jump, Pole vault, Long jump, Discus, Shot put and Javelin. The performance in the first four of these events is consolidated into Score 1, the next three into Score 2 and the last three into Score 3. Each such consolidation is obtained by giving appropriate positive weights to individual events. The final score is simply the total of these three scores. The athletes with the highest, second highest and the third highest final scores receive the gold, silver and bronze medals, respectively. The table given below gives the scores and performance of nineteen top athletes in this event.

Name	Country	Final Score	Score 1	Score 2	Score 3	100 m	High jump	Pole vault
Eduard Hamalainen	BLS	8802	491	5322	2989	10.74	2.1	4.8
Michael Smith	CAN	8855	174	5274	3407	11.23	2.0	4.9
Tomas Dvorak	CZE	8796	499	5169	3128	10.63	1.9	4.7
Uwe Ffrimuth	DDR	8799	441	5491	3124	11.06	2.0	4.8
Torsten Voss	DHK	8880	521	5234	5868	10.69	2.1	5.1
Erki Nool	EST	8768	408	5553	2808	10.71	2.0	5.4
Christian Plaziat	FRG	8775	563	5430	2781	10.72	2.1	5.0
Jurgen Hingsen	FRG	8792	451	5223	3033	10.95	2.0	4.9
Siegfried Wentz	FRG	8856	470	5250	3137	10.85	2.1	4.8
Guido Kratschmer	FRG	8861	575	5308	3064	10.58	2.0	4.6
Daisy Thompson	GBR		582		3003	10.55	2.1	4.6

Name	Country	Final Score	Score 1	Score 2	Score 3	100 m	High jump	Pole vault
Frank Busemann	GER	8905	568	5392	2945	10.60	2.0	4.8
Alexander Apaichev	SOV	8803	492	5370	3115	10.92	2.0	4.8
Grigory Degtyarov	SOV	8823	339	5196	3114	11.05	2.1	4.9
Robert Zmelik	TCH	8832	494	5455	2883	10.78	2.1	5.1
Dave Johnson	USA	8811	366	5370	3114	10.78	2.1	5.0
Steve Fritz	USA	8827	427	5163	3119	10.75	2.0	5.0
Bruce Jenner	USA	8846	483	5280	3200	10.94	2.0	4.8
Dan O'Brien	USA	8897	408	5331	3120	10.36	2.1	4.8

189) The athletes from FRG and USA decided to run a 4×100 m relay race for their respective countries with the country having three athletes borrowing the athlete from CZE. Assume that all the athletes ran their stretch of the relay race at the same speed as in Decathlon event. How much more time did the FRG relay team take as compared to the USA team?

- (a) 0.18 (b) 0.28 (c) 0.78 (d) 0.00

190) What is the least that Daley Thompson must get in Score 2 that ensures him a bronze medal?

- (a) 5309 (b) 5296 (c) 5271 (d) 5270

191) At least how many competitors (excluding Daley Thomson) must Michael Smith have out jumped in the long jump event?

- (a) 1 (b) 2 (c) 3 (d) 4

Directions (Q. Nos. 192-195) *Answer the questions based on the following information.* (2003)

The following is the Wholesale Price Index (WPI) of a select list of items with the base year of 1993-94. In other words, all the item prices are made 100 in that year (1993-94). Price in all other year for an item are measured with respect to its price in the base year. For instance, the price of cement went up by 1% in 1994-95 as compared to 1993-94. Similarly, the price of power went up by 3% in 1996-97 as compared to 1993-94.

	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03
All Items	100	102.0	102.5	104.00	103.00	105.00	106.00	108.00	107.00	106.00
Cement	100	101.0	100.5	103.00	102.50	103.50	103.10	103.80	103.70	104.00
Limestone	100	102.0	102.5	102.75	102.25	103.00	104.00	105.00	104.50	105.00
Power	100	101.5	102.5	103.00	103.50	104.00	106.00	107.00	107.50	108.00
Steel	100	101.5	101.0	103.50	104.00	104.25	105.00	105.50	106.00	105.50
Timber	100	100.5	101.5	102.00	102.50	102.00	103.00	103.50	104.00	104.50
Wages	100	101.5	103.0	103.50	104.00	104.25	104.00	104.75	104.90	105.30

192) Let us suppose that one bag of cement (50 kg) consumes 100 kg of limestones and 10 unit of power. The only other cost item in producing cement is in the form of wages. During 1993-94, limestone, power and wages contribute, respectively 20%, 25% and 15% to the cement price per bag. The average operating profit (% of price per cement bag) earned by a cement manufacturer during 2002-03 is closest to

- (a) 40% (b) 39.5% (c) 38.5% (d) 37.5%

193) Steel manufacturing requires the use of iron ore, power and manpower. The cost of iron ore has followed the All Item index. During 1993-94 power accounted for 30% of the selling price of steel, iron ore for 25% and wages for 10% of the selling price of steel. Assuming the cost and price data for cement as given in the previous question, the operating profit (% of selling price) of an average steel manufacture in 2002-03.

- (a) is more than that of a cement manufacturer
- (b) is less than that of a cement manufacturer
- (c) is the same as that of a cement manufacturer
- (d) Cannot be determined

194) Which item experienced continuous price rise during the ten-year period?

- (a) Power
- (b) Cement
- (c) Wages
- (d) Limestone

195) Which item(s) experienced only one decline in price during the ten-year period ?

- (a) Steel and Limestone
- (b) Steel and Timber
- (c) Timber
- (d) Timber and Wages

Directions (Q. Nos. 196-198) Answer the questions based on the following table.

(2003)

	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001
AP	985	992	993	987	980	986	981	977	975	972	978
Assam	919	915	896	874	875	868	869	896	910	923	932
Bihar	1061	1051	1020	995	1002	1000	1005	957	948	907	921
Goa	1091	1108	1120	1088	1084	1128	1066	981	975	967	960
Gujarat	954	946	944	945	941	952	940	934	942	934	921
Haryana	867	835	844	844	869	871	868	867	870	865	861
HP	884	889	890	897	890	912	938	958	973	976	970
J&K	882	876	870	865	869	873	878	878	892	896	900
Karnataka	983	981	969	965	960	966	959	957	963	960	964
Kerala	1004	1008	1011	1022	1027	1028	1022	1016	1032	1036	1058
MP	972	967	949	947	946	945	932	920	921	912	920
Maharashtra	978	966	950	947	949	941	936	930	937	934	922
Orissa	1037	1056	1086	1067	1053	1022	1001	988	981	971	972
Punjab	832	780	799	815	836	844	854	865	879	882	874
Rajasthan	905	908	896	907	906	921	908	911	919	910	922
TN	1044	1042	1029	1027	1012	1007	992	978	977	974	986
UP	938	916	908	903	907	998	907	876	882	876	898
WB	945	925	905	890	852	865	878	891	911	917	934
India	972	964	955	950	945	946	941	930	934	927	933

196) Each of the following statements concerns to the number of states with females outnumbering males in a given census year.

Which of these statements is NOT correct?

- (a) This number never exceeded 5 in any census year
 (b) This number registered its sharpest decline in the year 1971
 (c) The number of consecutive censuses in which this number remained unchanged never exceeded
 (d) Prior to the 1971 census, this number was never less than 4

197) The two states which achieved the largest increases in sex ratio over the period 1991-2001 are

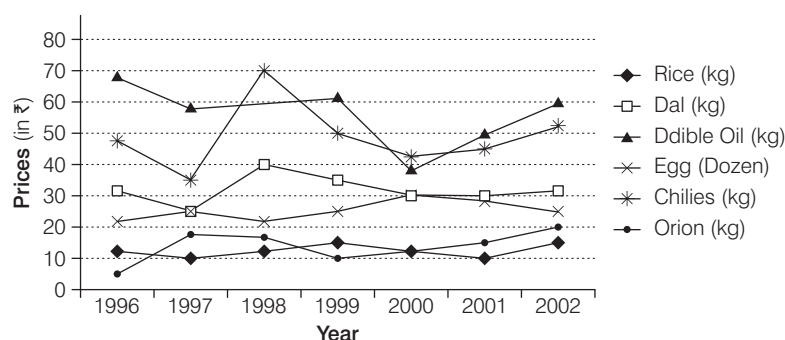
- (a) Punjab and HP (b) HP and Kerala (c) Assam and J & K (d) Kerala and J & K

198) Among the states which have a sex ratio exceeding 1000 in 1901, the sharpest decline over the period 1901-2001 was registered in the state of

- (a) Goa (b) TN (c) Bihar (d) Orissa

Directions (Q. Nos. 199-201) Answer the questions on the basis of the data presented in the figure below. (2003)

Mid-year prices of Essential commodities



199) During 1996-2002, the number of commodities that exhibited a net overall increase and a net overall decrease, respectively, were

- (a) 3 and 3 (b) 2 and 4 (c) 4 and 2 (d) 5 and 1

200) The number of commodities that experienced a price decline for two or more consecutive years is

- (a) 2 (b) 3 (c) 4 (d) 5

201) For which commodities did a price increase immediately follow a price decline only one in this period?

- (a) Rice, Edible oil and Dal (b) Egg and Dal (c) Onion only (d) Egg and Onion

Directions (Q. Nos. 202-205) The table provides information about the salary and the number of working days of employees in a company. Employment will be paid only if he works with minimum required efficiency. (2002)

Employee Code	Total Salary (in ₹)				No. of Working Days			
	Complex	Medium	Simple	Total	Complex	Medium	Simple	Total
200040	149	-	50	199	10	0	3	13
200050	236	536	-	722	9	11	0	20
200060	350	-	100	450	11	0	4	15
200070	500	405	76	981	13	6	4	23
200080	600	-	20	620	10	0	11	21
200090	450	700	120	1270	8	10	6	24
200100	550	377	200	1127	9	7	9	25
200110	140	50	176	366	11	2	9	22

Employee Code	Total Salary (in ₹)				No. of Working Days			
200120	250	-	126	376	4	0	1	5
200130	330	100	86	516	9	6	2	17
200140	390	-	56	446	10	0	10	20
200150	360	166	46	572	6	1	1	8
200160	160	-	89	249	15	0	6	21
200170	490	120	129	739	8	5	6	19
200180	1234	600	300	2134	19	2	1	22

202) How many employees are getting more than ₹ 50 per day in complex work?

- (a) 2 (b) 5 (c) 7 (d) None of these

203) Which employee has received maximum salary per day in complex work?

- (a) 200180 (b) 200080 (c) 200170 (d) 200040

204) How many employees are having more than 80% attendance and earning more than ₹ 600 in the month of June which consists of 25 working days?

- (a) 5 (b) 7 (c) 8 (d) 10

205) How many people worked for complex and medium both and earn more in complex work than in medium work?

- (a) 7 (b) 4 (c) 5 (d) 9

Directions (Q. Nos. 206-212) *Following table gives the data about operations performed by a company in different countries.* (2002)

	Year	Total	Spain	Africa	Far East	North America	Australia	Argentina	North Sea	Other World
Income	98	3790	169	106	408	709	690	806	300	611
	99	2832	91	215	340	680	306	454	716	30
	2000	4357	324	660	1354	1094	66	224	409	216
Expenses	98	2996	129	53	340	594	409	774	82	645
	99	1372	38	142	296	450	2	298	146	44
	2000	2960	205	465	1024	818	126	115	23	184
Profit Before Tax	98	794	40	55	68	115	281	62	218	-34
	99	1460	53	73	44	230	304	256	570	-14
	2000	1397	119	195	230	276	-60	119	396	30
Tax and Charges	98	487	16	30	33	63	209	31	105	-
	99	727	30	35	21	137	176	134	280	-
	2000	888	59	153	184	218	-	72	196	6
Net Profit After Tax and Charges	98	307	24	20	35	52	72	31	113	-32
	99	733	23	38	23	93	128	122	290	-14
	2000	509	60	42	46	58	-60	47	200	24

- 206)** How many operations has increase of more than 200% in expenses from 1999-2000 ?
 (a) 3 (b) 4 (c) 5 (d) None of these
- 207)** If ratio of net profit to tax and charges is defined as profitability, then which of the following has shown highest profitability in
 (a) Far East (b) North America (c) Argentina (d) North Sea
- 208)** How many operations have less than 5% contribution to total revenue in 98?
 (a) 4 (b) 5 (c) 5 (d) None of these
- 209)** If income to expenses ratio is defined as efficiency, which operation has the last efficiency for year 99 ?
 (a) Spain (b) Africa (c) Far East (d) None of these
- 210)** Which of the following is not true?
 (a) Spain has higher efficiency in 99 than 98 (b) North America profitability has decreased from 98 to 99
 (c) Efficiency of Far East has increased from 99 to 2000 (d) None of these
- 211)** For which of the following the profitability has shown maximum % increase in year 98-99 ?
 (a) Spain (b) Africa (c) North America (d) Argentina
- 212)** For how many countries profit before tax increase in every year in given period?
 (a) 3 (b) 4 (c) 5 (d) None of these

Directions (Q. Nos. 213-215) *The questions are based on the following table.*

(2002)

Country	Capital	Longitude	Latitude	Country	Capital	Longitude	Latitude
Argentina	Buenes Aires	34 S	58 E	Ireland	Dublin	53 N	6 E
Australia	Canberra	35 S	149 E	Libya	Tripli	32 N	13 E
Austria	Venna	48 N	16 E	Malaysia	Kuala Lumpur	4 N	101 E
Bulgaria	Sofia	42 N	23 E	Peru	Lima	12 S	77 E
Brazil	Brasilia	15 S	48 E	Poland	Warsaw	52 N	21 E
Canada	Ottawa	45 N	75 E	New Zealand	Wellington	41 S	174 E
Cambodia	Phnom Penh	11 N	105 E	Saudi Arabia	Riyadh	24 N	46 E
Equador	Quito	0 S	78 E	Spain	Madrid	40 N	3 W
Ghana	Accra	5 N	1 E	Sri Lanka	Colombo	7 N	80 E
Iran	Tehran	35 N	51 E	Zambia	Lusaka	15 S	28 E

- 213)** What percentage of cities within 10 E to 40 E lie in the Southern hemisphere?
 (a) 15% (b) 20%
 (c) 25% (d) 30%
- 214)** Number of capital cities name starting with consonants in the Northern hemisphere in the table.
 (a) exceeds the number of cities starting with consonants in the Southern hemisphere by 1
 (b) exceeds the number of cities starting with consonants in the Southern hemisphere by 2
 (c) is less than the number of cities starting with consonants in the East of the meridian by 1
 (d) is less than the number of cities name starting with consonants in the East of the meridian by 2

215) What is the ratio of names of country starting from a vowel and situated in southern hemisphere to the number of countries whose capitals begin with a vowel is

- (a) 3 : 2 (b) 3 : 3
(c) 3 : 1 (d) 4 : 3

Directions (Q. Nos. 216-221) *Answer the question based on the following table.*

(2002)

There are seven depots namely, AA, AB, AC, AD, AE, AF, AG supplying gas by following refineries BA, BC, BD, BE, BF, BG and these depots supply the gas to the districts AAA, AAB, AAC, AAD, AAE, AAF, AAG, AAH and AAI.

	BA	BC	BD	BE	BF	BG
AA	125	525	50	346	67	248
AB	220	0	63	224	213	69
AC	327	320	170	123	225	735
AD	0	237	525	108	447	567
AE	437	1154	0	1167.3	175	335
AF	323	469	447	871	375	537
AG	323.5	523	1024	989	567	1025

	AA	AB	AC	AD	AE	AF	AG
AAA	571.1	205	352	159	434.5	178	337
AAB	200	337.5	291	201	0	980.7	434
AAC	100	0	275	277	850	770.5	835
AAD	0	415.7	350	760	300	560	444.7
AAE	223.5	300	440	1035	880	325	526.5
AAF	577.6	725	443.5	560	1025.7	570	530
AAG	340	410.6	886.7	0	800.7	680.5	800
AAH	627	556.5	1023	1124	759	1025.7	300
AAI	439	738	980	1031.7	1024	1200	757

216) What is the least cost to transport one unit from any refinery to any district?

- (a) 253 (b) 357 (c) 0 (d) None of these

217) What is the minimum cost of transportation of one unit from refinery BD to any district?

- (a) 125 (b) 0 (c) 375 (d) None of these

218) What is the minimum cost of transportation from any refinery to AAG district?

- (a) 0 (b) 137 (c) 140 (d) None of these

219) What is the maximum cost of transportation of one unit from any refinery?

- (a) 1,800 (b) 1,130.5 (c) 2,193 (d) None of these

220) In how many ways can you transfer the oil from any of the refinery to any of the district?

- (a) 42 (b) 63 (c) 378 (d) None of these

221) What is the minimum cost of transportation from refinery BE to district AAA?

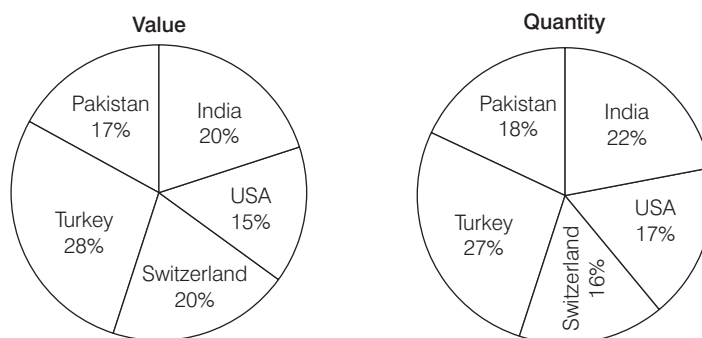
- (a) 327 (b) 267 (c) 123 (d) None of these

Directions (Q. Nos. 222-224) The table gives the data about the crops produced in various regions. (2002)

Crop-1	High	R_1, R_3, R_7
	Medium	R_4, R_5, R_6
	Low	$R_9, R_{16}, R_{15}, R_{17}$
Crop-2	High	R_5, R_7, R_{18}
	Medium	R_9, R_{10}, R_{11}
	Low	R_{10}, R_{12}, R_{13}
Crop-3	High	R_2, R_8, R_{10}
	Medium	R_{10}, R_{11}, R_{12}
	Low	R_8, R_{13}, R_{14}
Crop-4	High	R_3, R_6, R_5
	Medium	R_{10}, R_{11}
	Low	R_9, R_7

- 222)** How many regions crop 1 or crop 2 in medium quality and crop 3 or crop 4 in low quality?
 (a) 0 (b) 1 (c) 2 (d) None of these
- 223)** Which of the following is true?
 (a) Regions R_1 and R_2 produce all types of crops
 (b) Same number of region produce crop 2 and crop 4
 (c) There are exactly four regions producing crop 1 that also produce crop 4 but not crop 3
 (d) None of the above
- 224)** How many regions produce crop 3 medium and crop 2 or crop 4 high?
 (a) a (b) 1 (c) 2 (d) None of these

Directions (Q. Nos. 225-226) The pie charts give the data about a textile manufacturing unit exporting to different countries. (2002)



The total value is 5760 million Euro and the total quantity is 1.055 million tonnes.

225) Which country has the highest price for its supply?

- (a) Pakistan (b) Turkey (c) Switzerland (d) India

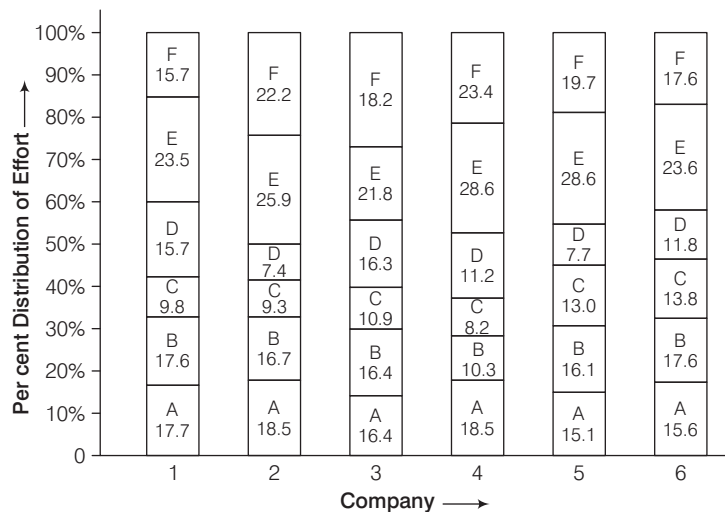
226) What is the price in Euro/kg for Turkey?

- (a) 6.3 (b) 5.6 (c) 4.8 (d) 4.5

Directions (Q. Nos. 227-229) Answer these questions based on the data given below.

(2001)

There are six companies, 1 through 6. All of these companies use six operation, A through F. The following graph shows the distribution of efforts put in by each company in these six operations.



227) Suppose effort allocation is interchanged between operations B and C, then C and D and then D and E. If companies are then ranked in ascending order of effort in E, what will be the rank of company?

- (a) 2 (b) 3 (c) 4 (d) 6

228) A new technology is introduced in company 4 such that the total effort for operations B through F get even distributed among these. What is the change in the percentage of effort in operation?

- (a) Reduction of 12.3 (b) Increase of 12.3 (c) Reduction of 5.6 (d) Increase of 5.6

229) Suppose the companies find that they can remove operations B, C and D and re-distribute the effort released equally among the remaining operations. Then, which operation will show the maximum across all companies and all operations?

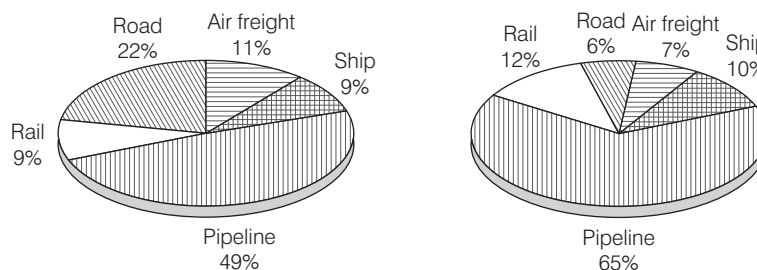
- (a) Operation E in company 1 (b) Operation E in company 4 (c) Operation F in company 5 (d) Operation E in company 5

Directions (Q. Nos. 230-232) The questions are based on the pie charts given below.

Chart 1 Shows the distribution of twelve million tonnes of crude oil transported through different modes over a specific period of time.

Chart 2 Shows the distribution of the cost of transporting this crude oil. The total cost was ₹ 30 million.

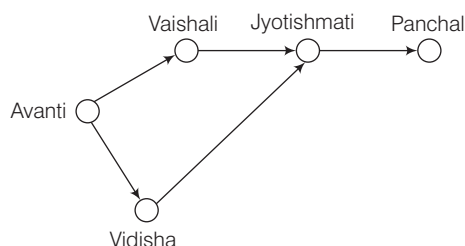
(2001)



- 230)** The cost (in rupees per tonne) of oil moved by rail and road happens to be roughly
 (a) 3 (b) 1.5 (c) 45 (d) 48
- 231)** From the charts given, it appears that the cheapest mode of transport is
 (a) Road (b) Rail (c) Pipeline (d) Ship
- 232)** If the cost per tonne of transport by ship, air and road are represented by P, Q and R respectively; which of the following is true?
 (a) $R > Q > P$ (b) $P > R > Q$ (c) $P > Q > R$ (d) $R > P > Q$

Directions (Q. Nos. 233-235) Answer these questions based on the pipeline diagram below. (2001)

The following sketch shows the pipelines carrying material from one location to another. Each location has a demand for material. The demand at Vaishali is 400, at Jyotishmati is 400, at Panchal is 700 and at Vidisha is 200. Each arrow indicates the direction of material flow through the pipeline. The flow from Vaishali to Jyotishmati is 300. The quantity of material flow is such that the demands at all these locations are exactly met. The capacity of each pipeline is 1000.

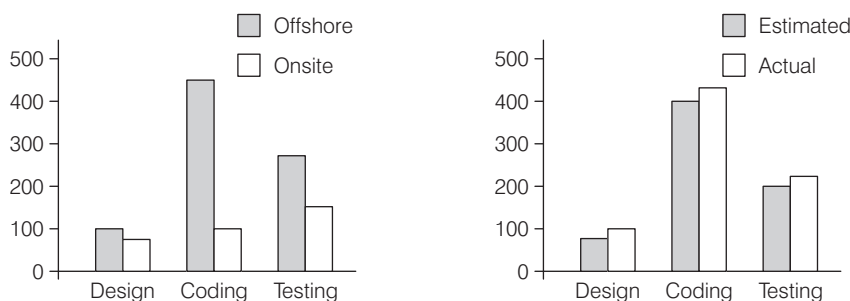


- 233)** The quantity moved from Avanti to Vidisha is
 (a) 200 (b) 800 (c) 700 (d) 1000
- 234)** The free capacity available at the Avanti-Vaishali pipeline is
 (a) 0 (b) 100 (c) 200 (d) 300
- 235)** What is the free capacity available in the Avanti-Vidisha pipeline?
 (a) 300 (b) 200 (c) 100 (d) 0

Directions (Q. Nos. 236-241) Answer these questions based on the two graphs shown below. (2001)

Figure 1 shows the amount of work distribution, in man-hours, for a software company between offshore and onsite activities. Figure 2 shows the estimated and actual work effort involved in the different offshore activities in the same company during the same period.

(Note Onsite refers to work performed at the customer's premise and offshore refers to work performed at the developer's premise)



- 236)** Which of the work requires as many man-hours as that spent in coding?
 (a) Offshore, design and coding (b) Offshore coding
 (c) Testing (d) Offshore, testing and coding

- 237)** Roughly what percentage of the total work is carried out onsite ?
 (a) 40 per cent (b) 20 per cent (c) 30 per cent (d) 50 per cent
- 238)** The total effort in man-hours spent onsite is nearest to which of the following?
 (a) The sum of the estimated and actual effort for offshore design (b) The estimated man-hours of offshore coding
 (c) The actual man-hours of offshore testing (d) Half of the man-hours of estimated offshore coding
- 239)** If the total working hours were 100, which of the following tasks will account for approximately 50 h ?
 (a) Coding (b) Design (c) Offshore testing (d) Offshore testing plus design
- 240)** If 50 per cent of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, the proportion of testing carried out offshore would be
 (a) 40 per cent (b) 30 per cent (c) 50 per cent (d) 70 per cent
- 241)** If 50 percent of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, which of the following is true of all work carried out onsite?
 (a) The amount of coding done is greater than that of testing.
 (b) The amount of coding done onsite is less than that of design done onsite.
 (c) The amount of design carried out onsite is greater than that of testing.
 (d) The amount of testing carried out offshore is greater than that of total design.

Directions (Q. Nos. 242-245) Answer these questions based on the table given below concerning the busiest twenty international airports in the world. (2001)

No.	Name	International Airport	Code	Location	Passengers
1.	Hartsfield	A	ALT	Atlanta, Georgia, USA	77939536
2.	Chicago-O' Hare	A	ORD	Chicago, Illinois, USA	72568076
3.	Los Angeles	A	LAX	Los Angeles, California, USA	63876561
4.	Heathrow Airport	E	LHR	London, United Kingdom	62263710
5.	DFW	A	DFW	Dallas/Ft. Worth, Texas, USA	60000125
6.	Haneda Airport	F	HND	Tokyo, Japan	54338212
7.	Frankfurt Airport	E	FRA	Frankfurt, Germany	45858315
8.	Roissy-Charles de Gaulle	E	CDG	Paris, France	43596943
9.	San Francisco	A	SFO	San Francisco, California, USA	40387422
10.	Denver	A	DIA	Denver, Colorado, USA	38034231
11.	Amsterdam Schiphol	E	AMS	Amsterdam, Netherlands	36781015
12.	Minneapolis-St. Paul	A	MSP	Minneapolis-St. Paul, USA	34216331
13.	Detroit Metropolitan	A	DTW	Detroit, Michigan, USA	34038381
14.	Miami	A	MIA	Miami, Florida, USA	33899246
15.	Newark	A	EWR	Newark, New Jersey, USA	33814000
16.	McCarran	A	LAS	Las Vegas, Nevada, USA	33669185
17.	Phoenix Sky Harbor	A	PHX	Phoenix, Arizona, USA	33533353
18.	Kimpo	FE	SEL	Seoul, Korea	33371074
19.	George Bush	A	IAH	Houston, Texas, USA	33089333
20.	John F. Kennedy	A	JFK	New York, USA	32003000

- 242)** How many international airports of type A account for more than 40 million passengers?
 (a) 4 (b) 5 (c) 6 (d) 7
- 243)** What percentage of top ten busiest airports is in the United States of America ?
 (a) 60% (b) 80% (c) 70% (d) 90%
- 244)** Of the five busiest airports, roughly what percentage of passengers is handled by Heathrow airport ?
 (a) 30 (b) 40 (c) 20 (d) 50
- 245)** How many international airports not located in the USA handle more than 30 million passengers?
 (a) 5 (b) 6 (c) 10 (d) 14

Directions (Q. Nos. 246-249) Answer the questions based on the following table.

The following is a table describing garments manufactured based upon the colour and size for each lay. There are four sizes : M-Medium, L-Large, XL-Extra Large and XXL-Extra-Extra Large. There are three colours : Yellow, Red and White. (2001)

Lay	Number of Garments											
	Yellow				Red				White			
Lay No.	M	L	XL	XXL	M	L	XL	XXL	M	L	XL	XXL
1	14	14	7	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	42	42	21	0
3	20	20	10	0	18	18	9	0	0	0	0	0
4	20	20	10	0	0	0	0	0	30	30	15	0
5	0	0	0	0	24	24	12	0	30	30	15	0
6	22	22	11	0	24	24	12	0	32	32	16	0
7	0	24	24	12	0	0	0	0	0	0	0	0
8	0	20	20	10	0	2	2	1	0	0	0	0
9	0	20	20	10	0	0	0	0	0	22	22	11
10	0	0	0	0	0	26	26	13	0	20	20	10
11	0	22	22	11	0	26	26	13	0	22	22	11
12	0	0	2	2	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	20	20
14	0	0	0	0	0	0	0	0	0	0	22	22
15	0	0	10	10	0	0	2	2	0	0	22	22
16	0	0	0	0	1	0	0	0	1	0	0	0
17	0	0	0	0	0	5	0	0	0	0	0	0
18	0	0	0	0	0	32	0	0	0	0	0	0
19	0	0	0	0	0	32	0	0	0	0	0	0

20	0	0	0	0	0	5	0	0	0	0	0	0
21	0	0	0	18	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	26	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	22
24	0	0	0	8	0	0	0	1	0	0	0	0
25	0	0	0	8	0	0	0	0	0	0	0	12
26	0	0	0	0	0	0	0	1	0	0	0	14
27	0	0	0	8	8	0	0	2	0	0	0	12
Production	76	162	136	97	67	194	89	59	135	198	195	156
Order	75	162	135	97	67	194	89	59	135	197	195	155
Surplus	1	0	1	0	0	0	0	0	0	1	0	1

246) How many lays are used to produce Yellow coloured fabrics?

- (a) 10 (b) 11 (c) 12 (d) 14

247) How many lays are used to produce Extra-Extra Large fabrics?

- (a) 15 (b) 16 (c) 17 (d) 18

248) How many lays are used to product Extra-Extra Large Yellow or Extra-Extra Large White fabrics?

- (a) 8 (b) 9 (c) 10 (d) 15

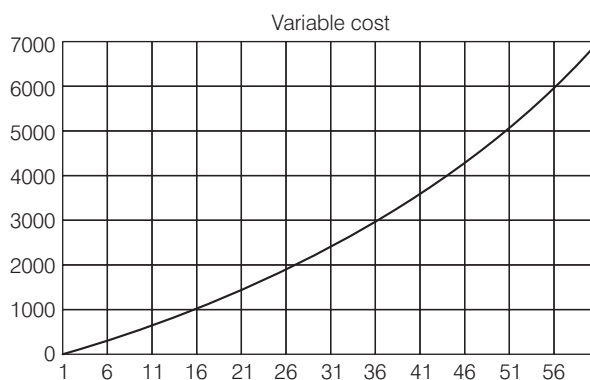
249) How many varieties of fabrics, which exceed the order, have been produced?

- (a) 3 (b) 4 (c) 5 (d) 6

Directions (Q. Nos. 250-255) Answer the questions based on the following information.

(2000)

ABC Ltd. produces widgets for which the demand is unlimited and they can sell all of their production. The graph below describes the monthly variable costs incurred by the company as a function of the quantity produced. In addition, operating the plant for one shift results in a fixed monthly cost of ₹ 800. Fixed monthly costs for second shift operation are estimated at ₹ 1200. Each shift operation provides capacity for producing 30 widgets per month.



Note Average unit cost, $AC = \text{Total monthly costs} / \text{monthly production}$ and marginal cost, MC is the rate of change in total cost for unit change in quantity produced.

250) Total production in July is 40 unit. What is the approximate average unit cost for July?

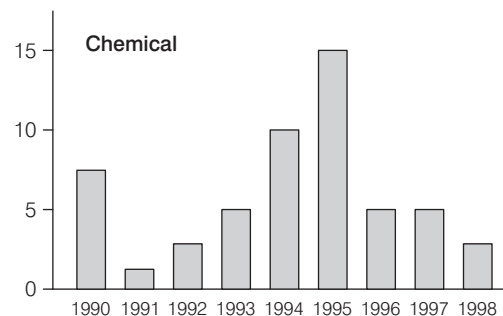
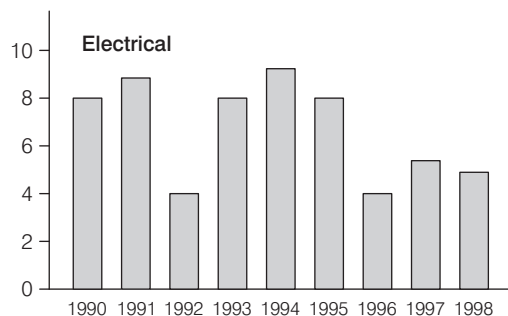
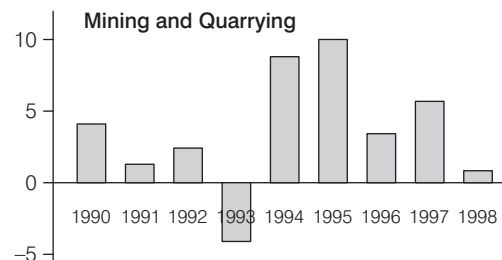
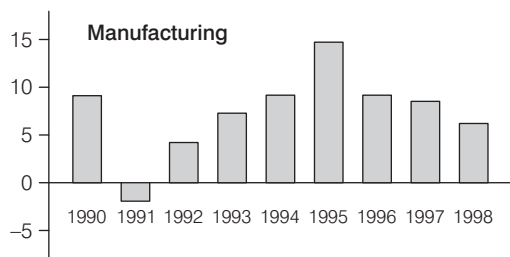
- (a) 3600 (b) 90 (c) 140 (d) 115

- 251)** ABC Ltd. is considering increasing the production level. What is the approximate marginal cost of increasing production from its July level of 40 unit to 41 unit?
 (a) 110 (b) 130 (c) 150 (d) 160
- 252)** From the data provided it can be inferred that, for production levels in the range of 0 to 60 unit
 (a) MC is an increasing function of production quantity
 (b) MC is a decreasing function of production quantity
 (c) Initially MC is a decreasing function of production quantity, attains a minimum and then it is an increasing function of production quantity
 (d) None of the above
- 253)** Suppose that each widget sells for ₹ 150. What is the profit earned by ABC Ltd. in July? (Profit is defined as the excess of sales revenue over total cost.)
 (a) 2400 (b) 1600 (c) 400 (d) 0
- 254)** Assume that the unit price is ₹ 150 and profit is defined as the excess of sales revenue over total costs. What is the monthly production level of ABC Ltd. at which the profit is highest?
 (a) 30 (b) 50 (c) 60 (d) 140
- 255)** For monthly production level in the range of 0 to 30 unit
 (a) AC is always higher than MC
 (b) AC is always lower than MC
 (c) AC is lower than MC up to a certain level and then is higher than MC
 (d) None of the above

Directions (Q. Nos. 256-261) Answer the questions based on the following information.

(2000)

The figures overleaf present annual growth rate, expressed as the percentage change relative to the previous year in four sectors of the economy of the Republic of Reposia during the 9-year period from 1990 to 1998. Assume that the index of production for each of the four sectors is set at 100 in 1989. Further, the four sectors manufacturing, mining and quarrying, electricity and chemicals, respectively, constituted 20%, 15%, 10% and 15% of total industrial production in 1989.



- 256)** Which is the sector with the highest growth during the period 1989 to 1998 ?
 (a) Manufacturing (b) Mining and quarrying
 (c) Electricity (d) Chemicals
- 257)** The overall growth rate in 1991 of the four sectors together is approximately
 (a) 10% (b) 1% (c) 2.5% (d) 1.5%
- 258)** When was the highest level of production in the manufacturing sector achieved during the 9 year period 1990-98?
 (a) 1998 (b) 1995 (c) 1990 (d) Cannot be determined
- 259)** When was the lowest level of production of the mining and quarrying sector achieved during the 9 year period 1990-98 ?
 (a) 1996 (b) 1993 (c) 1990 (d) Cannot be determined
- 260)** The percentage increase of production in the four sectors, namely, manufacturing, mining and quarrying, electricity and chemicals, taken together in 1994, relative to 1989 is approximately
 (a) 25% (b) 20% (c) 50% (d) 40%
- 261)** It is known that the index of total industrial production in 1994 was 50% more than in 1989. Then, the percentage increase in production between 1989 and 1994 in sectors other than the four listed above is
 (a) 57.5 (b) 87.5 (c) 127.5 (d) 47.5

Directions (Q. Nos. 262-265) Answer the questions based on the following table. (2000)

The table shows trends in external transactions of Indian corporate sector during the period 1993-94 to 1997-98. In addition, following definitions hold good

Sales_i, Imports_i and Exports_i, respectively denote the sales, imports and exports in year *i*.

Deficit for year *i*, Deficit_i = Imports_i – Exports_i

Deficit intensity in year *i*, DI_i = Deficit_i/Sales_i

Growth rate of deficit intensity in year *i* GDI_i = (DI_i – DI_{i-1}) / DI_{i-1} – 1

Further, note that all imports are classified as either raw material or capital goods.

Trends in External Transactions of Indian Corporate Sector
 (All figure in per cent)

Year	1997-98	1996-97	1995-96	1994-95	1993-94
Export intensity*	9.2	8.2	7.9	7.5	7.3
Import intensity *	14.2	16.2	15.5	13.8	12.4
Imported raw material / total cost of raw material	20.2	19.2	17.6	16.3	16
Imported capital goods / gross fixed assets	17.6	9.8	11.8	16.3	19.5

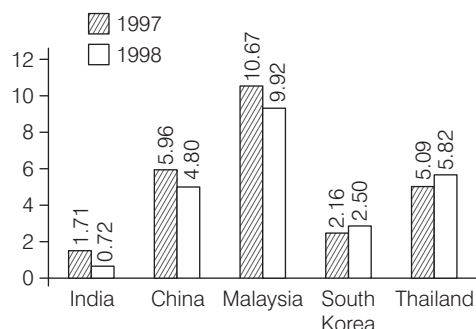
* Ratio of Export (or Imports) to sales.

- 262)** The highest growth rate in deficit intensity was recorded in
 (a) 1994-95 (b) 1995-96 (c) 1996-97 (d) 1997-98
- 263)** The value of the highest growth rate in deficit intensity is approximately
 (a) 8.45% (b) 2.15% (c) 33.3% (d) 23.5%
- 264)** In 1997-98, the total cost of raw materials is estimated as 50% of sales of that year. The turnover of gross fixed assets, defined as the ratio of sales to gross fixed assets, in 1997-98 is, approximately
 (a) 3.3 (b) 4.3
 (c) 0.33 (d) Not possible to determined

265) Which of the following statements can be inferred to be true from the given data?

- (a) During the 5 yr period between 1993-94 and 1997-98 exports have increased every year
- (b) During the 5 yr period between 1993-94 and 1997-98, imports have decreased every year
- (c) Deficit in 1997-98 was lower than that in 1993-94
- (d) Deficit intensity has increased every year between 1993-94 and 1996-97

Directions (Q. Nos. 266-269) Answer these questions based on the data presented in the figure below. (2000)



FEI for a country in a year, is the ratio (expressed as a percentage) of its foreign equity inflows to its GDP. The figure given displays the FEIs for select Asian countries for 1997 and 1998.

266) The country with the largest change in FEI in 1998 relative to its FEI in 1997, is

- (a) India
- (b) China
- (c) Malaysia
- (d) Thailand

267) Based on the data provided, it can be concluded that

- (a) absolute value of foreign equity inflows in 1998 was higher than that in 1997 for both Thailand and South Korea.
- (b) absolute value of foreign equity inflows was higher in 1998 for Thailand and lower for China than the corresponding values in 1997.
- (c) absolute value of foreign equity inflows was lower in 1998 for both India and China than the corresponding values in 1997.
- (d) None of the above can be inferred.

268) It is known that China's GDP in 1998 was 7% higher than its value in 1997, while India's GDP grew by 2% during the same period. The GDP of South Korea, on the other hand, fell by 5%. Which of the following statements is/are true?

- I. Foreign equity inflows to China were higher in 1998 than in 1997.
- II. Foreign equity inflows to China were lower in 1998 than in 1997.
- III. Foreign equity inflows to India were higher in 1998 than in 1997.
- IV. Foreign equity inflows to South Korea decreased in 1998 relative to 1997.
- V. Foreign equity inflows to South Korea increased in 1998 relative to 1997.

- (a) I, III and IV
- (b) II, III and IV
- (c) I, III and V
- (d) II and V

269) China's foreign equity inflows in 1998 were 10 times that into India. It can be concluded that

- (a) China's GDP in 1998 was 40% higher than that of India.
- (b) China's GDP in 1998 was 70% higher than that of India.
- (c) China's GDP in 1998 was 50% higher than that of India.
- (d) No inference can be drawn about relative magnitudes of China's and India's GDPs.

Directions (Q. Nos. 270-274) *Answer these questions based on the data provided in the table below.* (2000)

Factory Sector by Type of Ownership

Sector	Factories	Employment	Fixed Capital	Gross output	Value added
Public	7	27.7	43.2	25.8	30.8
Central government	1	10.5	17.5	12.7	14.1
State local government	5.2	16.2	24.3	11.6	14.9
Central and state local government	0.8	1.0	1.4	1.5	1.8
Joint	1.8	5.1	6.8	8.4	8.1
Wholly private	90.3	64.6	46.8	63.8	58.7
Others	0.9	2.6	3.2	2.0	2.4
Total	100	100	100	100	100

All figures in the table are in per cent of the total for the corresponding column.

- 270)** Suppose the average employment level is 60 per factory. The average employment in 'wholly private' factor is approximately
 (a) 43 (b) 47 (c) 50 (d) 54
- 271)** Among the firms in different sectors, value added per employee is highest in
 (a) Central Government (b) Central and State/Local Governments
 (c) Joint sector (d) Wholly private
- 272)** Capital productivity is defined as the gross output value per rupee of fixed capital. The three sectors with the higher capital productivity, arranged in descending order are
 (a) Joint, wholly private, central and state/local (b) Wholly private, joint, central and state/local
 (c) Wholly private, central and state/local, joint (d) Joint, wholly private, central
- 273)** A sector is considered 'pareto efficient' if its value added per employee and its value added per rupee of fixed capital is higher than those of all other sectors. Based on the table data, the pareto efficient sector is
 (a) Wholly private (b) Joint (c) Central and state/local (d) Others
- 274)** The total value added in all sectors is estimated at ₹ 140000 crore. Suppose the number of firms in the joint sector is 2700. The average value added per factory (in ₹ crore) in the Central Government is
 (a) 141 (b) 14.1 (c) 131 (d) 13.1

Directions (Q. Nos. 275-277) *Answer these questions with reference to the table.* (2002)

Information Technology Industry in India

(Figures are in million US Dollars)

		1994-95	1995-96	1996-97	1997-98	1998-99
Software						
	Domestic	350	490	670	950	1250
	Exports	485	734	1083	1750	2650
Hardware						
	Domestic	590	1037	1050	1205	1026
	Exports	177	35	286	201	4
Peripherals						

	1994-95	1995-96	1996-97	1997-98	1998-99
Domestic	148	196	181	229	329
Exports	6	6	14	19	18
Training	107	143	185	263	302
Maintenance	142	172	182	221	236
Networking and others	36	73	156	193	237
Total	2041	2886	3807	5031	6052

- 275)** The total annual exports lay between 35 and 40 per cent to the total annual business of the IT industry, in the year
 (a) 1997-98 and 1994-95 (b) 1996-97 and 1997-98 (c) 1996-97 and 1998-99 (d) 1996-97 and 1994-95
- 276)** The highest percentage growth in the total IT business, relative to the previous year was achieved in
 (a) 1995-96 (b) 1996-97 (c) 1997-98 (d) 1998-99
- 277)** Which one of the following statements is correct?
 (a) The annual software exports steadily increased but annual hardware exports steadily declined during 1994-99.
 (b) The annual peripheral exports steadily increased during 1994-99.
 (c) The IT business in training during 1994-99 was higher than the total IT business in maintenance during the same period.
 (d) None of the above

Directions (Q. Nos. 278-279) Answer the questions based on the following information. (2000)

For any activity A, year X dominates year Y if the IT business in activity A, in the year X, is greater than the IT business, in activity A, in the Year Y. For any two IT business activities, A and B, year X dominates year Y if :

- I. the IT business in activity A, in the year X, is greater than or equal to the IT business, in activity A in the year Y,
 II. the IT business in activity B, in the year X, is greater than or equal to the IT business in activity B in the year Y
 and
 III. there should be strict inequality in the case of at least one activity.

- 278)** For the IT hardware business activity, which one of the following is not true?
 (a) 1997-98 dominates 1996-97 (b) 1997-98 dominates 1995-96
 (c) 1995-96 dominates 1998-99 (d) 1998-99 dominates 1996-97
- 279)** For the two IT business activities, hardware and peripherals, which one of the following is true?
 (a) 1996-97 dominates 1995-96 (b) 1998-99 dominates 1995-96
 (c) 1997-98 dominates 1998-99 (d) None of these

Directions (Q. Nos. 280-284) Answer the questions based on the following information. (1999)

The table below presents data on percentage population covered by drinking water and sanitation facilities in selected Asian countries.

Population covered by drinking water and sanitation facilities
Percentage coverage

	Drinking water			Sanitation facilities		
	Urban	Rural	Total	Urban	Rural	Total
India	85	79	81	70	14	29
Bangladesh	99	96	97	79	44	48
China	97	56	67	74	7	24

Drinking water				Sanitation facilities		
Pakistan	82	69	74	77	22	47
Philippines	92	80	86	88	66	77
Indonesia	79	54	62	73	40	51
Sri Lanka	88	52	57	68	62	63
Nepal	88	60	63	58	12	1

(Source: World Resources 1998-99, p. 251, UNDP, UNEP and World Bank)

Country A is said to dominate B or $A > B$ if A has higher percentage in total coverage for both drinking water and sanitation facilities and B is said to be dominated by A, or $B < A$. A country is said to be on the coverage frontier if no other country dominates it. Similarly, a country is not on the coverage frontier if it is dominated by at least one other country.

280) What are the countries on the coverage frontier?

- (a) India and China
(b) Sri Lanka and Indonesia
(c) Philippines and Bangladesh
(d) Nepal and Pakistan

281) Which of the following statements are true?

- A. India > Pakistan and India > Indonesia
B. India > China and India > Nepal
C. Sri Lanka > China
D. China > Nepal

- (a) A and C
(b) B and D
(c) A, B and C
(d) B, C and D

282) Using only the data presented under 'sanitation facilities' columns, it can be concluded that rural population in India, as a percentage of its total population is approximately

- (a) 76
(b) 70
(c) 73
(d) Cannot be determined

283) Again, using only the data presented under 'sanitation facilities' columns, sequence China, Indonesia and Philippines in ascending order of rural population as a percentage of their respective total population. The correct order is

- (a) Philippines, Indonesia, China
(b) Indonesia, China, Philippines
(c) Indonesia, Philippines, China
(d) China, Indonesia, Philippines

284) India is not on the coverage frontier because

- A. it is lower than Bangladesh in terms of coverage of drinking water facilities.
B. it is lower than Sri Lanka in terms of coverage of sanitation facilities.
C. it is lower than Pakistan in terms of coverage of sanitation facilities.
D. it is dominated by Indonesia.

- (a) A and B
(b) A and C
(c) D
(d) None of these

Directions (Q. Nos. 285-286) Answer the questions based on the following information.

(1999)

These relate to the above table with the additional provision that the gap between the population coverages of 'sanitation facilities' and 'drinking water facilities' is a measure of disparity in coverage.

285) The country with the most disparity in coverage of rural sector is

- (a) India
(b) Bangladesh
(c) Nepal
(d) None of these

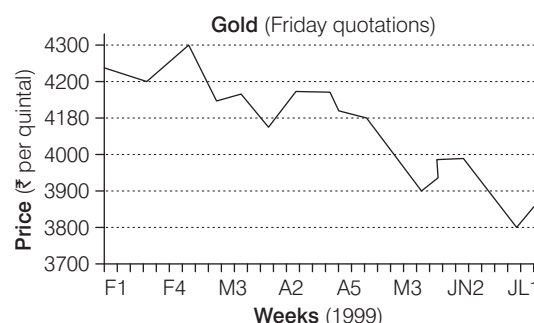
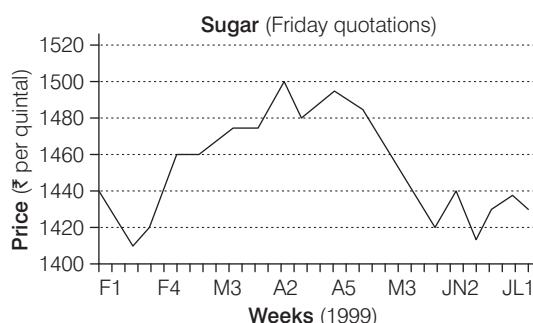
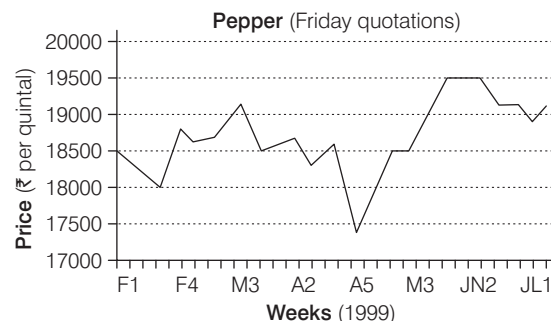
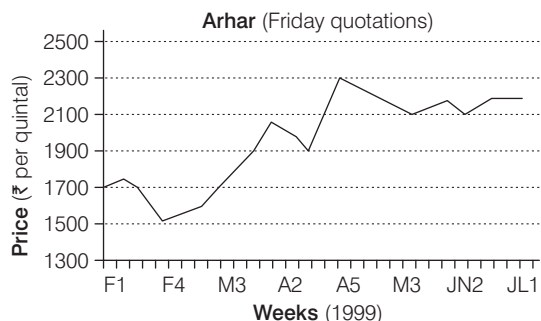
286) The country with the least disparity in coverage of urban sector is

- (a) India
(b) Pakistan
(c) Philippines
(d) None of these

Directions (Q. Nos. 287-290) Answer the questions based on the following information.

(1999)

These questions are based on the price fluctuations of four commodities = arhar; pepper, sugar and gold during February-July 1999 as described in the figures.



- 287)** Price change of a commodity is defined as the absolute difference in ending and beginning prices expressed as a percentage of the beginning. What is the commodity with the highest price change?
 (a) Arhar (b) Pepper (c) Sugar (d) Gold
- 288)** Price volatility (PV) of a commodity is defined as follows

$$PV = \frac{\text{Highest price during the period} - \text{Lowest price during the period}}{\text{Average price during the period}}$$
 What is the commodity with the lowest price volatility?
 (a) Arhar (b) Pepper (c) Sugar (d) Gold
- 289)** Mr. X, a fund manager with an investment company invested 25% of his funds in each of the four commodities at the beginning of the period. He sold the commodities at the end of the period. His investments in the commodities resulted in
 (a) 17% profit (b) 5.5% loss (c) no profit, no loss (d) 5.4% profit
- 290)** The price volatility (PV) of the commodity with the highest PV during the February-July period is approximately equal to
 (a) 3% (b) 40% (c) 20% (d) 12%

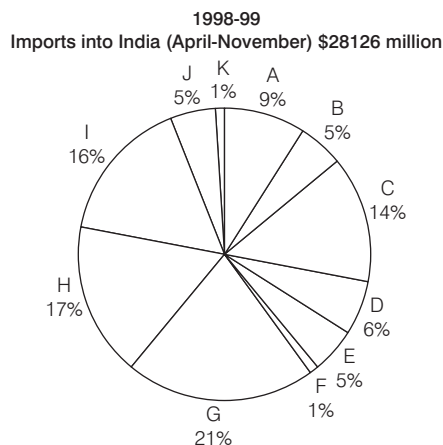
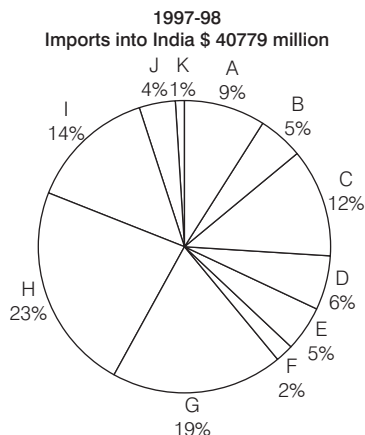
Directions (Q. Nos. 291-294) Answer the questions based on the following information.

(1999)

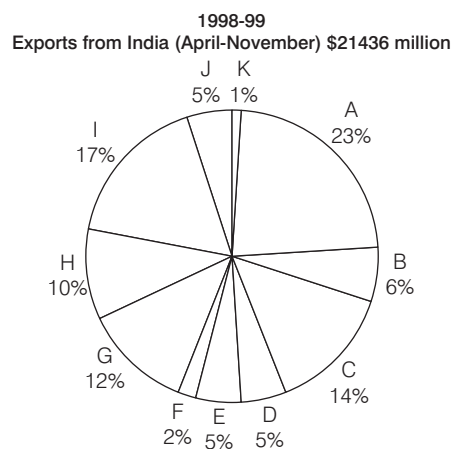
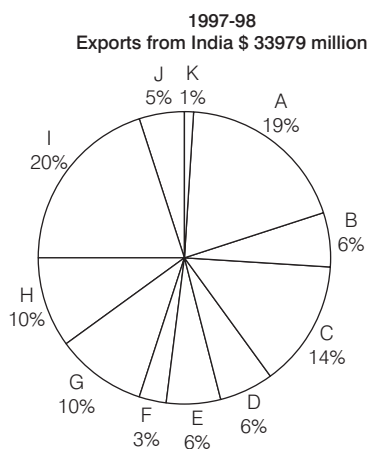
Consider the information provided in the figure below relating to India's foreign trade in 1997-98 and the first eight months of 1998-99. Total trade with a region is defined as the sum of exports and imports from that region. Trade deficit may be negative

A. USA	B. Germany	C. Other EU	D. UK
E. Japan	F. Russia	G. Other East Europe	H. OPEC
I. Asia	J. Other LDCs	K. Others	

Source of Imports



Destination of Exports



- 291)** What is the region with which India had the highest total trade in 1997-98 ?
 (a) USA (b) Other EU
 (c) OPEC (d) Others
- 292)** In 1997-98, the amount of Indian exports, million US dollars, to the region with which India had the lowest total trade, is approximately
 (a) 750 (b) 340
 (c) 220 (d) 440
- 293)** In 1997-98, the trade deficit with respect to India, billion US dollars, for the region with the highest trade deficit with respect to India, is approximately equal to
 (a) 6.0 (b) 3.0
 (c) 4.5 (d) 7.5
- 294)** What is the region with the lowest trade deficit with India in 1997-98 ?
 (a) USA (b) Asia
 (c) Others (d) Other EU

Directions (Q. Nos. 188-189) Answer the questions based on the following information.

(1999)

Assume that the average monthly exports from India and imports to India during the remaining four months of 1998-99 would be the same as that for the first eight months of the year.

295) What is the region to which India's exports registered the highest percentage growth between 1997-98 and 1998-99?

- (a) Other East Europe (b) USA (c) Asia (d) Exports have declined, no growth

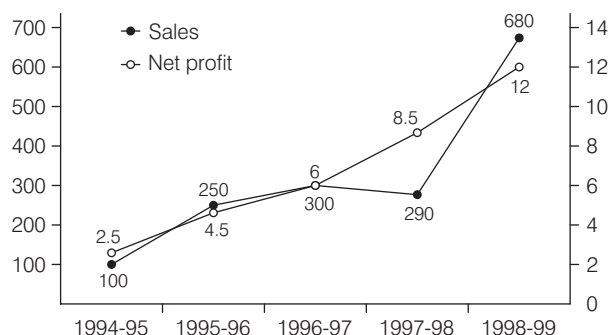
296) What is the percentage growth rate in India's total trade deficit between 1997-98 and 1998-99 ?

- (a) 43 (b) 47 (c) 50 (d) 40

Directions (Q. Nos. 297-300) Answer the questions based on the following information.

(1999)

The figure below represents sales and net profit in ₹ crore of IVP Ltd. For the 5 yr from 1994-95 to 1998-99. During this period, the sales increased from ₹ 100 crore to ₹ 680 crore. Correspondingly, the net profit increased from ₹ 2.5 crore to ₹ 12 crore. Net profit is defined as the excess of sales over total costs.



297) The highest percentage of growth in sales, relative to the previous year, occurred in

- (a) 1995-96 (b) 1996-97 (c) 1997-98 (d) 1998-99

298) The highest percentage growth in net profit, relative to the previous year, was achieved in

- (a) 1998-99 (b) 1997-98 (c) 1996-97 (d) 1995-96

299) Defining profitability as the ratio of net profit to sales, IVP Ltd. recorded the highest profitability in

- (a) 1998-99 (b) 1997-98 (c) 1994-95 (d) 1996-97

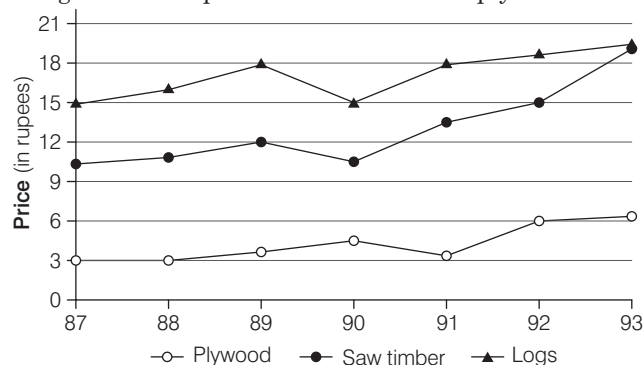
300) With profitability as defined in question 200, it can be concluded that

- (a) profitability is non-decreasing during the 5 yr from 1994-95 to 1998-99.
 (b) profitability is non-increasing during the 5 yr from 1994-95 to 1998-99.
 (c) profitability remained constant during the 5 yr from 1994-95 to 1998-99.
 (d) None of the above

Directions (Q. Nos. 301-306) Answer the questions based on the following information.

(1998)

In the following chart, the price of logs shown in per cubic metre that of plywood and saw timber is per tonne.

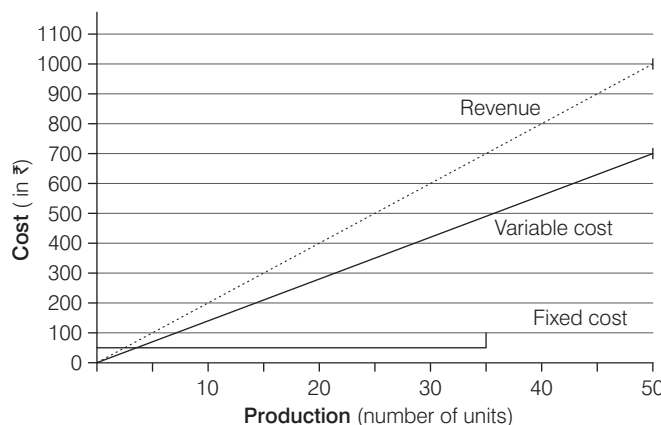


- 301)** What is the maximum percentage increase in price per cubic metre or per tonne over the previous year ?
 (a) 33.33% (b) 85% (c) 50% (d) Cannot be determined
- 302)** Which product shows maximum percentage increase in price over the period?
 (a) Saw timber (b) Plywood (c) Logs (d) Cannot be determined
- 303)** If $1 \text{ m}^3 = 750 \text{ kg}$ for saw timber, find in which year was the difference in prices of saw timber and logs the least?
 (a) 1989 (b) 1990 (c) 1991 (d) 1992
- 304)** If one cubic metre = 700 kg for plywood and 800 kg for saw timber, find in which year was the difference in the prices of plywood and saw timber (per cubic metre) the maximum?
 (a) 1989 (b) 1990 (c) 1991 (d) 1992
- 305)** If the volumes of sales of plywood, saw timber and logs were 40%, 30% and 30% respectively, then what was the average realisation in 1993 per cubic metre of sales? (One cubic metre of saw dust and plywood both = 800 kg)
 (a) 18 (b) 15 (c) 16 (d) 13
- 306)** In the previous question, if in 1994 prices increased by 5%, 1% and 10% while the volume of sales break-up was 40%, 30% and 30% for plywood, saw timber and logs respectively, then what was the average realisation?
 (a) 18.95 (b) 16.45 (c) 13.15 (d) 10.25

Directions (Q. Nos. 307-311) Answer the questions based on the following information.

(1998)

Ghosh Babu has a manufacturing unit. The following graph gives the cost for various number of unit. Given that Profit = Revenue – Variable cost – Fixed cost. The fixed cost remains constant up to 34 unit after which additional investment is to be done in fixed assets. In any case, production cannot exceed 50 unit.



- 307)** What is the minimum number of unit that need to be produced to make sure that there was no loss?
 (a) 5 (b) 10 (c) 20 (d) Cannot be determined
- 308)** How many unit should be manufactured such that profit was at least ₹ 50 ?
 (a) 20 (b) 34 (c) 45 (d) 30
- 309)** If at the most 40 unit can be manufactured, then what is the number of unit that can be manufactured to maximise profit per unit?
 (a) 40 (b) 34 (c) 35 (d) 25
- 310)** If the production cannot exceed 45 unit, then what is the number of unit that can maximise profit per unit?
 (a) 40 (b) 34 (c) 45 (d) 35
- 311)** If the fixed cost of production goes up by ₹ 40, then what is the minimum number of unit that need to be manufactured to make sure that there is no loss ?
 (a) 10 (b) 19 (c) 15 (d) 20

Directions (Q. Nos. 312-316) Answer the questions based on the following information.

(1998)

Krishna distributed 10 acre land to Gopal and Ram who paid him the total amount in the ratio 2 : 3. Gopal invested a further ₹ 2 lakh in the land and planted coconut and lemon trees in the ratio 5 : 1 on equal areas of land. There were a total of 100 lemon trees. The cost of one coconut was ₹ 5. The crop took 7 yr to mature and when the crop was reaped in 1997, the total revenue generated was 25% of the total amount put in by Gopal and Ram together. The revenue generated from the coconut and lemon trees was in the ratio 3 : 2 and it was shared equally by Gopal and Ram as the initial amounts spent by them were equal.

312) What was the total output of coconuts?

- (a) 24000 (b) 36000 (c) 18000 (d) 48000

313) What was the value of output per acre of lemon trees planted?

- (a) 0.24 lakh/acre (b) 2.4 lakh/acre
(c) 24 lakh/acre (d) Cannot be determined

314) What was the amount received by Gopal in 1997?

- (a) ₹ 1.5 lakh (b) ₹ 3 lakh
(c) ₹ 6 lakh (d) None of these

315) What was the value of output per tree for coconuts?

- (a) ₹ 36 (b) ₹ 360
(c) ₹ 3,600 (d) ₹ 240

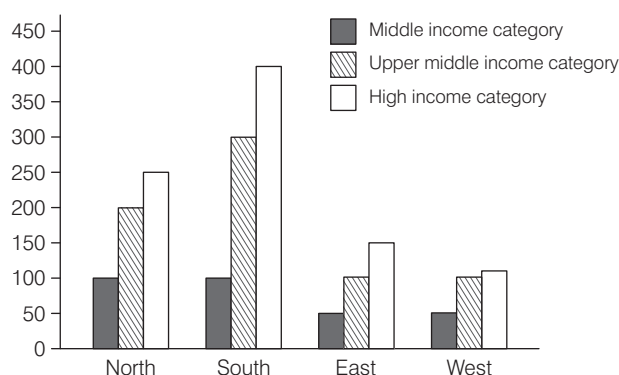
316) What was the ratio of fields per acre of land for coconuts and lemons (in terms of number of lemons and coconuts)?

- (a) 3 : 2 (b) 2 : 3
(c) 1 : 1 (d) Cannot be determined

Directions (Q. Nos. 317-320) Answer the questions based on the following information.

(1998)

The following bar chart gives the growth percentage in the number of households in middle, upper-middle and high-income categories in the four regions for the period between 1987-88 and 1994-95.



	Number of households in 1987-88 (in thousands)	Average household income in 1987-88	Growth in average household income (1994-95 over 1987-88)
Middle income	40	₹ 30000	50%
Upper middle	10	₹ 50000	60%
High income	5	₹ 75000	90%

317) Which region showed the highest growth in number of households in all the income categories for the period?

- (a) North (b) South (c) West (d) None of these

318) What was the total household income in Northern region for upper-middle class?

- (a) ₹ 50 lakh (b) ₹ 500 million
(c) ₹ 300 million (d) Cannot be determined

319) What is the percentage increase in total number of households for the Northern region (upper-middle) over the given period?

- (a) 100% (b) 200%
(c) 240% (d) Cannot be determined

320) What was the average income of the high-income group in 1987-88 ?

- (a) ₹ 75000 (b) ₹ 25000
(c) ₹ 225000 (d) Cannot be determined

Directions (Q. Nos. 321-322) Answer the questions based on the following information. (1998)

The number of households in each category were equally distributed in all the regions.

321) The ratio of total income for the high-income category to the upper-middle class increased by how much percentage in the given period?

- (a) 20% (b) 36%
(c) 25% (d) Cannot be determined

322) The average income for the Northern region in 1987-88 was

- (a) ₹ 37727 (b) ₹ 37277
(c) ₹ 35000 (d) Cannot be determined

Directions (Q. Nos. 323-328) The following table gives the quantity of apples (in tonnes) arriving at New Delhi market from various states in a particular year. The month in which demand was more than supply, the additional demand was met by the stock from cold storage. (1998)

Month	State			cold storage	Total
	HP	UP	J&K		
April	7	0	7	59	73
May	12	1	0	0	13
June	9741	257	8017	0	18015
July	71497	0	18750	0	90247
August	77675	0	20286	0	97961
September	53912	0	56602	0	110514
October	12604	0	79591	24	92219
November	3499	0	41872	42	45413
December	1741	0	14822	15	16578
January	315	0	10922	201	11438
February	25	0	11183	77	11285
March	0	0	683	86	769

323) What was the maximum percentage of apples supplied by any state in any of the months?

- (a) 99% (b) 95%
(c) 88% (d) 100%

324) Which state supplied the maximum apples?

- (a) UP (b) HP (c) J & K (d) Cold storage

325) Which state supplied the highest percentage of apples from the total apples supplied?

- (a) HP (b) UP (c) J & K (d) Cannot be determined

326) In which of the following periods was the supply greater than the demand?

- (a) August-March (b) June-October (c) May-September (d) Cannot be determined

327) If the yield per tree was 40 kg, then from how many trees were the apples supplied to New Delhi (in million) during the year?

- (a) 11.5 (b) 12.5 (c) 13.5 (d) Cannot be determined

328) Using the data in question 179, if there were 250 trees per hectare, then how many hectares of land was used?

- (a) 9400 (b) 49900 (c) 50000 (d) 49450

Directions (Q. Nos. 329-334) *Answer the questions based on the following table.*

(1997)

Year	Loan from Rural Banks			Agricultural Loans		
	Number of rural banks	Average number of loans	Average size (in ₹)	No. ('000)	Value (₹ in million)	Consumer price index
1970	90	28	109	18.3	2.00	43
1971	115	39	133	20.4	3.58	49
1972	130	52	178	25.1	6.26	55
1974	260	98	243	41.2	34.54	70
1975	318	121	283	51.4	52.21	78
1980	605	288	567	135.7	498.4	131
1981	665	312	622	152.8	612.4	137
1983	840	380	711	211.6	915.7	149

329) In 1974, the agricultural loans formed what per cent of the total loans?

- (a) 85% (b) 71% (c) 77% (d) Cannot be determined

330) From the given data, the number of rural loans up to 1980 formed approximately what per cent of those in 1983?

- (a) 112% (b) 80% (c) 97% (d) Cannot be determined

331) Which of the following pairs of year showed the maximum increase in the number of rural bank loans?

- (a) 1971-72 (b) 1974-75 (c) 1970-71 (d) 1980-81

332) What is the value of the agricultural loans in 1983 at 1970 prices?

- (a) ₹ 326 (b) ₹ 264
(c) ₹ 305 (d) None of these

333) In which year was the number of rural bank loans per rural bank least?

- (a) 1974 (b) 1971 (c) 1970 (d) 1975

334) What is the simple annual rate of increase in the number of agricultural loans from 1970 to 1983 ?

- (a) 132% (b) 81% (c) 75% (d) 1056%

Directions (Q. Nos. 335-336) *Answer the questions based on the following information.*

(1997)

If the consumer price index for 1970 is to be taken as 105 and the indices for the subsequent year are to be corrected accordingly, then answer 129-130.

335) By roughly how many points do the indices for the year 1983 and 1975 differ?

- (a) 174 (b) 180
(c) 188 (d) 195

336) What is the value of the loans in 1980 at 1983 prices?

- (a) ₹ 570 million (b) ₹ 680 million
(c) ₹ 525 million (d) ₹ 440 million

Directions (Q. Nos. 337-338) *Answer the questions based on the following information.*

(1997)

The following table gives the tariff (in paise per kilo-watt-hour (k Wh)) levied by the UPSEB in 1994-95, in four sectors and the regions within them. The table also gives the percentage change in the tariff as compared to 1991-92.

	Region 1		Region 2		Region 3		Region 4		Region 5	
	P/kWh	% increase	P/kWh	% increase	P/kWh	% increase	P/kWh	% increase	P/kWh	% increase
Sector 1	425	+15	472	+5	420	- 4	415	+ 8	440	+ 10
Sector 2	430	+ 12	468	+ 8	448	+ 7	423	- 3	427	+ 11
Sector 3	428	+ 8	478	- 4	432	+ 6	441	+10	439	+ 8
Sector 4	434	- 5	470	+15	456	+ 10	451	+ 12	446	- 12

337) If the amount of power consumed by the various regions in sector 1 is the same, then as compared to 1991-92 the net tariff in 1994-95

- (a) increased by 6.5% (b) decreased by 3.5%
(c) increased by 10.2% (d) decreased by 7.3%

338) What was the approximate average tariff in region 3 in 1991-92?

- (a) 407 (b) 420
(c) 429 (d) None of these

Directions (Q. Nos. 339-341) *Answer the questions based on the following information.*

(1997)

The UPSEB supplies power under four categories; urban (25%), domestic (20%), industrial (40%) and rural (15%). In 1994-95, the total power produced by the UPSEB was 7875 megawatts.

339) If in 1994-95, there was a 10% decrease in the domestic consumption of power as compared to that in 1991-92, what was the consumption of power in the rural sector in 1991-92?

- (a) 1312 megawatt (b) 1422 megawatt
(c) 1750 megawatt (d) None of these

340) In the given 2 yr, what is the total tariff paid by the urban sector?

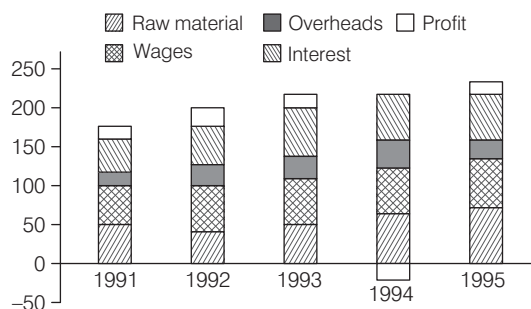
- (a) ₹ 22.4 lakh (b) ₹ 21.6 lakh
(c) ₹ 27.2 lakh (d) Cannot be determined

341) Which of the following statements is true?

- (a) The average tariff in region 4 is 437.5 P/kWh
(b) The average tariff in region 2 is greater than the average tariff in region 5
(c) In 1991-92, the industrial sector contributed to about 42% of the total revenue from power
(d) None of the above

Directions (Q. Nos. 342-347) Answer the questions based on the following graph.

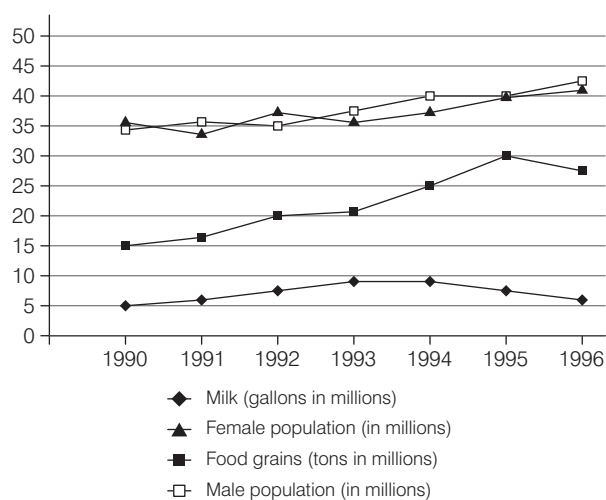
(1997)



- 342)** In which year was the increase in raw material maximum?
 (a) 1992 (b) 1993 (c) 1994 (d) 1995
- 343)** In which period was the change in profit maximum?
 (a) 1991-92 (b) 1992-93 (c) 1993-94 (d) 1994-95
- 344)** Which component of the cost production has remained more or less constant over the period?
 (a) Interest (b) Overheads (c) Wages (d) Raw material
- 345)** In which year were the overheads, as a percentage of the raw material, maximum?
 (a) 1995 (b) 1994 (c) 1992 (d) 1993
- 346)** What per cent of the costs did the profits form over the period?
 (a) 3% (b) 5% (c) 8% (d) 11%
- 347)** If the interest component is not included in the total cost calculation, which year would show the maximum profit per unit cost?
 (a) 1991 (b) 1992 (c) 1993 (d) 1995

Directions (Q. Nos. 348-353) Answer the questions based on the following graph.

(1997)



- 348)** When was the capita production of milk least?
 (a) 1990 (b) 1992 (c) 1994 (d) 1996

- 349)** When was the per capita production of foodgrains most?
 (a) 1992 (b) 1993 (c) 1994 (d) 1995
- 350)** In which year was the difference between the percentage increase in the production food grains and milk maximum?
 (a) 1993 (b) 1994 (c) 1995 (d) 1996
- 351)** If milk contains 320 calories and foodgrains contain 160 calories, in which year was the per capita consumption of calories highest?
 (a) 1993 (b) 1994 (c) 1995 (d) 1996
- 352)** If one gallon milk contains 120 g of a particular nutrient and one tonne of foodgrains contains 80 g of the same nutrient, in which year was the availability of this nutrient maximum?
 (a) 1993 (b) 1994 (c) 1995 (d) 1996
- 353)** Referring to the above question, in which year was the per capita consumption of this nutrient highest?
 (a) 1993 (b) 1994 (c) 1995 (d) 1996

Directions (Q. Nos. 354-355) Answer the question based on the following table.

(1997)

Hotels in Mumbai

Project	No. of rooms	Cost (in ₹ crores)	Year of completion	Company
Windsor Manor	600	275	1999	IHCL
Leela Hotels	310	235	1999	Leela Hotels
Mumbai Heights	250	250	1998	Bombay Hotels
Royal Holidays	536	225	1998	Lokhandwala Group
Majestic Holiday	500	250	1999	Raheja Group
Supremo Hotel	300	300	1999	ITC
Hyatt Regency	500	250	2000	Asian Hotels

- 354)** Which of the following had the least cost per room?
 (a) Lokhandwala group (b) Raheja group
 (c) IHCL (d) ITC
- 355)** Which of the following has the maximum number of rooms per crore of rupees?
 (a) IHCL (b) Raheja Group
 (c) Lokhandwala Group (d) ITC

Directions (Q. Nos. 356-358) Answer the questions based on the following information.

(1997)

Assume that the cost of the project is incurred in the year of completion; interest is charged at the rate of 10% per annum.

- 356)** What is the cost incurred for projects completed in 1998?
 (a) ₹ 475 crore (b) ₹ 500 crore (c) ₹ 522.5 crore (d) ₹ 502.5 crore
- 357)** What is the cost incurred for projects completed in 1999?
 (a) ₹ 1282.6 crore (b) ₹ 1270 crore (c) ₹ 1805.1 crore (d) ₹ 1535 crore
- 358)** What is the approximate cost incurred for projects completed in 2000?
 (a) ₹ 1785 crore (b) ₹ 2140 crore (c) ₹ 2320 crore (d) None of these

Directions (Q. Nos. 359-363) Answer the questions based on the following information.

(1996)

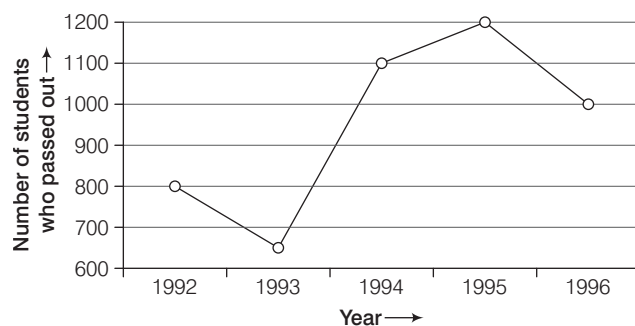
The first table gives the percentage of students in MBA class, who sought employment in the areas of finance, marketing and software. The second table gives the average starting salaries of the students per month, (rupees in thousands) in these areas. The third table gives the number of students who passed out in each year.

First table

	Finance	Marketing	Software	Others
1992	22	36	19	23
1993	17	48	23	12
1994	23	43	21	13
1995	19	37	16	28
1996	32	32	20	16

Second table

	Finance	Marketing	Software
1992	5450	5170	5290
1993	6380	6390	6440
1994	7550	7630	7050
1995	8920	8960	7760
1996	9810	10220	8640



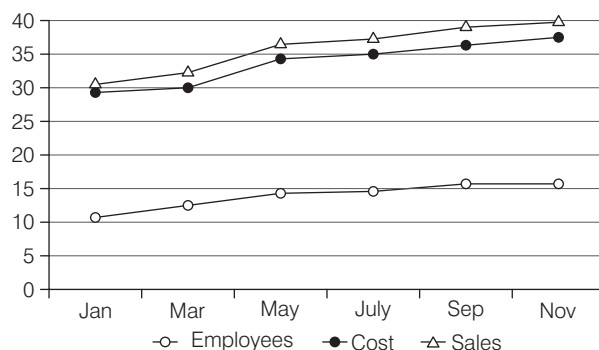
- 359)** The number of students who get jobs in finance is less than the students getting marketing jobs, in the 5 yr, by
- (a) 826 (b) 650
(c) 750 (d) 548
- 360)** What is the percentage increase in the average salary of finance from 1992 to 1996 ?
- (a) 60% (b) 32%
(c) 96% (d) 80%
- 361)** The average annual rate at which the initial salary offered in software increases is
- (a) 21% (b) 33%
(c) 15.9% (d) 65%
- 362)** What is the average monthly salary offered to a management graduate in 1993 ?
- (a) ₹ 6403 (b) ₹ 6330
(c) ₹ 6333 (d) Cannot be determined

363) In 1994, students seeking jobs in finance earned more than those opting for software (per annum)

- (a) ₹ 43 lakh (b) ₹ 33.8 lakh
(c) ₹ 28.41 lakh (d) ₹ 38.8 lakh

Directions (Q. Nos. 364-368) Answer the questions based on the following graph.

(1996)



364) Which month records the highest profit?

- (a) September (b) July (c) March (d) May

365) In which month is the total increase in the cost highest as compared to two months ago?

- (a) March (b) September
(c) July (d) May

366) In which month is the percentage increase in sales two months before, the highest?

- (a) March (b) September
(c) July (d) May

367) Which month has the highest profit per employee?

- (a) September (b) July
(c) January (d) March

368) Assuming that no employees left the job, how many more people did the company take on in the given period?

- (a) 4600 (b) 5000
(c) 5800 (d) 6400

Directions (Q. Nos. 369-373) Answer the questions based on the following information.

(1996)

The amount of money invested (rupees in crores) in the core infrastructure areas of two districts, chittoor and Khamman, Andhra Pradesh, in as follows

Chittor district			Khammam district		
Core area	1995	1996	Core area	1995	1996
Electricity	815.2	1054.2	Electricity	2065.8	2365.1
Chemical	389.5	476.7	Chemical	745.3	986.4
Thermal	632.4	565.9	Thermal	1232.7	1026.3
Solar	468.1	589.6	Solar	1365.5	1792.1
Nuclear	617.9	803.1	Nuclear	1674.3	2182.1
Total	2923.1	3489.5	Total	7081.6	8352.0

369) By what per cent was the total investment in the two districts more in 1996 as compared to 1995?

- (a) 14% (b) 21% (c) 24% (d) 18%

- 370)** The investment in electricity and thermal energy in 1995 in these two districts formed what per cent of the total investment made in that year?
 (a) 41% (b) 47% (c) 52% (d) 55%
- 371)** In Khammam district, the investment in which area in 1996 showed the highest percentage increase over the investment in that area in 1995?
 (a) Electricity (b) Chemical (c) Solar (d) Nuclear
- 372)** Approximately how many times was the total investment in Chittoor to the total investment in Khammam?
 (a) 2.8 (b) 2 (c) 2.4 (d) 1.7
- 373)** If the total investment in Khammam shows the same rate of increase in 1997, as it had shown from 1995 to 1996, what approximately would be the total investment in Khammam in 1997?
 (a) ₹ 9850 crore (b) ₹ 10020 crore (c) ₹ 9170 crore (d) ₹ 8540 crore

Directions (Q. Nos. 374-378) Answer the questions based on the following information.

Mulayam Software Co., before selling a package to its clients, follows the given schedule.

(1996)

Month	Stage	Cost (₹ '000 per man/month)
1-2	Specification	40
3-4	Design	20
5-8	Coding	10
9-10	Testing	15
11-15	Maintenance	10

The number of people employed in each month is

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Number of people employed	2	3	4	3	4	5	5	4	4	1	3	3	1	1	1

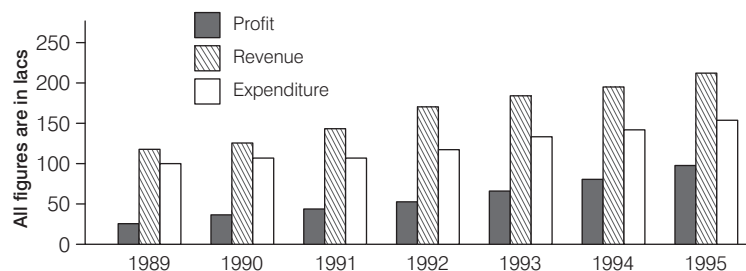
- 374)** Due to overrun in 'design', the design stage took 3 months, i.e., months 3, 4 and 5. The number of people working on design in the fifth month was 5. Calculate the percentage change in the cost incurred in the fifth month. (Due to improvement in 'coding' technique, this stage was completed in months 6-8 only).
 (a) 225% (b) 150%
 (c) 275% (d) 240%
- 375)** With reference to the above questions, what is the cost incurred in the new 'coding' stage? (Under the new technique, 4 people work in the sixth month and 5 in the eighth).
 (a) ₹ 140000 (b) ₹ 150000
 (c) ₹ 160000 (d) ₹ 190000
- 376)** What is the difference in cost between the old and the new techniques?
 (a) ₹ 30000 (b) ₹ 60000
 (c) ₹ 70000 (d) ₹ 40000
- 377)** Under the new technique, which stage of software development is most expensive for Mulayam Software Co.?
 (a) Testing (b) Specification
 (c) Coding (d) Design
- 378)** Which five consecutive months have the lowest average cost per man-month under the new technique?
 (a) 1-5 (b) 9-13
 (c) 11-15 (d) None of these

Directions (Q. Nos. 379-383) Answer the questions based on the following information, which gives data about certain coffee producers in India. (1996)

	Production (‘000 tonnes)	Capacity utilisation (%)	Sales (‘000 tonnes)	Total Sales Value (in ₹ crores)
Brooke Bond	2.97	76.50	2.55	31.15
Nestle	2.48	71.20	2.03	26.75
Lipton	1.64	64.80	1.26	15.25
MAC	1.54	59.35	1.47	17.45
Total (including others)	11.60	61.30	10.67	132.80

- 379)** What is the maximum production capacity (in ‘000 tonnes) of Lipton for coffee?
 (a) 2.53 (b) 2.85 (c) 2.24 (d) 2.07
- 380)** Which company out of the four companies mentioned above has the maximum utilised capacity (in ‘000 tonnes)?
 (a) Lipton (b) Nestle (c) Brooke Bond (d) MAC
- 381)** What is the approximate total production capacity (in ‘000 tonnes) for coffee in India?
 (a) 18 (b) 20 (c) 18.7 (d) Data insufficient
- 382)** The highest price for coffee per kilogram is for
 (a) Nestle (b) MAC (c) Lipton (d) Data insufficient
- 383)** What per cent of the total market share (by sales value) is controlled by ‘others’ ?
 (a) 60% (b) 32% (c) 67% (d) Data insufficient

Directions (Q. Nos. 384-388) Answer the questions based on the following information. (1996)



- 384)** The average revenue collected in the given 7 yr is approximately
 (a) ₹ 164 lakh (b) ₹ 168 lakh (c) ₹ 171 lakh (d) ₹ 175 lakh
- 385)** The expenditure for the 7 yr together form what per cent of the revenues during the same period?
 (a) 75% (b) 67% (c) 62% (d) 83%
- 386)** Which year showed the greatest percentage increase in profit as compared to the previous year?
 (a) 1993 (b) 1994 (c) 1990 (d) 1992
- 387)** In which year was the growth in expenditure maximum as compared to the previous year?
 (a) 1993 (b) 1995 (c) 1991 (d) 1992
- 388)** If the profit in 1996 shows the annual rate of growth as it had shown in 1995 over the previous year, then what approximately will be the profit in 1996 ?
 (a) ₹ 72 lakh (b) ₹ 82 lakh (c) ₹ 93 lakh (d) ₹ 78 lakh

Directions (Q. Nos. 389-393) *Answer the questions based on the following information.*

(1995)

A company produces five types of shirts—A, B, C, D and E—using cloth of three qualities—high, medium and low, using dyes of three qualities—high, medium and low. One shirt requires 1.5 m of cloth. The following table gives respectively.

1. The number of shirts (of each category) produced, in thousands.
2. The percentage distribution of cloth quality in each type of shirt.
3. The percentage distribution of dye quality in each type of shirt.

		Distribution of cloth (%)				Distribution of dye (%)			
Shirt type	Number in thousands	Shirt type	High	Medium	Low	Shirt type	High	Medium	Low
A	20	A	80	20	—	A	70	15	15
B	30	B	30	40	30	B	20	50	30
C	30	C	—	70	30	C	—	60	40
D	10	D	—	60	40	D	—	40	60
E	10	E	—	10	90	E	—	20	80

389) What is the total requirement of cloth?

- (a) 150000 m (b) 20000 m (c) 225000 m (d) 250000 m

390) How many metres of low-quality cloth is consumed?

- (a) 22500 m (b) 46500 m (c) 60000 m (d) 40000 m

391) How many metres of high quality cloth is consumed by A-type shirts?

- (a) 8000 m (b) 112000 m
(c) 24000 m (d) 30000 m

392) What is the ratio of the three qualities of dyes in high-quality cloth?

- (a) 2 : 3 : 5 (b) 1 : 2 : 5 (c) 7 : 9 : 10 (d) Cannot be determined

393) What is the ratio of low-quality dye used for C-type shirts to that used for D-type shirts?

- (a) 3 : 2 (b) 2 : 1 (c) 1 : 2 (d) 2 : 3

Directions (Q. Nos. 394-398) *Answer the questions based on the following table.*

(1995)

Machine M_1 as well as machine M_2 can independently produce either product P or product Q. The time taken by machines M_1 and M_2 in minutes to produce one unit of product P and product Q are given in the table below. (Each machine works 8 h per day).

Product	M_1	M_2
P	10	8
Q	6	6

394) What is the maximum number of unit that can be manufactured in one day?

- (a) 140 (b) 160 (c) 120 (d) 180

395) If M_1 works at half its normal efficiency, what is the maximum number of unit produced, if at least one unit of each must be produced?

- (a) 96 (b) 89 (c) 100 (d) 119

396) What is the least number of machine hours required to produce 30 pieces of P and 25 pieces of Q, respectively?

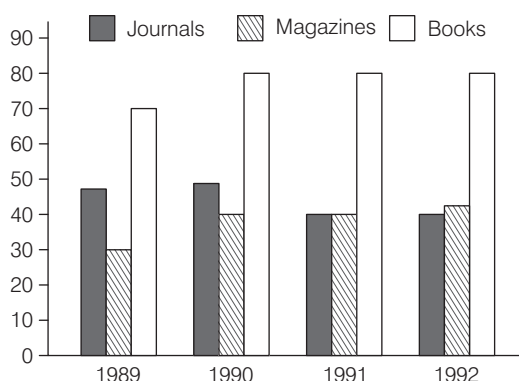
- (a) 6 h 30 min (b) 7 h 24 min (c) 6 h 48 min (d) 4 h 6 min

- 397)** If the number of unit of P is to be three times that of Q, what is the maximum idle time to maximize total unit manufactured?
 (a) 0 min (b) 24 min (c) 1 h (d) 2 h
- 398)** If equal quantities of both are to be produced, then out of the four choices given below, the least efficient way would be
 (a) 48 of each with 3 min idle (b) 64 of each with 12 min idle (c) 53 of each with 10 min idle (d) 71 of each with 9 min idle

Directions (Q. Nos. 399-403) Answer the questions based on the following graph.

Revenue obtained by a publishing house while selling books, magazines and journals (in ₹ lakh.)

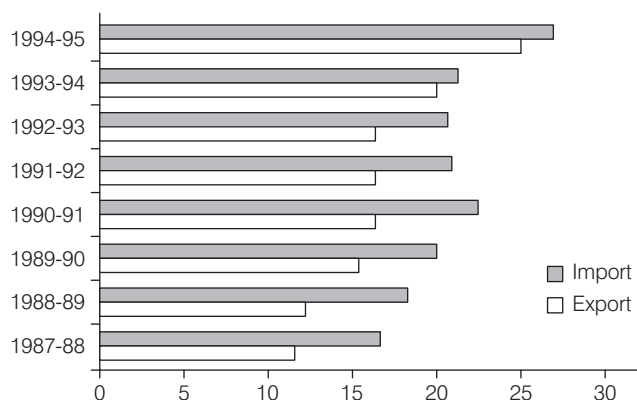
(1995)



- 399)** Which year shows the highest change in revenue obtained from journals?
 (a) 1989 (b) 1990 (c) 1991 (d) 1992
- 400)** In 1992, what per cent of the total revenue came from books?
 (a) 45% (b) 55% (c) 35% (d) 25%
- 401)** The number of year in which there was an increase in revenue from atleast two categories is?
 (a) 1 (b) 2 (c) 3 (d) 4
- 402)** If 1993 were to show the same growth as 1992 over 1991, the revenue in 1993 must be
 (a) ₹ 194 lakh (b) ₹ 187 lakh (c) ₹ 172 lakh (d) ₹ 177 lakh
- 403)** The growth in total revenue from 1989 to 1992 is
 (a) 21% (b) 28% (c) 15% (d) 11%

Directions (Q. Nos. 404-408) Answer the questions based on the following graph.

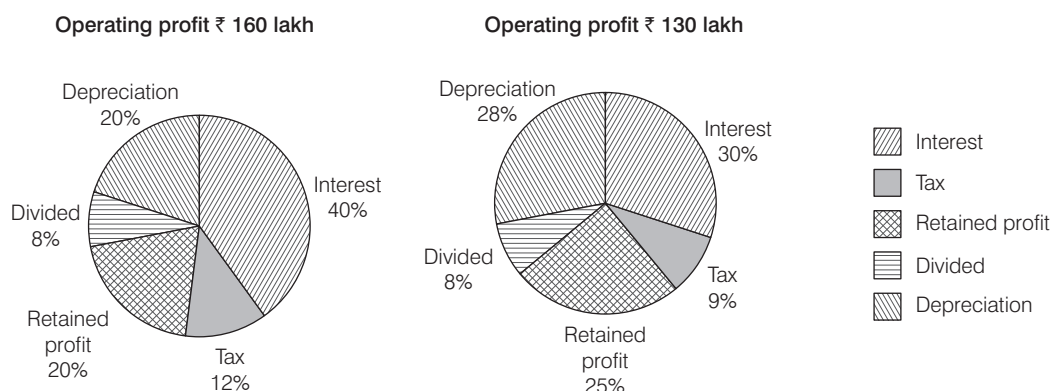
(1995)



- 404)** In which year was the trade deficit highest?
 (a) 1987-88 (b) 1988-89 (c) 1989-90 (d) 1990-91
- 405)** In how many year was the trade deficit less than the trade deficit in the succeeding year?
 (a) 1 (b) 2 (c) 3 (d) 4
- 406)** Export earning in 1990-91 is how many per cent of imports in 1991-92 ?
 (a) 82% (b) 85% (c) 90% (d) 15%
- 407)** In the last three year, the total export earnings have accounted for how many per cent of the value of the imports?
 (a) 80% (b) 83% (c) 95% (d) 88%
- 408)** Which of the following statements can be inferred from the graph?
 I. In all the year shown in the graph, the trade deficit is less than the export earning.
 II. Export earnings increased in every year between 1989-90 and 1991-92.
 III. In all the year shown in the graph, the earning by exports is less than the expenditure on imports in the preceding year.
 (a) Only I (b) Only II (c) Only III (d) I and III

Directions (Q. Nos. 409-413) Answer the questions based on the following pie-charts.

(1995)



- 409)** The operating profit in 1991-92 increased over that in 1990-91 by
 (a) 23% (b) 22%
 (c) 25% (d) 24%
- 410)** The interest burden in 1991-92 was higher than that in 1990-91 by
 (a) 50% (b) ₹ 25 lakh
 (c) 90% (d) ₹ 41 lakh
- 411)** If on an average, 20% rate of interest was charged on borrowed funds, then the total borrowed funds used by this company in the given 2 yr amounted to
 (a) ₹ 221 lakh (b) ₹ 195 lakh
 (c) ₹ 368 lakh (d) ₹ 515 lakh
- 412)** The retained profit in 1991-92, as compared to that in 1990-91 was
 (a) higher by 2.5% (b) higher by 1.5%
 (c) lower by 2.5% (d) lower by 1.5%
- 413)** The equity base of these companies remained unchanged. Then, the total dividend earning by the share holders in 1991-92 is
 (a) ₹ 104 lakh (b) ₹ 9 lakh
 (c) ₹ 12.8 lakh (d) ₹ 15.6 lakh

Directions (Q. Nos. 414-418) *Answer the questions based on the following table.*

(1995)

Market share in four metropolitan cities				
Period/Product	Mumbai 1993-94	Kolkata 1993-94	Delhi 1993-94	Chennai 1993-94
HD	20-15	35-30	20-15	20-30
CO	20-25	30-15	15-10	20-15
BN	45-40	25-35	35-35	10-10
MT	15-20	10-20	10-10	50-45

- 414)** The maximum percentage decrease in market share is
 (a) 60% (b) 50% (c) 53.3% (d) 20%
- 415)** The city in which minimum number of products increased their market shares in 1993-94 is
 (a) Mumbai (b) Delhi (c) Kolkata (d) Chennai
- 416)** The market shares of which product did not decrease between 1993-94 in any city?
 (a) HD (b) CO (c) BN (d) None of these
- 417)** The number of products which had 100% market share in four metropolitan cities is
 (a) 0 (b) 1 (c) 2 (d) 3
- 418)** The number of products which doubled their market shares in one or more cities is
 (a) 0 (b) 1 (c) 2 (d) 3

Directions (Q. Nos. 419-423) *Answer the questions based on the following information.*

(1995)

Ghosh Babu surveyed his companies and obtained the following data. Income tax is paid profit before tax and the remaining amount is apportioned to dividend and retained earnings. The retained earnings were accumulated into reserves. The reserves at the beginning of 1991 were ₹ 80 lakh.

Figure (in ₹ lakh)

	1994	1993	1992	1991
Share capital	0310	0205	0098	0098
Sales	6435	4725	2620	3270
Profit before tax	0790	0525	0170	0315
Dividends	0110	0060	0030	0030
Retained earnings	0400	0245	0070	0140

- 419)** In which year was the tax per rupee of 'profit before tax' lowest?
 (a) 1991 (b) 1992 (c) 1993 (d) 1994
- 420)** In which year was the sales per rupee of share capital highest?
 (a) 1991 (b) 1992 (c) 1993 (d) 1994
- 421)** In which year the profit before tax per rupee of sales was the highest?
 (a) 1991 (b) 1992 (c) 1993 (d) 1994
- 422)** In which year was the percentage addition to reserves over previous year reserves the highest?
 (a) 1991 (b) 1992 (c) 1993 (d) 1994
- 423)** Amount of the reserves at the end of 1994 is
 (a) ₹ 935 lakh (b) ₹ 915 lakh (c) ₹ 230 lakh (d) None of these

Directions (Q. Nos. 424-427) Answer the questions based on the following information.

(1994)

Bankatlal works x hours a day and rests y hours a day. This pattern continues for 1 week, with an exactly opposite pattern next week and so on for four weeks. Every fifth week he has a different pattern. When he works longer than he rests, his wage per hour is twice what he earns per hour when he rests longer than he works.

The following are his daily working hours for the weeks numbered 1 to 13.

	1st week	5th week	9th week	13th week
Rest	2	3	4	—
Work	5	7	6	8

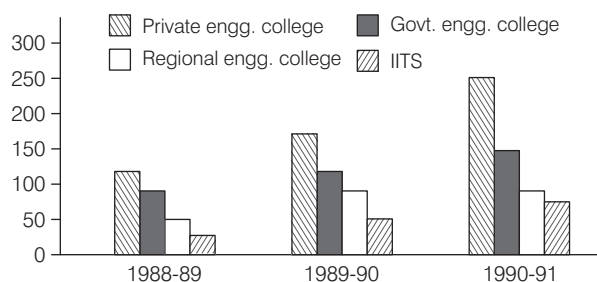
A week consists of six days and a month consists of four weeks.

- 424)** If Bankatlal is paid ₹ 20 per working hour in the 1st week, what is his salary for the 1st month ?
 (a) ₹ 1760 (b) ₹ 1440 (c) ₹ 1320 (d) ₹ 1680
- 425)** Referring to the data given in question 22 Bankatlal's average monthly salary at the end of the first four months will be
 (a) ₹ 1780 (b) ₹ 2040 (c) ₹ 1830 (d) ₹ 1680
- 426)** The new manager Khushaldas stipulated that ₹ 5 be deducted for every hour for rest and ₹ 25 be paid per hour starting 9th week, that what will be the change in Bankatlal's salary for the 3rd month ? (Hourly deductions are constant for all weeks starting 9th week.)
 (a) ₹ 540 (b) ₹ 480 (c) ₹ 240 (d) ₹ 120
- 427)** Using the data in the previous questions what will be the total earning of Bankatlal at the end of sixteen weeks?
 (a) ₹ 7,320 (b) ₹ 7,800
 (c) ₹ 8,400 (d) ₹ 9,600

Directions (Q. Nos 428-431) Answer the questions based on the following graph.

(1994)

Number of engineering students (in hundreds) at institutions of different kinds.



- 428)** What was the total number of engineering students in 1989-90 ?
 (a) 28500 (b) 4400 (c) 4200 (d) 42000
- 429)** The growth rate of students in government engineering colleges compared to that of private engineering colleges between 1988-89 is
 (a) more (b) less (c) equal (d) $\frac{3}{2}$
- 430)** The total number of engineering students in 1991-92, assuming a 10% reduction in the number over the previous year, is
 (a) 5700 (b) 57000 (c) 44800 (d) None of these
- 431)** In 1990-91, what percentage of engineering students were studying at IITs ?
 (a) 16% (b) 15% (c) 14% (d) 12%

Directions (Q. Nos. 432-435) *Answer the questions based on the following information.*

(1994)

The following table gives the sales details for text books and reference books at primary/secondary/higher secondary/graduate levels.

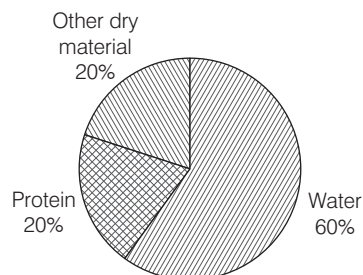
Year	Primary	Secondary	Higher Secondary	Graduate Level
1975	42137	8820	65303	25343
1976	53568	10285	71602	27930
1977	58770	16437	73667	28687
1978	56872	15475	71668	30057
1979	66213	17500	78697	33682
1980	68718	20177	82175	36697

- 432)** What is the growth rate of sales of books at primary school level from 1975 to 1980?
 (a) 29% (b) 51% (c) 63% (d) 163%
- 433)** Which of the categories shows the lowest growth rate from 1975 to 1980?
 (a) Primary (b) Secondary (c) Higher secondary (d) Graduate level
- 434)** Which category had the highest growth rate in the period?
 (a) Primary (b) Secondary (c) Higher secondary (d) Graduate level
- 435)** Which of the categories had either a consistent growth or a consistent decline in the period shown?
 (a) Primary (b) Secondary (c) Higher secondary (d) Graduate level

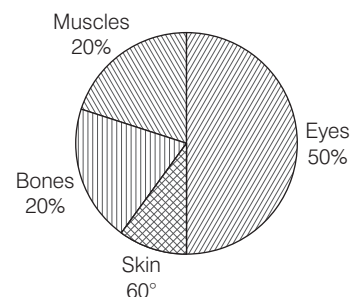
Directions (Q. Nos. 436-439) *Answer the questions based on the following pie charts.*

(1994)

Distribution of material of Sandeep's body
(as percentage of total body weight)



Occurrence of protein in different
organs of Sandeep's body



- 436)** What fraction of Sandeep's weight consists of muscular and skin protein?
 (a) $\frac{1}{50}$ (b) $\frac{2}{25}$ (c) $\frac{3}{50}$ (d) Cannot be determined
- 437)** Ratio of distribution of protein in muscles to the distribution of protein in eyes is
 (a) 11 : 25 (b) 12 : 50
 (c) 13 : 11 (d) $5\frac{1}{2}$: 25
- 438)** What percentage of Ghosh Babu's body weight is made up of bones?
 (a) 0.15% (b) 10%
 (c) 1.2% (d) Cannot be determined

439) In terms of total body weight, the portion of material other than water and protein is closest to

- (a) $\frac{1}{5}$ (b) $\frac{1}{15}$ (c) $\frac{85}{100}$ (d) $\frac{1}{20}$

Directions (Q. Nos. 440-443) Answer the questions based on the following information.

(1994)

In 1984-85, value of exports of manufactured articles exceeds over the value of exports of raw materials by 100%. In 1985-86, the ratio of percentage of exports of raw material to that of exports of manufactured articles is 3 : 4. Exports of food in 1985-86 exceeds the 1984-85 figures by ₹ 1006 crore.

Item	1984-85	1985-86
Food		23%
Manufactured articles		
Raw materials		
Total value of exports in crores of ₹	22400	25800

440) In 1984-85, what percentage of total values of exports accounts for items related to food?

- (a) 23% (b) 29.2% (c) 32% (d) 22%

441) During 1984-85, how much more raw material than food was exported?

- (a) ₹ 2580 crore (b) ₹ 896 crore (c) ₹ 1986 crore (d) ₹ 1852 crore

442) Value of exports of raw materials during 1984-85 was how much per cent less than that for 1985-86 ?

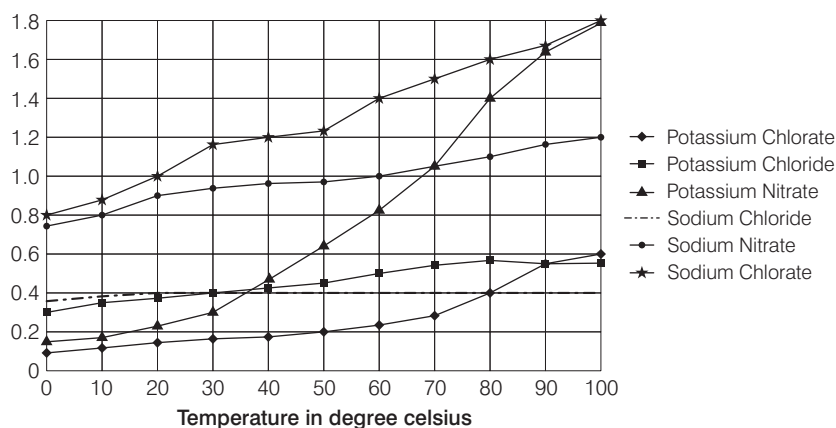
- (a) 39% (b) 46.18% (c) 7% (d) 31.6%

443) The change in value of exports of manufactured articles from 1984-85 to 1985-86 is

- (a) ₹ 296 crore (b) ₹ 629 crore (c) ₹ 2064 crore (d) ₹ 1792 crore

Directions (Q. Nos. 444-448) Answer the questions based on the following graph.

(1994)



Solubility temperature relationships for various salts.

The Y-axis denotes solubility (Kg/L of water).

444) Which of the following salts has the greatest solubility ?

- (a) Potassium chlorate at 80°C (b) Potassium chloride at 35°C
(c) Potassium nitrate at 39°C (d) Sodium chloride at 85°C

445) Approximately, how many kilograms of potassium nitrate can be dissolved in 10 L water at 30°C?

- (a) 0.04 kg (b) 0.2 kg (c) 4 kg (d) 0.35 kg

- 446)** By what percentage is the solubility of potassium chlorate in water increased as the water is heated from 30°C to 80°C?
 (a) 100% (b) 172.8% (c) 223.33% (d) 166.66%
- 447)** If one mole of potassium chloride weighs 0.07456 kg, approximately, how many moles of potassium chloride can be dissolved in 100 L water at 36°C?
 (a) 700 (b) 650 (c) 480 (d) 580
- 448)** Which of the salts has greater change in solubility in kg/L of water between 15°C and 25°C?
 (a) Potassium chlorate (b) Potassium nitrate (c) Sodium chlorate (d) Sodium nitrate

Directions (Q. Nos. 449-452) Answer the questions based on the following information. (1993)

Given below are the forecasts of the World and Asian energy demand for the yr 1990, 2000 and 2010 AD. The demand is given in million barrels per day, crude oil equivalent.

	1990		2000		2010	
	World	Asia	World	Asia	World	Asia
Petroleum	50.0	4.0	70.0	10.0	80.0	15.0
Natural Gas	30.0	0.5	40.0	2.5	50.0	5.0
Solid Fuels	50.0	4.0	60.0	5.0	75.0	10.0
Nuclear	10.0	0.5	20.0	1.0	25.0	1.3
Hydropower	10.0	1.0	10.0	1.5	20.0	2.0
Total	150.0	10.0	200.0	20.0	250.0	33.3

- 449)** Which is the fuel whose proportion in the total energy demand will decrease continuously over the period 1990?
 (a) Natural gas (b) Solid fuels
 (c) Nuclear (d) Hydropower
- 450)** Which is the fuel whose proportion in the total energy demand of the world will remain constant over the period 1990-2010, but whose proportion will increase in the total energy demand in Asia?
 (a) Solid Fuels (b) Nuclear
 (c) Hydropower (d) Natural Gas
- 451)** Over 1990-2010, which two fuels meet more than 60 per cent of the total energy demand of both World and Asia?
 (a) Petroleum and Natural Gas (b) Petroleum and Solid Fuels
 (c) Natural Gas and Solid Fuels (d) None of these
- 452)** Which fuel's proportion in the total energy demand increases over the decade 1990-2000 and decreases over the decade 2000-2010 for both the World and Asia?
 (a) Petroleum (b) Natural gas
 (c) Solid Fuels (d) Nuclear

Directions (Q. Nos. 453-457) Answer the questions based on the following information. (1993)

A professor keeps data on students tabulated by performance and sex of the student. The data is kept on a computer disk, but unfortunately some of it is lost because of a virus. Only the following could be recovered

	Performance			Total
	Average	Good	Excellent	
Male			10	
Female				32
Total		30		

Panic buttons were pressed but to no avail. An expert committee was formed, which decided that the following facts were self-evident

Half the students were either excellent or good. 40% of the students were females. One third of the male students were average.

453) How many students are both female and excellent?

- (a) 0 (b) 8 (c) 16 (d) 32

454) What proportion of good students are male?

- (a) 0 (b) 0.73 (c) 0.4 (d) 1.0

455) What proportion of female students are good?

- (a) 0 (b) 0.25 (c) 0.5 (d) 1.0

456) How many students are both male and good?

- (a) 10 (b) 16 (c) 22 (d) 48

457) Among average students, what is the ratio of male to female?

- (a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Directions (Q. Nos. 458-461) *Answer the questions based on the following information.*

(1993)

Sweta, Swarna, Sneha and Soumya are four sister who have an agreement that they share all snacks among themselves. One day, uncle Prem gave a box of cookies to Sweta. Since, the other sisters were not around. Sweta divided the cookies into four parts, ate her share and put the rest into the box. As she was closing the box, Swarna came in. She took all the cookies from the box and divided them into four equal parts. Sweta and Swarna ate one part each and put the rest in the box. Just then, Sneha walked in. She took all the cookies from the box, divided them into four equal parts. The three of them ate their respective shares and put the rest into the box. Later, when Soumya came, she divided all the cookies into four equal parts and all the four sisters ate their respective shares. In total, Soumya ate 3 cookies.

458) How many cookies, in total, did Sneha eat?

- (a) 30 (b) 12
(c) 15 (d) 6

459) How many cookies, in total, did Swarna eat?

- (a) 9 (b) 30
(c) 39 (d) 78

460) How many, cookies, in total, did Sweta eat?

- (a) 32 (b) 142
(c) 72 (d) 71

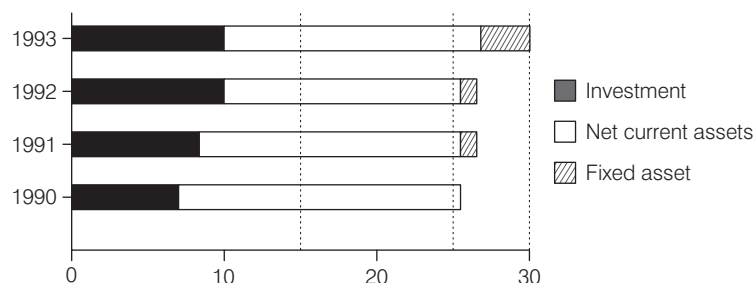
461) How many cookies did uncle Prem give to Sweta?

- (a) 128 (b) 156
(c) 256 (d) 192

Directions (Q. Nos. 462-465) *Study the graph below and answer the questions.*

(1993)

Assets are defined as Net Fixed Assets + Net Current Assets + Investments



462) What is the approximate simple annual growth rate of Total Assets between 1990 and 1993?

(a) 36%	(b) 12%
(c) 9%	(d) 27%

463) In any two consecutive year, the growth rate is lowest for

(a) Net Fixed Assets	(b) Net Current Assets
(c) Investments	(d) Total Assets

464) The only item which has shown positive growth in every year between 1990 and 1993 is

(a) Net Fixed Assets	(b) Net Current Assets
(c) Investments	(d) Total Assets

465) Between 1991 and 1992, the highest growth rate was seen for

(a) Net Fixed Assets	(b) Net Current Assets
(c) Investments	(d) Total Assets

Directions (Q. Nos. 466-469) Answer the questions based on the following information.

(1993)

Ghosh Babu has recently acquired four companies namely Arc-Net Technologies (ANT), Babu Anta Transport (BAT), Charles Anter Tailors (CAT) and Daud Akba Transistor (DAT). When the results of the companies for the year 1992-93 were placed before him, he found a few interesting things about them. While the profits of CAT and DAT were the same, the sales of CAT were the same as those of BAT. Profits of ANT were 10% of its sales, where as the profits of BAT were 20% of its sales. While the total expenses of CAT were 5 times its profits, sales of DAT were 3 times its profits. The total expenses of CAT were ₹ 10 lakhs and of ANT were 10% less than those of CAT. Profits are defined as the difference between sales and total expenses.

466) Which company had the lowest sales?

(a) ANT	(b) BAT
(c) CAT	(d) DAT

467) Which company had the highest profits?

(a) ANT	(b) BAT
(c) CAT	(d) DAT

468) Which company had the highest total expenses?

(a) ANT	(b) BAT
(c) CAT	(d) DAT

469) Which company had the lowest profits?

(a) ANT	(b) BAT
(c) CAT	(d) DAT

HINTS & SOLUTIONS

- 1) (b) Required percentage = $\left(\frac{10-6}{6} \times 100\right)\% = \left(\frac{4}{6} \times 100\right)\% = 66.6\%$
- 2) (b) Change in profit for A for pair of year 2007 and 2008 = $\left(\frac{6-4}{4} \times 100\right)\% = \left(\frac{2}{4} \times 100\right)\% = 50\%$
 Change in profit for B for pair of year 2007 and 2008 = $\left(\frac{5-3}{3} \times 100\right)\% = \left(\frac{2}{3} \times 100\right)\% = 66.6\%$
 Change in profit for D for pair of year 2007 and 2011 = $\left(\frac{7-5}{5} \times 100\right)\% = \left(\frac{2}{5} \times 100\right)\% = 40\%$
 Change in profit for E for pair of year 2007 and 2011 = $\left(\frac{4-6}{6} \times 100\right)\% = \left(\frac{-2}{6} \times 100\right)\% = -33.3\%$
 So, it is clear that B has maximum profit.
- 3) (b) Let the income of D in 2009 be ₹ x .
 Then, 30% of $x = 6$ lakh $\Rightarrow \frac{30 \times x}{100} = 6 \Rightarrow x = \left(\frac{6 \times 100}{30}\right) = ₹ 20$ lakh
 $\therefore$ Income of D in 2009 = ₹ 20 lakh
- 4) (d) Income for $C = \left(\frac{11 \times 100}{20}\right)$ lakh = ₹ 55 lakh
 Income for $E = \left(\frac{7 \times 100}{20}\right)$ lakh = ₹ 35 lakh
 Required ratio = $\frac{55}{35} = \frac{11}{7} = 11 : 7$
- 5) (a) Using the given graph, the percentage growth in sales are

Years	Previous sales	Current sales	Difference	Percentage
2011-12	100	250	150	150%
2012-13	250	300	50	20%
2013-14	300	290	- 10	- 3.33%
2014-15	290	680	390	134.5%

It is obvious from the above table that the maximum percentage increase relative to previous year occurred in 2011-12.

- 6) (d) Using the given graph, the percentage growth in profits are

Years	Previous profit	Current profit	Difference	Percentage
2011-12	2.5	4.5	2	80%
2012-13	4.5	6	1.5	33.33%
2013-14	6	8.5	2.5	41.66%
2014-15	8.5	12	3.5	41.2%

The above table shows that the highest percentage growth in net profit relative to the previous year was achieved in 1995-96.

- 7) (b) Using the given graph, we can make a table, which is as follows

Years	Net profit	Net sales	Ratio
2010-11	2.5	100	0.025
2011-12	4.5	250	0.02
2012-13	6	300	0.02
2013-14	8.5	290	0.03
2014-15	12	680	0.018

Therefore, the profitability is maximum in 2013-14.

- 8) (d) It can be seen that profitability does not follow a fixed pattern and the first three statements try to generalise the profitability.
Therefore, they are not applicable and option (d) is the correct answer.

- 9) Largest importing country is E whose import
 $= (32 + 29 + 48 + 2 + 3)$ thousand tonne
 $= 114$ thousand tonne
 Second largest importing country is C whose import
 $= (25 + 22 + 26 + 20 + 8)$ thousand tonne
 $= 101$ thousand tonne

According to the question, second largest importing country will be at par with the largest importing country. Then, it's share

$$= \frac{114}{69 + 84 + 114 + 23 + 114 + 96} \times 100\%$$

$$= \frac{114}{500} \times 100\% = 22.8\% \approx 23\%$$

- 10) Quantity of Iron ore exported from India
 $= 18 + 12 + 25 + 11 + 32 + 5 = 103$ thousand tonne
 Quantity of Coal exported from India
 $= 12 + 38 + 22 + 6 + 29 + 42 = 149$ thousand tonne
 Quantity of Silver exported from India
 $= 14 + 18 + 26 + 3 + 48 + 23 = 132$ thousand tonne
 Quantity of Copper exported from India
 $= 23 + 12 + 20 + 2 + 2 + 16 = 75$ thousand tonne
 Quantity of Gold exported from India
 $= 2 + 4 + 8 + 1 + 3 + 10 = 28$ thousand tonne
 Therefore, total quantity exported from India
 $= 103 + 149 + 132 + 75 + 28 = 487$ thousand tonne
 If India were to ban the export of Gold, percentage increase in the export of rest of the minerals to maintain the total export as before

$$= \frac{28}{487 - 28} \times 100\%$$

$$= \frac{28}{459} \times 100\% \approx 6\%$$

- 11) 18% of E 's requirement of Iron ore = 32000

$$\Rightarrow E\text{'s requirement of Iron ore} = 32000 \times \frac{100}{18}$$

$$= 177777.77$$

$$E\text{'s requirement of Iron ore in 2011} = 78\% \text{ of } 177777.77$$

$$= 138666.66$$

$$\therefore \text{Import of Iron ore from India by } E \text{ in 2011} = 16640$$

Now, total imports of E from India in 2010

$$= (32 + 29 + 48 + 2 + 3) \times 1000 = 114000$$

and total imports of E from India in 2011

$$= 16640 + (29 + 48 + 2 + 3) \times 1000 = 98640$$

Thus, required percentage drop

$$= \frac{114000 - 98640}{114000} \times 100\% = 13.4\%$$

- 12) After increment, international demand of Coal = 112% of 149 = 166.88 thousand tonne

$$\text{Iron ore} = 108\% \text{ of } 103 = 111.24 \text{ thousand tonne}$$

$$\text{Copper} = 115\% \text{ of } 75 = 86.25 \text{ thousand tonne}$$

Therefore, after increment total quantity of minerals exported from India.

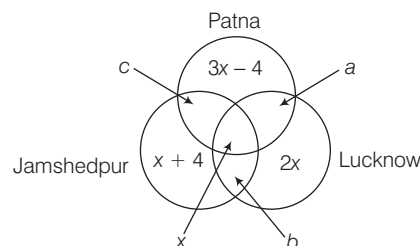
$$= 166.88 + 111.24 + 86.25 + 132 + 28$$

$$= 524.37 \text{ thousand tonne}$$

Thus, required percentage increase

$$= \frac{524.37 - 487}{487} \times 100\% = \frac{37.37}{487} \times 100\% = 7.6\%$$

- 13) (d) The question is understood best if done by Venn diagrams. As per the given conditions the following Venn diagram may be drawn.



Let the number of teachers teaching in all the three cities be x and the number of teachers teaching in exactly two cities be a , b and c respectively as shown in the above Venn diagram.

As per the given condition $a + x + c = 10$ and

$$3x - 4 = 24 - 10 = 14$$

Thus, $x = 6$ and $a + c = 4$. Since a , b and c are in the ratio of 1:2:3 and $a + b = 4$, then obviously $a = 1$ and $c = 3 \Rightarrow b = 2$

Thus, total faculty members

$$= 14 + 12 + 10 + 6 + 2 + (a + c)$$

$$= 44 + 4 = 48.$$

- 14) (c) Statement I was inferred by us in the last question. Hence, it need not be checked. As per the question, we need to find the exact values of a and b . From Statement II $12 + 6 + 2 + a = 21$. Hence, $a = 1$ and $c = 3$. Hence, Statement II can be used.
Similarly, from Statement III, we have $10 + 6 + 2 + c = 21$ and hence $c = 3$ and $a = 1$. Hence, Statement III can also be used.
- 15) (c) All the 6 faculty members teaching at all the three centres have to be withdrawn into two projects. As per the given conditions. If number of teachers withdrawn from Patna is x , then those withdrawn from Lucknow and Jamshedpur are $x - 2$ and $x - 4$, respectively.
Thus, $x + (x - 2) + (x - 4) = 6 \Rightarrow x = 4$
Hence, number of teachers working at Patna : $24 - 4 = 20$
Lucknow : $21 - (4 - 2) = 19$
Jamshedpur : $21 - (4 - 4) = 21$
Clearly, both statements (a) and (b) are incorrect.
- 16) (b) From the above question, number of faculty members involved in each of the three centres after withdrawal is known. Hence, if 3 new faculty members are inducted, the numbers shall become equal.
- 17) (c) Bangladesh > Philippines ($97 > 86$) for drinking water and Philippines > any other countries for sanitation. Hence, both Philippines and Bangladesh are on the coverage frontier.
- 18) (b) Since, a country A is said to dominate B or $A > B$, if A has higher percentage in total coverage for both drinking sanitation facilities. Therefore, option (b) is correct.
India > China ($81 > 67$) for drinking water and for sanitation, likewise India > Nepal ($81 > 63$ and $29 > 18$). Also, China > Nepal ($67 > 63$ and $24 > 18$).
- 19) (c) Let the urban and rural population be x and y respectively, then

$$0.7x + 0.14y = 0.29(x + y)$$

$$\Rightarrow 0.7x + 0.14y = 0.29x + 0.29y$$

$$\Rightarrow 0.41x = 0.15y \Rightarrow x = \frac{15}{41}y$$

$$\therefore \text{Percentage of rural population} = \frac{y}{x + y} \times 100 = \frac{y}{\frac{15}{41}y + y} \times 100 = \frac{41}{56} \times 100 = 73.21\% = 73\% \text{ (approx.)}$$
- 20) (c) Difference in number of students employed from finance and marketing = $1837 - 1087.5 = 749$ (approx)

Years	Number of students employed	Number of students employed from finance	Number of students employed from marketing
1992	800	$0.22 \times 800 = 176$	$0.36 \times 800 = 288$
1993	640	$0.17 \times 650 = 110.5$	$0.48 \times 650 = 312$
1994	1100	$0.23 \times 1100 = 253$	$0.43 \times 1100 = 473$
1995	1200	$0.19 \times 1200 = 228$	$0.37 \times 1200 = 444$
1996	1000	$0.32 \times 1000 = 320$	$0.32 \times 1000 = 320$
Total		1087.5	1837

- 21) (d) Percentage increase in the average salary of finance = $\frac{9810 - 5450}{5450} \times 100 = 80\%$

- 22) (c) Average annual rate at which the initial salary offered in software increases

$$= \frac{1}{4} \left[\left(\frac{8640 - 5290}{5290} \right) \times 100 \right] = 15.9\% \text{ (approx.)}$$

- 23) (a) Average monthly salary offered to a management graduate in 1993 = $\frac{6380 + 6390 + 6440}{3} = ₹ 6403$
- 24) (b) Earnings of students seeking job in finance = $253 \times 7550 = ₹ 1910150$
 Earning of students seeking job in software = $231 \times 7550 = ₹ 1628550$
 $\therefore$ Difference in the amount earned = $1910150 - 1628550 = ₹ 281600$
 $\simeq ₹ 2.82$ lakh per month = $₹ 2.82 \times 12 = ₹ 33.8$ lakh per annum
- 25) State tax revenue from individual income = $17 \times \frac{525}{100} = \$ 89.25$ mn
 Local tax revenue from individual income = $2 \times \frac{525}{100} = \$ 10.5$ mn
 Required difference = $89.25 - 10.5 = \$ 78.75$ mn
- 26) Tax revenue from highway users in 2000 = $\frac{8 \times 500}{100} = \$ 40.0$ mn
 Therefore, tax revenue from other sources in 2000 = $500 - 40 = \$ 460$ mn
 Therefore, percentage increase in tax revenue from other sources = $\frac{460 - 440}{440} \times 100 = 4.5\%$
- 27) Taking into consideration above rates:
 1 US Dollar = ₹ 45.94 and 1 Singapore Dollar = ₹ 30.27
 Hence, 1 US Dollar = 1.52 Singapore Dollar
 The Singapore Dollar has lost 2% with respect to the above given exchange rates. So, 1 US Dollar = $1.52 \times 1.02 = 1.55$ Singapore Dollar.
 Hence, 65 Singapore Dollar = 41.9 US
 Thus, the person should give 41.9 US Dollar to get 65 Singapore Dollar.
- 28) Price for 800 barrels = 37600
 Euros = ₹ 1253960
 However, if we are paying in US Dollar, we will be paying Dollar 23200 = ₹ 1065808
 Thus, we are paying ₹ 188152 less = 4096 US Dollar
- 29) (a) Taking the minimum value of the expected returns as 10. We have to see which of the two values of 10 and 20 multiplied by 2 and 1.5 and vice-versa yields the minimum value.
 Hence, comparing the minimum value between $20 \times 2 + 10 \times 1.5$ and $20 \times 1.5 + 10 \times 2$, the 2nd one is minimum.
 $\therefore$ Minimum average return = $\frac{20 \times 1.5 + 10 \times 2 + 30 + 40}{4} = 30\%$
- 30) (b) If the average return is 35%, then the total return is $35 \times 4 = 140$. The possible arrangement of 140 being $40 \times 1.5 + 30 + 20 \times 2 + 10$
 $A = 20 \times 2$ (Cement or IT)
 $B = 10, C = 30$
 $B = 40 (1.5)$ (Steel or Auto)
 From the data given in the question, we see that A has to be Cement or IT. D is Steel or Auto.
 Hence, Statements II and III are true. Therefore, option (b) is correct.
- 31) (c) Total return $38.75 \times 4 = 155$
 The possible arrangement is $20 + 10 + 30 \times 1.5 + 40 \times 2$
 $\therefore A = 20, B = 10, C = 30$ (Steel or Auto), $D = 40$ (Cement or IT)
 Hence, Statements I and IV are correct. Therefore, option (c) is correct.
- 32) (b) Given C...Cement or IT industry C's return = $30 \times 2 = 60\%$.
 Among the other values we see that the possible arrangement can be $10 \times 1.5 + 20 + 40, 10 + 20 \times 1.5 + 40, 40 + 20 + 40 \times 1.5$

The average returns will be in each case

$$\frac{10 \times 1.5 + 20 + 40 + 60}{4} = 33.75\%$$

$$\frac{10 + 20 \times 1.5 + 40 + 60}{4} = 35\%$$

$$\frac{40 + 20 + 40 \times 1.5 + 60}{4} = 45\%$$

Considering 33.75% as the valid value, then B belongs to the Auto industry. Hence, Statements II and IV are true. Therefore, option (b) is correct.

- 33) (c) Contribution as a percentage of the total by developed countries in 2000 = $\frac{554.58}{8099.01} \times 100\% \approx 69\%$

- 34) (d) There is no data given in the table in support of the classification of USA.

- 35) (d) In 1966, UK's share = $\frac{45.40}{1358.31} \times 100\% = 3.34\%$

$$\text{In 2000, UK's share} = \frac{430.55}{8099.01} \times 100\% = 5.31\%$$

$$\therefore \text{Required growth} = 5.31\% - 3.34\% = 1.97\% \approx 2\%$$

- 36) (a) Statement I is correct, as by going through the table USA emerges to be the largest approver of foreign investments.

Now, we will check Statements II and III. Share of USA in total approvals,

$$\text{in 1996} = \frac{475.15}{1358.31} \times 100\% = 34.98\%$$

$$\text{in 1997} = \frac{1135.29}{2571.99} \times 100\% = 44.14\%$$

$$\text{in 1998} = \frac{1111.78}{2819.06} \times 100\% = 39.43\%$$

Thus, contribution of USA is neither increasing nor same.

- 37) (b) Total production of all the four products

$$\text{in 2005} = 45 + 95 + 75 + 115 = 330$$

$$\text{in 2006} = 25 + 40 + 95 + 155 = 315$$

$$\text{in 2007} = 40 + 105 + 102 + 165 = 412$$

$$\text{in 2008} = 35 + 60 + 62 + 140 = 297$$

$$\text{in 2009} = 75 + 40 + 135 + 85 = 335$$

$$\text{in 2010} = 55 + 70 + 120 + 95 = 340$$

Now, growth rate of total production

$$\text{in 2007} = \frac{412 - 315}{315} \times 100\% = 30.79\%$$

$$\text{in 2009} = \frac{335 - 297}{297} \times 100\% = 12.79\%$$

$$\text{in 2010} = \frac{340 - 335}{335} \times 100\% = 1.49\%$$

In the remaining years, the total production has decreased.

Hence, annual growth rate is highest in the year 2007.

- 38) (d) Consider for product S,

$$\text{Total production} = 115 + 155 + 165 + 140 + 85 + 95 = 755 \text{ tonne}$$

$$\text{Average production} = \frac{755}{6} = 125.83 \text{ tonne}$$

$$\text{Maximum production} = 165 \text{ tonne}$$

$$\text{Minimum production} = 85 \text{ tonne}$$

$$\text{Thus, stability} = \frac{125.83}{165 - 85} = 1.57$$

Other products have lesser stability.

- 39) (c) Here, two products with higher prices are *P* and *R*.

So, their production is lowest in 2008.

Hence, total revenue of all the products will be lowest in year 2008.

- 40) (b) Total revenue of product *P* = $275 \times 9 = ₹ 2475$

$$\text{Total revenue of product } Q = 410 \times 4 = ₹ 1640$$

$$\text{Total revenue of product } R = 589 \times 13 = ₹ 7657$$

$$\text{Total revenue of product } S = 755 \times 3 = ₹ 2265$$

Thus, product *Q* fetches the lowest revenue.

Solutions (Q. Nos. 41-44)

Female students = 32, which is 40% of total students. So, total number of students = $\frac{32}{0.4} = 80$

Therefore, males = $(80 - 32) = 48$. It is further given, that half the students were either excellent or good and one-third of the male students were average. Hence, the table can be completed as under:

Sex	Performance			Total
	Average	Good	Excellent	
Male	16	22	10	48
Female	24	8	0	32
Total	40	30	10	80

- 41) (a) There is no female excellent student in the class.

- 42) (b) Proportion of good male students = $\frac{22}{30} = 0.73$

- 43) (c) There are 22 male students who are good.

- 44) (d) Ratio of average male to average female
= $16 : 24 = 2 : 3$

- 45) (b) Suppose *x* units are produced each year.

$$\text{In the year 2002, Total revenue} = 1200 \Rightarrow 12 \times x = 1200 \Rightarrow x = 100$$

$$\text{Profit} = 300$$

$$\therefore \text{Cost price} = 1200 - 300 = 900$$

$$\therefore \text{Cost per unit} = \frac{900}{100} = 9$$

In the year 2001, Total revenue = 1400

$$\Rightarrow 14 \times x = 1400 \Rightarrow x = 100$$

Profit = 100

$$\therefore \text{Cost price} = 1400 - 100 = 1300,$$

$$\text{Cost per unit} = \frac{1300}{100} = 13$$

In the year 2005, Total revenue = 400

$$\Rightarrow 8 \times x = 400 \Rightarrow x = 50$$

Profit = 150

$$\therefore \text{Cost price} = 400 - 150 = 250$$

$$\therefore \text{Cost per unit} = \frac{250}{50} = 5$$

In the year 2007, Total revenue = 700

$$\Rightarrow 14 \times x = 700 \Rightarrow x = 50$$

Profit = 200

$$\therefore \text{Cost price} = 700 - 200 = 500$$

$$\therefore \text{Cost per unit} = \frac{500}{50} = 10$$

Thus, per unit cost is highest in the year 2001.

46) (b)

Years	Unit price	Revenue	Total units = $\frac{\text{Revenue}}{\text{Unit price}}$
2000	10	700	70
2001	14	1400	100
2002	12	1200	100
2003	12	900	75
2004	11	1100	100
2005	8	400	50
2006	10	200	20
2007	14	700	50
2008	10	600	60
2009	10	800	80
2010	15	900	60
Total			= 765

$$\therefore \text{Average units} = \frac{765}{11} \approx 70$$

47) (c)

Years	New revenue	Total cost = Old revenue - Profit
2000	80% of 700 = 560	700
2001	80% of 1400 = 1120	1300
2002	80% of 1200 = 960	900
2003	80% of 900 = 720	750
2004	80% of 1100 = 880	1100
2005	400	120% of 250 = 300
2006	200	120% of 100 = 120
2007	700	120% of 500 = 600
2008	600	120% of 600 = 720
2009	800	120% of 400 = 480
2010	900	120% of 600 = 720

In a year when total cost is more than new revenue then in that year there is loss.

These years are 2000, 2001, 2003, 2004 and 2008.

So, there are total 5 yr.

- 48) (c) Checking of option (a),

$$\text{Volatility per unit} = \frac{15 - 8}{\frac{126}{11}} = \frac{77}{126} = 0.611$$

Checking of option (b),

Total cost = Revenue – Profit

$$\begin{aligned} &= (700 + 1400 + 1200 + 900 + 1100 + 400 + 200 \\ &+ 700 + 600 + 800 + 900) - (0 + 100 + 300 + 150 \\ &\quad + 0 + 150 + 100 + 200 + 0 + 400 + 300) \\ &= 8900 - 1700 = 7200 \end{aligned}$$

$$\text{Average cost per unit} = \frac{7200}{11}$$

$$\begin{aligned} \text{Volatility cost per unit} &= \frac{(1400 - 100) - (200 - 100)}{7200} \\ &= \frac{1300 - 100}{7200} \times 11 = 1.833 \end{aligned}$$

$$\text{Checking of option (c), Average profit} = \frac{1700}{11}$$

$$\therefore \text{Profit volatility} = \frac{400 - 0}{\frac{1700}{11}} = \frac{44}{17} = 2.588$$

$$\text{Checking of option (d), Average revenue} = \frac{8600}{11}$$

$$\begin{aligned} \therefore \text{Revenue volatility} &= \frac{1400 - 200}{\frac{8600}{11}} \\ &= \frac{132}{86} = 1.535 \end{aligned}$$

Hence, total profit has highest volatility.

- 49) (b) It can be observed that hours spend in class for studying Reasoning is almost equal to the time spend in self study of Quantitative Aptitude.

So, hours spent on studying Quantitative Aptitude is equal to the hours spend in class studying Reasoning and Quantitative Aptitude.

- 50) (c) Hours spent in class = $80 + 35 + 50 = 165$ h

Hours spent an self-study = $40 + 15 + 35 = 90$ h

$$\begin{aligned} \therefore \text{Required percentage} &= \frac{165}{165 + 90} \times 100\% \\ &= \frac{165}{255} \times 100\% = 64.7\% \approx 65\% \end{aligned}$$

- 51) (c) Total hours spent on self-study = $40 + 15 + 35 = 90$ h and close set to the required hours is sum of prescribed and actual hours spend on studying Quantitative Aptitude.

- 52) (a) For India to reach the finals with the minimum number of points, one of the teams, say Australia should have won all the matches and India and Sri Lanka should have won two matches each in the four matches they played. So India would have scored eight points, same as Sri Lanka and can still advance to the finals on the basis of better net run rate.

- 53) (d) This scenario happens when each team wins four matches that too all of them with bonus points, such that each team ends up with 20 points and one of the teams would be eliminated.

- 54) (b) To top the preliminary stage with the least number of points, all teams should have the same number of wins, i.e. 4 and as Australia had the highest, it could have won one of the matches with a bonus point to have a total of 17 points.

Solutions (Q. Nos. 55-56)

- 55) (d) The data is tabulated below

I Tank		II Tank		Total
Petrol	Kerosene	Petrol	Kerosene	
100				
$100 - x$	x	$x \frac{(100 - x)^2}{100}$	$\frac{(100 - x)x}{100}$	100

The amount of petrol in the second tank is

$$\frac{(100 - x)^2 + 100x}{100} = \frac{10000 - 100x + x^2}{100} = \frac{(x - 50)^2 + 7500}{100}$$

(which is greater than or equal to 75)

$\therefore$ The concentration is greater than or equal to 75%.

- 56) (a) If the concentration in tank II is 75%, $x = 50$

The quantity of petrol in tank II is $x + \frac{(100 - x)^2}{100}$

$= 50 + 25 = 75$ and that of kerosene is 25.

If the cost of kerosene is k , the cost of petrol is $2k$ and the cost price for the contents of tank II is $25k + 75(2k) = 175k$.

The nominal rate of profit is 25%, i.e. the selling price is $200k + 50k + 250k$

$$\begin{aligned} \therefore \text{Actual profit percentage} &= \frac{250 - 175}{175} \\ &= \frac{75}{175} = \frac{3}{7} = \frac{300}{7}\% = 42\frac{6}{7}\% \end{aligned}$$

Solutions (Q. Nos. 57-59)

- 57) (b) By observation we see that the increases is about 33% from 1985 to 1986.

- 58) (a) The lowest numerator and the highest denominator appear together in C, 1986 and this will give us lowest percentage contribution.

- 59) (d) By noticing that for each Bank, there has been at least one really bad year, in which it has failed to get 20% of the total disbursements that year and hence none of the banks meets the qualifying criteria.

Solutions (Q. Nos. 60-62)

- 60) (d) Total of 5% of time spent on each area = 5% of total time spent on preparation.
Hence, first subtract this 5% from the total time spent on solved examples, i.e. 10% of total time. We are left with 5% of total time. All of this remaining 5% may belong to only one area of study. To get the required percentage maximum, the total time spent on the area must be as less as possible. Hence, it could be either DS or LA, i.e., 10% of total time spent on preparation. Now, 5% = 50% of 10% and already 5% of 10% was allotted. Hence, 50% + 5 = 55% of the time spent on a single area of study, say DS, was spent on solved examples. Hence, 55% is the maximum.

- 61) (c) The student cannot cover the complete critical analysis at friend's place. He/she has to leave our critical analysis of atleast one subject at friend's place. At the most he/she covered critical analysis of five subjects at friend's place.

- 62) (c) At the most, the time that would have been spent on tests in VA = Smaller value of tests and VA = Smaller of 10% and 15% = 10%. Time that would have been spent at the most on revision in LA = Smaller of 20% and 10% = 10%. All together he would have spent 10% + 10% = 20% of TIME classes on the above two topics. Hence, % of time spent on the above two is

$$\frac{10\% + 10\%}{30\%} = \frac{20}{30} = 66\frac{2}{3}\%$$

- 63) (b) Most popular brand is brand D and after that it is brand C as is clear from the pie-chart.

Brand D sold = 26% and Brand C sold = 22%

So, the difference is 4% of total market

$$= 25000 \times \frac{4}{100} = 1000$$

- 64) (d) Revenue earned before tax
= Number of units sold $\times$ Unit price

$$\text{Revenue earned by brand A} = \left(18 \times \frac{25000}{100}\right) \times 14500$$

$$= 65250000$$

$$\text{Revenue earned by brand B} = \left(14 \times \frac{25000}{100}\right) \times 16000$$

$$= 56000000$$

Similarly, the revenue earned by C = 66,000,000.

$$= \left(26 \times \frac{25000}{100}\right) \times 13000 = 84500000$$

Revenue earned by E = 67500000

So, maximum revenue is earned by D.

- 65) (d) Revenue earned after tax = Revenue earned before tax – Tax

Sales tax %	Revenue earned before tax	Tax paid	Revenue earned after tax
Brand A 14	65250000	9135000	65115000
Brand B 11	56000000	6160000	49840000
Brand C 10	66000000	6600000	59400000
Brand D 9	84500000	7605000	76895000
Brand E 11	67500000	7425000	60075000
Total	339250000	36925000	302325000

So, brand D earned the maximum revenue after tax.

- 66) (d) Since, if Amit sings, then Bharat gets a headache and Chandu complains. Then we're told that Chandu is not complaining. Using the contra positive, we get the following logic. If Bharat doesn't have a headache and/or if Chandu isn't complaining, then Amit must not be singing. So, if Chandu is not complaining, then there is no way that Amit is singing, and choice (d) is the answer.
- 67) (b) The sentence can be rearranged to read: "If Bhanu does not cook, then Atul will eat the apple. Whenever a Logical Reasoning question gives you an "If ... then" sentence, the only thing that must be true is called the "contrapositive" take the opposite of each half of the statement, and flip the two halves. For this question, the contrapositive is "If Atul did not eat the apple, then Bhanu did cook." Choice (b) matches this perfectly.
- 68) (b) There are 45 children of height not exceeding 135 and 48 children of age not exceeding 9 years. Consider the tallest child of the 45 children with height not exceeding 135. We can be very sure that his age is less than 9 years as taller children have higher weights. Thus, all 45 children of heights not exceeding 135 will have age not exceeding 9 years.
- 69) (a) Using the same logic as above, there are 25 children taller than 150 cm and more than 10 years of age. There, are 9 children of weights more than 38. These 9 children are surely included in the 25 children taller than 150 cm and more than 10 years of age because of the assumption given. Thus, 25 – 9 = 16 children satisfy the condition.
- 70) (c) There are 55 children not exceeding 12 years but older than 6 years. Again 33 children weigh less than or equal to 38. Of these, 22 are those who are less than 6 years of age. Thus, 11 of the 55 students weigh less than or equal to, 38 years. So, the answer is 55 – 11 = 44.

- 71) (a) For India-China dissimilarity = 2
For India-Japan dissimilarity = 4
For India-Malaysia dissimilarity = 3
Hence, answer is (a).
- 72) (b) From above assertion, answer option is (b).
- 73) (d) For China-Japan dissimilarity = 3
For India-China dissimilarity = 2
For Malaysia-Japan dissimilarity = 3
For Thailand-Japan dissimilarity = 4
So, answer is (d).
- 74) (d) For Malaysia-China dissimilarity = 4
For China-Thailand dissimilarity = 4
For Thailand-Japan dissimilarity = 4
For Japan-Malaysia dissimilarity = 3
So, answer is (d).
- 75) (c) In case of products, percentage of spam e-mails is increasing but at decreasing rate from Sep 2002 to Dec 2002 products increased more than 100% and in March 2003 about 45% in Jun 2003 about 10%.
- 76) (a) Was larger as in Dec 2002 it is a higher percentage of a higher base compared to Jun 2003.
- 77) (d) Cannot be determined, as in Sept 2002, it is a lower percentage than March 2003, however the base in Sept 2003 is higher than that in March 2002. Thus, we cannot say anything.
- 78) (d) In May, number of employees suddenly increases but the profit is increasing at much slower rate so profit per employee must be highest either in January or in March and comparing the values for the graph. March is the correct answer.
- 79) (a) Profit = (Sales – Cost) the difference between the line graph for sales and line graph for cost is maximum in September and so, September is the correct answer.
- 80) (a) Comparing the value for sales in various months as per the conditions, maximum difference is between January and March and base value is minimum difference is between January, so % increase will be maximum in March.
- 81) (d) Increase in cost is maximum for May, i.e., $34 - 30 = 4$ on the line graph.
- 82) (b) Number of persons employed = Number of employee in Nov – Numbers of Employee in Jan = $15800 - 10800 = 5000$ (approx.)
- 83) (b) Decrease in the number of refrigerators manufactured in 2007 from 2006 = $24700 - 19200 = 5500$
- Percentage decrease = $\frac{5500}{24700} \times 100 = 22.3 = 22\%$ (approx.)
- 84) (c) Total number of washing machines and refrigerators manufactured in 2006 = $20500 + 24700 = 45200$
Total number of washing machines and refrigerators manufactured in 2008 = $16400 + 20200 = 36600$
Difference = $45200 - 36600 = 8600$
- 85) (a) Value of one packet
In 2005 = $\frac{150}{1.00} = ₹ 150$, In 2006 = $\frac{150}{0.75} = ₹ 200$
In 2007 = $\frac{330}{1.50} = ₹ 220$, In 2008 = $\frac{400}{1.60} = ₹ 250$
In 2009 = $\frac{500}{2.00} = ₹ 250$
- 86) (d) Difference between the packets exported in 2007 and 2008 is = $160 \text{ lakh} - 150 \text{ lakhs} = 10 \text{ lakh}$
- 87) Percentage increase in export value from 2005 – 2009
$$\left(\frac{500 \text{ crores} - 150 \text{ crores}}{150 \text{ crores}} \right) \times 100 = \frac{350}{150} \times 100\% = 233.3\%$$
- 88) (b) Percentage decrease in export quantity from 2005 – 2006.
$$= \left(\frac{100 - 75}{100} \right) \times 100 = \frac{25}{100} \times 100 = 25\%$$
- 89) (b) In 2007 the cost of 150 lakh packets = ₹ 330 crores
 $\therefore$ Cost of one packet = $\frac{330 \text{ crore}}{150 \text{ lakh}} = ₹ 220$
In 2008, the export value
= ₹ 160 lakh $\times$ 220
= (160×220) crores
= ₹ 352 crores
- 90) (c) Increase in import in
2004 over 2003 = $2413 - 1811 = 602$
2005 over 2004 = $4203 - 2413 = 1790$
2006 over 2005 = $7016 - 4203 = 2813$
2009 over 2008 = $2500 - 2000 = 500$
 $\therefore$ In 2006 increase in import was highest.
- 91) (d) Let in 2007 the imports be X times to that of 2003
 $\therefore X \times 1811 = 5832$
or $X = \frac{5832}{1811} = 3.22$

- 92) (d) The average import is
- $$\frac{3465 + 1811 + 2413 + 4203 + 7016 + 5832 + 2000 + 2500}{8}$$
- $$= \frac{29240}{8} = 3655$$

The years in which import was above average are 2005, 2006 and 2007, other 5 years have recorded import below average.

- 93) (a) Increase in year 2009 as compared to year 2008

$$\frac{2500 - 2000}{2000} \times 100 = 25\%$$

- 94) (b) Average import for the given years: 3655

Import in the year 2005 = 4203

$$\therefore x\% \text{ of } 3655 = 4203$$

$$\frac{x}{100} \times 3655 = 4203$$

$$x = \frac{4203 \times 100}{3655} = 115\%$$

- 95) (e) Let the volume of data transfer in India = Volume of data transfer = x (given)

INDIA : ARDT for India = \$1 (approx.)

$\therefore$ Revenue generated from data transfer for India

$$= \$ x \text{ (approx.)}$$

According to information given in question,

$$\frac{\text{Revenue from data transfer}}{\text{Total revenue}} \times 100 = 9\%$$

$$\therefore \text{Total Revenue} = \frac{x}{9} \times 100 = 11.11\%$$

Singapore : ARDT = \$9 $\times$ (approx.)

$\therefore$ Revenue for data transfer = \$9 $\times$ (approx.)

$$\frac{\text{Revenue from data transfer}}{\text{Total revenue}} \times 100 = 20.5\% \text{ (approx.)}$$

$$\Rightarrow \text{Total revenue} = \frac{9x}{20.5} \times 100 = 43.90$$

Hence, it is clear that revenue in Singapore is about 4 times that of India.

- 96) (c) Let the total revenue generated in Sweden in 2010 be x .

$\therefore$ Total revenue of India in 2010 = $2x$

Now, ARDT of Sweden in 2010 = \$6

Revenue from data transfer = $2 \times 18\%$ of x

$$\therefore \text{Volume of data transfer} = \frac{2 \times 18\% \text{ of } x}{6}$$

Let ARDT of India in 2010 be y .

$$\text{Revenue from data transfer} = \frac{3 \times 9\% \text{ of } 2x}{y}$$

$$\text{Therefore, } \frac{2 \times 18\% \text{ of } x}{6} = \frac{3 \times 9\% \text{ of } 2x}{y} \Rightarrow y = \$9$$

Therefore, per cent change in ARDT of India

$$= \frac{9-1}{1} \times 100 = 800\%$$

- 97) (d) UK

$$\frac{\text{Revenue from data transfer}}{\text{Total revenue}} \times 100 = 30\%$$

$$\text{Revenue from data transfer} = \frac{30}{100} \times \text{Total revenue}$$

ARDT = \$13 (approx.)

$$\therefore \text{Volume of data transfer} = \frac{30}{100} \times \frac{\text{Total revenue}}{13}$$

$$\approx \frac{3}{130} \times \text{Total revenue}$$

SPAIN

$$\frac{\text{Revenue from data transfer}}{\text{Total revenue}} \times 100 = 15\%$$

ARDT = 6.5 (approx.)

$$\therefore \text{Volume of data transfer} = \frac{15}{100} \times \frac{\text{Total revenue}}{6.5} \approx \frac{3}{130} \times \text{Total revenue}$$

Hence, option (d) is the correct choice.

Solutions (Q. Nos. 98-100)

	Sectional cut-off Marks				Aggregate cut-off Marks
	Section A	Section B	Section C	Section D	
College 1	42	42	42		176
College 2		45	45		175
College 3			46		171
College 4	43			45	178
College 5	45		43		180
College 6		41		44	176

In the above table Aggregate cut-off marks of each college is given but sectional cut-off for some of the college are not given. Students are advised not to suppose any sectional cut-off for these colleges. However, minimum and maximum marks for such sections can be deducted.

For example maximum 4 minimum marks of section D for college 1 is 50.

- 98) (b) To obtain minimum aggregate marks in order to get call from each college we require the maximum marks which should be equal to the cut-off marks for each section.

From the above table it is clear that the required marks for section A, B, C and D are 45, 45, 46 and 45 respectively. The total of these marks is 181 which is our answer.

- 99) (c) From the above table lowest aggregate cut-off is 171 and second lowest cut-off is 175. It means if he gets aggregate 175 marks he gets calls from college 2 and college 3 provided candidate qualities sectional cut-off for both the colleges.

	Section A	Section B	Section C	Section D	Aggregate cut-off
College 2		45	45		175
College 3			46		176

Now to get minimum marks in any one of the two sections for college 2 i.e. section A and Section D will be obtained when marks obtained in the other section is maximum e.g. marks for section D is 50, then marks obtained for section A will be

$$175 - (50 + 45 + 45) = 35.$$

Like wise minimum marks in any of the three sections for college 3 i.e. section A, section B and section D will be

$$171 - (50 + 50 + 46) = 25.$$

- 100) (c) Aditya did not get call from even a single college. Then maximum marks obtained by him of section C will be arrived by decreasing the minimum sectional cut-off marks of that section by 1. Therefore, section C it is $42 - 1 = 41$. We have chosen section C because it is the only section in the table where cut-off marks are available for maximum number of colleges, i.e., (1, 2, 3 and 5) and minimum cut-off, i.e. 42 is available. Therefore, if Aditya gets 41 marks in section C he does not get admission in colleges 1, 2, 3 and 5. For colleges 4 and 6, by reducing the marks obtained in section D to 43, Aditya does not get admission in colleges 4 and 6. In the other two sections A and B, Aditya may score 50 each. So, the maximum possible aggregate marks.

$$50 + 50 + 41 + 43 = 184$$

- 101) (a) Subscription in Europe in 2006 = 380 USD

Subscription in Europe in 2007 = 500 USD

$$\text{Per cent growth rate in 2007 over 2006} = \frac{500 - 380}{380} \times 100 = 31.5\% \approx 30\%$$

Therefore, the subscription (base 0 upon the growth rate of 2007 over 2006) in 2008 should have been
 $= 500 \times 1.3 = 650 \text{ USD (approx.)}$

Therefore, difference from the estimated subscription = $(650 - 600) = 50 \text{ USD}$

- 102) (a) Let the number of subscribers be $100x$.

Number of Men = $60x$

Therefore, number of men in 2010 = $60x \times (1.03)^7 = 84.42x$ (approx.)

Number of women = $40x$

Therefore, number of women in

$$2010 = 40x \times (1.1)^7 = 77.94x \text{ (approx.)}$$

Therefore, the total number of subscribers = $84.42x + 77.94 = 162.36x$

$$\therefore \text{Percentage growth of subscribers} = \frac{162.36x - 100x}{100x} = 62.36 \text{ (approx.)}$$

- 103) (d) Gap in 2008 = $780 - 600 = 180 \text{ USD}$

Gap in 2009 = $810 - 700 = 110 \text{ USD}$

$$\therefore \text{Annual percentage change} = \frac{110 - 180}{180} \times 100 = -39\%$$

Absolute change = 39%

$\therefore$ In year 08-09 the value of absolute change is highest.

- 104) (c) Growth rate of 2007 = $\frac{500 - 380}{380} \times 100 = 31.58\%$

$$\text{Growth rate of 2005} = \frac{280 - 190}{190} \times 100 = 47.37\%$$

Therefore, per cent change in growth rate of 2007 in relation to growth rate of 2005 is $\frac{47.37 - 31.58}{47.37} \times 100 \approx 35\%$

- 105)** (c) Average gross pay of HR department before transfer = ₹ 5000 × 1.7 = ₹ 8500
Basic pay of the transferred person = ₹ 8000
New allowance of transferred person = (80 + 10) = 90% of basic pay.
New gross pay of transferred person = 8000 × 1.9 = ₹ 15200

New average gross pay of HR department

$$= 8500 + \left(\frac{15200 - 8500}{6} \right) = ₹ (8500 + 1116)$$

$$\therefore \text{Percentage Change} = \frac{1116}{8500} \times 100 = 13\%$$

- 106)** (c) Since, increase in average age of the finance department is one year, the age of the person moving from marketing to finance is more than that moving from finance to marketing by $1 \times 20 = 20$ yr

Hence, due to this transfer, cumulative age of marketing department has gone down by 20 yr. But since the average age of marketing department remained unchanged.

The person moving from marketing to HR has age = (Average age of marketing) - 20 = 15 yr.

$$\therefore \text{New average age of HR department} = \frac{(5 \times 45) + (1 \times 15)}{5 + 1} = 40 \text{ yr}$$

- 107)** (b) Total basic pay of HR = 5 × 5000 (existing) + 2 × 6000 (maintenance) + 1 × 8000 (marketing) = ₹ 45000

$$\text{Now, average} = \frac{45000}{8} = ₹ 5625$$

$$\therefore \text{Per cent change} = \frac{625}{5000} = 12.5\%$$

Solutions (Q. Nos. 108-111) From the data table and information given in the question, it is clear that the costs which are directly proportional to the change in volume of production are 'material, labour and operation cost of machines'. Rest of the costs are all fixed costs. If 'x' is the number of unit produced in 2007, then the total cost of production would be

$$C = 9600 \text{ (fixed)} + 100 \times (\text{variable})$$

Variable cost = 100x because the number of unit for 2006 is 1200 and variable cost is 1,20,000, i.e. 100 times the number of unit.

- 108)** (b) Total cost = 9600 + 100 × 1400 = 1,49,600

$$\text{Cost per unit} = \frac{1,49,600}{1,400} = 107 \text{ (approximately)}$$

- 109)** (c) To avoid any loss the total SP should be equal to the total cost price. If 'x' unit are produced and SP of each unit is ₹ 125.

$$\text{Therefore, } 12x = 9600 + 100x$$

$$25x = 9600 \Rightarrow x = 384.$$

Hence, 384 unit should be produced.

- 110)** (b) As the selling price is reduced by ₹ 5. Now, the SP is ₹ 120.

$$\therefore \text{Profit} = 120x - (9600 + 100x) = 20x - 9600$$

So, profit would be maximum when x is maximum.

$$\text{The maximum profit} = 20 \times 1700 - 9600 = 24,400$$

- 111)** (e) Profit would be maximum if the number of unit are maximum i.e., 2000.

Solutions (Q. Nos. 112-115) From the given information in the question following table can be formed

	Male	Female	Veg	NVeg	Total
Class 12	48	32	32	48	80
Class 11	44	36	40	40	80
Secondary section	288	352	352	288	640
Total	380	420	424	376	800

- 112)** (a) % of vegetarian students in Class

$$12 = \frac{32}{80} \times 100 = 40\%$$

- 113)** (e) Male vegetarian = 32 × 25% = 8

$$\therefore \text{Female vegetarian} = 32 - 8 = 24$$

$$\text{Difference} = 24 - 8 = 16$$

- 114)** (b) Percentage of male students in the secondary section = $\frac{288}{800} \times 100 = 45\%$

- 115)** (d)

- 116)** (c) For Malaysia, total cost = (11,000 + 6,000) + (10,000 + 8,000) + (10,000 + 8,000) = US \$ 47,000 (minimum)
Hence, answer is Malaysia.

- 117)** (d) In India, total cost in US \$ = 3000 + 5000 + $\frac{1500}{32.89}$
(Transportation cost) = 8456.06.

In Thailand, total cost in US \$ = 4500 + 6000 = 10,500
Difference in amount is 10,000 - 8456.06 = US \$ 2044 ≈ 67500 Bhats

- 118)** (a) In India total cost in US \$ = 8500 + 9000 = 17,500 which is maximum. Hence, the answer is India.

- 119)** (b) In India, total cost for spinal fusion in US \$ = $\frac{5500 \times 40.928}{35} = 6431.5$

In Singapore, total cost for spinal fusion in US \$ = 9000.
Difference (in US \$) is 900 - 6431.5 = 2568.5 ≈ 2500

- 120) (d) The shortest route as per the given condition is A – C – F – J.

Following table complies the distance and the corresponding price :

Path	Distance	Price
A – C	790	1350
C – F	410	430
F – J	970	1150
Total	2170	2930

Hence, the price for travelling by the shortest route is ₹ 2930.

- 121) (b) For the lowest price we have to consider the path A – H – J.

Following table complies the distance and corresponding price

Path	Distance	Price
A – H	1950	1850
H – J	400	425
Total	2350	2275

If the company charges 5% below the minimum price of ₹ 2275, then it should charge $0.95 \times 2275 = ₹ 2161$.

- 122) (c) If the airports C, D and H are closed, then the passenger must follow the path A – F – J for minimum price. Following table complies the distance and the corresponding price :

Path	Distance	Price
A – F	1345	1700
F – J	970	1150
Total	2315	2850

- 123) (b) For minimum cost per km, we have to consider the path A – H – J. From solution 39 we know the distance of path A – H – J is 2350 km and the price is ₹ 2275. The price includes a margin of 10%.

$$\text{So, the minimum cost per km} = 2275 \times \frac{10}{11} \times \frac{1}{2350} = 0.88$$

- 124) (d) For minimum cost per km again we have to consider the path A – H – J as in solution 41. The distance of path A – H – J is 2350 km.

- 125) (d) The required diet can be formed by mixing *P* and *S* or *Q* and *S* only but the lowest cost per unit can be obtained by *Q* and *S* only.

- 126) (e) To make a diet with atleast 60% carbohydrates we can use option (b) or (e) only but the lowest cost per unit can be achieved when *P*, *Q* and *S* are mixed in the ratio 4 : 1 : 1.

- 127) (e) As the ingredients are fixed in equal amounts, so we can take the average of the constituent % of the element used. Only option (e) *O* and *S* satisfies all the conditions.

- 128) (a) As the diet should contain 10% minerals and only two ingredient contains 10% minerals i.e. *O* and *Q*. Hence, only be mixing *O* and *Q* a diet with 10% minerals can be formed. Hence, there is only one ways.

- 129) (c) Let marks obtained by Dipan in English group paper II be x , then group average of Dipan

Physics, Chemistry and Biology group = 98

Maths = 95

Social Science = 95.5

Vernacular group = 95

$$\text{English group} = \frac{96 + x}{2}$$

$$\text{Now, final score} = \frac{98 + 95 + 95.5 + 95 + \frac{96 + x}{2}}{5} \Rightarrow 96 = \frac{767 + (96 + x)}{10} = \frac{863 + x}{10} \text{ or } 960 = 863 + x \text{ or } x = 97$$

130) (d) Group total of Shreya is Physics, Chemistry and Biology group is 90.

Group total of Ram in Vernacular group is 94.

Group total of Ayesha in Social Science is 94.

Group that of Dipan in all the subjects in 95 or more.

131) (d)

Name of the students	Paper selected for improvement	Revised group average	Revised final score
Ram	Vernacular group I or II-94	97	$\frac{97 + 97 + 95.5 + 97 + 97}{5} = 96.7$
Agni	Vernacular group I-82	96.5	$\frac{97 + 99 + 95.5 + 96.5 + 92.5}{5} = 96.1$
Pritam	Social Science, History-83	97.5	$\frac{97 + 98 + 97.5 + 91.5 + 94}{5} = 95.6$
Ayesha	Social Science, Geo.-93	97.5	$\frac{97 + 98 + 97.5 + 95 + 97}{5} = 96.9$
Dipan	Vernacular group II-94	95	$\frac{98 + 95 + 95.5 + 98 + 96.5}{5} = 96.6$

Clearly, final score of Ayesha is maximum.

132) (a) The only boy getting 95 in atleast one of the subjects of the group among all the groups is Dipan.

133) (a) Revised final scores of all the four students after revision in group scores of social Science.

$$\text{Pritam : } \frac{97 + 98 + 100 + 91.5 + 94}{5} = 96.1$$

$$\text{Joseph : } \frac{94 + 100 + 100 + 91 + 94.5}{5} = 95.9$$

$$\text{Agni : } \frac{97 + 99 + 100 + 87.5 + 92.5}{5} = 95.2$$

$$\text{Tirna : } \frac{97 + 99 + 100 + 91.5 + 91.5}{5} = 95.8$$

134) (d) As from the table Haryana, Gujarat, Punjab, MP, Tamilnadu, Maharashtra, UP and AP are intensive rice producing States.

135) (a)

State	Productivity
Haryana	$\frac{19.2}{3.2} = 6$
Punjab	$\frac{24}{4} = 6$
Andhra Pradesh	$\frac{112}{22.4} = 5$
Uttar Pradesh	$\frac{67.2}{16.8} = 4$

Hence, Haryana and Punjab have the highest productivity.

136) (b) Gujarat $\Rightarrow 24/51 = 0.47$

Only per capita production of rice for Haryana, Punjab, Maharashtra and Andhra Pradesh are greater than 0.47.

137) (b) Gayatri, Urvashi and Zeena cannot attend atleast more than one workshop.

138) (b) Anshul, Bushkant, Gayatri and Urvashi cannot attend any of the workshops.

139) (a) Rahul and Yamini.

Solutions (Q. Nos. 140-143)

Marketing	Total age
2000	$49.33 \times 3 = 148$
2001	$44 \times 4 = 176$ here, one faculty joined age 25
2002	$45 \times 4 = 180$
2003	$46 \times 4 = 184$
OB	Total Age
2000	$50.5 \times 4 = 202$
2001	$51.4 \times 4 = 205.6$
2002	$52.4 \times 4 = 209.6$
2003	$47.8 \times 4 = 191.2$ One faculty joined age 25
Finance	Total Age
2000	$50.2 \times 5 = 251$
2001	$49 \times 4 = 196$ year 2001 one faculty joined age 60
2002	$45 \times 5 = 225$ year 2001 one faculty joined age 25
2003	$46 \times 5 = 230$
OM	Total Age
2000	$45 \times 6 = 270$
2001	$43 \times 7 = 301$ one faculty joined age 25
2002	$44 \times 7 = 308$
2003	$45 \times 7 = 315$

140) (a) Faculty member retired from finance.

141) (c) In the year 2002. One faculty member joined the finance at the age of 25.

142) (c) At the age of 27.

143) (d) 52.

Solutions (Q. Nos. 144-147)

States	Firm A	Firm B	Firm C	Firm D
UP	49	82	80	55
Bihar	69	72	70	65
MP	72	63	72	65
Total	190	217	222	185

- 144) (b) As Truthful Ltd. has highest market share hence truthful be A or C. From neutral statement either B or C are aggressive and honest or A and D are aggressive and honest.

According to Statement I, B is profitable, then A and D are aggressive and honest.

Then, honest total revenue cannot be more than that of profitable, hence Statement II is false.

- 145) (c) B is honest according to Statement I.

Almost only one statement can be true as both give aggressive and honest as firm B. Firm B cannot have two names.

- 146) (c) According to Statement I aggressive is (B). Then, Honest Ltd. has to be C (as given in neutral statement). Then, Statement II is also true have Honest Ltd.s, lowest is form Bihar.

- 147) (c) Profitable can be either A or D. Then, aggressive and honest has to be B and C. Hence, truthful is A or D. Hence, for both A and D lowest revenue is from UP.

- 148) (d)

1	16
2	15
3	14
4	13
5	12
6	11
7	10
8	9

In the question we will have to draw two tables winners after round two would be 1, 2, 3, 4, 5, 11, 10, 9 for 8 rounds respectively. As Lindsay is number two she will play Venus Williams in quarterfinal.

- 149) (a)

1	32
②	③1
3	30
④	②9
5	28
⑥	②7
7	26
⑧	②5
9	24
⑩	②3
11	22
⑫	②1
13	20
⑭	①9
15	18
⑯	①7

Matches in circle has upsets.

Then, the table would be winners are

1, 31, 29, 5, 27, 7, 25, 9, 23, 11, 21, 13, 19, 15, 17

So, for next round table is

1	17
31	15
3	19
29	13
5	21
27	11
7	23
25	9

No upset in second round, hence table in next round

1	9
15	7
3	11
13	5

Table in next round

1	5/13
7	3

Hence, Anastasia will play with Maria Sharapova.

- 150) (c) Elena is at number 6, Serena is at number 8. If they loose, then table would be

1	9
2	7
3	11
4	5

Maria is number 1 she will play number 9, i.e. Nadia Petrova.

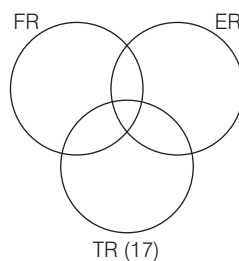
- 151) (c)

1	8
2	7
3	6
4	5

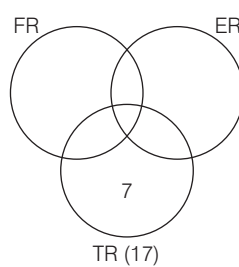
In this case Kim Clijsters will either not reach semi final or she will play Maria in semi final. Hence, she cannot play Maria in final.

Solutions (Q. Nos. 152-155) 17 in TR

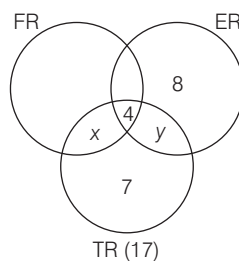
- 17 in TR



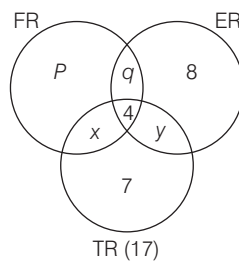
- 10 in TR also in atleast one more
 $\Rightarrow$ 7 in TR alone



- TR alone = one less than ER alone $\Rightarrow$ ER alone = 8
- ER alone = double of all 3 $\Rightarrow$ In all time = $\frac{8}{2} = 4$



- FR alone = (FR and ER)



$$\Rightarrow P = q + 4$$

$$\text{Total} = 37 \Rightarrow p = 8 \text{ and } q = 4$$

Now, total number of FR is maximum

$$\Rightarrow 8 + 4 + 4 + x > 8 + 4 + 4 + y \Rightarrow x > y \text{ and } x + y = 6 \Rightarrow x = \{4, 5, 6\}, y = \{0, 1, 2\}$$

- 152) (c) Both FR and TR but not ER = x

Minimum $x = 4$

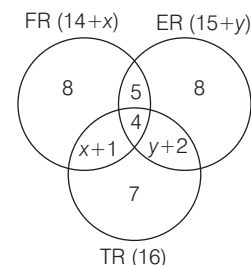
- 153) (a) Option (b) and option (c) are superfluous. They are not required, option (a), if give, would tell us the value of $x = 4$ and hence $y = 2$.

- 154) (b) Out of 4 who are in all three, 2 move out of FR and one-one move out of ER and TR.

Minimum in ER = $14 + x = 14 + 4 = 18$

Maximum in ER = $15 + y + 15 + 2 = 17$

Hence, option (b) is correct answer.



- 155) (d) FR and ER = 5

ER and TR = $y + 2 \Rightarrow 5 = y + 2 \Rightarrow y = 3$

Hence, option (d) is correct answer.

Solutions (Q. Nos. 156-159) The possible arrangement of votes in all the rounds for the given countries can be shown in the table below (encircled values denote the calculated values). Arrows indicate the way the members voted in each round.

Round	Total Votes	London	Paris	Beijing (B)	New York (NY)
1	82	30	24	16	12
2	83	30	24 + 4 + (3) + NY (own vote) = 32	75% 12 + (9) = 21	Ineligible to vote as they have already voted twice
3	75	30 + 8 = 38	32 + 4 + B (own vote) = 37		

- 156) (d) As soon from the table Paris got 24 votes.

- 157) (d) Required per cent = $\frac{8}{12} \times 100 = 66.67\%$

- 158) (a) Based on the table IOC members from New York must have voted for Paris in round (2).

- 159) (d) Required Percentage = $\frac{9}{12} \times 100 = 75\%$

- 160) (a) Taking the minimum value of the expected returns as 10. We have to see which of the two values of 10 and 20 multiplied by 2 and 1.5 and *vice-versa* yields the minimum value.

Hence, comparing the minimum value between $20 \times 2 + 10 \times 1.5$ and $20 \times 1.5 + 10 \times 2$

Hence, the minimum average return is $\frac{20 \times 2 + 10 \times 2 + 30 + 40}{4} = 30\%$

- 161) (b) If the average return is 35%, then the total return is $35 \times 4 = 140$. The possible arrangement of 140 being $40 \times 1.5 + 30 + 20 \times 2 + 10$.

$A = 20 \times 2$ (Cement or IT)

$B = 10$

$C = 30$

$D = 40$ (1.5) (Steel or Auto)

From the data given in the question we see that A has to be Cement or IT.

D is Steel or Auto.

Hence, Statements II and III are correct.

- 162) (c) Total return is $38.75 \times 4 = 155$

The possible arrangement is $20 + 10 + 30 \times 1.5 + 40 \times 2$

Hence, $A = 20, B = 10, C = 30$ (Steel or Auto) $D = 40$ (Cement or IT)

Hence, Statements I and IV are correct.

- 163) (b) Given C....Cement or IT industry

C's return is $30 \times 2 = 60\%$

Among the other values we see that the possible arrangement can be

$10 \times 1.5 + 20 + 40, 10 + 20 \times 1.5 + 40, 40 + 20 + 40 \times 1.5$

The average returns will be in each case

$$\frac{10 \times 1.5 + 20 + 40 + 60}{4} = (33.75\%)$$

$$\frac{10 + 20 \times 1.5 + 40 + 60}{4} = (35\%)$$

$$\frac{40 + 20 + 40 \times 1.5 + 60}{4} = (45\%)$$

Considering 33.75% as the valid value, then *B* belongs to the Auto industry.

Hence, Statements II and IV are correct. Therefore, option (b) is the correct choice.

- 164) (d) Total points for Tara is $2.4 \times 5 = 12$

It is given that she has the same number of points in exactly 3 courses.

Since, the total is 12, she can't have 3 As.

She cannot have 3 Cs because she already has 1 B and with 3 Cs the total would become $3 \times 3 + 4 = 13$ which is more than 12.

She cannot have 3 Ds because the total points from four subjects becomes 10. She must then have 1 more D in the last subject to make the total 12 i.e., she ends up with the same grade in 4 subjects, which violates the given condition.

She cannot have 3 Fs because irrespective of what grade she gets in the 5th subject her total will not be 12.

$\therefore$ She can have 3 B's and 2 F's (total can be 12).

$\therefore$ In operations she can get either *B* or *F* as the grade. Since, Ismet, Hari and Jagdeep none have *B* or *F* as the grade in Operations, the answer is Manab.

- 165) (a) Total points for Preeti = $3.2 \times 5 = 16$

Grades in Finance, Marketing and Strategy are *F*, *D* and *D* respectively, which amounts to $(0 + 2 + 2) = 4$ marks.

$\therefore$ In Statistics and Operations she has $(16 - 4) = 12$ marks.

$\therefore$ She has to get both *A* grades.

- 166) (b) Total points for Gowri = $3.8 \times 5 = 19$

$\therefore$ In Strategy she has $19 - (3 + 3 + 6 + 4) = 3$ points i.e., Grade '*C*'.

Since, Nisha, Fazal and Rahul have higher grades than Gowri the only possibility could be Hari.

- 167) (c) Total points for Fazal = 12

$\therefore$ Grade in Strategy would be *B*.

$\therefore$ Utkarsh's Marketing grade = *B*.

Total points for Utkarsh = 15

$\therefore$ In Finance, Utkarsh's points = $15 - (4 + 0 + 3 + 6) = 2$ i.e. Grade '*B*'

- 168) (d) By observation, the average expenditure of the Dubey family is close to 2000 while that of other families is less than 2000.

Alternative method

Approximate average expenditure of the Ahuja family

$$= \frac{800 + 1700 + 2700}{3} = \frac{5200}{3} \approx 1733$$

Approximate average expenditure of the Bose family

$$= \frac{900 + 1600 + 2300}{3} = 1600$$

Approximate average expenditure of the coomar family

$$= \frac{400 + 1100 + 1900}{3} \approx 1133$$

Approximate average expenditure of the Dubey family

$$= \frac{1200 + 2800}{2} = 2000$$

- 169) (c) By observation, the average income of the Coomar family is less than 2000 while that of other families is more than 2000.

Alternative method

The total income of the Ahuja family

$$\approx 3200 + 3000 + 2800 = 9000$$

Approximate average income of the Ahuja family

$$= \frac{9000}{3} = 3000$$

Similarly approximate average income of the Bose family

$$\approx \frac{2300 + 2100 + 2800}{3} = \frac{2700}{3} = 2400$$

Approximate average Income of the Coomar family

$$= \frac{1100 + 2200 + 1600}{3} = \frac{4900}{3} \approx 1633$$

Approximate average Income of the Dubey family

$$= \frac{3200 + 1200}{2} = \frac{4400}{2} = 2200$$

- 170) (d) Approximate average savings of the Ahuja family

$$= \frac{2500 + 1300 + 100}{3} = \frac{3900}{3} = 1300$$

Approximate average savings of the Bose family

$$= \frac{1600 + 400 + 400}{3} = \frac{2400}{3} = 800$$

Approximate average savings of the Coomar family

$$= \frac{700 + 1100 - 300}{3} = 500$$

Approximate average savings of the Dubey family

$$= \frac{0 + 400}{2} = 200$$

- 171) (a) The highest amount of savings accrues to a member of the Ahuja family i.e. $3200 - 800 = 2400$.

Alternative method

To get the highest savings, the amount of expenditure should be closest to the Y-axis and the income should be farthest from the X-axis. By observing the graph, we can see that a member from the Ahuja family is satisfying the condition.

- 172) (b) In the year 1998, $(80 - 30) = 50$ mixer-grinders were purchased.

∴ In the year 2000, 10 (= % of 50) were disposed.

Similarly; number of mixer-grinders bought in 1997 is 30.

The number of mixer-grinders disposed in 1999 is 6 (= 20% of 30)

∴ Total number of mixer-grinders disposed off by the end of 2000 is 16.

- 173) (b) It is given that 20% of the mixer-grinders are disposed off after 2 yr. Therefore, in the year 1999, 6 (= 20% of 30) mixer-grinders were disposed. Also, the number of mixer-grinders in circulation in 1999 is 124 and in 1998 is 80.

The difference is 44.

∴ Total number of mixer-grinders purchased is $(44 + 6) = 50$.

- 174) (d) Since, information about purana mixer-grinders is not known for the even-numbered years (1996, 1998, etc.), the number of mixer-grinders disposed off in 2000 cannot be determined.

- 175) (a) Since, it is known that 10 purana mixer-grinders were disposed off in 1997, the number of mixer-grinders in circulation in 1997 should have been $162 - 10 = 152$. But it is given as 182 which implies that 30 were purchased.

∴ Number of mixer-grinders disposed off in 1999 should be 6. (= 20% × 30)

∴ Number of mixer-grinders in circulation in 1999 should have been $222 - 6 = 216$. But it is given as 236, which implies that the number of purana mixer-grinders purchased in 1999 is $236 - 216 = 20$.

- 176) (b)

- 177) (a)

- 178) (d)

- 179) (a)

- 180) (b) Export of tea as a proportion of production is highest for the year 1997 (approx 35%).

- 181) (a) Population would be calculated as (Availability of Tea) ÷ (Per capita Availability of Tea). On calculating the values for these years, value for the year 1995 comes out to be the lowest.

- 182) (a) Tea productivity would be highest for the year 1999 because in the year 1999, production is the maximum and area under cultivation is the minimum.

- 183) (a) The two companies excluded from the third chart are companies B and D. These companies have had a negative profitability. Thus the only answer has to be.

- 184) (c) From third chart.

- 185) (d) Option (a), (b) and (c) are correct.

- 186) (d) Companies with profitability exceeding 10% in F.Y. 2002-03 are C and E. Their operating profits are 30 and 35 crores respectively. Thus, the average is 32.5.

- 187) (c)

- 188) (b)

- 189) (a) Total time taken by FRG team
 $= (10.95 + 10.85 + 10.58 + 10.63) = 43.01$
 Total time taken by USA team
 $= (10.78 + 10.75 + 10.94 + 10.36) = 42.83$
 Difference = 0.18

- 190) (b) First ranked person has total score of 8905 and second ranked person has total score of 8897. Therefore, he must get a score of greater than 8880 but less than 8897. Presently he is scoring $582 + 3003 = 3585$. Therefore, if he gets a score of 5296, his total score would become $3585 + 5296 = 8881$, it ensures him a bronze medal.

- 191) (d) There would be 4 competitors namely Torsten Voss, Jurgen Hingsen, Grigory Degtyarov and Steve Fritz in which Michael Smith has performed better in Long jump than his competitors.

- 192) (c)

Cement Cost	WPI	Weights	Cost
Limestone	105	0.2	21
Power	108	0.25	27
Wages	105.3	0.15	15.795
Total Cost			63.795

Thus, operating profit per bag of cement

$$= \{(104 - 63.795) \times 100\} \div 104 = 38.5\%$$

- 193) (d) The question asks us to find the operating profit as a percentage of selling price. The selling price of steel is not given.

- 194)** (a) It can be clearly seen from the table, "Power" experiences continuous price rise during the ten-year period.
- 195)** (d) It can be clearly seen from the table, "Timber" and "Wages" experience only one decline in price during the ten-year period.
- 196)** (c)
- 197)** (b)
- 198)** (c)
- 199)** (c) The commodities that exhibited net overall increase were onion, rice, egg and chillies. Therefore, the commodities that exhibited net overall decrease were dal and edible oil.
- 200)** (d) The commodities that experienced a price decline for and two or more consecutive year were rice, egg, onion, dal and chillies.
- 201)** (c) The given condition is satisfied only for the commodity onion.
- 202)** (c) If we multiply the complex column of the head working days in the table with 50, we get the salary paid for the same work of the same employees. The figure so obtained should be compared with the respective head of salary. As such we get seven employees whose salary for complex work exceeds ₹ 50 per day.
- $$600 > 10 \times 50, 450 > 8 \times 50, \\ 250 > 4 \times 50, 360 > 6 \times 50, 490 > 8 \times 50 \text{ and } 1,234 > 19 \times 50.$$
- 203)** (a) Salary per day of 2,00,180 $-\frac{1,234}{19} = 64.94$,
 $2,00,080 - \frac{600}{10} = 60,200,170 - \frac{490}{8} = 61.25$,
 $2,00,040 - \frac{149}{10} = 14.9$.
Hence, employee 2,00,180 gets the maximum salary per day in complex work.
- 204)** (a) 80% attendance in the month of June $= 25 \times \frac{80}{100} = 20$ h.
Hence, those employee who work more than 20 h and earning more than ₹ 600 are required to answer the question and these are five such employees complying this requirement.
- 205)** (a) There are 9 employees who worked for complex and medium both. Out of these 9, only 6 earn more in complex work than in medium work.
- 206)** (c) A number is 200% of other number then it should be 3 times of the other number. Hence, if we compare expenses of year 2000, we find that expenses of five countries - Spain, Africa, Far-East, Australia and other world in the year 2000 is more than 3 times from that of in the year 1999.
- 207)** (a) Out of the four options only two options (a) and (d) show the net profit exceeding tax and charges. Ratio of net profit to tax and charges of these countries are Far-East $= \frac{23}{21} = 1.09$ North Sea $= \frac{290}{280} = 1.03$. Hence, option (a) is the correct answer.
- 208)** (d) Total revenue is 1998 = 3,790, 5% of 3,790 = 189.5. Now, it is clear that only two countries have revenue contribution less than 5% to the total revenue.
- 209)** (d) If we compare income of 99 with expenses of 99, the only country which has expenses exceeding income is other world. Hence, other world has least efficiency.
- 210)** (d) Efficiency of Spin in
 $99 = \frac{2,832}{1,372} = 2.06$; $98 = \frac{3,790}{2,996} = 1.26$; $99 > 98$, hence (a) is true.
Profitability of North America in
 $99 = \frac{93}{137} = 0.68$; $98 = \frac{52}{63} = 0.83$;
 $99 < 98$, hence (b) is true.
Efficiency of Far-East in
 $2000 = \frac{1,354}{1,024} - 1.32$, $1999 = \frac{340}{296} = 1.15$; $2000 > 1999$,
hence (c) is true.
Since, all the options are correct, correct option would (d).
- 211)** (b) It is clear from the table that expenses of Africa in 98 is more than the income. But in the year 99, expenses of Africa is less than the income. Hence, it shows the maximum per cent increase in the profitability.
- 212)** (b) There are four countries which show increase in profit before tax every year-Spain, Africa, North America and other world.
- 213)** (b) Cities within 10 E to 40 E which lie in southern hemisphere are Veinna, Sofia, Tripli, Warsaw and Lusaka. Seven such cities are there. Out of these only one Lusaka lies in the Southern hemisphere. Hence, required percentage $= \frac{1}{5} \times 100 = 20\%$.
- 214)** (d) (a) Number of cities with name starting with consonants in the northern hemisphere = 11
(b) Number of cities with names starting with consonants in east of the meridian = 13
Now, (a) is 2 less than (b). Hence, option (d) gives the right answer.

- 215) (a) Number of countries with names starting from a vowel situated in southern hemisphere = 3
Number of cities with names starting with a vowel = 2
Hence, required ratio = 3 : 2.

Solutions (Q. Nos. 216-221) It is given in the question that seven depots which are getting supply of gas from six refineries are further supplying it to 9 districts. Table shows the cost incurred in transporting the gas from refinery to depot (Table-I) and depot to districts (Table-2).

- 216) (c) To answer the question both the tables have to be studied in relation to other. It is clear that minimum cost of transporting gas from any refinery to depot and then depot to final destination any refinery is 0 shown by the following channels.

Refinery	Depot	District
BA →	AD →	AAG
BC →	AB →	AAC
BD →	AE →	AAB

- 217) (b) It is clear from the above solution that one of the ways which show minimum cost incurred in transporting the gas is BD → AE → AAB. Hence, minimum cost incurred is 0.
- 218) (a) Again from the same, one of the ways incurring least cost ie, 0 is BA → AD → AAG.
- 219) (c) From table-I we find that maximum cost incurred for transportation of gas is 1,167.30 from BE → AE and maximum cost incurred from AE to any refinery is 1,025.70 from AE → AAG. Hence, total cost incurred from BE → AAG = 1,167.30 + 1,025.70 = 2,193.
- 220) (b) For one refinery we have 7 depots and 9 districts. Hence, number of ways in which gas can be transferred from any refinery to any district = $1 \times 7 \times 9 = 63$.
- 221) (b) Minimum cost from BE to AD = 180 and cost from AD to AAA = 159. Hence, total cost from BE to AAA = 108 + 159 = 267.
- 222) (b) Medium quality regions for crop 1 or crop 2 = $R_4, R_5, R_6, R_9, R_{10}, R_{11}$
Low quality regions for crop 3 or crop 4 = $R_7, R_8, R_9, R_{13}, R_{14}$
Required regions = Common regions = R_9 . Hence, only one region has crop 1 or crop 2 of medium quality and crop 3 or crop 4 of low quality.
- 223) (d) Statement (a) is not true-Region R_1 produces only crop-1 and no other crop.
Statement (b) is not true-Crop 2 is produced by 9 regions and crop 4 is produced by 7 regions.
Statement (c) is also not true-Regions common to crops 1 and 4 are 3, 6, 5, 9, 7 and none of these produces crop 3.
Hence, option (d) none of these is our answer.

- 224) (a) Medium quality regions for crop 3 – R_{10}, R_{11}, R_{12}
High quality regions for crop 2 or crop 4 – $R_5, R_7, R_{18}, R_3, R_6, R_5$
Common regions = 0. Hence, no region is common.

- 225) (c) In solving such question, students are not required to calculate the comparative price for its supply for each option separately. Since, the total value of supply and quantity is same for each country, then a mere approximation will solve the question.

$$\text{Price for its supply for Pakistan} = \frac{17}{18} = 0.94,$$

$$\text{Turkey} = \frac{28}{27} = 1.03,$$

$$\text{Switzerland} = 1.25 \text{ and India} = 0.90.$$

Now, we see that Switzerland has the highest price for its supply.

- 226) (b) 1.055 million tonnes = 1,055 million kg.

$$\therefore \text{Price in Euro/kg for Turkey} = \frac{5,760}{1,055} = 5.46 \text{ or } 5.6 \text{ (nearest answer).}$$

- 227) (b) If effort allocation is interchanged as given in the question. Then operation E will assume the position of B. Now, if we arrange the effort E in ascending order, then order of companies in ascending order would be 4, 5, 3, 1, 2, 6. Hence, company 3 is ranked at the third position.

- 228) (a) Total effort for operation B through F = $(10.3 + 8.2 + 11.2 + 28.6 + 23.4) = 81.7$
After even distribution each operation will get
$$= \frac{81.7}{5} = 16.34.$$

Change (Reduction) in the percentage of effort in operation E = $(28.6 - 16.3) = 12.3$. Hence, option (a) is the correct answer.

- 229) (d) For company 1, the share of E
$$= \frac{17.6 + 9.8 + 15.7}{3} = 14.37$$

$$\text{Hence, total effort of operation E in company 1} = 23.5 + 14.37 = 37.87$$

$$\text{For company 4, the share of E} = \frac{10.3 + 8.2 + 11.2}{3} = 9.9,$$

$$\text{Hence, total effort of operation E in company 4} = 28.6 + 9.9 + 38.50$$

$$\text{Likewise, total effort of operation F in company 5} = 19.7 + 12.26 = 31.96$$

and total effort of operation E in company 5
 $= 28.6 + 12.26 = 40.86$.

It is Now, clear that operation E in company 5 shows the maximum across all companies and all operation.

- 230)** (b) Volume transported by rail and road
 $= (22 + 9) = 31\%$ of 12 = 3.72 million tonnes
 Cost of transportation by rail and road
 $= (12 + 6) = 18\%$ of 30 = ₹ 5.4 million.
 $\therefore$ Cost is ₹ per tonne = $\frac{5.4}{3.72} = 1.45$ or 1.5

- 231)** (a) Cheapest mode of transportation has least cost per tonne

$$\text{Road} = \frac{6}{22} = 0.27, \text{ Rail} = \frac{12}{9} = 1.33,$$

$$\text{Pipeline} = \frac{65}{49} = 1.32, \text{ Ship} = \frac{10}{9} = 1.11$$

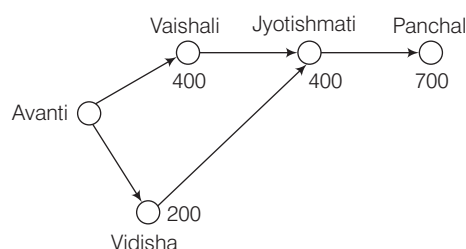
It is clear that cheapest mode of transportation is Road.

- 232)** (c) In the previous question we have calculated the cost per tonne on road and ship as 0.27 and 1.11 respectively. Cost of transportation per tonne for air
 $= \frac{7}{11} = 0.63$

Hence, cost of transportation can be ranked as ship > Air > Road.

or P > Q > R.

Solutions (Q. Nos. 233-235) In solving questions from 238 to 240 two information are important the maximum capacity of each pipeline is 1,000 and flow from Vaishali to Jyotishmati is restricted to maximum 300.



- 233)** (d) Jyotishmati gets supply from two directions one from Vaishali max 300 and rest from Vidisha. All supply given to Panchal is received by Jyotishmati through Vidisha. Hence, Vidisha retains 200 for itself, supplies 700 to Panchal through Jyotishmati and supplies 100 for Jyotishmati because it receives only 300 (max flow) from Vaishali. Hence, quantity moved from Avanti to Vidisha = $(200 + 100 + 700) = 1,000$.
- 234)** (d) Capacity of pipelines is 1,000. It supplies 300 to Jyotishmati through Vaishali, gives 400 to Vaishali and balance 300 is kept free in Avanti-Vaishali pipeline.

- 235)** (d) As we have already discussed in question 40 that quantity moved from Avanti to Vidisha pipeline is 1,000 and capacity of pipeline is 1,000. Hence, no free capacity is available.

- 236)** (a) Men hours spent in coding (both off shore and onsite) = $430 + 100 = 530$ (approx.)
 Option (a) — Offshore designing and offshore coding
 $= (100 + 430) = 530$
 Option (b) — Offshore coding = 430
 Option (c) — Testing = $(280 + 150) = 430$
 Option (d) — Offshore testing and offshore coding
 $= (280 + 430) = 710$.

Clearly option (a) is the correct answer.

- 237)** (c) Total work = (off shore) + (onsite)
 $= (100 + 430 + 280) + (80 + 100 + 150)$
 $= 810 + 330 = 1,140$

$$\therefore \text{Required percentage} = \frac{330}{1,140} \times 100 = 28.94\% = 30\%(\text{nearest})$$

- 238)** (c) Total man-hours spent onsite = 330

Option (a) — $(80 + 100) = 180$

Option (b) — 400

Option (c) — 280

Option (d) — $\frac{400}{2} = 200$

On comparison of man-hours spent onsite with each option we find that option (c) is nearest to it, hence is the correct answer.

- 239)** (a) Total working hours = 1,140

Now, is given that 100 hours is equal to 1,140 man hours

$$\text{Hence, 50 h will be equal to } \frac{1,140}{100} \times 50 = 570 \text{ man}$$

hours.

and among the given options, (a) shows the man hours nearest to it = $430 + 100 = 530$

Hence, option (a) is the correct answer.

- 240)** (b) Total offshore work = $(100 + 430 + 280) = 810$
 50% of off shore work is carried out onsite = 405
 Distribution of efforts

$$= (80 + 100), (430 + 100), (280 + 150)$$

$$= 180 : 530 : 430$$

$$= 18 : 53 : 43$$

Efforts distributed to testing

$$= \frac{43}{114} \times 405 = 153 \text{ man hours.}$$

Offshore testing work 50% of 280 = 140.

∴ Proportion of testing carried out offshore = $\frac{140}{140 + 140 + 153} \times 100 = 32.33$ or 30% (approx)

- 241)** (a) Ratio of distribution of efforts = Design : Coding : Testing = 180 : 530 : 430 = 18 : 53 : 43

It is given that 50% of offshore work is carried out onsite i.e. 50% of 810 or 405 man hours is carried onsite. Then distribution of onsite work

$$= 80 + \left(\frac{18}{114} \times 405 \right), 100 + \left(\frac{53}{114} \times 405 \right),$$

$$140 + \left(\frac{43}{114} \times 405 \right) = 144, 288, 293$$

$$\text{Amount of coding done} = 288 + 430 \times \frac{50}{100} = 503$$

$$\text{Amount of testing done} = 293 + 270 \times \frac{50}{100} = 433.$$

Since, amount of coding done is greater than amount of testing done, hence (a) is the correct answer.

- 242)** (b) Serial number: 1, 2, 3, 5 and 9 show those A type airport which account for more than 40 million passengers.

- 243)** (a) From the table, it is very much clear that airports have been classified and presented in descending order of passengers attendance.

Hence, out of first ten (top ten) six airports are present in USA. Hence, required percentage

$$= \frac{6}{10} \times 100 = 60\%$$

- 244)** (c) As we have to answer the question in nearest percentage. We can take the number of passengers in million to avoid calculation complexity.

$$\text{Hence, required percentage} = \frac{62}{(77 + 72 + 63 + 62 + 60)} = 18.56 \text{ or } 20\%.$$

- 245)** (b) It is clear that all international airports handle more than 30 million passengers. Hence, we have the count only those locations from the table which do not have USA as one of the countries. And here are six such locations.

- 246)** (d) Required number of lays = (Total number of lays) – (Number of lays which do not produce any size of yellow fabric)
- $$= (27 - 13) = 14.$$

- 247)** (b) Required number of lays = (Total number of lays) – (Number of lays which do not produce XXL of any coloured fabric)
- $$= (27 - 11) = 16.$$

- 248)** (d) Required number of lays = lays which produce either XXL of yellow fabric or XXL of white fabric or XXL of yellow and white fabric = 15.

- 249)** (b) There are four entries in the surplus row. Hence, there are three varieties of fabrics which exceed the order.

- 250)** (c) Total fixed cost = 800 + 1,200 = ₹ 2,000

Variable cost for 40 units = ₹ 3,600

Hence, total monthly cost = ₹ 5,600

$$\text{Therefore, } AC = \frac{5,600}{40} = ₹ 140$$

- 251)** (b) Marginal cost = ₹ (3,730 – 3,600) = ₹ 130.

- 252)** (d) From the graph, it is clear that marginal cost initially is an increasing function of production quantity and then becomes a decreasing function of production quantity.

- 253)** (c) Calculated above, total monthly cost for 40 units = ₹ 3,600

and total sales revenue = 150 × 40 = ₹ 6,000

Hence, profit generated = ₹ (6,000 – 3,600) = ₹ 400.

- 254)** (a) Total fixed cost incurred in manufacturing of 30 widgets in ₹ 800 only because second shift is not required, hence profit is maximum in producing 30 widgets.
- 255)** (d) None of the option is definitely true.
- 256)** (d) From the graph, it is clear that electrical sector shows the maximum growth during the period 1989 to 1998.
- 257)** (d)

	Growth in 1990	Production in 1990	Growth in 1991	Production in 1991
Manufacturing	$20 \times 0.09 = 1.8$	$20 + 1.8 = 21.8$	$-21.8 \times 0.01 = -0.22$	21.58
Mining	$15 \times 0.04 = 0.6$	$15 + 0.6 = 15.6$	$15.6 \times 0.01 = +0.16$	15.76
Electrical	$10 \times 0.08 = 0.8$	$10 + 0.8 = 10.8$	$10.8 \times 0.09 = +0.97$	11.77
Chemical	$15 \times 0.07 = 1.05$	$15 + 1.05 = 16.05$	$16.05 \times 0.01 = +0.16$	16.21
		64.25		65.21

Therefore, total growth percentage of all the four sectors taken together = $\frac{(65.32 - 64.25)}{64.25} \times 100 = 1.6\%$

or 1.5% (approximately)

- 258)** (b) From the graph, it is clear that maximum level of production was achieved in the year 1995 in the manufacturing unit.
- 259)** (b) Clear from the graph.
- 260)** (a) Production of for sectors in the year 1994;

Manufacturing = 25.54, Mining and quarrying = 16, Electricity = 14.00 and chemical = 19.5. Total production of four sectors taken together = $(25.54 + 16 + 14 + 19.5) = 75.04$.

Hence, percentage increase in production as compared to the year 1989 = $\frac{75.04 - 60.00}{60} \times 100 = 25\%$ (approx)

- 261)** (b) Index for the 1994 = 150. Production of all the sectors = 75.04.

Hence, production for the remaining sectors

$$= (150 - 75.04) = 74.96.$$

Likewise production of remaining sectors in the year

$$1989 = (100 - 60) = 40.$$

∴ Percentage increase in production

$$= \frac{74.96 - 40}{40} \times 100 = 87.4\% \text{ (approx)}$$

- 262)** (a) Deficit intensity of the year

$$97-98 = (14.2 - 9.2) = 5, 96-97 = (16.2 - 8.2) = 8$$

$$96-96 = (15.5 - 7.9) = 7.6, 94-95 = (13.8 - 7.5) = 6.3$$

$$93-94 = (12.4 - 7.3) = 5.1$$

Now, growth rate in deficit intensity in the year 94-95

$$= \frac{6.3 - 5.1}{5.1} = 0.23$$

$$95-96 = \frac{7.6 - 6.3}{6.6} = 0.20$$

$$96-97 = \frac{8 - 7.6}{7} = 0.058,$$

$$97-98 = \frac{5 - 8}{4} = -0.75$$

It is therefore clear that growth rate is deficit intensity is higher in the year (94-95).

- 263)** (d) It is clear in the previous year that growth rate in deficit intensity is higher in the year (1994-95) and it is calculated as

$$\frac{6.3 - 5.1}{5.3} \times 100 = 23\% \text{ (approx)}$$

- 264)** (b) For the year 1997-98

$$\text{Import intensity} = \frac{\text{Import}}{\text{Sales}} = 14.2 \Rightarrow \text{Import} = 14.2$$

Sales.

$$\frac{\text{Imported raw material}}{0.5 \times \text{sales}} = 20.2$$

$$\Rightarrow \text{raw material} = 10.1 \times \text{sales} \text{ (given raw material} \\ = 50\% \text{ sales)}$$

Now, Import = Raw material + Capital goods

$$\Rightarrow 14.2 \text{ sales} = 10.1 \text{ sales} + \text{Capital goods}$$

$$\text{Capital goods} = 4.1 \text{ sales} \times \frac{\text{Imported capital goods}}{\text{Gross Fixed Assets}} \\ = \frac{4.1 \text{ sales}}{\text{GFA}} = 17.6$$

$$\therefore \frac{\text{Sales}}{\text{GFA}} = \frac{17.6}{4.1} = 4.29 \text{ or } 4.3$$

- 265)** (d) Option (a) cannot be inferred because sales component is not given. Option (b) and option (c) cannot be inferred because of the same reason.

However, it is very clear that deficit intensity has increased from 1993-94 to 1996-97.

Hence, option (d) is the correct choice.

- 266)** (a) The country with the largest change in FEI is India.

- 267)** (d) Absolute value is not given, hence nothing can be inferred.

- 268)** (d) Let GDP of China in 1997 be x , then GDP in 1998 = $1007x$.

$$\text{FEI of China in 1997} = x \times 5.96,$$

$$\text{FEI in 1998} = 1.07 \times 4.8x = 5.136x$$

$$\therefore \text{FEI of China in 1998} < \text{FEI in 1997}$$

and similarly FEI of South Korea in 1998 > FEI in 1997.

- 269)** (c) Let the equity inflow of India in 1998 be x , then equity inflow of china would be $10x$.

$$\text{FEI of India in 1998} = 0.72 = \frac{x}{\text{GDP}}$$

$$\therefore \text{GDP of India in 1998} = \frac{x}{0.72} = 1.39x$$

$$\text{Likewise GDP of China in 1998} = \frac{10x}{4.8} = 2.08x$$

It is now, clear that GDP of China is 50% more than that of India $\frac{2.08x - 1.39x}{1.39x} \times 100 = 0.49\% \text{ or } 50\%$

- 270)** (a) Average employment level is 60 per factory. Since, there are 100 factories. Hence, total employment in 100 factories = $100 \times 60 = 6,000$. Employment in wholly private factories = $6,000 \times 64.6\% = 3876$.

There are 90.3 wholly private factories.

$$\therefore \text{Average employment} = \frac{3,876}{90.3} = 42.92 \text{ or } 43.$$

- 271)** (b) Value added per employee in central and state/local.

$$\text{Government} = \frac{1.8}{1} = 1.8 \text{ which is maximum among other options.}$$

- 272)** (b) Capital productivity of joint sector = $\frac{8.4}{6.8} = 1.23$

$$\text{Capital productivity of central and state local} \\ = \frac{1.5}{1.4} = 1.07$$

$$\text{Capital productivity of wholly private} = \frac{63.8}{46.8} = 1.36$$

And all these may be arranged in descending order as wholly private, joint, central and state/local.

- 273)** (c) Value added per employment and value added per fixed capital respectively for sector given in options are as wholly private = 0.9 and 1.25, Joint sector 1.59 and 1.19

$$\text{Central/state/local} = 1.8, 1.28, \text{ others } 0.92 \text{ and } 0.75.$$

It is now, clear that central and state/local has the highest ratio among all others.

- 274)** (d) Percentage of joint sector firm = 1.8, Now, 1.8% of Total = 2,700

$$\therefore \text{Total firms} = \frac{2,70,000}{1.8} = 1,50,000$$

$$\text{Now, number of central government factories} \\ = 150,000 \times 1\% = 15$$

$$\text{Value added for central government firms} \\ = 140,000 \times 14.1\% = 19,740$$

$$\text{Hence, average value added per factory} \\ = \frac{19,740}{1,500} = 13.1$$

- 275)** (b) Total annual exports for the year 1994-95

$$= (485 + 177 + 6) = 668$$

$$\therefore \text{Percentage to total annual business of the year} \\ = \frac{668}{2,041} \times 100 = 32.73\%$$

$$\text{Similarly percentage of annual export to total annual business for the year, 1996-97} = \frac{1,383}{3,807} \times 100 = 36.33\%$$

$$\text{Year 1997-98} = \frac{1,970}{5,031} \times 100 = 39.16\%$$

It is clear that required percentage for the years 96-97 lie between 35 and 40 per cent. Hence option (b) is the answer.

$$276) (a) \text{ Growth per cent for 95-96} = \frac{845}{2,041} \times 100 = 41.40$$

$$\begin{aligned} 96-97 &= \frac{921}{8,886} \times 100 \\ &= 31.91, 97-98 \\ &= \frac{1,224}{3,807} \times 100 = 32.15, 98-99 \\ &= \frac{1,021}{5,031} \times 100 = 20.29 \end{aligned}$$

It is therefore, clear that growth percentage for the year 95-96 was the highest.

- 277) (c) It is clear that options (a) and (b) are not correct. Now, let us check option (c).

$$\begin{aligned} \text{Total IT business in training during 94-99} \\ &= (302 - 107) = 195 \end{aligned}$$

$$\begin{aligned} \text{Total IT business in maintenance during 94-99} \\ &= (236 - 142) = 94 \end{aligned}$$

Hence, option (c) is the correct answer.

- 278) (d) As per instruction, any particular dominates other year if hardware activity in that year is greater than other year. All options other than (d) are correct because in the year 1998-99 hardware activity = 1,030 and in the year 1996-97 hardware activity = 1,336.

- 279) (d) Option (a) is not true because peripherals activity in 1996-97 is 194 which is less than that of in the year 1995-96 ie, 202.

Option (b) is not true because hardware activity in 1998-99 is less than that of in the year 1995-96.

Option (c) is not true because peripheral activity in 1997-98 is less than that of in the year 1998-99.

Since, none of the option is correct, our answer would be (d).

- 280) (c) Bangladesh > Philippines (97 > 86) for drinking water. And Philippines > any other countries for sanitation. Hence, both Bangladesh and Philippines are on the coverage frontier.

- 281) (b) Since, a country *A* is said to dominate *B* or $A > B$ if *A* has higher percentage in total coverage for both drinking water and sanitation facilities. Therefore, options (B) and (D) are correct. India > China (81 > 67) for drinking water and (29 > 24) for sanitation likewise India > Nepal (81 > 63 and 29 > 18). Also China > Nepal (67 > 63 and 24 > 18).

- 282) (c) Let the urban and rural population be *x* and *y* respectively, then $0.7x + 0.14y = 0.29(x + y)$

$$\Rightarrow 0.41x = 0.15y$$

$$\therefore x = \frac{15}{41}y$$

$$\begin{aligned} \therefore \text{Percentage of rural population} &= \frac{y}{x + y} \times 100 \\ &= \frac{y}{\frac{15}{41}y + y} \times 11 \\ &= 73.2\% \end{aligned}$$

- 283) (a) Percentage of rural population for Philippines, Indonesia and China are 50%, 66.66% and 79.8% respectively. Hence, $P < I < C$.

- 284) (d) India is not on coverage frontier because it is below Bangladesh and Philippines for drinking water and for sanitation it is below Philippines, Sri Lanka, Indonesia and Pakistan,

- 285) (a) Disparity = (Percentage denoting drinking facility coverage – Percentage denoting sanitation coverage)
Now, the country with most disparity in India $(79 - 14) = 65\%$

- 286) (c) The country with least disparity in urban sector is Philippines $(92 - 88) = 4\%$.

- 287) (a) Price change for Arhar = $\frac{2,125 - 1,700}{1,700} \times 100 = 25\%$,

likewise for Pepper, Sugar and Gold it is 4%, -0.3% and -7.8% respectively. Hence, highest price change is shown by Arhar.

- 288) (c) Average price for Arhar

$$\begin{aligned} &\frac{\text{Highest price} + \text{lowest price} + \text{ending} \\ &\quad + \text{beginning price}}{4} \\ &= 1,900 \text{ (approx)} \end{aligned}$$

Difference between highest price and lowest price for Arhar = 800. Hence, price volatility

$$= \frac{\text{Difference}}{\text{Average price}} = 0.42. \text{ It is clear that price}$$

volatility is least for sugar.

- 289) (d) From question (188), the price increase (profit/loss percent) for Arhar, Pepper, Sugar and Gold is 25%, 4%, -0.3% and -7.8% respectively. Therefore, profit for these commodities per ₹ 100 will be ₹ 25, ₹ 4.00, ₹ 0.3 (loss), -₹ 7.8 (loss)

Hence, total profit percentage

$$\begin{aligned} &= \frac{25 + 4 - 0.3 - 7.8}{400} \times 100 = \frac{20.9}{400} = 5.22\% \\ &= 5.22\% \text{ or } 5.4\% \text{ profit (approx)} \end{aligned}$$

- 290) (b) As calculated previously that maximum price volatility has been registered by Arhar which is approximately 40%.

- 291) (c) Total trade = Import + Export. Total trade for USA (A) = $(9 + 19) = 28\%$, other EU(C) = $(12 + 14) = 26\%$, OPEC (H) = $(23 + 10) = 33\%$, others (K) = $(1 + 1) = 2\%$. It is therefore clear that total trade is highest for OPEC.

- 292)** (b) India had the lowest total trade to others region represented by K. Hence, export to region K = 1% of \$ 33,979 million = \$ 340 million.
- 293)** (a) Trade deficit for the region H is the highest and is equal to $(40,779 \times 0.23 - 33,979 \times 0.10) = (9,379 - 3,398) = 5,981$ million or \$ 6 billion.
- 294)** (a) Lowest trade deficit is represented by region A and is equal to $(40,779 \times 0.09 - 33,979 \times 0.19) = -2785.9$ million.
- 295)** (b) On comparing the two pie-charts for exports it is clear that growth has been registered by two regions only namely A and G. It is therefore clear that if we include the exports for the remaining four months for the 1998-99 the region showing the maximum growth in export will be one of these regions only. And it is very clear that region A will register the maximum growth.
- 296)** (b) Total export from India for the year 1998-99 = $\frac{21,436}{8} \times 12 = 32,154$
 Total import from India for the year 1998-99 = $\frac{28,126 \times 12}{8} = 42,189$
 Hence, deficit for 1997-98 = $(40,779 - 33,979) = 6,800$ and deficit for 1998-99 = $(42,189 - 32,154) = 10,035$
 $\therefore$ Percentage growth = $\frac{10,035 - 6,800}{6,800} \times 100 = 47\%$ (approx)
- 297)** (a) Sales growth in 1995-96 = $\frac{250 - 100}{100} \% = 150\%$
 In 1996-97 = $\frac{300 - 250}{250} \% = 20\%$, In 1997-98 = $\frac{290 - 300}{30} \% = -33.33\%$, In 1998-99 = $\frac{680 - 290}{290} = 134.48\%$
 It is, therefore clear that sales growth is highest in 1995-96.
- 298)** (d) Net profit growth in 1995-96 = $\frac{4.5 - 2.5}{2.5} \% = 80\%$
 In 1996-97 = $\frac{6 - 4.5}{4.5} \% = 33.33\%$, In 1997-98 = $\frac{8.5 - 6}{6} \% = 41.66\%$, In 1998-99 = $\frac{12 - 8.5}{8.5} \% = 41.17\%$
 It is maximum in the year 1995-96.
- 299)** (b) Profitability in 1994-95 = 0.25, 1995-96 = 0.02, 1997-98 = 0.029, 1998-99 = 0.017.
 It is clear that profitability is maximum in the year 1997-98.
- 300)** (d) None of the options is true.
- 301)** (c) From the graph, it is clear that maximum increase is registered in plywood from 1991 to 1992 and is equal to $\frac{6 - 4}{4} \times 100 = 50\%$
- 302)** (b) Percentage increase in plywood = $\frac{7 - 3}{3} \times 100 = 133.33\%$, in saw timber it is $\frac{19 - 10}{10} \times 100 = 90\%$ and in logs it is $\frac{(20 - 15)}{15} \times 100$. Thus, we see that maximum percentage increase over the period is shown by plywood.
- 303)** (b) 1 tonne = $\frac{4}{3} = 1.33 \text{ m}^3$

Year	Saw Timber (Price in ₹/Tonnes)	Saw Timber (Price in ₹/Cubic metres)	Logs price in (₹/cubic metres)	Difference in price
1989	12	9	18	9
1990	10	7.50	15	7.50
1991	13	9.75	18	8.25
1992	15	11.25	19	7.75

It is hence, clear that the difference is least in the year 1990.

- 304) (d) 1 tonne of plywood = $\frac{10}{7} \text{ m}^3 = 1.43 \text{ m}^3$ and 1 tonne of saw timber = $\frac{5}{3} \text{ m}^3 = 1.25 \text{ m}^3$

Hence, like previous question, the difference is maximum for the year 1992.

- 305) (d) Ratio of volumes of plywood, saw timber and logs = 4 : 3 : 3. So, the average realisation per metre³ of sales
- $$= \frac{[(4 \times 5.26) + (3 \times 14.28) + (3 \times 20)]}{(4 + 3 + 3)}$$

$$= ₹ 12.4 = ₹ 13 \text{ (approx)}$$

- 306) (c) The change for price increase

$$= \frac{(4 \times 5.26 \times 1.05) + (3 \times 14.28 \times 1.01) + (3 \times 20 \times 1.1)}{(4 + 3 + 3)}$$

$$= ₹ 13.15$$

- 307) (b) No loss situation comes where profit is 0 and more than zero. From the graph it is clear that minimum number of unit produced where loss is zero is 10. Because profit = 200 - 130 - 70 = 0

- 308) (a) From the graph it is clear that at 20 unit there is a profit of ₹ 50 and this will reduce if the number of unit produced is less than 20 unit. Hence, to ensure that the profit is at least ₹ 50, 20 unit have to be produced.

- 309) (b) The best way to answer the question is to check profit per units for each option.

$$\text{For 20 unit profit per unit} = \frac{400 - (280 + 70)}{20} = 2.5 -$$

$$\text{Profit} = ₹ 50$$

$$\text{For 34 unit profit per unit} = \frac{680 - (476 + 70)}{34} = 3.94 -$$

$$\text{Profit} = ₹ 133.96$$

$$\text{For 45 unit profit per unit} = \frac{800 - (580 + 70)}{45} = 3.33 -$$

$$\text{Profit} = ₹ 149.85$$

$$\text{For 30 unit profit per unit} = \frac{600 - (420 + 70)}{30} = 3.66 -$$

$$\text{Profit} = ₹ 109.8$$

In all the above case profit generated is more than ₹ 50. But, Since, for 34 unit, profit per unit is ₹ 3.94. Hence, this is the correct answer.

- 310) (b) From above question, it is clear that profit per unit is ₹ 3.33. Hence, to maximise profit 34 unit will have to be produced.

- 311) (b) Using all options we find that in order to incur no loss 19 unit will have to be produced. Here profit = 380 - (266 + 110) = ₹ 4

- 312) (b) Let the amount invested by Gopal and Ram be 2x and 3x respectively. Gopal further invested ₹ 2 lakh. Given $(2x + 2) = 3x$ or $x = 2$ lakh. Hence, initial amount paid by Gopal and Ram to Krishna is 4 lakh and 6 lakh respectively.

Hence, total money invested by them together = (6 + 6) = 12 lakh. The total revenue generated = $12 \times 25\% = 3$ lakh. The ratio of revenue from coconut and lemon trees are in the ratio 3 : 2. Hence, revenue from coconut = ₹ 1,80,000 and revenue from lemons = ₹ 1,20,000. So, total output of coconut

$$= \frac{1,80,000}{5} = 36,000.$$

- 313) (a) The value of lemon output per acre of land

$$= \frac{1,20,000}{5} = 0.24 \text{ lakh/acre.}$$

- 314) (a) Since, revenue of ₹ 3,00,000 is equally divided by Gopal and Ram. Hence, amount received by Gopal in 1997 = $\frac{1}{2} \times 3,00,000 = ₹ 1,50,000$.

- 315) (b) Ratio of number of coconut trees and lemon trees = 5 : 1, therefore number of coconut trees is 500. Since, revenue generated from coconut trees is ₹ 1,80,000. Hence, value per tree = $\frac{1,80,000}{500} = ₹ 360$.

- 316) (d) Data are insufficient to determine the required ratio.

- 317) (b) From the graph it is clear that southern region showed the highest growth in number of households in all the income categories for the period.

- 318) (d) Regionwise breakup is not available. Hence, question cannot be answered.

- 319) (b) The percentage increase in total number of households for the northern region for upper middle income category is 200%.

- 320) (a) The average income of high income group is 1987-88 is ₹ 75,000.

- 321) (b) Current ratio of total income

$$= (5,000 \times 75,000) : (10,000 \times 50,000)$$

$$= 3 : 4 = 0.75.$$

The average household income for high income category increased by 90%. Hence, average household income for this category in 1994-95 = $(75,000 \times 1.9)$

$$= ₹ 1,42,500.$$

Hence, total income for high income category in 1994-95 = $(30,125 \times 80,000) = ₹ 2,476$ million. Likewise, the average household income for upper middle class category increased by 60%.

Hence, average household income for this category in 1994-95 = $(50,000 \times 1.6) = ₹ 80,000$

Hence, total income for high income category in 1994-95 = $(30,125 \times 80,000)$

$$= ₹ 2,410 \text{ million}$$

Hence, ratio of total income for these two categories in 1994-95 = $\frac{2,476}{2,410} = 1.02$

Therefore, percentage increase in ratio

$$= \frac{(1.02 - 0.75)}{0.75} = 36\%$$

- 322) (a)** Average income for the northern region

$$= \frac{518.75}{13,750} = ₹ 37,727$$

- 323) (a)** It is very clear from the data table that quantity of apples supplied by J and K in the month of february 11,183 tonnes is very close to the total figure 11,285, which is = $\frac{11,183}{11,285} \times 100 = 99\%$. Hence, it shows the maximum percentage.

- 324) (c)** HP supplied a total of 2,31,028 tonnes, UP supplied a total of 258 tonnes and J and K supplied a total of 2,62,735 tonnes. Hence, state J and K. Supplied maximum number of apples .

- 325) (c)** It is clear that J and K supplied the highest percentage of apples.

- 326) (c)** The stock taken from the month may to september is zero hence during this period supply was greater than the demand.

- 327) (b)** Total quantity of apples supplied to Delhi during the year was $(2,31,028 + 258 + 2,62,735) = 4,94,021$ tonnes or 49,40,21,000 kg. If 1 tree yield 40 kg of apples, then the number of trees require to yield 49,40,21,000 kg = $\frac{49,40,21,000}{40} = 1,23,50,525$ trees = 12.5 million trees (approx)

- 328) (d)** Required area = $\frac{1,23,50,525}{250} = 49,402$ (approximately)

- 329) (a)** Loans from rural banks in 1974 = $(260 \times 38 \times 243) = ₹ 6.19$ million

Hence, total amount of loan = $(34.54 + 6.19) = ₹ 40.73$ million. Hence, percentage of agriculture loans

$$= \frac{34.54}{40.73} = 84.79\% = 85\% \text{ (approx)}$$

- 330) (b)** Total number of loans upto 1980

$$= (2,520 + 4,485 + 6,760 + 25,480 + 38,478 + 1,74,240) = 2,51,963.$$
 And the total number of rural loans in 1983 = 3,19,200.

- 331) (d)** Maximum increase in the number of loans for rural bank in 1980-81.

- 332) (b)** Value of agricultural loan in 1983 at 1970 prices

$$= \frac{43 \times 915.7}{149} = 264.$$

- 333) (c)** The number of rural bank loans per rural bank is least in 1970.

- 334) (b)** Required per cent increase

$$= \frac{2,11,600 - 18,300}{18,300} \times 100$$

$$= 1057\%$$

Since, this growth is spread across 13 yr, therefore simple annual rate of increase = $\frac{1,057\%}{13} = 81.3\%$ or 81% approximately.

- 335) (a)** Consumer price index in 1970 is 43 which is to be taken as 105 as per instruction.

Accordingly price index for the year 1983 and 1975 should be taken as $\left(149 \times \frac{105}{43}\right) = 363.83$ and

$$\left(78 \times \frac{105}{43}\right) = 190.46, \text{ respectively.}$$

Hence, their difference

$$= (363.83 - 190.46)$$

$$= 173.37 = 174 \text{ (approx)}$$

- 336) (b)** Total value of loans = Rural bank loans + Agriculture loan. Rural bank loan in 1980

$$= (605 \times 288 \times 567) = ₹ 98.79 \text{ million.}$$

Total value of agriculture loan in 1980 = ₹ 498.4 million. Hence, total loans in 1980

$$= (98.79 + 498.4) = 597.19.$$

But this is at a CPI = 131. If it is to be calculated at 1983 CPI, then its value will be

$$597.19 \times \left(\frac{149}{131}\right) = ₹ 679.24 \text{ million} = ₹ 680 \text{ million}$$

(approx)

- 337) (a)**

	Tariff 94-95	% Change over 1991-92	Tariff 1991-92
Region 1	425	+ 15%	369.5
Region 2	472	+ 5%	449.5
Region 3	420	- 4%	437.5
Region 4	415	+ 8%	384.25
Region 5	440	+ 10%	400
	2172		2040.75

On the basis of data presented in the table, it is clear that net tariff in the year 94-95 as compared to 1991-92 increased by $\frac{2172 - 2040}{2040} \times 100 = 6.5\%$

338) (b)

	Tariff 94-95	% Change over 1991-92	Tariff 1991-92
Sector 1	420	-4	437.50
Sector 2	448	+7	418.7
Sector 3	432	+6	407.5
Sector 4	456	+10	414.5
			1678.2

Average tariff for region 3 in 1991-92

$$= \frac{1678.2}{4} = 419$$

$$= 420(\text{approx})$$

339) (a) The domestic consumption in 1991-92

$$= \frac{1575}{0.9} = 1750 \text{ megawatts. This constitutes 20\% of}$$

total power consumed in 91-92 and the rural consumption constitutes 15% of total power in 91-92.

Hence, in 1991-92, the rural consumption

$$= \left(1750 \times \frac{15}{20} \right) = 1312 \text{ megawatts.}$$

340) (d) It cannot be determined because the rates for the urban sector is not known.

341) (d) The average tariff in region

$$4 = \frac{415 + 423 + 441 + 451}{4}$$

$$= 432.5 \text{ P/kwh}$$

$$\text{In region 2} = \frac{(472 + 468 + 478 + 470)}{4}$$

$$= 472 \text{ p/kwh and region.}$$

$$5 = \frac{(440 + 427 + 439 + 446)}{4}$$

$$= 438 \text{ P/kwh.}$$

Hence, the average tariff in region 2 is higher than in region 5. This statement is not correct hence third statement cannot be evaluated.

342) (b) From the graph, it is clear that increase in raw material is maximum in 1993 i.e., 15 point increase.

343) (c) There is 50 point decrease in profit in the year 1993-94 which is maximum.

344) (a) It is very clear that interest component remained more or less constant over the given period.

345) (c) The percentage of overheads to raw material is maximum in 1992.

$$\frac{20}{50} \times 100 = 40\%$$

$$346) (b) \frac{\text{Profit}}{\text{Cost}} = \frac{15 + 25 + 20 - 30 + 15}{330 + 290 + 90 + 260 + 45}$$

$$= \frac{45}{1015} = 4.43 = 5\%$$

347) (b) Profit per unit cost in 1992 = $\frac{25}{70} \times 100 = 35.71\%$ which is maximum.348) (a) Per capita production of milk was least in the year 1990, which is equal to $\frac{5}{(34 + 36)} = \frac{5}{70} = 0.071$.349) (d) Per capita production of food grain was maximum in 1995 = $\frac{30}{80} = 0.37$.

350) (c) The difference between percentage increase in production of food grains and percentage increase in production of milk was maximum.

351) (c) Per capita consumption of calories in 1995 = $(320 \times \text{per capita consumption of milk}) \times (160 \times \text{per capita consumption of food grain})$
 $= (320 \times 0.093) + (160 \times 0.37) = 88.96$, which is highest.352) (c) Availability of nutrient is maximum in 1995 which is equal to $(120 \times \text{production of milk}) + (60 \times \text{production of food grain})$
 $= 120 \times 6.8 + 60 \times 32 = 2736$, which is maximum.353) (c) Per capita consumption is maximum in 1995 and is equal to $\frac{2736}{80} = 34.2$ 354) (a) Cost per room for Lokhandwala = $\frac{225}{535} = 0.42$,

$$\text{for Raheja} = \frac{250}{500} = 0.50, \text{ for 1 HCl} = \frac{275}{600} = 0.45,$$

$$\text{for ITC} = \frac{300}{300} = 1, \text{ it is, hence clear that cost per room is least for Lokhandwala.}$$

355) (c) Explanation same as above.

356) (c) In 1998, two projects namely Mumbai heigh and Royal holidays are completed.

$$\text{The cost of project} = (250 + 225) = 475 \text{ crore.}$$

$$\text{Cost incurred} = 475 + 10\% \text{ of } 475 = 522.5$$

357) (a) Cost of projects – Majestic, supremo, windsor and leela, completed in 1999
 $= 250 + 300 + 275 + 235 = 1060$.

$$\text{Hence, the cost incurred} = 1060 \times (1.1)^2 = 1282.6 \text{ crore.}$$

358) (b) Approximate cost of projects completed by 2000 is
 $= 1282.6 + 522.5 + [250 \times (1.1)^3] = 2140$

Solution (Q. Nos. 359-363)

Year	Number of students employed	Number of students employed from finance	Number of students employed from marketing
1992	800	$0.22 \times 800 = 176$	$0.36 \times 800 = 288$
1993	640	$0.17 \times 650 = 110.5$	$0.48 \times 650 = 312$
1994	1100	$0.23 \times 1100 = 253$	$0.43 \times 1100 = 473$
1995	1200	$0.19 \times 1200 = 228$	$0.37 \times 1200 = 444$
1996	1000	$0.32 \times 1000 = 320$	$0.32 \times 1000 = 320$
Total		1087.5	1837

359) (c) Difference in number of students employed from finance and marketing = $1837 - 1087 = 750$.

360) (d) Percentage increase in the average salary of finance = $\frac{9810 - 5450}{5450} \times 100 = 80\%$

361) (c) Average annual rate at which the initial salary offered in software increases = $\frac{1}{4} \left[\left(\frac{8640 - 5290}{5290} \right) \times 100 \right]$
 = 15.9% approximately.

362) (a) Average monthly salary offered to a management graduate in 1993 = $\frac{6380 + 6390 + 6440}{3} = 6403$.

363) (b) Earning of students seeking job in finance = $253 \times 7550 = ₹ 1628550$

Difference in the amount earned = $1910150 - 1628550 = ₹ 28160 = ₹ 2.81 \text{ lakh per month} = ₹ 33.8 \text{ lakh per annum}$.

364) (b) Profit is given by (Sales-cost).

∴ Maximum profit is in July = $(37 - 34) = 3$

365) (d) Total increase in cost is the highest as compared to two months ago (May-March) = $(34 - 30) = 4$

366) (d) The percentage increase in sales two months before is highest in the month of May = $\frac{36 - 32}{32} \times 100 = 12.5\%$.

367) (b) Profit per employee is highest in the month of July = $\frac{3}{14} = 0.2142$.

368) (b) Required number of employees = $(16 - 11) = 5 \text{ thousand} = 5000$

369) (d) Required percentage = $\frac{(11840 - 10000)}{10000} = 18\%$

370) (b) Total investment in electricity and thermal energy in both the districts in 1995 = $(815.2 + 632.4 + 2065.8 + 1232.7) = 4746.1$

Total investment made in that year = $2923 + 7081 = 10004$ or 10000 approximately.

Hence, required percentage = $\frac{4746}{10000} = 47\%$ (approx)

371) (b) Percentage increase in investment in Khammam = $\frac{986 - 745}{745} \times 100 = 32\%$ (approx) which is the highest.

372) (c) Required ratio = $\frac{15430}{6410} = 2.4 \text{ times}$

373) (a) Percentage increase in total investment in Khammam in 1996 = $\left(\frac{8352 - 7081}{7081} \right) \times 100 = 18\%$ (approx)

Solution (Q. Nos. 374-378)

Original Scheme				New Scheme			
Month	People	Cost per man/month	Total cost	People	Cost per man/month	Total cost	
5	4	10000	40000	5	20000	100000	
6	5	10000	50000	4	10000	40000	
8	4	10000	40000	5	10000	50000	
Total cost			130000	Total cost			190000

374) (b) Percentage change in the cost incurred in the fifth month = $\frac{100000 - 40000}{40000} \times 100 = 150\%$

375) (d) Cost incurred in the new coding stage = ₹ 190000

376) (b) Difference between old and new techniques = $(190000 - 130000) = ₹ 60000$

377) (b) Cost incurred in specification stage = $(80000 + 120000) = ₹ 200000$, which is the maximum cost.

378) (c) Average cost for 5 consecutive month is lowest for months 11 to 15.

379) (a) Production capacity for lipton is 64.80% for 1.64 thousand tonnes. Since, maximum capacity is 100%. Hence, for 100% it would be = $\left(\frac{100}{64.8}\right) \times 1.64 = 2.53$ thousand tonne.

380) (d) Unutilised capacity for Brooke Bond = $\left(\frac{2.97}{76.5} \times 100 - 2.94\right) = 0.912$, for Nestle

= 1.003, for Lipton = 0.89 for MAC, it is 1.05.

Hence, it is maximum for MAC.

381) (c) Capacity utilisation for coffee is 61.30 for 11.60 ('000 tonne)

Hence, for 100% it is = $\frac{100}{61.3} \times 11.6 = 18.7$ ('000 tonnes)

382) (d) Data insufficient to answer the question.

383) (b) Sales of coffee (others) = $132.80 - (31.15 + 26.75 + 15.25 + 17.45) = 42.2$

Hence, required per cent = $\frac{42.2}{132.8} \times 100 = 32\%$ approximately.

384) (b) Average revenue collection in 7 yr = $\frac{(120 + 130 + 145 + 165 + 185 + 200 + 220)}{7} = 166.42 = 168$ lakh (approximately)

385) (a) Required per cent = $\frac{\text{Expenses of 7 yr}}{\text{Revenue of 7 yr}} = \frac{877}{1165} = 75\%$ (approximately)

386) (d) Profit is maximum in the year 1992 = $\frac{10}{30} \times 100 = 33.33\%$

387) (d) Growth in expenditure is maximum in the year 1992 = $\frac{10}{115} \times 100 = 8.7\%$

388) (b) Growth percent in profit in 1995 over 1994 = $\frac{(70 - 60)}{60} \times 100 = 16.66\%$

∴ Profit in 1996 = $(70 + 70 \times 16.66\%) = ₹ 82$ lakh.

389) (a) Total cloth requirement = Number of shirts × cloth required per shirt
= $(20 + 30 + 30 + 10 + 10) \times 1000 \times 1.5 = 150000$ m.

- 390)** (b) Total low quality cloth consumed

$$= 1.5(30000 \times 30\% + 30000 \times 30\% + 10,000 \times 40\% + 10,000 \times 90\%)$$

$$= 46,500 \text{ m}$$
- 391)** (c) Quantity used for A-type shirt made of high cloth

$$= (20000 \times 80\%) \times 1.5 = 24000 \text{ m}$$
- 392)** (d) No relationship between type of shirt and cloth used and type of shirt and dye used, hence no relationship between can be found between type of cloth and dye used.
- 393)** (b) Low quality dye used for C-type shirt

$$= (30000 \times 40\%) = 12000 \text{ unit}$$

 Low quality die used for D-type shirt

$$= (10000 \times 60\%) = 6000 \text{ unit}$$

 Hence, required ratio = $\left(\frac{12000}{6000}\right) = 2 : 1$
- 394)** (b) Both the machines work for 8 h per day. Hence, maximum number of unit can be produced if both the machines produce product Q. Hence, number of unit produced

$$= \frac{8 \times 60}{6} + \frac{8 \times 60}{6} = 160.$$
- 395)** (d) Since, efficiency of machine M_1 is reduced to half, therefore the given table changes as below
- | Product | M_1 | M_2 |
|---------|-------|-------|
| P | 20 | 8 |
| Q | 12 | 6 |
- Now, in order to produce maximum number of unit, Q has to be produced on M_2 as it takes only 6 min per piece. Since, atleast one unit of each has to be produced then it should be produced on machine M_2 as it takes 8 min. In the remaining time i.e., $(480 - 8) = 472$ min. Number of Q unit produced

$$= \frac{472}{6} = 78.$$
 It takes less time to produce Q on M_1 ,
 hence number of unit produced on $M_1 = \frac{8 \times 60}{12} = 40.$
- Hence, maximum number of unit manufactured

$$= (1 + 78 + 40) = 119 \text{ unit.}$$
- 396)** (a) Time required to manufacture 30 unit of P on $M_2 = (30 \times 8) = 240 \text{ min} = 4 \text{ h.}$ Time required to produce 25 unit of Q on $M_1 = (25 \times 6) = 150 \text{ min} = 2.5 \text{ h.}$
- Hence, total time taken

$$= (4 + 2.5) = 6.5 \text{ or } 6 \text{ h } 30 \text{ min.}$$

- 397)** (a) Since, P has to be produced in more number than Q and Since, time taken to produce P is least on M_2 , to maximise the output, the entire time on M_2 has to be utilised for producing P. Number of unit of P produced in this time = $\frac{8 \times 60}{8} = 60$ unit. It is given, that number of unit of Q should be one-third that of P, 20 unit of Q should be manufactured and time taken in doing so on $M_1 = 120 \text{ min.}$ Time left on $M_1 = (480 - 120) = 360.$ Hence, to maximize the out put it is possible to have no idle time on any of the machines .
- 398)** (c) Option (c) gives the least production, hence it is the least efficient way.
- 399)** (c) Highest change in revenue is obtained from journals in the year 1991 i.e. $(47 - 45) = 2.$
- 400)** (a) In 1992, percentage of revenue generated from book

$$= \frac{79}{173} \times 100 = 45\% \text{ (approximately)}$$
- 401)** (b) In 1992, revenue generated from magazines only increased. In 1991, revenue generated increased from magazines and books and in 1990, the revenue increased in all the three categories.
- 402)** (d) Growth of revenue in the year 1992

$$= \frac{(173 - 169)}{169} = 2.36\%$$

 Hence, revenue generated in the year 1993 with the same growth

$$= 173 \times \left(1 + \frac{2.36}{100}\right) = 177 \text{ lakh (approximately)}$$
- 403)** (c) Growth in total revenue

$$= \frac{173 - 150}{150} = 15.33\%$$

$$= 15\% \text{ (approximately)}$$
- 404)** (b) Trade deficit = (Import - Export) is highest in the year 1988-89

$$= (19 - 12) = 7 \text{ billion dollars.}$$
- 405)** (d) From the graph, it is clear that trade deficit is less than that in the succeeding year in 1987-88, 1989-90, 1991-92 and 1993-94 i.e. four yr.
- 406)** (c) Required per cent = $\frac{18}{20} \times 100 = 90\%$
- 407)** (d) Required percentage

$$= \frac{\text{Export in last three years}}{\text{Import in last three years}}$$

$$= \frac{63}{72} \times 100 = 87.5\%$$

$$= 88\% \text{ (approx)}$$

- 408)** (a) Statement II is not true as export earning has remained constant for three year between 1990 and 1993. Statement III is not true as the export in 1994-95 is more than the imports in 1993-94. Statement I is true because the trade deficit in each year is less than the export earning.
- 409)** (a) Required percentage increase in operating profit

$$= \frac{160 - 130}{130} \times 100 = 23\%$$
- 410)** (b) Interest in 1990-91 = 30% of 130

$$= ₹ 39 \text{ lakh}$$

 Interest in 1991-92 = 40% of 160

$$= ₹ 64 \text{ lakh}$$

$$\therefore \text{Difference} = (64 - 39) = ₹ 25 \text{ lakh.}$$
- 411)** (d) As calculated in the previous question, total interest = (39 + 64) = ₹ 103 lakh
 Given that, this interest is calculated on 20% of the borrowed fund.
 Hence, borrowed funds = $\frac{103 \times 100}{20} = ₹ 515 \text{ lakh.}$
- 412)** (d) Retained profit in 1990-91

$$= (25\% \text{ of } 130) = ₹ 32.5 \text{ lakh.}$$

 Retained profit in 1991-92 = (20% of 160)

$$= ₹ 32 \text{ lakh} = \frac{(32.5 - 32)}{32.5} = 1.5\% \text{ decrease.}$$
- 413)** (c) Total dividend earned by shareholders in 1991-92

$$= (8\% \text{ of } 160) = ₹ 12.8 \text{ lakh.}$$
- 414)** (b) From the table, it is clear that maximum percentage decrease is shown by CO m Kolkata which is $= \frac{15}{30} \times 100 = 50\%$.
- 415)** (b) In Mumbai, two products i.e. CO and MT increased their market share, in Kolkata two products BN and MT increased their market share, in Chennai one product ie, HD increased their market share and in Delhi none of the products increased the market share.
- 416)** (d) The market share of any of the four products did not decrease between 1993-94 in any city.
- 417)** (a) None of the products has 100% market share.
- 418)** (b) Only product MT doubled its market share in Kolkata in 1993-94.
- 419)** (d) Tax = (Profit before tax) – (Dividends + Retained earnings)
 Hence, tax for the year 1991, 1992, 1993 and 1994 are 145, 70, 220 and 280 respectively. It is therefore, clear that tax per rupee of 'profit before tax' for the year 1994 = $\frac{280}{790} = 0.35$ is the lowest.
- 420)** (a) Sales per rupee of share capital

$$= \frac{\text{Sales}}{\text{Share capital}} = \frac{3270}{98} = 33.36 \text{ for 1991 is the maximum.}$$
- 421)** (d) Profit before tax per rupee of sales was highest in the year 1994 is $= \frac{790}{6435} = 0.12$.
- 422)** (a) Percentage addition to reserves in the year 1991, 1992, 1993 and 1994 is

$$\frac{140}{80} \times 100 = 175\%, \frac{70}{220} \times 100 = 31\%, \frac{245}{290} \times 100 = 84\%,$$

$$\frac{400}{535} \times 100 = 75\% \text{ respectively.}$$
- 423)** (a) Amount of reserves at the end of 1994

$$= (80 + 140 + 70 + 245 + 400)$$

$$= 935 \text{ lakh.}$$
- 424)** (b) Wages of 1st week = Days $\times$ Working hours $\times$ Wage per hour = ₹ 600
 Wages of IIInd week = Days $\times$ Working hours $\times$ Wage per hour

$$= 6 \times 2 \times 10 = ₹ 120$$

 Likewise, wages of IIIrd week = ₹ 600 and that of IVth week = ₹ 120.
 Hence, total wages for four weeks

$$= (600 + 600 + 120 + 120) = ₹ 1440.$$
- 425)** (c) Salary for first month = ₹ 1440 (as calculated earlier)
 Salary for second month

$$= 2 \times (7 \times 6 \times 20) + 2(3 \times 6 \times 10) = ₹ 2040$$

 Salary for third month

$$= 2 \times (6 \times 6 \times 20) + 2(4 \times 6 \times 10) = ₹ 1920$$

 Salary for fourth month

$$= 2 \times (8 \times 6 \times 20) = ₹ 1920$$

 Hence, average salary for four months

$$= ₹ 1830.$$
- 426)** (d) Salary for the third month under old, working condition = ₹ 1920 and salary for the third month under new working condition.

$$2 \times (6 \times 6 \times 25) + 2 \times (4 \times 6 \times 12.5)$$

$$= 6(4 \times 5 \times 2 \times 6 \times 5 \times 2) = 1800$$

 Hence, change in salary = (1920 – 1800) = ₹ 120
- 427)** (d) Under new conditions, salary for the first month

$$= 1440$$

 Salary for the second month = 2440
 Salary for the third month = 1800
 And salary for the fourth month = 4320
 Hence, total salary for the four months

$$= (1440 + 2440 + 1800 + 4320) = ₹ 9600$$

- 428) (d)** Total number of engineering colleges in 1989-90

$$= (180 + 130 + 70 + 40) \\ = 420 \times 1000 \\ = 43000$$

- 429) (c)** Growth rate of government engineering college between 88-89 and 89-90

$$= \frac{120 - 80}{80} \times 100 = 50\%.$$

Growth rate of private engineering college between 88-89 and 89-90

$$= \frac{180 - 120}{120} \times 100 = 50\%.$$

Hence, the growth rate is equal.

- 430) (d)** Total number of engineering colleges in (1990-91)

$$= (250 + 140 + 80 + 60) \\ = 530 \times 1000 = 53000$$

Therefore, member of engineering colleges in 1991-92 = $53000 \times 0.90 = 47700$. None of the option shows the figure close to it.

- 431) (d)** Percentage of IITians

$$= \frac{60}{530} \times 100 = 12\% \text{ (approx)}$$

- 432) (c)** Growth rate of sales of primary books from 1997 to 1980

$$= \frac{68718 - 42137}{42137} \times 100 = 63\%.$$

- 433) (c)** From the table, it is clear that higher secondary categories shows the lowest growth rate

$$= \frac{82175 - 65303}{65303} \times 100 = 25.83\%$$

- 434) (b)** Highest growth rate is shown by secondary book

$$= \frac{20177 - 8820}{8820} \times 100 = 128\%$$

- 435) (d)** Graduate level category shows the consistent growth.

- 436) (c)** Total protein = 20% of total body weight and skin and muscular protein = 30% of total proteins. Therefore, the percentage of skin and muscular protein as a fraction of the total body weight = $20\% \text{ of } 30\% = 6\% = \frac{3}{50}$

- 437) (a)** Required ratio = $22:50 = 11:25$

- 438) (d)** Data are not adequate to answer the question.

- 439) (a)** Required proportion = $\frac{20}{100} = \frac{1}{5}$.

- 440) (d)** Food related exports in

$$1985 - 86 = 0.23 \times 25800 = 5934.$$

Hence, food related exports in

$$1984 - 95 = (5934 - 1006) = 4,928$$

Hence, percentage of food related exports in

$$84 - 85 = \frac{4928}{22400} = 22\%.$$

- 441) (b)** Manufactured articles and raw material exports in

$$1984 - 85 = (22400 - 4928) = ₹ 17472 \text{ crore.}$$

Since, it is given that export in manufactured goods is twice that of raw material, hence ₹ 17472 will have to be apportioned in the ratio 2:1.

Hence, export of manufactured goods

$$= \frac{2}{3} \times 17472 = ₹ 11648 \frac{1}{3} \times 17,472 = ₹ 5824$$

- 442) (b)** The ratio of manufactured articles and raw material = 4:3 and combined percentage of manufactured articles and raw material = 77%.

Therefore, export of manufactured articles = 44% and export of raw material = 33%.

Hence, value of manufactured articles

$$= 25800 \times \frac{44}{100} = 11352 \text{ and value of raw}$$

material = ₹ 8514 crore.

Therefore, required percentage difference

$$= \frac{8514 - 5824}{5824} = 46.18\%.$$

- 443) (a)** Required change in value of exports

$$= (11648 - 11352) = ₹ 296 \text{ crore.}$$

- 444) (c)** From the graph, it is clear that solubility for potassium nitrate at 39° C is maximum i.e. 0.48.

- 445) (c)** Solubility of potassium nitrate at 39° C is 0.39 kg/L. Hence, for 10 L the solubility = $0.39 \times 10 = 3.9$.

- 446) (d)** Solubility of Potassium chlorate at 30° C and 80° C is 0.15 and 4 kg/L respectively. Hence, required change

$$= \frac{4 - 0.15}{0.15} \times 100 = 166\%.$$

- 447) (d)** Amount of potassium chloride that can be dissolved in 100 L at 30° C = $0.4 \times 100 = 40 \text{ kg.}$

$$\therefore \text{Number of moles} = \frac{490}{0.07456} = 533.$$

- 448) (c)** From the figure, it is very clear that the max rise is shown by the graph representing sodium chlorate from 15° C to 25° C.

Hence, option (c) is the answer.

- 449) (d)** The demand of hydropower decreases over the period 1990 - 2010 in Asia.

$$= \frac{1}{10} \times 100 = 10\%, \frac{1.5}{20} \times 100 = 7.5\%, \frac{2}{33.3} \times 100 = 6\%.$$

- 450)** (a) Natural gas registered a constant proportion in the total energy demand of the world and registered an increase proportion in the total energy demand in Asia.
- 451)** (b) It is clear from the data given that two items namely petroleum and solid fuels acquire major share in total energy for world and Asia as well.
- 452)** (a) It is petroleum which shows increase over the decade 1990–2000.

	1990	2000
World	33%	35%
Asia	40%	50%

and shows decrease over the decade 2000–2010.

	1990	2000
World	35%	32%
Asia	50%	45%

Solutions (Q. Nos. 453-457) Females students = 32 which is 40% of total students. Hence, total number of students = $\frac{32}{0.4} = 80$.

Hence, males = $(80 - 32) = 48$. It is further given, that half the students were either excellent or good and one third of the male students were average. Hence, the table can be completed as under

	Performance			Total
	Average	Good	Excellent	
Male	16	22	10	48
Female	24	8	—	32
Total	40	30	10	80

- 453)** (a) There is no female excellent student in the class.
- 454)** (b) Proportion of good male students = $\frac{22}{30} = 0.73$.
- 455)** (b) Proportion of good female students = $\frac{8}{30} = 0.26$
- 456)** (c) There are 22 male students who are good.
- 457)** (d) Ratio of average male to average female = $16:24 = 2:3$.

Solutions (Q. Nos. 458-461) It is given that Soumya was the last sister to walk in and she ate 3 cookies. It is, therefore, clear that total number of cookies before Soumya walked in = $3 \times 4 = 12$

	Balance Before	Sweta	Swarna	Sneha	Soumya	Balance after
Last Round	12	3	3	3	3	0
IIIrd Round	$x - \frac{3x}{4} = 12 \Rightarrow x = 48$	12	12	12	0	12
IInd Round	$x - \frac{2x}{4} = 48 \Rightarrow x = 96$	24	24	0	0	48
Ist Round	$x - \frac{x}{4} = 96 \Rightarrow x = 128$	32	0	0	0	96
Total		71	39	15	3	128

458) (c) Sneha ate in all 15 cookies.

459) (c) Swarna ate in all 39 cookies.

460) (d) Sweta ate in all 71 cookies.

461) (a) Total number of cookies given by uncle Prem = 128.

462) (b) Simple annual growth rate of total assets between 1990–93 = $\frac{(30-22)}{22 \times 3} \times 100 = 12\%$.

463) (b) From the graph it is very clear that in the year 1991-92. Net current assets shows the growth rate in any two consecutive year.

464) (c) Investments show the positive growth in every year between 1900 and 1993.

465) (c) Clearly, item investment shows highest growth between 1991 and 1922.

Solutions (Q. Nos. 466-469) On the basis of the information given in the question Sales, Expenses and Profit for all the four companies can be calculated as under

Company	Sale	Expenses	Profit
ANT	10	9	1
BAT	12	9.6	2.4
CAT	12	10	2
DAT	6	4	2

466) (d) Company DAT had the lowest sales only ₹ 6 lakhs.

467) (b) Company BAT had the highest profit.

468) (b) Expenses for the company BAT were highest.

469) (a) Lowest profit is shown by company ANT.

ENGLISH USAGE

- Odd One Out
- Word Usage
- Error Detection
- Summarising
- Sentence Correction/Improvement
- Decision Making, One Word Substitution
- Paragraph Conclusion/Completion
- Fillers
- Analogy

Odd One Out

Directions (Q. Nos. 1-3) *Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent paragraph. Identify the odd one out. Choose its number as your answer. (2016)*

- 1) 1. Man, whether civilised or savage is a child of nature, he is not the master of nature.
2. He must conform his actions to certain natural laws if he is to maintain his dominance over his environment.
3. Civilised man was nearly always able to become master of his environment temporarily.
4. When he tries to circumvent the laws of nature, he usually destroys the natural environment that sustains him.
5. And when his environment deteriorates rapidly, his civilisation declines.
- 2) 1. It is a bonding process with the entire situation where you, your car and its name make the entire equation.
2. Good car names are catchy and fit the product such as the Beetle or the Mini.
3. Marketing departments of car companies spend a lot of time and money thinking up names for cars.
4. The car you drive tells the world about your status. How much money you have and the socio-economic group you belong to (or want to belong to).
5. The name should be a reflection of the brand product and target group.

- 3) 1. *Impatiens psittacina* is a very rare species of a perennial flowering balsam plant from South-East Asia.
2. Without its exotic light purple and carmine red parrot flowers the plant has few redeeming ornamental features looking more like a tall weed than a prized ornamental possession.
3. Seeds of *Impatiens psittacina* were presented to the Royal Gardens in 1899 and the plants flowered in 1900.
4. It is called the parrot flower because its flower bears a resemblance to a parrot in flight when viewed from the side.
5. In Thai, this species is known as “Dork Nok Kheaw” which translates to “Flower Bird Parrot”.

Directions (Q.Nos. 4-9) *Answer the questions based on the following information.*

In the following questions, a set of four words has been given. Three of the words are related in some way. You have to select the word that does not fit in the relation. (1997)

- 4) (a) Keen (b) Kin
(c) Enthusiastic (d) Willing
- 5) (a) Adept (b) Adapt
(c) Skilful (d) Proficient
- 6) (a) Ring (b) Round
(c) Bell (d) Circle

- 7) (a) Computer (b) Internet
(c) Grid (d) Network

- 8) (a) Suffer (b) Endure
(c) Bear (d) Withstand

- 9) (a) Break (b) Hiatus
(c) Chasm (d) Bridge

Directions (Q.Nos. 10-14) Answer the questions based on the following information.

Find the odd word out from each of the following sets of four words. (1996)

- 10) (a) Impetuosity (b) Equanimity
(c) Zealousness (d) Effervescence

- 11) (a) Drip (b) Intrusion
(c) Percolation (d) Effluence

- 12) (a) Duplicity (b) Guilelessness
(c) Artfulness (d) Shrewdness

- 13) (a) Taxi (b) Cruiser
(c) Amble (d) Cab

- 14) (a) Hiatus (b) Break
(c) Pause (d) End

Directions (Q.Nos. 15-24) Answer the questions based on the following information.

In the following questions, a set of four words is given. Three of the words are related in some way, the remaining word is not related to the rest. You have to pick the word which does not fit in the relation and mark that as your answer: (1995)

- 15) (a) Couple (b) Sever
(c) Rend (d) Lacerate

- 16) (a) Quell (b) Ruffle
(c) Allay (d) Control

- 17) (a) Cease (b) Launch
(c) Initiate (d) Commence

- 18) (a) Brink (b) Hub
(c) Verge (d) Brim

- 19) (a) Eulogy (b) Panegyric
(c) Ignominy (d) Glorification

- 20) (a) Detest (b) Abhor
(c) Ardour (d) Loathe

- 21) (a) Adroit (b) Adept
(c) Dexterous (d) Awkward

- 22) (a) Taciturn (b) Reserved
(c) Clamorous (d) Silent

- 23) (a) Sporadic (b) Frequent
(c) Intermittent (d) Scarce

- 24) (a) Fanatic (b) Zealot
(c) Maniac (d) Rational

Directions (Q.Nos. 25-29) Answer the questions based on the following information.

Each question has four items. Mark the one that does not belong to this group. (1993)

- 25) (a) Abstract (b) Conceptual
(c) Material (d) Ideational

- 26) (a) Ring (b) Shoulder
(c) Finger (d) Write

- 27) (a) Apt (b) Relevant
(c) Appropriate (d) Adept

- 28) (a) Equestrian (b) Neigh
(c) Derby (d) Bark

- 29) (a) Invoice (b) Sales Tax
(c) Octroi (d) Quotation

Summarising

Directions (Q. Nos. 30-32) Given below is a short test. Write its summary in about 30-35 words. (2015)

- 30) You seemed at first to take no notice of your school-fellows, or rather to set yourself against them because they were strangers to you. They knew as little of you as you did of them; this would have been the reason for their keeping a loof from you as well, which you would have felt as a hardship. Learn never to conceive a prejudice

against others because you know nothing of them. It is bad to prejudice and makes enemies of half the world. Do not think ill of them till they behave ill to you; and then strive to avoid the faults which you see in them. This will disarm their hostility sooner than pique or resentment or complaint.

- 31) Local communities have often come in conflict with agents trying to exploit resources, at a faster pace, for an expanding commercial-industrial

economy. More often than not, such agents of resource intensification are given preferential treatment by the state, through the grant of generous long leases over mineral or fish stocks, etc, or the provision of raw material at an enormously subsidised price. With the injustice so compounded, local communities at the receiving end of this process have no recourse except direct action, resisting both the state and outside exploiters through a variety of protechniques. These struggles might perhaps be seen as a manifestation of a new kind of class conflict.

- 32) Physically, inertia is a feeling that you just can't move; mentally, it is a sluggish mind. Even if you try to be sensitive, if your mind is sluggish, you just don't feel anything intensely. You may even see a tragedy enacted in front of eyes and not be able to respond meaningfully. You may see one person exploiting another, one group persecuting another, and not be able to get angry. Your energy is frozen. You are not deliberately refusing to act; you just don't have the capacity.

Directions (Q.Nos. 33-34) *Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.* (2004)

- 33) You seemed at first to take no notice of your school-fellows, or rather to set yourself against them because they were strangers to you. They knew as little of you as you did of them; this would have been the reason for their keeping aloof from you as well, which you would have felt as a hardship. Learn never to conceive a prejudice against others because you know nothing of them. It is bad reasoning, and makes enemies of half the world. Do not think ill of them till they behave ill to you; and then strive to avoid the faults which you see in them. This will disarm their hostility sooner than pique or resentment or complaint.

- (a) The discomfort you felt with your school fellows was because both sides knew little of each other. You should not complain unless you find others prejudiced against you and have attempted to carefully analyse the faults you have observed in them.
- (b) The discomfort you felt with your school fellows was because both sides knew little of each other. Avoid prejudice and negative thoughts till you encounter bad behaviour from others, and then win them over by shunning the faults you have observed.
- (c) You encountered hardship amongst your school fellows because you did not know them well. You should learn to not make enemies because of your prejudices irrespective of their behaviour towards you.

- (d) You encountered hardship amongst your school fellows because you did not know them well. You should learn to not make enemies because of your prejudices unless they behave badly with you.

- 34) The human race is spread allover the world, from the polar regions to the tropics. The people of whom is made up eat different kinds of food, partly according to the climate in which they live, and partly according to the kind of food which their country produces. In hot climates, meat and fat are not much needed; but in the Arctic regions they seem to be very necessary for keeping up the heat of the body. Thus, in India, people live chiefly on different kinds of grains, eggs, milk or sometimes fish and meat. In Europe, people eat more meat and less grain. In the Arctic regions, where no grains and fruits are produced, the Eskimo and other races live almost entirely on meat and fish.

- (a) Food eaten by the people in different regions of the world depends on the climate and produce of the region, and varies from meat and fish in the Arctic to predominantly grains in the tropics.
- (b) Hot climates require people to eat grains while cold regions require people to eat meat and fish.
- (c) In hot countries people eat mainly grains while in the Arctic, they eat meat and fish because they cannot grow grains.
- (d) While people in Arctic regions like meat and fish and those in hot regions like India prefer mainly grains, they have to change what they eat depending on the local climate and the local produce.

Directions (Qs. 35-37) *Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.* (2004)

- 35) Although almost all climate scientists agree that the Earth is gradually warming, they have long been of two minds about the process of rapid climate shifts within larger periods of change. Some have speculated that the process works like a giant oven or freezer, warming or cooling the whole planet at the same time. Others think that shifts occur on opposing schedules in the Northern and Southern Hemispheres, like exaggerated seasons. Recent research in Germany examining climate patterns in the Southern Hemisphere at the end of the last Ice-Age strengthens the idea that warming and cooling occurs at alternate times in the two hemispheres. A more definitive answer to this debate will allow scientists to better predict when and how quickly the next climate shift will happen.

- (a) Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; research will help find a definitive answer and better predict climate shifts in future.
 - (b) Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; finding a definitive answer will help them better predict climate shifts in future.
 - (c) Research in Germany will help scientists find a definitive answer about warming and cooling of the Earth and predict climate shifts in the future in a better manner.
 - (d) More research rather than debates on warming or cooling of the Earth and exaggerated seasons in its hemispheres will help scientists in Germany predict climate changes better in future.
- 36)** Local communities have often come in conflict with agents trying to exploit resources, at a faster pace, for an expanding commercial-industrial economy. More often than not, such agents of resource -intensification are given preferential treatment by the state, through the grant of generous long leases over mineral or fish stocks, for example, or the provision of raw material at an enormously subsidized price. With the injustice so compounded, local communities at the receiving end of this process have no recourse except direct action, resisting both the state and outside exploiters through a variety of protest techniques. These struggles might perhaps be seen as a manifestation of a new kind of class conflict.
- (a) A new kind of class conflict arises from preferential treatment given to agents of resource intensification by the state which the local community sees as unfair.
 - (b) The grant of long leases to agents of resource-intensification for an expanding commercial-industrial economy leads to direct protests from the local community, which sees it as unfair.
 - (c) Preferential treatment given by the state to agents of resource-intensification for an expanding commercial-industrial economy exacerbates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
 - (d) Local communities have no option but to protest against agents of resource-intensification and create a new type of class conflict when they are given raw material at subsidized prices for an expanding commercial-industrial economy.
- 37)** Modern bourgeois society, said Nietzsche, was decadent and enfeebled - a victim of the excessive development of the rational faculties at the expense of will and instinct. Against the liberal-rationalist stress on the intellect, Nietzsche urged recognition

of the dark mysterious world of instinctual desires-the true forces of life. Smother the will with excessive intellectualizing and you destroy the spontaneity that sparks cultural creativity and ignites a zest for living. The critical and theoretical outlook destroyed the creative instincts. For man's manifold potential to be realized, he must forego relying on the intellect and nurture again the instinctual roots of human existence.

- (a) Nietzsche urges the decadent and enfeebled modern society to forego intellect and give importance to creative instincts.
- (b) Nietzsche urges the decadent and enfeebled modern society to smother the will with excessive intellectualising and ignite a zest for living.
- (c) Nietzsche criticizes the intellectuals for enfeebling the modern bourgeois society by not nurturing man's creative instincts.
- (d) Nietzsche blames excessive intellectualization for the decline of modern society and suggests nurturing creative instincts instead.

Directions (Q.Nos. 38-42) *Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.* (2003)

- 38)** Some decisions will be fairly obvious- "no-brainers". Your bank account is low, but you have a two-week vacation coming up and you want to get away to some place warm to relax with your family. Will you accept your in-laws' offer of free use of their Florida beachfront condo? Sure. You like your employer and feel ready to move forward in your career. Will you step in for your boss for three weeks while she attends a professional development course? Of course.
- A. Some decisions are obvious under certain circumstances. You may, for example, readily accept a relative's offer of free holiday accommodation. Or step in for your boss when she is away.
 - B. Some decisions are no-brainers, You need not think when making them. Examples are condo offers from in laws and job offers from bosses when your bank account is low or boss is away.
 - C. Easy decisions are called 'no-brainers' because they do not require any cerebral activity. Examples such as accepting free holiday accommodation abound in our lives.
 - D. Accepting an offer from in-laws when you are short on funds and want a holiday is a no-brainer, Another no-brainer is taking the boss's job when she is away.
- (a) A (b) B (c) C (d) D

- 39) Physically, inertia is a feeling that you just can't move; mentally, it is a sluggish mind. Even if you try to be sensitive, if your mind is sluggish, you just don't feel anything intensely. You may even see a tragedy enacted in front of your eyes and not be able to respond meaningfully. You may see one person exploiting another, one group persecuting another and not be able to get angry. Your energy is frozen. You are not deliberately refusing to act; you just don't have the capacity.
- A. Inertia makes your body and mind sluggish. They become insensitive to tragedies, exploitation, and persecution because it freezes your energy and decapacitates it.
- B. When you have inertia you don't act although you see one person exploiting another or one group persecuting another. You don't get angry because you are incapable.
- C. Inertia is of two types-physical and mental. Physical inertia restricts bodily movements. Mental inertia prevents mental response to events enacted in front of your eyes.
- D. Physical inertia stops your body from moving; mental inertia freezes your energy and stops your mind from responding meaningfully to events, even tragedies, in front of you.
- (a) A (b) B
(c) C (d) D
- 40) Try before you buy. We use this memorable saying to urge you to experience the consequences of an alternative before you choose it, whenever this is feasible. If you are considering buying a van after having always owned sedans, rent one for a week or borrow a friend's. By experiencing the consequences first hand, they become more meaningful. In addition, you are likely to identify consequences you had not even thought of before. May be you will discover that it is difficult to park the van in your small parking space at work, but that your elderly father has a much easier time getting in and out of it.
- A. If you are planning to buy a van after being used to sedans, borrow a van or rent it and try it before deciding to buy it. Then you may realize that parking a van is difficult while it is easier for your elderly father to get in and out of it.
- B. Before choosing an alternative, experience its consequences if feasible. If, for example, you want to change from sedans to a van, try one before buying it. You will discover aspects you may never have thought of.
- C. Always try before you buy anything. You are bound to discover many consequences. One of the consequences of going in for a van is that it is more difficult to park than sedans at the office car park.
- D. We urge you to try products such as vans before buying them. Then you can experience consequences you have not thought of such as parking problems. But your father may find vans more comfortable than cars.
- (a) A (b) B
(c) C (d) D
- 41) It is important for shipping companies to be clear about the objectives for maintenance and materials management-as to whether the primary focus is on service level improvement or cost minimization. Often when certain systems are set in place, the cost minimization objective and associated procedure become more important than the flexibility required for service level improvement. The problem really arises since cost minimization tends to focus on out of pocket costs which are visible, while, the opportunity costs, often greater in value, are lost sight of.
- A. Shipping companies have to either minimize costs or maximize service quality. If they focus on cost minimization, they will reduce quality. They should focus on service level improvement, or else opportunity costs will be lost sight of.
- B. Shipping companies should determine the primary focus of their maintenance and materials management. Focus on cost minimization may reduce visible costs, but ignore greater invisible costs and impair service quality.
- C. Therefore, shipping companies must be clear about the primary focus of their maintenance and materials management before embarking on cost minimization.
- D. Shipping companies should focus on quality level improvement rather than cost cutting. Cost cutting will lead to untold opportunity costs. Companies should have systems in place to make the service level flexible.
- (a) A (b) B
(c) C (d) D
- 42) In the given question, all the sentences except of sentence, when properly sequenced from a coherent paragraph. Each sentence is labelled with a letter. Choose the sentence which does not form a part of the paragraph from among the four given choices.

- A. The revolution called Human Relations is quieter but more profound and is sweeping through industry.
- B. Gradually, men felt themselves swallowed by a vast, impersonal machine, which rubbed away their self-respect and, in a way, their identities.
- C. In anger against betrayal of the human spirit by the Industrial Revolution, millions of workers listened to the false promises of Marx's philosophy.
- D. The Industrial Revolution, replacing the tools of the independent workmen with machines, had transformed handicraftsmen who were their own bosses into hired hands subject to the orders of managers. (2011)
- (a) A (b) B
(c) C (d) D

Paragraph Conclusion/Completion

Directions (Q. Nos. 43-45) *The passage given below is followed by four alternative summaries. Choose the option that best captures the essence of the passage. Key in the number of the option you choose as your answer.* (2016)

- 43) Local communities have often come in conflict with agents trying to exploit resources at a faster pace for an expanding commercial-industrial economy. More often than not, such agents of resource-intensification are given preferential treatment by the state, through the grant of generous long leases over mineral or fish stocks for example or the provision of raw material at an enormously subsidised price. With the injustice so compounded, local communities at the receiving end of this process have no resource except direct action, resisting both the state and outside exploiters through a variety of protest techniques. These struggles might perhaps be seen as a manifestation of new kind of class conflict.
1. A new kind of class conflict arises from preferential treatment given to agents of resource-intensification by the state which the local community sees as unfair.
 2. The grant of long leases to agents of resource-intensification for an expanding commercial-industrial economy leads to direct protests from the local community, which sees it as unfair.
 3. Preferential treatment given by the state to agents of resource-intensification for an expanding commercial industrial economy exacerbates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
 4. Local communities have no option but to protest against agents of resource-intensification and create a new type of class conflict when they are given raw material at subsidised prices for an expanding commercial-industrial economy.
- 44) Modern bourgeois society said Nietzsche was decadent and enfeebled - a victim of the excessive development of the rational faculties at the expense of will and instinct against the liberal-rationalist-stress on the intellect. Nietzsche urged recognition of the dark mysterious world of instinctual desires - the true force of life. Smother the will with excessive intellectualising and you destroy the spontaneity that sparks cultural creativity and ignites a zest for living. The critical and theoretical outlook destroyed the creative instincts. For man's manifold potential to be realised he must forego relying on the intellect and nurture again the instinctual roots of human existence. (2016)
1. Nietzsche urges the decadent and enfeebled modern society to forego intellect and give importance to creative instincts.
 2. Nietzsche urges the decadent and enfeebled modern society to smother the will with excessive intellectualising and ignite a zest for living.
 3. Nietzsche criticises the intellectuals for enfeebling the modern bourgeois society by not nurturing man's creative instincts.
 4. Nietzsche blames excessive intellectualisation for the decline of modern society and suggests nurturing creative instincts instead.
- 45) Although almost all climate scientists agree that the Earth is gradually warming, they have long been of two minds about the process of rapid climate shifts within larger periods of change. Some have speculated that the process works like a giant oven or freezer warming or cooling the whole planet at the same time. Others think that shifts occur on opposing schedules in the Northern and Southern Hemispheres, like exaggerated seasons. Recent research in Germany examining climate patterns in the Southern

Hemisphere at the end of the last Ice Age strengthens the ideas that warming and cooling occurs at alternate times in the two hemispheres. A more definitive answer to this debate will allow scientists to better predict when and how quickly the next climate shift will happen.

1. Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; research will help find a definitive answer and better predict climate shifts in future.
2. Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres finding a definitive answer will help them better predict climate shifts in future.
3. Research in Germany will help scientists find a definitive answer about warming and cooling of the Earth and predict climate shifts in the future in a better manner.
4. More research rather than debates on warming or cooling of the Earth and exaggerated seasons in its hemispheres will help scientist in Germany predict climate changes better in future.

Directions (Q. Nos. 46-49) *There are four short passages given below in which the concluding statement has been missing. For the missing statement four options are given, out of which only one is correct. Choose the correct one.* (2014)

- 46) He walked into the showroom dressed in shorts and his simplest outfit. All the sales people around him ignored him. So, he showed himself around and walked around the car on display. He was ready to place a booking even without test driving the car... but there wasn't anyone who wanted to approach him to take his booking. So, finally he walked over to the other end of the showroom where the lower end Mercedes C-class were all on display. Immediately, a salesperson approached him and introduced himself as Kee. He then walked with my uncle through the C-class and told all its features. Kee wasn't the smoothest of car salesman. By the way he spoke English, you could tell English probably wasn't his first language but he knew his facts and seemed honest in his recommendations. When Kee was done with his run down of the C-class, my uncle's friend finally told him that he wanted to book the higher end flagship S-class right there and then. Kee looked a little disappointed and said 'I'm sorry sir I can't sell you the S- class. For that, I need to pass you on to my colleague. He then later went on to explain why.

My uncle cannot remember exactly why but perhaps it was something to do with Kee being a junior salesperson, so he wasn't allowed to sell the higher end cars. My uncle's friend didn't give up.

He thought why should he give the sale and the commission then to a so-called higher ranking salesperson who didn't seem to given a damn about him when he walked in. So, he asked to see Kee's manager. When his manager came by he said, "I want to buy the S-class right now but I only want to buy it from Kee".

- (a) The manager would have given Kee a big blow and would have fired him.
- (b) The manager would have fired all his salesman who ignored the potential buyer.
- (c) The manager might have got very impressed with his salesman Kee.
- (d) The manager would have sold the car instantly with Kee being the salesman.

- 47) Water conservation is a big thing, but every little bit helps, so don't think that what you do doesn't matter. A whole lot of people doing a little bit adds up to a whole lot. We must all make changes in our lifestyles that will change the course of our water and its quality. Water conservation needs to be a way of life, not just something we think about once in a while.

If we all do our part in conserving water, we can make a huge difference for the environment. Water conservation means using our water wisely and caring for it properly. Since each of us depends on water for life, it is our responsibility to learn more about water conservation and how we can help keep our water pure and safe for generation to come. Since we all enjoy the benefits of having pure, clean water, we must help conserve water, so that we may continue to enjoy these benefits.

- (a) Water is not in plenty and hence needs to be protected
- (b) Water conservation is important for the environment
- (c) Both 'a' and 'b'
- (d) None of the above

- 48) Over the last three decades, secular states, virtually everywhere, have come under strain. Hardly surprising, political secularism, the doctrine that defends them, has been subjected to severe criticism. Some scholars have concluded that this critique is ethically and morally so profound and justified that it is time to abandon political secularism. I reject this conclusion. I argue that the criticism of secularism looks unanswerable only because critics have focused on

mainstream conceptions developed in largely religiously homogenous societies. It is time we shifted the focus away from doctrines underpinning some Western secular states towards the normative practices of a wide variety of states, including the best practices of non-Western states, such as India. Once we do this, we will begin to see secularism in a new light, as an ethical and moral perspective criticising, not religion as such but religious homogenisation and institutional domination. Of all available alternatives, secularism remains our best bet to help us deal with ever deepening religious diversity and the problems endemic to it.

- (a) Political secularism needs to be abandoned
- (b) Ethical and moral secularism should be practised
- (c) Religious diversity should be maintained
- (d) None of the above

- 49) Unfortunately, animals can't talk to us, so we have to learn to read their behaviour, to understand their needs and we have to apply the findings of science to provide for their welfare. This requires practical experience as well as academic understanding, which in traditional degree programmes is hard to achieve. The Foundation Degree in Animal Management has been specifically designed for study either part-time for people working in animal management environments, so, they can stay in employment and earn a degree directly related to their work; or full-time for students aspiring to a career in animal management industries.
- (a) Animals should be studied by everyone
 - (b) There are ample opportunities for employment in a zoo
 - (c) It is always desirable to acquaint oneself who aspires to be involved in the work of animal management
 - (d) Universities must offer the courses on animal management

Directions (Q.Nos. 50-52) A paragraph is given below from which the last sentence is missing. From the given options, choose the one that completes the paragraph in the most appropriate way. (2013)

- 50) The computer industry's estimate that it loses millions of dollars when users illegally copy programs without paying for them is greatly exaggerated. Most of the illegal copying is done by people with no serious interest in the programs. Thus the loss to the industry is quite small, because
- (a) many users who illegally copy programs never find any use of them

- (b) most people who illegally copy programs would not purchase them even if purchasing them were the only way to obtain them
- (c) even if the computer industry received all the revenue it claims to be losing, it would still be experiencing financial difficulties
- (d) the total market value of all illegal copies is low in comparison to the total revenue of the computer industry

- 51) Some sociologists believe that religious sects such as the California based waiters, who believe the end of the world is imminent and seek to purify their souls by, among other things, abstaining completely from sexual relations are a product of growing disaffection with modern, industrialised and urbanised living. As evidence, they cite the fact that there are no other active organisations of the same type which are more than 50 or 60 years. The evidence however, fails to support the conclusion for
- (a) the restrictions on sexual relations are such that the only source of new members is outside recruitment, so such sects tend to die out after a generation or two
 - (b) it is simply not possible to gauge the intensity of religious fervour by the length of time the religious sect remains viable
 - (c) the waiters group may actually survive beyond the second generation of its existence
 - (d) there are other religious sects that emphasize group sexual activity which currently have several hundred members
- 52) In a survey of job applicants, two-fifths admitted to being atleast a little dishonest. However, the survey may under-estimate the proportion of job applicants who are dishonest, because
- (a) some dishonest people taking the survey might have claimed on the survey to be honest
 - (b) some generally honest people taking the survey might have claimed on the survey to be dishonest.
 - (c) some people who claimed on the survey to be atleast a little dishonest may be very dishonest.
 - (d) some people who claimed on the survey to be dishonest may have been answering honestly.

Directions (Q. Nos. 53-54) Each of the following questions has a paragraph from which a sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way. (2012)

- 53) RD Laing developed a broad range of thought on interpersonal psychology. This deals with interactions between people, which he considered important, for an ethical action always occurs between one person and another. In books such as

The Politics of Experience, he deal with issues concerning how we should relate to persons labelled by the psychiatric establishment as “schizophrenic”.

- (a) He came to be seen as a champion for the rights of those considered mentally ill
- (b) He spoke out against (and wrote about) practices of psychiatrists which he considered inhumane or barbaric, such as electric shock treatment
- (c) Laing also did work in establishing true asylums as places of refuge for those who feel disturbed and want a safe place to go through whatever it is they want to explore in themselves and with others
- (d) He suggested that the effects of psychiatric drugs (some of which are very deleterious, such as tardive dyskinesia) be called just that: ‘effects’ and not be referred to by the preferred euphemisms of the drug companies, who prefer to call them ‘side effects’

- 54)** Jurisprudence is the theory and philosophy of law. Students of jurisprudence aim to understand the fundamental nature of law and to analyse its purpose, structure and application. Jurisprudential scholars (sometimes confusingly referred to as ‘jurists’ hope to obtain a deeper understanding of the law, the kind of power that it exercises and its role in human societies.

They seek a deeper understanding behind law’s seemingly unpredictable and uncertain nature.

- (a) At a practical level, some jurists hope to improve society by studying what the Law is, what it ought to be, and how it actually operates
- (b) A common starting point in understanding jurisprudence is the objective of law to achieve justice
- (c) Hence, the arguable scientific nature of jurisprudence
- (d) Jurisprudence seeks to draw on unrestricted elements of life and the world to aid the critical study of law

Directions (Q.Nos 55-57) *Given below is a paragraph whose last line is missing. Choose the line which completes the paragraph most logically from the options given below.* (2011)

- 55)** The real change in corporate culture began with the personal computer. With the PC, any employee could have a computer of his or her very own and use it for real work. It simplified applications that were cumbersome with a mainframe even without taking into account the problem of gaining access. A mainframe required a skilled programmer to do things that a non-technical user eventually could

easily do with a spreadsheet on a PC. The forms and macros required to solve problems on PCs were trivial compared to traditional programming in COBOL or other computer languages.

- (a) Soon PCs were ubiquitous among managers and professionals.
- (b) Management Information System (MIS) managers reacted in horror as they saw these rogue computers serving important functions within their corporations.
- (c) These PCs held vital information in inconsistent and inaccessible formats and were not secure from loss or damage.
- (d) Eventually, MIS departments connected PCs to their corporate mainframes, but primarily as replacements for dumb terminals. Some users, however, were more creative.

- 56)** So, the unpleasant shocks that used to affect other people now affect us. Few of us have not been touched on the shoulder lightly or, in some cases, heavily, by the hand of failure. A dozen or more years ago, failure was for the untalented or the unlucky. Today, no one is safe.

- (a) It is a strange irony that while changes in fortune are now more personal, other changes have become less so.
- (b) This, of course, applies to services as well as products.
- (c) Constantly improving products and services is an intrinsic part of staying in business.
- (d) Another is the fact that there are more scientists alive today than ever lived in the history of the world.

- 57)** The remake the world (including Nature), Fourier mobilised : an intolerance (for civilisation), a form (classification), a standard (pleasure), an imagination (the scene), a discourse (his book), all of which pretty well define the action of the signifier or the signifier in action. This action continually makes visible on the page a glaring lack, that of science and politics, that is, of the signified.

- (a) What Fourier lacks points is return to what we ourselves lack when we reject Fourier : to be ironic about Fourier is always even from the scientific point of view to censure the signifier.
- (b) However, the relationship of Desire and Need is not complementary were they fitted one into the other, everything would be perfect, but supplementary; each is the excess of the other.
- (c) The excess : what does not pass through.
- (d) The vomiting of politics is what Fourier calls Invention.

Directions (Q. 58-60) *Each of the following questions has a paragraph from which a question is being asked. From the given options that answers the question in the most appropriate way.* (2009)

- 58)** Lycopene, glutathione and glutamine are powerful antioxidants that neutralise the free radicals that are produced in the body as a result of routine bodily processes. An excess of these free radicals in your system causes rapid aging because they accelerate the rate of cellular damage. Aging is simply the result of this damage. Thus, to slow down aging it is necessary to supplement your diet with these antioxidants on a daily basis.

Which of the following, if true, most seriously undermines the author's contention?

- (a) Most persons aren't concerned with the effects of aging until it is too late to do anything.
 - (b) Exercise associated with normal daily activities effectively neutralizes and dissipates the free radicals that are produced as a result of routine bodily processes.
 - (c) The cost of antioxidants is exorbitantly high and well beyond the budget of most consumers.
 - (d) Only overweight people who do not exercise on a daily basis are likely to have an excess of free radicals in their systems.
- 59)** Is it wrong for doctors to lie about their patients' illnesses? Aren't doctors just like any other people we hire to do a job for us? Surely, we would not tolerate not being told the truth about the condition of our automobile from the mechanic we hired to fix it, or the condition of our roof from the carpenter we employed to repair it. Just as these workers would be guilty of violating their good faith contracts with us if they were to do this, doctors who lie to their patients about their illnesses violate these contracts as well and this is clearly wrong.
- The conclusion of the argument is best expressed by which of the following?
- (a) Doctors who lie to their patients about their illnesses violate their good faith contracts with their patients.
 - (b) Doctors often lie to their patients about their illnesses.
 - (c) Doctors are just hired workers like mechanics and carpenters.
 - (d) It is wrong for doctors to lie about their patients' illnesses.
- 60)** The Japanese economic model created strong domestic industries through subsidies from its Ministry of Trade and by closing off competitive

foreign firms to its domestic market. This strategy promised to help economic growth by incubating domestic industries, New Japanese industries could count on a known local demand and would be protected from competition by tariffs and other barriers. The program could reduce the amount of imports and therefore improve the nation's balance of trade.

Which of the following, based on the passage above, is a weakness in this economic strategy?

- (a) A protectionist policy will create animosity among other nations.
- (b) Fast growth of small industries will create a class of millionaires and increase the inequality of income.
- (c) Subsidies and import constraints keep domestic prices high and impose a burden on consumers.
- (d) Quotas are more regressive than tariffs.

Directions (Q.Nos. 61-64) *Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.* (2008)

- 61)** Most people at their first consultation take a furtive look at the surgeon's hands in the hope of reassurance. Prospective patients look for delicacy, sensitivity, steadiness, perhaps unblemished pallor. On this basis, Henry Perowne loses a number of cases each year. Generally, he knows it's about to happen before the patient does the downward glance repeated, the prepared questions beginning to falter, the overemphatic thanks during the retreat to the door.
- (a) Other people do not communicate due to their poor observation.
 - (b) Other patients don't like what they see but are ignorant of their right to go elsewhere.
 - (c) But Perowne himself is not concerned.
 - (d) But others will take their place, he thought.
 - (e) These hands are steady enough, but they are large.
- 62)** Trade protectionism, disguised as concern for the climate, is raising its head. Citing competitiveness concerns, powerful industrialised countries are holding out threats of a levy on imports of energy-intensive products from developing countries that refuse to accept their demands. The actual source of protectionist sentiment in the OECD countries is, of course, their current lacklustre economic performance, combined with the challenges posed by the rapid economic rise of China and India in that order.

- (a) Climate change is evoked to bring trade protectionism through the back door.
- (b) OECD countries are taking refuge in climate change issues to erect trade barriers against these two countries.
- (c) Climate change concerns have come as a convenient stick to beat the rising trade power of China and India.
- (d) Defenders of the global economic status quo are posing as climate change champions.
- (e) Today's climate change champions are the perpetrators of global economic inequity.

63) Mattancherry is Indian Jewry's most famous settlement. Its pretty streets of pastel coloured houses, connected by first-floor passages and home to the last twelve saree-and-sarong-wearing, white-skinned Indian Jews are visited by thousands of tourists each year. Its synagogue, built in 1568, with a floor of blue-and-white Chinese tiles, a carpet given by Haile Selassie and the frosty Yaheh selling tickets at the door, stands as an image of religious tolerance.

- (a) Mattancherry represents, therefore, the perfect picture of peaceful co-existence.
- (b) India's Jews have almost never suffered discrimination, except for European colonizers and each other.
- (c) Jews in India were always tolerant.
- (d) Religious tolerance has always been only a facade and nothing more.
- (e) The pretty pastel streets are, thus, very popular with the tourists.

64) Given the cultural and intellectual interconnections, the question of what is 'Western' and what is 'Eastern' (or Indian) is often hard to decide, and the issue can be discussed only in more dialectical terms. The diagnosis of a through as 'purely Western' or 'purely Indian' can be very illusory.

- (a) Thoughts are not the kind of things that can be easily categorized.
- (b) Though 'occidentalism' and 'orientalism' as dichotomous concepts have found many adherents.
- (c) 'East is East and West is West' has been a discredited notion for a long time now.
- (d) Compartmentalizing thought is often desirable.
- (e) The origin of a thought is not the kind of thing to which 'purity' happens easily.

Directions (Q.Nos. 65-67) Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way. (2007)

65) Characters are also part of deep structure. Characters tie events in a story together and provide a thread of continuity and meaning. Stories can be about individuals, groups, projects, or whole organizations, so from an organizational studies perspective, the focal actor(s) determine the level and unit of analysis used in a study. Stories of mergers and acquisitions, for example, are common place. In these stories whole organizations are personified as actors. But these macro-level stories usually are not told from the perspective of the macro-level participants, because whole organizations cannot narrate their experiences in the first person.

- (a) More generally, data concerning the identities and relationships of the characters in the story are required, if one is to understand role structure and social networks in which that process is embedded.
- (b) Personification of a whole organization abstracts away from the particular actors and from traditional notions of level of analysis.
- (c) The personification of a whole organization is important because stories differ depending on who is enacting various events.
- (d) Every story is told from a particular point of view, with a particular narrative voice, which is not regarded as part of the deep structure.
- (e) The personification of a whole organization is a textual device we use to make macro-level theories more comprehensible.

66) Nevertheless, photographs still retain some of the magical allure that the earliest daguerre types inspired. As objects, our photographs have changed; they have become physically flimsier as they have become more technologically sophisticated. Daguerre produced pictures on copper plates; today many of our photographs never become tangible things, but instead remains filed away on computers and cameras, part of the digital either that envelops the modern world. At the same time, our patience for the creation of images has also eroded. Children today are used to being tracked from birth by digital cameras and video recorders and they expect to see the results of their poses and performances instantly. The space between life as it is being lived and life as it is being displayed shrinks to a mere second.

- (a) Yet, despite these technical developments, photographs still remain powerful because they are remainders of the people and things we care about.
- (b) Images, after all, are surrogates carried into battle soldier or by a traveller on holiday.
- (c) Photographs, be they digital or traditional, exist to remind us of the absent, the beloved and the dead.

- (d) In the new era of the digital image, the images also have a greater potential for fostering falsehood and trickery, perpetuating fictions that seems so real we cannot tell the difference.
- (e) Anyway, human nature begin what it is, little time has passed after photography's invention became means of living life through images.

67) Mma Ramotswe had a detective agency in Africa, at the foot of Kgale Hill. These were its assets: a tiny white van, two desks, two chairs, a telephone, and an old typewriter. Then there was a teapot, in which Mma Ramotswe-the only private lady detective in Botswana-brewed redbush tea. And three mugs-one for herself, one for her secretary, and one for the client. What else does a detective agency really need? Detective agencies rely on human intuition and intelligence, both of which Mma Ramotswe had in abundance.

- (a) But there was also the view, which again would appear on no inventory.
- (b) She had an intelligent secretary too.
- (c) No inventory would ever include those, of course.
- (d) She was a good detective and a good woman.
- (e) What she lacked in possessions were more than made up by a natural shrewdness.

Directions (Q.Nos. 68-72) *Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.* (2006)

68) Relations between the factory and the dealer are distant and usually strained as the factory tries to force cars on the dealers to smooth out production. Relations between the dealer and the customer are equally strained because dealers continuously adjust prices-make deals-to adjust demand with supply while maximizing profits. This becomes a system marked by a lack of long-term commitment on either side, which maximizes feelings of mistrust. In order to maximize their bargaining positions, everyone holds back information the dealer about the product and the consumer about his true desires.

- (a) As a result 'deal making' becomes rampant, without concern for customer satisfaction.
- (b) As a result, inefficiencies creep into the supply chain.
- (c) As a result, everyone treats the other as an adversary, rather than as an ally.
- (d) As a result, fundamental innovations are becoming scarce in the automobile industry.
- (e) As a result, everyone loses in the long run.

69) We can usefully think of theoretical models as maps, which help us navigate unfamiliar territory. The most accurate map that it is possible to construct would be of no practical use whatsoever, for it would be an exact replica, on exactly the same scale, of the place where we were. Good maps pull out the most important features and throw away a huge amount of much less valuable information. Of course, maps can be bad as well as good-witness the attempts by medieval Europe to produce a map of the world. In the same way, a bad theory, no matter how impressive it may seem in principle, does little or nothing to help us understand a problem.

- (a) But good theories, just like good maps, are invaluable, even if they are simplified.
- (b) But good theories, just like good maps, will never represent unfamiliar concepts in detail.
- (c) But good theories, just like good maps, need to balance detail and feasibility of representation.
- (d) But good theories, just like good maps, are accurate only at a certain level of abstraction.
- (e) But good theories, just like good maps, are useful in the hands of a user who knows their limitations.

70) In the evolving world order, the comparative advantage of the United States lies in its military force. Diplomacy and international law have always been regarded as annoying encumbrances, unless they can be used to advantage against an enemy. Every active player in world affairs professes to seek only peace and to prefer negotiation to violence and coercion.

- (a) However, diplomacy has often been used as a mask by nations which intended to use force.
- (b) However, when the veil is lifted, we commonly see that diplomacy is understood as a disguise for the rule of force.
- (c) However, history has shown that many of these nations do not practice what they profess.
- (d) However, history tells us that peace is professed by those who intend to use violence.
- (e) However, when unmasked, such nations reveal a penchant for the use of force.

71) I am sometimes attacked for imposing 'rules'. Nothing could be further from the truth. I hate rules. All I do is report on how consumers react to different stimuli. I may say to a copywriter, "Research shows that commercials with celebrities are below average in persuading people to buy products. Are you sure, you want to use a celebrity?" Call that a rule? Or I may say to an art director, "Research suggests that if you set the copy in black type on a white background, more people

will read it than if you set it in white type on a black background.”

- (a) Guidance based on applied research can hardly qualify as ‘rules’.
- (b) Thus, all my so called ‘rules’ are rooted in applied research.
- (c) A suggestion perhaps, but scarcely a rule.
- (d) Such principles are unavoidable, if one wants to be systematic about consumer behaviour.
- (e) Fundamentally it is about consumer behaviour-not about celebrities or type settings.

72) Age has a curvilinear relationship with the exploitation of opportunity. Initially, age will increase the likelihood that a person will exploit an entrepreneurial opportunity because people gather much of the knowledge necessary to exploit opportunities over the course of their lives and because age provides credibility in transmitting that information to others. However, as, people become older, their willingness to bear risks declines, their opportunity costs rise and they become less receptive to new information.

- (a) As a result, people transmit more information rather than experiment with new ideas as they reach an advanced age.
- (b) As a result, people are reluctant to experiment with new ideas as they reach an advanced age.
- (c) As a result, only people with lower opportunity costs exploit opportunity when they reach an advanced age.
- (d) As a result, people become reluctant to exploit entrepreneurial opportunities when they reach an advanced age.
- (e) As a result, people depend on credibility rather than on novelty as they reach an advanced age.

Directions (Q.Nos. 73-76) *Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.*

73) Thus the end of knowledge and the closing of the frontier that it symbolizes are not a looming crisis at all, but merely one of many embarrassing fits of hubris in civilization’s long industry. In the end, it will pass away and be forgotten. Ours are not the first generation to struggle to understand the organizational laws of the frontier, deceive itself that it has succeeded and go to its grave having failed

.....

- (a) One would be wise to be humble
- (b) But we might be the first generation to actually reach the frontier

- (c) But we might be the first generation to deal with the crisis
- (d) However, this time the success is not illusory

74) Most firms consider expert individuals to be too elitist, temperamental, egocentric and difficult to work with. Force such people to collaborate on a high-stakes project and they just might come to fisticuffs. Even the very notation of managing such a group seems unimaginable. So, most organizations fall into default mode, setting up project teams of people who get along nicely

.....

- (a) The result, however, is disastrous
- (b) The result is mediocrity
- (c) The result is creation of experts who then become elitists
- (d) Naturally, they drive innovations

75) The audiences for crosswords and sudoku, understandably, overlap greatly, but there are differences, too. A crossword attracts a more literary person, while sudoku appeals to a keenly logical mind. Some crossword enthusiasts turn up their noses at sudoku because they feel it lacks depth. A good crossword requires vocabulary, knowledge, mental flexibility and sometimes even a sense of humor to complete. It touches numerous areas of life and provides an ‘Aha!’ or two along the way.

- (a) Sudoku, on the other hand, is just a logical exercise each one similar to the last
- (b) Sudoku, incidentally, is growing faster in popularity than crosswords, even among the literati
- (c) Sudoku, on the other hand, can be attempted and enjoyed even by children
- (d) Sudoku, however, is not exciting in any sense of the term

76) Federer’s fifth grand slam win prompted a reporter to ask whether he was the best ever. Federer is certainly not lacking in confidence, but he wasn’t about to proclaim himself the best ever. “The best player of this generation, ye”, he said, “But nowhere close to ever. Just look at the records that some guys have. I’m a minnow.”

.....

- (a) His win against Agassi, a genius from the previous generation, contradicts that
- (b) Sampras, the king of an earlier generation, was as humble
- (c) He is more than a minnow to his contemporaries
- (d) The difference between ‘the best of this generation’ and ‘the best ever’ is a matter of perception

Directions (Q.Nos. 77-79) *Each statement has a part missing. Choose the best option from the found options given below the statement to make up the missing part.*
(2004)

- 77) The ancient Egyptians believed so that when these objects were magically reanimated through the correct rituals, they would be able to function effectively.
- that it was essential that things they portrayed must have every relevant feature shown as clearly as possible.
 - it was essential for things they portray to have had every relevant feature shown as clearly as possible.
 - it was essential that the things they portrayed had every relevant feature shown as clearly as possible.
 - that when they portrayed things, it should have every relevant feature shown as clearly as possible.
- 78) Many people suggest and still others would like to convince people not to buy pirated cassettes.
- to bring down audio cassette prices to reduce the incidence of music piracy, others advocate strong legal action against the offenders.
 - bringing down audio cassette prices to reduce the incidents of music piracy, others are advocating strong legal action against offenders.
 - bringing down audio cassette prices to reduce the incidence of music piracy, others advocate strong legal action against offenders.
 - audio cassette prices to be brought down to reduce incidence of music piracy, others advocate that strong legal action must be taken against offenders.
- 79) Archaeologists believe that the pieces of red-ware pottery excavated recently near Bhavnagar and shed light on a hitherto dark 600-year period in the Harappan history of Gujarat.
- estimated with a reasonable certainty as being about 3400 years old.
 - are estimated reasonably certain to be about 3400 years old.
 - estimated at about 3400 years old with reasonable certainty.
 - estimated with reasonable certainty to be about 3400 years old.

Directions (Q.Nos. 80-83) *Answer the questions based on the following information.*
(1993)

Each question is a logical sequence of statements with a missing link, the location of which is shown parenthetically. From the four choices available you are required to choose the one which best fits the sequence logically.

- 80) People arguing for a position have been known to cast the opposite in an unnecessarily feeble light (.....). People who indulge in this fallacy may be

fearful or ignorant of a strong counter argument. Detecting this fallacy often depends on having already heard a better refutation, or having information which to construct one.

- Casting the opposite as weaker than it really is, is a very effective strategy.
- This portrayal of a refutation as weaker than it really is, is a sure way of proving your point.
- Casting the opposite as weaker than it really is, is not a very effective strategy.
- This portrayal of refutation as weaker than it really is, is unwarranted.

- 81) A deliberation is a form of discussion in which two people begin on different sides of an issue (.....). Then each decides in the light of the other argument whether to adopt the other position, to change his or her position somewhat, or to maintain the same position. Both sides realise that to modify one's position is not to lose, the point is to get closer to the truth of the matter.

- Each person argues his or her position most sincerely.
- The pre-requisite for deliberation to be productive is that persons involved must keep an open mind.
- The purpose is to resolve the issue to the satisfaction of both parties.
- The trick is to state, your viewpoint from a position of strength.

- 82) The question of what rights animals should enjoy is a vexatious one. Hundreds of millions of animals are put to death for human use each year. Contrariwise, it can be argued that slowing down scientific research would retard discovery of antidotes to diseases such as cancer which kill humans and animals alike..... What is super intelligent beings from Alpha Centuari landed on earth and decided to use us for their experiments, arguing that they could save far more of their and our lives by so doing?

- It will benefit both in the long run.
- Is the argument truly fair to animals.
- But the progress of human civilisation cannot be made contingent on some hypothetical rights of animals.
- There is no question of equating human rights with those of animals.

- 83) Many of us live one-eyed lives. We rely largely on the eye of the mind to form our images of reality. It is a mechanical world based on fact and reason (.....). So today more and more of us are opening the other eye, the eye of the heart, looking for realities to which the mind's eye is

blind. This is a world warmed and transformed by the power of love, a vision of community beyond the mind's capacity to see. Either eye alone is not enough. We need 'wholesight', a vision of world in which mind and heart unite.

- (a) It has led to unprecedented scientific growth and material well-being.

- (b) In the nuclear age, our mind-made world has been found flawed and dangerous, even lethal.
(c) The question is irrelevant whether or not there can be seen and reasoned.
(d) We have built our lives based on it because it seemed predictable and safe.

Word Usage

Directions (Q. Nos. 84-85) *In the following questions a word with different usages has been used in four different sentences. Match their usage with the sentence and choose the correct option.* (2014)

84) TURN

(A) Rotate	(1) The plough turned the soil and the farmer was happy.
(B) Away from	(2) It was my turn to throw the ball.
(C) Opportunity	(3) At the station he turned his head from his father.
(D) To bring the lower to the surface	(4) Turn the tap so that it can be opened.

Codes

A	B	C	D	A	B	C	D
(a) 4	3	2	1	(b) 3	2	1	4
(c) 2	1	3	2	(d) 1	4	4	3

85) CELL

(A) A small prison room	(1) The circuit is incomplete without a cell.
(B) A biological unit	(2) The cell is fundamental unit of life.
(C) A battery	(3) The cell of organisation is on strike.
(D) A smaller group of a large organisation	(4) The convict has to spend the night in his cell.

Codes

A	B	C	D	A	B	C	D
(a) 4	3	3	2	(b) 3	2	4	1
(c) 2	1	2	3	(d) 4	2	1	3

Directions (Q. Nos. 86-87) *Read the following information carefully and answer the questions based on that.*

For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D,) with

corresponding usage on the right (E, F, G, H). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages correctly matched. (2013)

86) DIVIDE

A. A difference of separation	E. The cochairman decided to divide his worktime equally between ministership he help at the center and the directorship of the company.
B. To cause to separate into two parts	F. We'll divide the costs equally since we are bound to reap the rewards too in equal proportion.
C. To share	G. I'd like the students to divide into small groups for the purpose of this project.
D. Use different amounts of something for different purposes	H. The divide between the rich and the poor has not been plugged at all, in fact, it is widening by the way.

- (a) A-F, B-G, C-H, D-E
(b) A-G, B-H, C-E, D-F
(c) A-H, B-G, C-F, D-E
(d) A-F, B-E, C-H, D-G

87) BLOW

A. Fail to take advantage	E. I really blew it when I turned down that job offer.
B. Spend extravagantly	F. The business loss was a big blow for the young company.
C. An unexpected bad happening	G. My mother blew up at me when she saw me among those street urchins.
D. To become suddenly angry	H. I blew up half my first salary on buying presents for my friends.

- (a) A-G, B-F, C-H, D-E
(b) A-E, B-H, C-F, D-G
(c) A-H, B-G, C-F, D-E
(d) A-E, B-F, C-G, D-H

Directions (Q. Nos. 88-92) *Find the incorrect usage the word in the following questions.* (2012)

88) SLAM

- (a) I heard the door slam behind him
- (b) She slammed down the phone angrily
- (c) She slammed his face hard
- (d) The ear skidded and slammed into a tree

89) STOP

- (a) The car stopped at the traffic light
- (b) Shantaram immediately stopped what he was doing
- (c) We need more laws to stop pollution
- (d) He is stopped by law from holding a licence

90) TIME

- (a) I can remember very few times when we had to cancel due to ill health
- (b) This is the first time that I have been to London
- (c) The train arrived right on time
- (d) The changing seasons mark the passing of time

91) SOMBRE

- (a) He was dressed in sombre shades of grey and black
- (b) Paul was in a sombre mood
- (c) The year ended on a sombre note
- (d) He is in the sombre position of not having to worry about money

92) CALL

- (a) She payed him a call from the pay phone near her home
- (b) I will call on you tomorrow evening at 7 pm
- (c) Vikram decided to call a meeting to discuss the trade fair
- (d) She felt the call of religion early in her life

Directions (Q.Nos 93-94) *Given below are sentences, each using the question word different ways. Identify the sentence which uses the question word in a grammatically incorrect manner.* (2011)

93) Happen

- (a) Accept it, mistakes will happen
- (b) It happened on a system that worked
- (c) I promise nothing will happen to you
- (d) If so happens I'm going your way

94) Gut

- (a) The fire gutted the building
- (b) The prisoner's letters were gutted by heavy censorship.
- (c) The famous stars spills his guts in his autobiography.
- (d) Climbing that cliff takes a lot of guts.

Directions (Q.Nos. 95-96) *In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.* (2009)

95) Heena wore a beautiful broach (A)/brooch(B) on the lapel of her jacket.

The last scene provided a climactic(A)/climatic(B) ending to the play.

In case I see you engaging in such exceptional(A)/exceptionable(B) behaviour, I will be forced to punish you.

I give my consent(A)/assent(B) to the surgical treatment.

He does not seem to be adverse(A)/averse(B) to helping me out.

(a) BABAA	(b) BABAB
(c) BAAAB	(d) ABABA

96) The ice cream served at the wedding had lots of currents (A)/currants(B) and nuts in it.

If you want to know more about the career option, please meet your councillor(A)/counselor(B).

I would like to advicce(A)/advise(B) you about your insurance policy.

The minister is obliged(A)/compelled(B) to report regularly to a parliamentary board.

His analysis of the situation is far too sanguine(A)/genuine(B).

(a) BBABA	(b) BBAAA
(c) BBBBA	(d) ABBAB

Directions (Q. 97-98) *In each of the questions a word has been used in sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is incorrect or inappropriate.* (2009)

97) Earn

- (a) His fair dealing earned our confidence.
- (b) She earned the reputation as a hard worker.
- (c) A savings account that earns interest on deposited funds, is a good investment.
- (d) He earned a mention in the news.

98) Round

- (a) A round of tear gas shells was fired to disperse the crowd.
 (b) I met her round the corner.
 (c) The doctor is on a hospital round.
 (d) I shall not come round to admitting it.

Directions (Q.Nos. 99-102) *In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.* (2008)

- 99)** Anita wore a beautiful **broach** (A)/**brooch** (B) on the lapel of her jacket.

If you want to complain about the amenities in your neighbourhood, please meet your **councillor** (A)/**counsellor** (B).

I would like your **advice** (A)/**advise** (B) on which job I should choose.

The last scene provided a **climactic** (A)/**climatic** (B) ending to the film.

Jeans that **flair** (A)/**flare** (B) at the bottom are in fashion these days.

- (a) BABAA (b) BABAB (c) BAAAB
 (d) ABABA (e) BAABA

- 100)** The cake had lots of **currents** (A)/**currants** (B) and nuts in it.

If you engage in such **exceptional** (A)/**exceptionable** (B) behaviour, I will be forced to punish you.

He has the same capacity as an adult to **consent** (A)/**assent** (B) to surgical treatment.

The minister is **obliged** (A)/**compelled** (B) to report regularly to a parliamentary board.

His analysis of the situation is far too **sanguine** (A)/**genuine** (B).

- (a) BBABA (b) BBAM (c) BBBBA
 (d) ABBAB (e) BABAB

- 101)** She managed to bite back the **ironic** (A)/**caustic** (B) report on the tip of her tongue.

He gave an impassioned and valid (A)/cogent (B) plea for judicial reform.

I am not **adverse** (A)/**averse** (B) to helping out.

The **coupe** (A)/**coup** (B) broke away as the train climbed the hill.

They heard the bells **peeling** (A)/**pealing** (B) far and wide.

- (a) BBABA (b) BBBAB (c) BAABB
 (d) ABBAA (e) BBBBA

- 102)** We were not successful in *defusing* (A) / *diffusing* (B) the Guru's ideas.

The students **baited** (A)/**bated** (B) the instructor with irrelevant questions. The **hoard** (A)/**horde** (B) rushed into the campus.

The prisoner's **interment** (A)/**internment** (B) came to an end with his early release.

The hockey team could not deal with his **unsociable** (A)/**unsocial** (B) tendencies.

- (A) BABBA (b) BBABB (c) BABAA
 (d) ABBAB (e) AABBA

Directions (Q.Nos. 103-106) *In each of the questions, a word has been used in sentences in five different ways. Choose the option corresponding to the sentence in which the usage of the word is incorrect or inappropriate.* (2008)

103) Run

- (a) I must run fast to catch up with him.
 (b) Our team scored a goal against the run of play.
 (c) You can't run over him like that.
 (d) The newly released book is enjoying a popular run.
 (e) This film is a run-of-the-mill production.

104) Round

- (a) The police fired a round to tear gas shells.
 (b) The shop is located round the corner.
 (c) We took a ride on the merry-go-round.
 (d) The doctor is on a hospital round.
 (e) I shall proceed further only after you come round to admitting it.

105) Buckle

- (a) After the long hike our knees were beginning to buckle.
 (b) The horse suddenly broke into a buckle.
 (c) The accused did not buckle under police interrogation.
 (d) Sometimes, an earthquake can make a bridge buckle.
 (e) People should learn to buckle up as soon as they get into a car.

106) File

- (a) You will find the paper in the file under C.
 (b) I need to file an insurance claim.
 (c) The cadets were marching in a single file.
 (d) File your nails before you apply nail polish.
 (e) When the parade was on, a soldier broke the file.

Directions (Q.Nos. 107-109) *In each question, there are four sentences. Each sentence has pairs of words /phrases that are italicized and highlighted. From the italicized and highlighted word(s) /phrase(s), select the most appropriate word(s) /phrase(s) to form correct sentences. Then, from the options given, choose the best one.* (2007)

- 107) The cricket council that was [A]/**were** [B] **elected** last March is [A]/**are** [B] at sixes and sevens over new rules.

The critics **censored** [A]/**censured** [B] the new movie because of its social unacceptability.

Amit's explanation for missing the meeting was **credulous** [A]/**lcredible** [B].

She coughed discreetly [A]/**discretely** [B] to announce her presence.

- (a) AABBA (b) MABA
(c) BBBBA (d) BBAAA
(e) BBBAA

- 108) The **further** [A]/**farther** [B] he pushed himself, the more disillusioned he grew.

For the crowds it was more of a **historical** [A]/**historic** [B] event; for their leader, it was just another day.

The old man has a healthy **distrust** [A]/**mistrust** [B] for all new technology.

This film is based on a **real** [A]/**true** [B] story.

One suspects that the **compliment** [A]/**complement** [B] was backhanded.

- (a) BABAB (b) ABBBA
(c) BAABA (d) BBAAB
(e) ABABA

- 109) **Regrettably** [A]/**Regretfully** [B] I have to decline your invitation.

I am drawn to the poetic, **sensual** [A]/**sensuous** [B] quality of her paintings.

He was **besides** [A]/**beside** [B] himself with range when I told him what I had done.

After brushing against a **stationary** [A]/**stationery** [B] truck my car turned turtle.

As the water began to rise **over** [A]/**above** [B] the danger mark, the signs of an imminent flood were clear.

- (a) BAABA (b) AAABA
(c) BBBAB (d) BBAAB
(e) BABAB

Directions (Q.Nos. 110-112) *In each question, the word at the top of the table is used in four different ways, numbered 1 to 4. Choose the option in which the usage of the word is incorrect or inappropriate.* (2005)

110) Hand

- (a) I have my hand full, I cannot do it today.
(b) The minister visited the jail to see the breach at first hand.
(c) The situation is getting out of hand here!
(d) When the roof of my house was blown away, he was willing to lend me a hand.

111) For

- (a) He has a great eye for detail.
(b) We are waiting for the day.
(c) I can't bear for her to be angry.
(d) It couldn't be done for ever.

112) Near

- (a) I got there just after you left a near miss
(b) She and her near friend left early.
(c) The war led to a near doubling of oil prices.
(d) They came near to tears seeing the plight of the victims.

Directions (Q.Nos. 113-115) *In each question the word at the top of the table is used in four different ways, numbered (a) to (d). Choose the option in which the usage of the word is Incorrect or Inappropriate.* (2004)

113) PASSING

- (a) She did not have passing marks in mathematics.
(b) The mad woman was cursing everybody passing her on the road.
(c) At the birthday party all the children enjoyed a game of passing the parcel.
(d) A passing taxi was stopped to rush the accident victim to the hospital.

114) BOLT

- (a) The shopkeeper showed us a bolt of fine silk.
(b) As he could not move, he made a bolt for the gate.
(c) Could you please bolt the door?
(d) The thief was arrested before he could bolt from the scene of the crime.

115) FALLOUT

- (a) Nagasaki suffered from the fallout of nuclear radiation.
(b) People believed that the political fallout of the scandal would be insignificant.
(c) Who can predict the environmental fallout of the WTO agreements ?
(d) The headmaster could not understand the fallout of several of his good students at the public examination.

Directions (Q.Nos. 116-120) *In each question the word at the top of the table is used in four different ways, numbered (a) to (d), choose the option in which the usage of the word is Incorrect or Inappropriate.*
(2003)

116) Help

- (a) This syrup will help your cold.
- (b) I can't help the colour of my skin.
- (c) Ranjit may help himself with the beer in the fridge.
- (d) Do you really expect my to help you out with cash?

117) Reason

- (a) Your stand is beyond all reason.
- (b) Has she given you any reason for her resignation ?
- (c) There is little reason in your pompous advice.
- (d) How do you deal with friend who doesn't listen to a reason?

118) Paper

- (a) Your suggestions look great on the paper, but are absolutely impractical.
- (b) Do you know how many trees are killed to make a truckload of paper?
- (c) So far I have been able to paper over the disagreements among my brothers.
- (d) Dr. Malik will read a paper on criminalisation of politics.

119) Business

- (a) I want to do an MBA before going into business.
- (b) My wife runs profitable business in this suburb.
- (c) If we advertise we will get twice as much business as we have now .
- (d) How you spend your money is as much my business as yours.

120) Service

- (a) Customers have to service themselves at this canteen.
- (b) It's a service lift; don't get into it.
- (c) I'm not making enough even to service the loan.
- (d) Jyoti's husband has been on active service for three months.

Directions (Q.Nos. 121-125) *Answer the questions based on the following information.*

For every word a sentence is given, you have to find out the option which represents the similar meaning to the given word.
(2002)

121) OPPROBRIUM : The police had to bear the opprobrium generated by their blatant partisan conduct.

- (a) Harsh criticism
- (b) Acute distrust
- (c) Bitter enmity
- (d) Stark oppressiveness

122) PORTENDS : It appears to many that US'war on terrorism' portends trouble in Gulf.

- (a) Introduces
- (b) Bodes
- (c) Spells
- (d) Evokes

123) PREVARICATE : When her video tape recording was shown to her and asked to explain her presence, she started prevaricating.

- (a) Speaking evasively
- (b) Speaking violently
- (c) Lying furiously
- (d) Throwing a tantrum

124) RESTIVE : The waiting public started getting restive when the leader got late for the speech.

- (a) Angry
- (b) Violent
- (c) Restless
- (d) Distressed

125) OSTENSIBLE : The watchmen's ostensible job is to guard this building.

- (a) Blatant
- (b) Ostentatious
- (c) Insidious
- (d) Apparent

Directions (Q.Nos. 126-130) *Answer the questions based on the following information.*

For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given below the table, select the one that has all the definitions and their usages most closely matched.
(2002)

126) Measure

Dictionary Definition		Usage	
A	Size or quality found by measuring	E	Ameasure was instituted to prevent outsiders from entering the campus.
B	Vessel of standard capacity	F	Sheila was asked to measure each item that was delivered.
C	Suitable action	G	The measure of the cricket pitch was 22 yards.
D	Ascertain extent or quality	H	Ratnesh used a measure to take out one litre of oil.

A B C D

(a) H F E G

(c) G H E F

(b) G E F H

(d) F H E G

127) Bound

Dictionary Definition		Usage	
A	Obliged, constrained	E	Dinesh felt bound to walk out when the discussion turned to kick backs.
B	Limiting value	F	Bulleed by contradictory forces he was bound to lose his mind.
C	Move in a specified direction	G	Vidya's story strains the bounds of credulity.
D	Destined or certain to be	H	Bound for a career in law, Jyoti was reluctant to study Milton.
A B C D		A B C D	
(a) F H G E		(b) E G H F	
(c) E H F G		(d) F G E H	

128) Catch

Dictionary Definition		Usage	
A	Capture	E	All her friends agreed that Prasad took a good catch.
B	Grasp with senses or mind	F	The proposal sounds very good but where is the catch ?
C	Deception	G	Hussain tries to catch the spirit on India in this painting.
D	Thing or person worth trapping	H	Sorry,I couldn't catch you.
A B C D		A B C D	
(a) H F E G		(b) F G E H	
(c) G F E H		(d) G H F E	

129) Deal

Dictionary Definition		Usage	
A	Manage, attend to	E	Dinesh insisted on dealing the cards.
B	Stock, sell	F	This contract deals with handmade cards.
C	Give out to a number of people	G	My brother deals in cards.
D	Be connecerned with	H	I decided not to deal with handmade cards.
A B C D		A B C D	
(a) F E G H		(b) H G E F	
(c) F H G E		(d) H E G F	

130) Turn

Dictionary Definition		Usage	
A	Give new direction to	E	It was now his turn to be angry.
B	Send	F	Leena never turned away a beggar.
C	Chance in form	G	Ashish asked Laxman to turn his face to the left.
D	Opportunity coming successively for each person	H	The old school building has been turned into a museum.
A B C D		A B C D	
(a) H E F G		(b) G F E H	
(c) G E F H		(d) G F H E	

Directions (Q.Nos. 131-135) Answer the questions based on the following information.

For each of the words given below, a contextual usage is provided. Pick the word from the alternatives given that is most inappropriate in the given context. (2001)

131) Specious : A specious argument is not simply a false one but one that has the ring of truth.

- (a) Deceitful (b) Fallacious
(c) Credible (d) Deceptive

132) Obviate : The new mass transit system may obviate the need for the use of personal cars.

- (a) Prevent (b) Forestall
(c) Preclude (d) Bolster

133) Disuse : Some words fall into disuse as technology makes objects obsolete.

- (a) Prevalent (b) Discarded
(c) Obliterated (d) Bolster

134) Parsimonious : The evidence was constructed from very parsimonious scraps of information.

- (a) Frugal
(b) Penurious
(c) Obliterated
(d) Altruistic

135) Facetious : When I suggested that war is a method of controlling population, my father remarked that I was being facetious.

- (a) Jovian
(b) Joival
(c) Jocular
(d) Joking

Directions (Q.Nos. 136-140) *Answer the questions based on the following information.*

For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given below the table, select the one that has all the definitions and their usages correctly matched. (2001)

136) Exceed

Dictionary Definition		Usage	
A	To extend outside of or enlarge beyond used chiefly in strictly physical relations	E	The mercy of God exceeds our finite minds.
B	To be greater than or superior to	F	Their accomplishments exceeded our expectation.
C	Be beyond the comprehension of	G	He exceeded his authority when he paid his brother's gambling debts with money from the trust.
D	To go beyond a limit set by (as an authority or privilege)	H	If this rain keeps up, the river will exceed its banks by morning.
A B C D		A B C D	
(a) H F E G		(b) H E F G	
(c) G F E H		(d) F G H E	

137) Infer

Dictionary Definition		Usage	
A	To derive by reasoning or implication	E	We see smoke and infer fire.
B	To surmise	F	Given some utterance, a listener may infer from it all sorts of things which neither the utterance nor the utterer implied.
C	To point out	G	I waited all day to meet him. From this you can infer my zeal to see him.
D	To hint	H	She did not take part in the debate except to ask a question inferring that she was not interested in the debate.
A B C D		A B C D	
(a) G E H F		(b) F H E G	
(c) H G F E		(d) E F G H	

138) Mellow

Dictionary Definition		Usage	
A	Adequately and properly aged so as to be free of harshness	E	He has mellowed with age.
B	Freed from the rashness of youth	F	The tones of the old violin were mellow.
C	Of soft and loamy consistency	G	Some wines are mellow.
D	Rich and full but free from stridency	H	Mellow soil is found in the Gangetic plains.
A B C D		A B C D	
(a) E G F H		(b) E F G H	
(c) G E H F		(d) H G F E	

139) Relief

Dictionary Definition		Usage	
A	Removal or lightening of something distressing	E	A ceremony follows the relief of a sentry after the morning shift.
B	Aid in the forms of necessities for the indigent	F	It was a relief to take off the tight shoes.
C	Diversion	G	The only relief I get is by playing cards.
D	Release from the performance of duty	H	Disaster relief was offered to the victims.
A B C D		A B C D	
(a) E G F H		(b) F E H G	
(c) H F G E		(d) F H E G	

140) Purge

Dictionary Definition		Usage	
A	Remove a stigma from the name of	E	The opposition was purged after the coup.
B	Make clean by removing whatever is superfluous, foreign	F	The committee heard his attempt to purge himself of a charge of heresy.
C	Get rid of	G	Drugs that purge the bowels are often bad for the brain.
D	To cause evacuation of	H	It recommended to purge water by distillation.
A B C D		A B C D	
(a) F H E G		(b) F G G E	
(c) H F G E		(d) G E H F	

Sentence Correction/Improvement

Directions (Q. Nos. 141-143) *Read the following sentences and select the option that corrects the underlined part. If the sentences parts are correct as written, then choose option (a).* (2014)

- 141)** Once upon a time, a small person named Little Red Riding Hood initiated plans for the preparation, delivery and transportation of food stuffs to her Grandmother.
 (a) and transportation of food stuffs to her grandmother
 (b) and transportation of food stuffs to her grandmother
 (c) and transportation of food supplies to her grandmother
 (d) and transportation of foodstuffs to her grandmother
- 142)** Jessica Mitford wrote 'The American Way of Death', a best-selling book that led eventually to an official investigation of the funeral industry.
 (a) that led eventually (b) that had led eventually
 (c) that eventually led (d) which eventually led
- 143)** Quebec rises in a magnificent way above the St. Lawrence River.
 (a) rises in a magnificent way above
 (b) rises in a magnificent way, way above
 (c) rises magnificently above
 (d) rises magnificently way above

Directions (Q. Nos. 144-145) *Read the following information carefully and answer the questions based on that.*

Each of the following questions consists of a sentence, with some parts of it underlined, which could be erroneous. From the choices given, you have to select an answer that is the best possible replacement for the underlined part of the key sentence to form a logically and grammatically correct statement and mark its number as your answer. (2013)

- 144)** Some buildings that were destroyed and heavily damaged in the earthquake last year were constructed in violation of the city's building code.
 (a) Some buildings that were destroyed and heavily damaged in the earthquake last year were
 (b) Some buildings that were destroyed or heavily damaged in the earthquake last year had been
 (c) Some buildings that the earthquake destroyed and heavily damaged last year have been
 (d) Last year the earthquake destroyed or heavily damaged some buildings that have been

- 145)** Congress is debating a bill requiring certain employers provide workers with unpaid leave so as to care for sick or newborn children
 (a) provide workers with unpaid leave so as to
 (b) to provide workers with unpaid leave so as to
 (c) provide workers with unpaid leave in order that they
 (d) to provide workers with unpaid leave so that they can

Directions (Q.Nos. 146-149) *Each of the following questions has a paragraph with one italicised word that does not make sense. Choose the most appropriate replacement for that word from the options given below the paragraph.* (2005)

- 146)** It is *klang* to a sensitive traveler who walks through this great town, when he sees the streets the roads, and cabin doors crowded with beggars, mostly women, followed by three, four or six children, all in rags and importuning every passenger for alms.
 (a) amusing (b) irritating
 (c) disgusting (d) distressing
- 147)** Or there is the most *fingummy* diplomatic note on record: when Philip of Macedon wrote to the Spartans that, if he came within their borders, he would leave not one stone of their city, they wrote back the one word-'If'.
 (a) witty (b) rude
 (c) simple (d) terse
- 148)** Intelligent design derives from an early 19th century explanation of the natural world given by an English clergyman, William Paley. Paley was the populariser of the famous watchmaker analogy. Proponents of intelligent design are *crupping* Paley's argument with a new gloss from molecular biology.
 (a) destroying (b) testing
 (c) resurrecting (d) questioning
- 149)** Women squat, heads covered, beside huge piles of limp fodder and *blunk* oil/lamps and just about all the cows in the three towns converge upon this spot. Sinners, supplicants and yes, even scallywags hand over a few coins for a crack at redemption and a handful of grass.
 (a) shining (b) bright
 (c) sputtering (d) effulgent

Directions (Q.Nos. 150-153) *Answer the questions based on the following information.*

In each of the questions below, four different ways of writing a sentence are indicated. Choose the best way of writing the sentence. (2002)

- 150)** A. The main problem with the notion of price discrimination is that it is not always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
 B. The main problem with the notion of price discrimination is not that it is always a bad thing, it is the monopolist who has the power to decide who is charged what price.
 C. The main problem with the notion of price discrimination is not that it always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
 D. The main problem with the notion of price discrimination is not it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
 (a) A (b) B
 (c) C (d) D

- 151)** A. A symbiotic relationship develops among the contractors, bureaucracy and the politicians, and by a large number of device, costs are artificially escalated and black money is generated by underhand deals.
 B. A symbiotic relationship develops among contractors, bureaucracy and politicians, and costs are artificially escalated with a large number of devices and black money is generated through underhand deals .
 C. A symbiotic relationship develops among contrators, bureaucracy and the politicians, and by a large number of devices costs are artificially escalated and black money is generated on underhand deals.
 D. A symbiotic relationship develops among the contractors, bureaucracy and politicians, and by large number of devices costs are artifiically escalated and black money is generated by underhand deals.
 (a) A (b) B (c) C (d) D

- 152)** A. The distinctive feature of tariffs and export subsidies is that they create difference of prices at which goods are traded on the world market and their price within a local market.

- B. The distinctitive feature of traiffis and export subsidies is that they create a difference of prices at which goods are traded with the world market and their price in the local market.
 C. The distinctive feature of tariffs and export subsidies is the that they create a difference between price at which good are trades on the world market and their prices within a local market.
 D. The distinctitive feature of tariffs and esport subsidies is that they create subsidies is that they create a difference across prices at which goods are traded with the world market and their prices within a local market.
 (a) A (b) B
 (c) C (d) D

- 153)** A. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risk that private operators perceive and thereby encourage excessive hedging.
 B. Any action by government to reduce the systemic risk inherent in financial markets will also reduce the risk that private operators perceive and thereby encourage excessive gambling.
 C. Any action by government to reduce the systemic risk inherent due to financial markets will also reduce that risks that private operators perceive and thereby encourages excessive hedging.
 D. Any action of government to reduce the systemic risk inherent to financial markets will also reduce the risk that private operators perceive and thereby encourage excessive gambling.
 (a) A (b) B (c) C (d) D

Directions (Q.Nos. 154-161) *Answer the questions based on the following information.*

In each of the following sentences, a part of the sentence is underlined. Beneath each sentence, four different ways of phrasing the underlined part are indicated. Choose the best alternative among the four. (1999)

- 154)** It was us who had left before he arrived.
 (a) we who had left before time he had arrived.
 (c) us who had went before had arrived.
 (b) us who had went before the arrived.
 (d) we who had left before he arrived.

- 155) The MP rose up to say that in her opinion, she thought the Women's Reservation Bill should be passed on unanimously.
- rose to say that she thought the Women's Reservation Bill should be passed
 - rose up to say that, the Women's Reservation Bill should be passed on
 - rose to say that, in her opinion, she thought that the Women's Reservation Bill should be passed
 - rose to say that, in her opinion, the Women's Reservation Bill be passed on
- 156) Mr. Pillai, the President of the union and who is also a member of the community group, will be in charge of the negotiations.
- since he is a member of the community group
 - also being a member of the community group
 - a member of the community group
 - in addition, who is a member of the community group
- 157) Since the advent of cable television, at the beginning of this decade, the entertainment industry took a giant stride forward in our country.
- this decade saw the entertainment industry taking
 - this decade, the entertainment industry has taken
 - this decade, the entertainment industry had taken
 - this decade, the entertainment industry took
- 158) His mother made great sacrifices to educate him, moving house on three occasions, and severing the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need to persevere.
- severing the thread on her loom's shuttle whenever Mencius neglected his lesson to make him understand the need to persevere.
 - severed the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need to persevere.
 - severed the thread on her loom's shuttle whenever Mencius neglected his lessons to make him understand the need for persevering.
 - severing the thread on her loom's shuttle whenever Mencius neglected his lessons to make the understand the need to persevere.
- 159) If you are in a three-month software design project and in two weeks, you've put together a program that solves part of the problem, show it to your boss without delay.
- you've put together a program that solves part of the problem in two weeks
 - in two weeks you've put together a program that solves part of the problem

- you've put together a program that has solved part of the problem in two weeks
- in two weeks you put together a program that solved only part of the problem

- 160) Many of these environmentalist proclaim to save nothing less than the planet itself.
- to save nothing lesser than
 - that they are saving nothing lesser than
 - to save nothing less than
 - that they save nothing less than

- 161) Bacon believes that the medical profession should be permitted to ease and quicken death where the end would otherwise only delay for a few days and at the cost of great pain.
- be delayed for a few days
 - be delayed for a few days and
 - be otherwise only delayed or a few days and
 - otherwise only delay for a few days and

Directions (Q.Nos. 162-166) Answer the questions based on the following information.

A part of each sentence given below has been underlined. You have to select the option that best replaces the underlined part. (1998)

- 162) British Airspace has been focusing on building European links.
- concentrating on creating European links
 - pursuing ways of building European connectivity
 - stressing on building European links
 - focusing on forging European links
- 163) The appetite of banks for funds was lost under the onslaught of the slowdown, corporates refused to borrow even as bank deposits flourished.
- bank deposits flourished
 - bank deposits swelled
 - bank deposits were enhanced
 - bank deposits flummoxed
- 164) The 8th century revival of Byzantine learning is an inexplicable phenomenon, and its economic and military precursors have yet to discovered.
- phenomenon yet to be discovered
 - a phenomenon incompletely explained
 - an inexplicable phenomenon
 - an unidentifiable phenomenon
- 165) The management can still hire freely but cannot scold freely.
- cannot scold at will
 - cannot give umbrage
 - cannot take decisions to scold
 - cannot scold willfully

166) Many people mistake familiar for a vulgar style, and suppose that to write without affectation is to write at random speed.

- (a) is to write at random (b) is to write randomly
(c) is to write fast (d) is to do speed writing

Directions (Q.Nos. 167-171) Answer the questions based on the following information.

In each of the following questions, a part of the paragraph or sentence has been underlined. From the choices given, you are required to choose the one which would best replace the underlined part. (1997)

167) This government has given subsidies to the Navratnas but there is not telling whether the subsequent one will do.

- (a) whether the subsequent government will do so
(b) if the government to follow will accept the policy
(c) if the government to follow will adhere to the policy
(d) not telling whether the subsequent one will do so

168) Rahul Bajaj has done a great job of taking the company to its present status, but it is time that he let go off the reins.

- (a) let go of the reins
(b) stepped down
(c) let go off the reins
(d) delegated responsibility

169) With the pick up in the standard of education, expensive private schools have started blooming up in every corner of the country.

- (a) started blooming in every corner of the country
(b) have started mushrooming all over the country
(c) started mushrooming in every corner of the country
(d) blossomed all over the country

170) It is important that whatever else happens, these two factors should not messed around with.

- (a) It is important that
(b) It is a fact that
(c) It should be urgently understood that
(d) It should be understood that

171) It must be noticed that under no circumstance should the company go in for diversification.

- (a) It must be noticed (b) It must be noted
(c) It must be pointed out (d) It should be noticed

Directions (Q.Nos. 172-177) Answer the questions based on the following information.

In each of the following questions, a part of the paragraph or sentences has been underlined. From the choices given to you, you are required to choose the one which would best replace the underlined part. (1996)

172) The Romanians may be restive under Soviet direction but they are tied to Moscow by ideological and military links.

- (a) they are tied to Moscow by ideological and military links
(b) they are preparing for a great revolution
(c) secretly they rather enjoy the prestige of being protected by the mighty soviets
(d) there is nothing they can do about it.

173) In a penetrating study, CBS-TV focuses on these people without hope, whose bodies are cared for by welfare aid, but whose spirit is often neglected by a disinterested society.

- (a) whose bodies are cared for by welfare aid
(b) who do not have enough to eat
(c) whose hopelessness may be alleviated
(d) who may be physically satiated

174) Contemplating whether to exist with an insatiable romantic temperament, he was the author and largely the subject of a number of memorable novels.

- (a) Contemplating whether to exist
(b) Combining realistic details
(c) Miscegenating a brilliant mind
(d) Aware that he had been born

175) How many times have I asked myself: when is the world going to start to make sense? There is a monster out there, and it is rushing towards me over the uneven ground of consciousness.

- (a) There is a monster out there
(b) It is as if the world is on my shoulders
(c) The answer is out there somewhere
(d) There is a sea of sensibility in me

176) In Martin Amis' new novel, the narrator is trapped and hurtling towards a terrible secret, its resolution and the dreadful revelations it brings, ally to give an excruciating vision of guilt.

- (a) ally to give an excruciating vision of guilt
(b) to us give a vivid picture of guilt
(c) is a painful picture of a guilt ridden world
(d) does not really solve all the questions in the narrator's mind

177) Victory is everything in the Indian universe and Tendulkar will be expected to translate his genius to that effect. To contemplate any other option is to contemplate the risk of failure.

- (a) To contemplate any other option is to contemplate the risk of failure.
(b) Failure is not an action that can be contemplated.
(c) Any other action has the potential of failure.
(d) Failure is not an option.

Fillers

Directions (Q. Nos. 178-180) *Fill in the blanks with the most appropriate pair of word / words given below.*
(2014)

- 178)** The thought of his weaker and more pitiable companion never perhaps to him.
(a) leaving – struck (b) abandoning – came
(c) discarding – flashed (d) deserting – owned
- 179)** At midnight the storm the rolling clouds parted and the stars keenly above the sleeping camp.
(a) ceased – twinkled (b) stopped – appeared
(c) abated – glittered (d) continued – shined
- 180)** In a situation like the one emerging in Southern Afghanistan, America's present strategy is highly to succeed.
(a) impractical (b) illustrious
(c) unlikely (d) impossible

Directions (Q. Nos. 181-183) *Read the following information carefully and answer these questions given below.*

Each sentence in this part has one or two missing elements, as indicated by a series of dashes. Following the sentence, you will see lettered words or sets of words. Choose the word or sets of words that best fits the meanings of the sentence as a whole.
(2013)

- 181)** Some paleontologists debate whether the diversity of species has _____ since the cambrian period or whether imperfections in the fossil record only suggest greater diversity today, while in actuality there has been either _____ or decreased diversity.
(a) changed, escalation (b) increased, stasis
(c) expanded, discontinuity (d) declined, reduction
- 182)** Observable as a tendency of our culture is a _____ of _____ psychoanalysis we no longer feel that it can solve our emotional problems.
(a) divergence, certainty about
(b) confrontation, enigmas in
(c) withdrawal, belief in
(d) defense, weaknesses in
- 183)** Each question consists of sentences, which have one or two blanks, each blank indicating that something has been omitted. Below each sentence are four numbered words or sets of words labelled (A) through (D). Choose the set of words that, when

inserted in the sentence, best fits the meaning of the sentence as a whole.

A statement is an comparison; it does not compare things explicitly, but suggests, a likeness between them.
(2011)

- (a) sarcastic unfair
(b) blatant overt
(c) metaphorical implied
(d) sanguine inherent

Directions (Q. 184-185) *Each of the following questions has a sentence with two blanks: Given below each question are five pairs of words. Choose the pair that best completes the sentence.*
(2009)

- 184)** To make that claim, a large, longer-term trial would be needed, in which participants are assigned to exercise or not, and are then followed for the development of chronic conditions such as cancer, heart disease or dementia.
(a) innovative; communally
(b) controlled; exploitedly
(c) exigent; randomly
(d) disingenuous; viciously
- 185)** Meanwhile, ways thinks that preoccupation with survival is preventing the U.S. from explaining its positive assets the world, thinking about what to do next, and U.S. policies in key areas, to wit: U.S. military planners are forced to assume that the U.S. must suffer the first blow in any future war
(a) scrutinizing; believing
(b) observers; conceding
(c) observers; agreeing
(d) crippling; straitjacketing

Directions (Q. Nos. 186-189) *Each of the following questions has a sentence with two blanks. Given below each question are five pairs of words. Choose the pair that best completes the sentence.*
(2008)

- 186)** The genocides in Bosnia and Rwanda, apart from being mis-described in the most sinister and manner as 'ethnic cleansing', were also blamed, in further hand-washing rhetoric, on something dark and interior to and perpetrators alike.
(a) innovative; communicator
(b) enchanting; leaders
(c) disingenuous; victims
(d) exigent; exploiters
(e) tragic; sufferers

187) As navigators, calendar makers, and other of the night sky accumulated evidence to the contrary, ancient astronomers were forced to that certain bodies might move in circles about points, which in turn moved in circles about the earth.

- (a) scrutinizers; believe (b) observers; agree
(c) scrutinizers, suggest (d) observers; concede
(e) students; conclude

188) Every human being, after the first few days of his life, is a product of two factors: on the one hand, there is his endowment; and on the other hand, there is the effect of environment including

- (a) constitutional, weather (b) congenital; education
(c) personal; climate (d) economic; learning
(e) genetic; pedagogy

189) Exhaustion of natural resources, destruction of individual initiative by governments, control over men's minds by central of education and propaganda are some of the major evils which appear to be on the increase as a result of the impact of science upon minds suited by to an earlier kind of world.

- (a) tenets; fixation (b) aspects; inhibitions
(c) institutions; inhibitions (d) organs; tradition
(e) departments; repulsion

Directions (Q.Nos. 190-199) *Fill up the blanks numbered [190], [191]... up to [199], in the two passages below with the most appropriate word from the options given for each blank.* (2004)

"Between the year 1946 and the year 1955, I did not file any income tax returns." With that [190] statement, Ramesh embarked on an account of his encounter with the Income Tax Department. "I originally owed ₹ 20000 in unpaid taxes. With [191] and [192], the 20000 became 60000. The Income Tax Department then went into action, and I learned first hand just how much power the Tax, Department wields. Royalties and trust funds can be [193]; automobiles may be [194], and auctioned off. Nothing belongs to the [195] until the case is settled."

- 190)** (a) devious (b) blunt
(c) tactful (d) pretentious
- 191)** (a) interest (b) taxes
(c) principal (d) returns
- 192)** (a) sanctions
(b) refunds
(c) fees
(d) fines

- 193)** (a) closed (b) detached
(c) attached (d) impounded

- 194)** (a) smashed (b) seized
(c) dismantled (d) frozen

- 195)** (a) purchaser (b) victim
(c) investor (d) offender

At that time the White House was as serene as a resort hotel out of season. The corridors were [196]. In the various offices, [197] gray men in waistcoats talked to one another in low-pitched voices. The only colour; or choler, curiously enough, was provided by President Eisenhower himself. Apparently, his [198] was easily set off; he scowled when he [199] the corridors.

- 196)** (a) striking (b) hollow (c) empty (d) white

- 197)** (a) quiet (b) faded
(c) loud (d) stentorian

- 198)** (a) laughter (b) curiosity
(c) humour (d) temper

- 199)** (a) paced (b) strolled
(c) stormed (d) prowled

Directions (Q. Nos. 200-207) *Answer the questions based on the following information.*

There are two gaps of the following sentences. From the pairs of words given, choose the one that fill the gap most appropriately. The first word in the pair should fill the first gap. (2003)

- 200)** Their achievement in the field of literature is described as ; sometimes it is even called
(a) magnificent, irresponsible
(b) insignificant, influential
(c) significant, paltry
(d) unimportant, trivial

- 201)** From the time she had put her hair up, every man she had met had groveled before her and she had acquired a mental attitude toward the other sex which was a blend of and
(a) admiration, tolerance
(b) indifference, contempt
(c) impertinence, temperance
(d) arrogance, fidelity

- 202)** This simplified to the decision-making process is a must read for anyone important real estate, personal or professional decisions.
(a) primer, maximizing (b) tract, enacting
(c) introduction, under (d) guide, facing

203) Physicians may soon have to help paralysed people move their limbs by bypassing the nerves that once controlled their muscles.

- (a) instruments, detrimental
- (b) ways, damaged
- (c) reason, involuntary
- (d) impediments, complex

204) The Internet is a medium where users have nearly choices and constraints about where to go and what to do.

- (a) unbalanced, non-existent
- (b) embarrassing, no
- (c) unlimited, minimal
- (d) choking, shocking

205) The best punctuation is that of which the reader is least conscious, for when punctuation or lack of it, ... itself, it is usually because it

- (a) obtrudes, offends
- (b) enjoins, fails
- (c) conceals, recedes
- (d) effaces, counts

206) The argument that the need for a looser fiscal policy to demand outweighs the need to budget deficits is persuasive.

- (a) assess, minimize
- (b) outstrip, eliminate
- (c) stimulate, control
- (d) restrain, conceal

207) The Athenians on the whole were peaceful and prosperous, they had to sit at home and think about the universe and dispute with Socrates or to travel abroad and the world.

- (a) leisure, explore
- (b) time, ignore
- (c) ability, suffer
- (d) temerity, understand

Directions (Q.Nos. 208-213) Answer the questions based on the following information. (2002)

Fill in the gaps in the passage below with the most appropriate word from the options given for each gap. The right words are the ones used by the author. Be guided by the author's overall style and meaning when you choose the answer.

Von Neumann and Moregenstem assume a decision framework in which all options are thoroughly considered, each option being independent of the others, with a numerical value derived for the utility of each possible outcome (these outcomes reflecting, in turn, all possible combinations of choices). The decision is then made to maximize the expected utility .

.....[208]..... such a model reflects major simplifications of the way decisions are made in the real world. Humans are not to process information as quickly and effectively as the model assumes they tend not to think [209]

..... as easily as the model calls for, they often deal with a particular option without really assessing its[210] and when they do assess alternatives, they may be externally nebulous about their criteria of evaluation.

- 208)** (a) Regrettably (b) Firstly
(c) Obviously (d) Apparently

- 209)** (a) quantitatively
(b) systematically
(c) scientifically
(d) analytically

- 210)** (a) implications (b) disadvantages
(c) utility (d) alternatives

In a large company, ...[211]..... people is about as common as using a gun or a switch-blade to [212] an argument. As a result, most managers have little or no experience of firing people, and they find it emotionally automatic, as result, they often delay the act interminably, much as an unhappy spouse will prolong a bad marriage. And when the firing is done, it is often done clumsily, with far worse side effects than are necessary.

Do the world-class software organizations have a different way of firing people? No, but they do the dead swiftly, humanely and professionally.

The key point here is to view the fired employee as a 'failed product' and to ask how the process[213]..... such a phenomenon in the first place.

- 211)** (a) dismissing (b) punishing
(c) firing (d) admonishing

- 212)** (a) resolve (b) thwart
(c) defeat (d) close

- 213)** (a) derived (b) engineered
(c) produced (d) allowed

Directions (Q.Nos. 214-218) Answer the questions based on the following information.

In each of the following sentences, parts of the sentence are left blank. Beneath each sentence, four different ways of completing the sentence are indicated. Choose the best alternative from among the four. (2001)

214) But are now regularly written not just for tools but well-established practices, organisations and institutions not all of which seem to be away.

- (a) reports, withering
- (b) stories, trading
- (c) books, dying
- (d) obituaries, fading

215) The Darwin, who is most remarkable for the way in which he the attributes of the world class thinker and head of the household.

- (a) comes, figures (b) arises, adds
(c) emerges, combines (d) appeared, combines

216) Since her face was free of there was no way to if she appreciated what had happened.

- (a) make-up, realise (b) expression, ascertain
(c) emotion, diagnose (d) scars, understand

217) In this context, the of the British labour movement is particularly

- (a) affair, weird (b) activity, moving
(c) experience, significant (d) atmosphere, gloomy

218) Indian intellectuals may boast if they are so inclined of being to the most elitist among the intellectual of the world.

- (a) subordinate, traditions (b) heirs, cliques
(c) ancestors, societies (d) heir, traditions

Directions (Q.Nos. 219-223) Answer the questions based on the following information.

In each of the sentences, parts of the sentence are left blank. Beneath each sentence four different ways of completing the sentence are indicated. Choose the best alternative from among the four. (2000)

219) Though one eye is kept firmly on the the company now also promotes contemporary art.

- (a) present ... experimental (b) future ... popular
(c) present ... popular (d) market ... popular

220) The law prohibits a person from felling a sandal wood tree, even if it grows on one's own land without prior permission from the government. As poor people cannot deal with the government this legal provision leads to a rip-roaring business for, who care neither for the nor for the trees.

- (a) middlemen ... rich
(b) the government ... poor
(c) touts ... rich
(d) touts ... poor

221) It will take sometime for many South Koreans to the conflicting image of North Korea, let alone to what to make of their Northern cousins. (2000)

- (a) reconcile ... decide
(b) understand ... clarify
(c) make out ... decide
(d) reconcile ... understand

222) In these bleak and depressing times of prices, non-performing governments and crime rates, Sourav Ganguly has given us Indians a lot to cheer about.

- (a) escalating ... increasing (b) spiralling ... booming
(c) spiralling ... soaring (d) ascending ... debilitating

223) The manners and of the nouveau riche is a recurrent in the literature.

- (a) style ... motif (b) morals ... story
(c) wealth ... theme (d) morals ... theme

Directions (Q.Nos. 224-233) Answer the questions based on the following information.

Fill in the blanks of the following sentences using the most appropriate word or words from among the options given for each. (1998)

224) Football evokes a response in India compared to cricket, that almost the nation.

- (a) tepid ... boiling
(b) lukewarm ... electrifies
(c) turbid ... fascinating
(d) apocryphal ... genuinely fascinates

225) Social studies, science matters of health and safety, the very atmosphere of the classroom these areas are few of the for the of proper emotional reactions.

- (a) things growth
(b) fertile areas basis
(c) fertile fields inculcation
(d) important areas formation

226) When children become more experienced with words as visual symbols, they find that they can gain meaning without making sounds.

- (a) aural (b) audible (c) vocal (d) intelligible

227) Learning is more efficient when it is It is less efficient when it is

- (a) fast slow
(b) rapid turtle-slow
(c) tedious like a joy ride
(d) fun drudgery

228) To a greater or lesser degree all the civilized countries of the world are made up of a small class of rulers and of a large class of subjects.....

- (a) formed by a small minority who are uncivilized
(b) powerfully corrupt pointless crusaders
(c) corrupted by too much power corrupted by too much passive obedience
(d) who are ruled who ruled

- 229)** Simple arithmetic tells us that there is more than
 (a) imitation...innovation
 (b) improvisation...improvement
 (c) impracticality...knowledge
 (d) improbability...probability
- 230)** As a step towards protesting against the spiralling prices the farmers have decided to stage a picket in an effort to
 (a) show their virility (b) make themselves heard
 (c) curb the prices (d) topple the government
- 231)** Science is a sort of news agency comparable to other news agencies.
 (a) principally (b) in principle
 (c) in principal (d) in spirit and form
- 232)** Most political leaders acquire their position by causing a large number of people to believe that these leaders are by altruistic desires.
 (a) actuated (b) convinced
 (c) categorised (d) led
- 233)** Everyone will admit that swindling one's fellow beings is a necessary practice; upon it is based the really sound commercial success formula
 (a) sell what you cannot buy back
 (b) buy what you will sell to another at a higher price
 (c) buy cheap and sell dear
 (d) sell what you can, do not buy from a competitor

Directions (Q.Nos. 234-241) Answer the questions based on the following information.

In each of the following questions, a part of a sentence has been left blank. Select from among the four options given below each question, the one which would best fill in the blanks. (1997)

- 234)** An act of justice closes the book on a misdeed; an act of vengeance
 (a) is reprehensible (b) is sordid
 (c) reopens the first chapter (d) writes an epilogue
- 235)** This is about a sociological analysis can penetrate.
 (a) as far as
 (b) the outer limits that
 (c) just how far into the subject
 (d) just the relative distance that
- 236)** I am always the first to admit that I have not accomplished everything that I achieve five years ago.
 (a) set out to (b) went to
 (c) thought to (d) thought of

- 237)** This is not the first time that the management has done some.....
 (a) tough talk (b) tough talking
 (c) firm talk (d) firm talking
- 238)** In India the talent is prodigious and it increases
 (a) each year (b) year by year
 (c) annually (d) progressively
- 239)** The present Constitution will see amendments but its basic structure will survive.
 (a) much more (b) many more
 (c) too many more (d) quite a few more
- 240)** Taking risks, breaking the rules, and being a maverick have always been important for companies, but today, they are
 (a) more crucial than ever (b) more crucial
 (c) much more crucial (d) very crucial

- 241)** Education is central because electronic networks and software-driven technologies are beginning to the economic barriers between nations.
 (a) breakdown (b) break
 (c) crumble (d) dismantle

Directions (Q.Nos. 242-247) Answer the questions based on the following information.

In each of the following questions, a part of a sentence is left blank. Choose from among the four options given below each question, the one which would best fill the blanks. (1996)

- 242)** When we call others dogmatic, what we really object to is
 (a) their giving the dog a bad name
 (b) their holding dogmas that are different from our own
 (c) the extremism that goes along with it
 (d) the subversion of whatever they actually believe in concomitantly
- 243)** I am entertainer, I have to keep smiling because in my heart laughter and sorrow have an affinity.
 (a) even if I have tears in my eyes
 (b) even though I am depressed inside
 (c) while entertaining people
 (d) in the entertainment business
- 244)** The stock markets, The state they are in right now speaks volumes about this fact.
 (a) is the barometer of public confidence
 (b) are the best indicators of public sentiment
 (c) are used to trade in expensive shares
 (d) are not used to taking stock of all markets

- 245)** Political power is just as permanent as today's newspaper. Ten years down the line, ... the most powerful man in any state today.
 (a) who cares
 (b) nobody will remember what was written in today's newspaper or
 (c) few will know or care about
 (d) when a lot of water will have passed under the bridge, who will care
- 246)**, the more they remain the same.
 (a) People all over the world change
 (b) The more people change
 (c) The more they are different
 (d) The less people change
- 247)** Although, it has been more than 50 years since Satyajit Ray made *Pather Panchali*, ... refuse to go away from the mind.
 (a) the haunting images (b) its haunting images
 (c) its haunted images (d) the haunt of its images

Directions (Q.Nos. 248-254) Answer the questions based on the following information. Fill in the blanks of the sentences using one from the words, idioms or phrases provided in the four alternatives. (1994)

- 248)** On dark night, Darvesh passing by a dry well.
 (a) wasn't (b) happened to be
 (c) discovered in (d) found to
- 249)** Nordisk has recently a product called Glucometer.
 (a) started (b) commissioned
 (c) launched (d) begun
- 250)** I had already published a novel and it was an unexpected success. I thought my
 (a) days were up (b) chances were good
 (c) ladyluck was happy (d) fortune was made
- 251)** The neighbour grabbed the boy, and rolled him on the road to the flames.
 (a) smother (b) kill (c) burn out (d) fizz out
- 252)** Sam asked me to keep his secret
 (a) secret (b) in myself
 (c) amongst us (d) between us
- 253)** Sometimes the greatest inventions an idea of starting simplicity.
 (a) stumbles upon (b) hinge upon
 (c) starves without (d) lacks
- 254)** Real friends, genuinely wanting the best for the organization different garbs.
 (a) come in (b) clad in (c) dressed in (d) clothed in

Directions (Q.Nos. 255-259) Answer the questions based on the following information.

Four statements with blanks have been given. These statements are followed by four alternatives. Choose the one which fits into the set of statements the maximum number of times. (1994)

- 255)** A. Professional studies has become the of the rich.
 B. Every citizen has the to speak, travel and live as he pleases.
 C. He has a definite over all his rivals.
 D. Sheron no longer has the of the company's bungalow and car.
 (a) advantage (b) privilege (c) right (d) concession
- 256)** A. People sensed
 B. A bad case had come in a person with a smashed arm.
 C. And then, without warning, ... struck.
 D. The dogs were the first to recognize the signs of oncoming
 (a) tragedy (b) accident (c) disaster (d) calamity
- 257)** A. The men there have fought and emotional withdrawal, and were more capable of helping Jim.
 B. But does occasionally inflict all the adults.
 C. A person who is deeply hurt feels very
 D. It is hard to survive this feeling of
 (a) dejection (b) lonely (c) trouble (d) clamity
- 258)** A. I have a small power of
 B. Down with a very high fever, he suffers from frequent fits of
 C. They are now bitter enemies all because of a small
 D. Her is the most creative things she has ever possessed.
 (a) illusion (b) imagination
 (c) hallucination (d) misunderstanding
- 259)** A. Communism states that every individual must live for the
 B. The of the affairs of the nation is deplorable.
 C. have been laid down by the United States: States *The Statesman*.
 D. No has succeeded in gaining complete autonomy from the Federal Government.
 (a) state (b) nation
 (c) government (d) conditions

Error Detection

Directions (Q.Nos 260-261) *In each of the following questions there are sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is /are correct in terms of grammar and usage (including spelling, punctuation and logical consistency): Then, choose the most appropriate option.* (2011)

260) The question given below consists of a sentence which is divided into four parts, numbered (A) through (D). Only one part in the sentence is not acceptable in standard written English. Identify that part in the sentences which contains the error.

- (a) Her acceptance of speech
- (b) Was well received
- (c) Eliciting thunderous applause
- (d) At several points

261) In the following question, four different sentences are given. Choose the option that contains the grammatically incorrect sentence/s. (2011)

- I. He is feeling that this relocation is nothing but the kick upstairs.
 - II. Consensus is now emerging at our state and national levels.
 - III. A more and more rigorous circle is formed from which one is more and more unlikely to escape.
 - IV. It happened up on a system that worked.
- (a) I and IV
 - (b) I, II and III
 - (c) I, III and IV
 - (d) I and III

Directions (Q.Nos 262-264) *In each of the following questions there are sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is /are correct in terms of grammar and usage (including spelling, punctuation and logical consistency): Then, choose the most appropriate option.* (2009)

262) (A) It was a difficult situation and Manila was making pains to make it better.
 (B) Slowly her efforts bore fruits and things started improving.
 (C) What she learnt from this is that it is ideal for humans if reflection.
 (D) Preceded action and precision of thought facilitated precision of behaviour.

- (a) C only
- (b) B and C
- (c) A and B
- (d) A only

263) (A) So once a country is in recession,
 (B) the financial authority can, principally, move the economy
 (C) out of the slowdown-assuming
 (D) they know how to use a fiscal instrument-in its most effective manner?

- (a) A only
- (b) C only
- (c) A and B
- (d) B, C and D

264) (A) It is sometimes told that
 (B) one should react in an impassioned manner and must refrain
 (C) a coup. And also, one must manage to bite back the ironic retort
 (D) on the tip of the tongue itself lest it might damage one's chance for success, all at once.

- (a) A only
- (b) C only
- (c) A and B
- (d) C and D

Directions (Q.Nos. 265-268) *In each of the following questions there are sentences that form a paragraph. Identify the sentence(s) or partes) of sentence(s) that is /are correct in terms of grammar and usage (including spelling, punctuation and logical consistency). Then, choose the most appropriate option.* (2008)

265) A. In 1849, a poor Bavarian irnigrant named Levi Strauss
 B. landed in San Francisco, California,
 C. at the invitation of his brother-in-law David Stern
 D. owner of dry goods business
 E. This dry goods business would later become known as Levi Strauss and Company

- (a) B only
- (b) B and C
- (c) A and B
- (d) A only
- (e) A, B and D

266) A. In response to the allegations and condemnation pouring in,
 B. Nike implemented comprehensive changes in their labour policy,
 C. Perhaps sensing the rising tide of global labour concerns,
 D. from the public would become a prominent media issue,
 E. Nike sought to be a industry leader in employee relations.

- (a) D and E
- (b) D only
- (c) A and E
- (d) A and D
- (e) B, C and E

- 267) A. Charges and countercharges mean nothing
 B. to the few million who have lost their home
 C. The nightmare is far from over, for the government
 D. is still unable to reach hundreds who are marooned
 E. The death count have just begun
 (a) A only (b) C only (c) A and C
 (d) A, C and D (e) D only

- 268) A. I did not know what to make of you
 B. Because you'd lived in India, I associate you more with my parents than with me .
 C. And yet you were unlike my cousins in Kolkata, who seem so innocent and obedient when I visited them
 D. You were not curious about me in the least
 E. Although you did make effort to meet me
 (a) A only (b) A and B (c) A and E
 (d) D only (e) A and D

Directions (Q.Nos. 269-271) *In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is /are correct in terms of grammar and usage. Then, choose the most appropriate option. (2007)*

- 269) A. When I returned to home, I began to read
 B. everything I could get my hand on about Israel.
 C. that same year Israel's Jewish Agency sent
 D. a *Shaliach* a sort of recruiter to Minneapolis.
 E. I became one of his most active devotees.
 (a) C and E (b) C only (c) E only
 (d) B, C and E (e) C, D and E

- 270) A. So once an economy is actually in recession,
 B. the authorities can, in principle, move the economy
 C. out of slump-assuming hypothetically
 D. that they know how to-by a temporary stimuli.
 E. In the longer term, however, such policies have no affect on the overall behaviour of the economy.
 (a) A, B and E (b) B, C and E (c) C and D
 (d) E only (e) B only

- 271) A. It is sometimes told that democratic
 B. government originated in the city-states
 C. of ancient Greece. Democratic ideals have been handed to us from that time.
 D. In truth, however, this is an unhelpful assertion.

E. The Greeks gave us the word, hence did not provide us with a model.

- (a) A, B and D (b) B, C and D
 (c) Band D (d) B only
 (e) D only

Directions (Q.Nos. 272-275) *Each question consists of four sentences on a topic. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically correct and appropriate sentence(s). (2005)*

- 272) A. The balance of power will shift to the East as China and India evolve.
 B. Rarely the economic ascent of two still relatively poor nations have been watched with such a mixture of awe, opportunism and trepidation.
 C. Postwar era witnessed economic miracles in Japan and South Korea, but neither was populous enough to power worldwide growth or change the game in a complete spectrum of industries.
 D. China and India, by contrast, possess the weight and dynamism to transform the 21st century global economy.
 (a) A, B and C (b) A and D (c) C only (d) C and D

- 273) A. People have good reason to care about the welfare of animals.
 B. Ever since Enlightenment, their treatment has been seen as a measure of mankind's humanity.
 C. It is no coincidence that William Wilberforce and Sir Thomas Foxwell Buxton, two leaders of the movement to abolish the slave trade, helped found the Royal Society for the Prevention of Cruelty to Animals in 1820s.
 D. An increasing number of people go further: mankind has a duty not to cause pain to animals that have the capacity to suffer.
 (a) A and D (b) B only
 (c) A and C (d) C and D

- 274) A. When virtuoso teams begin their work, individuals are in and group consensus is out.
 B. As project progresses, however, the individual stars harness themselves to the product of the group.
 C. Sooner or later, the members break through their own egocentrism and become a plurality with single-minded focus on the goal.
 D. In short, they morph into a powerful team with a shared identity.
 (a) A and C (b) A and D (c) B and D (d) A, C and D

- 275)** A. Large reductions in the ozone layer, which sits about 15-30 km above the Earth, take place each winter over the polar regions, especially the Antarctic, as low temperatures allow the formation of stratospheric clouds that assist chemical reactions breaking down ozone.
 B. Industrial chemicals containing chlorine and bromine have been blamed for thinning the layer because they attack the ozone molecules, making them to break apart.
 C. Many an offending chemicals have now been banned.
 D. It will still take several decades before these substances have disappeared from the atmosphere.
- (a) D only (b) B and D
 (c) A and D (d) A and C

Directions (Q.Nos. 276-278) *Identify the incorrect sentence or sentences.* (2004)

- 276)** A. Last Sunday, Archana had nothing to do.
 B. After waking up, she lay on the bed thinking of what to do.
 C. At 11 O'clock she took shower and got ready.
 D. She spent most of the day shopping.
- (a) B and C (b) C only
 (c) A and B (d) B, C and D
- 277)** A. Harish told Raj to plead guilty.
 B. Raj pleaded guilty of stealing money from the shop.
 C. The court found Raj guilty of all the crimes he was charged with .
 D. He was sentenced for three years in jail.
- (a) A and C
 (b) B and D
 (c) A, C and D
 (d) B, C and D
- 278)** A. It was a tough situation and Manasi was taking pains to make it better.
 B. Slowly her efforts gave fruit and things started improving.
 C. Everyone complemented her for her good work.
 D. She was very happy and thanked everyone for their help.
- (a) A only
 (b) D only
 (c) Band C
 (d) A and C

Directions (Q.Nos. 279-283) *Answer the questions based on the following information.*

In these questions, each sentences has been divided into four parts, marked (a), (b), (c) and (d). Identify that part of the sentence which needs to be changed for the sentence to be grammatically correct. (1995)

- 279)** (a) Almost all school teachers insist that
 (b) a student's mother
 (c) is responsible for the student's conduct
 (d) as well as his dress
- 280)** (a) In the forthcoming elections
 (b) every man and woman
 (c) must vote for the candidate
 (d) of their choice
- 281)** (a) If one has to decide
 (b) about the choice of career
 (c) you should choose that option
 (d) which is really beneficial
- 282)** (a) It is essential that diseases like tuberculosis
 (b) are detected and treated
 (c) as early as possible in order to
 (d) assure a successful cure
- 283)** (a) The Mumbai police have found
 (b) the body of a man
 (c) who they believe to be
 (d) the prime suspect in a murder case

Directions (Q.Nos. 284-287) *Answer the questions based on the following information.*

Each question is a sentence broken into four parts. Select that part which has an error. (1993)

- 284)** (a) You did not wait
 (b) for us before you
 (c) went to meet him
 (d) isn't it ?
- 285)** (a) Who have you (b) invited for the lecture
 (c) on astrophysics (d) this evening?
- 286)** (a) I would have
 (b) showed you the
 (c) documents yesterday if
 (d) you had asked for them
- 287)** (a) The police have prevented
 (b) Rajan in leaving the
 (c) city without informing them
 (d) two days in advance

Decision Making

Directions (Q.Nos. 288-292) *Each question has a set of four sequentially ordered statements. Each statement can be classified as one of the following :*

Facts, which deal with pieces of information that one has heard, seen or read and which are open to discovery or verification (the answer option indicates such a statement with an 'F').

Inferences, which are conclusions drawn about the unknown, on the basis of the known (the answer option indicates such a statement with an 'I').

Judgements, which are opinions that imply approval or disapproval of persons, objects, situations and occurrences in the past, the present or the future (the answer option indicates such a statement with a 'J').

Select the answer option that best describes the set of four statements. (2006)

- 288)** (1) Given the poor quality of service in the public sector, the HIV/ AIDS affected should be switching to private initiatives that supply anti-retroviral drugs (ARVs) at a low cost.
 (2) The government has been supplying free drugs since 2004, and 35000 have benefited up to now-though the size of the affected population is 150 times this number.
 (3) The recent initiatives of networks and companies like AIDS Care Network, Emcure, Reliance-Cipla-CII, would lead to availability of much-needed drugs to a larger number of affected people.
 (4) But how ironic it is that we should face a perennial shortage of drugs when India is one of the world's largest suppliers of generic drugs to the developing world.
- (a) JFIJ (b) JIIJ (c) IFIJ
 (d) IFFJ (e) JEII

- 289)** (1) Inequitable distribution of all kinds of resources is certainly one of the strongest and most sinister sources of conflict.
 (2) Even without war, we know that conflicts continue to trouble us-they only change in character.
 (3) Extensive disarmament is the only insurance for our future, imagine the amount of resources that can be released and redeployed.
 (4) The economics of the industrialised western world derive 20% of their income from the sale of all kinds of arms.
- (a) IJJI (b) JIJF (c) IJIF
 (d) JIIF (e) IJIF

- 290)** (1) We should not be hopelessly addicted to an erroneous belief that corruption in India is caused by the crookedness of Indians.
 (2) The truth is that we have more red tape-we take eight-nine days to start a small business, Australians take two.
 (3) Red tape leads to corruption and distorts a people's character.
 (4) Every red tape procedure is a point of contact with an official and such contacts have the potential to become opportunities for money to change hands.
- (a) JFIF (b) JFJJ (c) JIJF
 (d) IFJF (e) JFIJ

- 291)** (1) So much of our day-to-day focus seems to be on getting things done, trudging our way through the tasks of living-it can feel like a treadmill that gets you nowhere; where is the childlike joy?
 (2) We are not doing the things that make us happy, that which brings us joy, the things that we cannot wait to do because we enjoy them so much.
 (3) This is the stuff that joyful living is made of identifying your calling and committing yourself wholeheartedly to it.
 (4) When this happens, each moment becomes a celebration of you; there is a rush of energy that comes with feeling completely immersed in doing what you love most.
- (a) IIIJ (b) IFIJ
 (c) JFJJ (d) JJJJ
 (e) JFII

- 292)** (1) According to all statistical indications, the Sarva Shiksha Abhiyan has managed to keep pace with its ambitious goals.
 (2) The Mid-Day Meal scheme has been a significant incentive for the poor to send their little ones to school, thus establishing the vital link between healthy bodies and healthy minds.
 (3) Only about 13 million children in the age group of 6 to 14 years are out of school.
 (4) The goal of universalisation of elementary education has to be a pre-requisite for the evolution and development of our country.
- (a) IIFJ (b) JIIJ (c) IJFJ
 (d) IJFI (e) JIFI

Directions (Q.Nos. 293-302) *Answer the questions based on the following information.* (2000)

There are ten short passages given below. Read each of the passages and answer the question that follows it.

- 293)** In a recent report the gross enrolment ratios at the primary level that is the number of children enrolled in classes one to five as a proportion of all children aged six to ten were shown to be very high for most states in many cases, they were way above 100 percent. These figures are not worth anything since they are based on the official enrolment data compiled from school records. They might as well stand for gross exaggeration ratios.

Which one of the following options best supports the claim that the ratios are exaggerated?

- (a) The definition of gross enrolment ratio does not exclude, in its numerator, children below six years or above ten years enrolled in classes one to five.
- (b) A school attendance study found that many children enrolled in the school records were not meeting a minimum attendance requirement of 80 percent.
- (c) A study estimated that close to 22 percent of children enrolled in the class one records were below six years of age and still to start going to school.
- (d) Demographic surveys show shifts in the population profile which indicate that the number of children in the age group six to ten years is declining.

- 294)** Szymanski suggests that the problem of racism in football may be present even today. He begins by verifying an earlier hypothesis that clubs' wage bills explain 90 percent of their performance. Thus if player's salaries were to be only based on their abilities, clubs that spend more should finish higher. If there is pay discrimination against some group of players-fewer teams bidding for black players thus lowering the salaries for blacks with the same ability as whites-that neat relation may no longer hold. He concludes that certain clubs seem to have achieved much less than what they could have by not recruiting black players.

Which one of the following findings would best support Szymanski's conclusion ?

- (a) Certain clubs took advantage of the situation by hiring above-average shares of black players.
- (b) Clubs hired white players at relatively high wages and did not show proportionately good performance.
- (c) During the study period, clubs in towns with a history of discrimination against blacks, underperformed relative to their wage bills.
- (d) Clubs in one region which had higher proportions of black players had significantly lower wage bills than their counterparts in another region which had predominantly white players.

- 295)** The pressure on Italy's 257 jails has been increasing rapidly. These jails are old and overcrowded. They are supposed to hold up 43,000 people-9,000 fewer than now. San Vittore in Milan which has 1,800 inmates is designed for 800. The number of foreigners inside jails has also been increasing. The minister in charge of prisons fears that tensions may snap and so has recommended to the government an amnesty policy.

Which one of the following, if true, would have most influenced the recommendation of the minister?

- (a) Opinion polls have indicated that many Italians favour a general pardon.
- (b) The opposition may be persuaded to help since amnesties must be approved by a two-thirds majority in Parliament.
- (c) During a recent visit to a large prison the Pope whose pronouncements are taken seriously appealed for 'a gesture of clemency'.
- (d) Shortly before the recommendation was made 58 prisons reported disturbances in a period of two weeks.

- 296)** The offer of the government to make iodised salt available at a low price of one rupee per kilogram is welcome especially since the government seems to be so concerned about the ill effects of non-iodised salt. But it is doubtful whether the offer will actually be implemented. Way back in 1994, the government in an earlier effort had prepared reports outlining three new and simple but experimental methods for reducing the costs of iodisation to about five paise per kilogram. But these reports have remained just those-reports on paper.

Which one of the following, if true, most weaken the author's contention that it is doubtful whether the offer will be actually implemented?

- (a) The government proposes to save on costs by using the three methods it has already devised for iodisation.
- (b) The chain of fair-price distribution outlets now covers all the districts of the state.
- (c) Many small-scale and joint-sector units have completed trials to use the three iodisation methods for regular production.
- (d) The government which initiated the earlier effort is in place even today and has more information on the effects of non-iodised salt.

- 297)** About 96 percent of Scandinavian moths have ears tuned to the ultrasonic pulses that bats, their predators, emit. But the remaining 4 percent do not have ears and are deaf. However, they have a larger wingspan than the hearing moths, and also have higher wing-loadings—the ratio between a wing’s area and its weight—meaning higher manoeuvrability.

Which one of the following can be best inferred from the above passage?

- (a) A higher proportion of deaf moths than hearing moths fall prey to bats.
- (b) Deaf moths may try to avoid bats by frequent changes in their flight direction.
- (c) Deaf moths are faster than hearing moths and so are less prone to becoming a bat’s dinner than hearing moths.
- (d) The large wingspan enables deaf moths to better receive and sense the pulses of their bat predators.

- 298)** Argentina’s beef cattle herd has dropped to under 50 million from 57 million ten years ago in 1990. The animals are worthless too : prices fell by over a third last year, before recovering slightly. Most local meat packers and processors are in financial trouble and recent years have been a string of plant closures. The Beef Producers Association has now come up with a massive advertisement campaign calling upon Argentines to eat more beef—their juicy, healthy, rotund, plate-filling’ steaks.

Which one of the following, if true, would contribute most to a failure of the campaign?

- (a) There has been a change in consumer preference towards eating leaner meats like chicken and fish.
- (b) Prices of imported beef have been increasing thus making locally grown beef more competitive in terms of pricing.
- (c) The inability to cross-breed native cattle with improved varieties has not increased production to adequate levels.
- (d) Animal rights pressure groups have come up rapidly demanding better and humane treatment of farmyard animals like beef cattle.

- 299)** The problem of traffic congestion in Athens has been testing the ingenuity of politicians and town planners for years. But the measures adopted to date have not succeeded in decreasing the number of cars on the road in the city centre. In 1980, an odds and evens number-plate legislation was introduced under which odd and even plates were banned in the city centre on alternate days thereby expecting to halve the number of cars in the city centre. Then in 1993 it was decreed that

all cars in use in the city centre must be fitted with catalytic converters; a regulation had just then been introduced substantially reducing import taxes on cars with catalytic converters, the only condition being that the buyer of such a ‘clean’ car offered for destruction a car at least 15-years old.

Which one of the following options if true, would best support the claim that the measures adopted to date have not succeeded?

- (a) In the 1980s, many families purchased second cars with the requisite odd or even number plate.
- (b) In the mid-1990s, many families found it feasible to become first-time car owners by buying a car more than 15 years old and turning it in for a new car with catalytic converters.
- (c) Post-1993, many families seized the opportunity to sell their more than 15-years old cars and buy ‘clean’ cars from the open market, even if it meant forgoing the import tax subsidy.
- (d) All of the above

- 300)** Although in the limited sense of freedom regarding appointments and internal working, the independence of the Central Bank in unequivocally ensured the same cannot be said of its right to pursue monetary policy without coordination with the Central Government. The role of the Central Bank has turned out to be subordinate and advisory in nature.

Which one of the following best supports the conclusion drawn in the passage?

- (a) A decision of the Chairman of the Central Bank to increase the bank-rate by two percentage points sent shock-waves in industry, academic and government circles alike.
- (b) Government has repeatedly resorted to monetisation of the debt despite the reservations of the Central Bank.
- (c) The Central Bank does not need the Central Government’s nod for replacing soiled currency notes.
- (d) The inability to remove coin shortage was a major shortcoming of this government.

- 301)** The ‘Shveta-chattra’ or the ‘White Umbrella’ was a symbol of sovereign political authority placed over the monarch’s head at the time of the coronation. The ruler so inaugurated was regarded not as a temporal autocrat but as the instrument of protective and sheltering firmament of supreme law. The white umbrella symbol is of great antiquity and its varied use illustrates the ultimate common basis of non-theocratic nature of states in the Indian tradition. As such, the umbrella is found although not necessarily a white one, over the head of Lord Ram, the Mohammedan sultans and Chatrapati Shivaji.

Which one of the following best summarises the above passage?

- (a) The placing of an umbrella over the ruler's head was a common practice in the Indian sub-continent.
- (b) The white umbrella represented by instrument of firmament of the supreme law and the non-theocratic nature of Indian states.
- (c) The umbrella, not necessarily a white one, was a symbol of sovereign political authority.
- (d) The varied use of the umbrella symbolised the common basis of the non-theocratic nature of states in the Indian tradition.

- 302)** The theory of games is suggested to some extent by parlour games such as chess and bridge. Friedman illustrates two distinct features of these games. First, in a parlour game played for money, if one wins the other (others) loses (lose). Second, these games are games involving a strategy. In a game of chess, while choosing what action is to be taken, a player tries to guess how his/her opponent will react to the various actions he or she might take. In contrast, the card-pastime, 'patience' or 'solitaire' is played only against chance.

Which one of the following can best be described as a 'game'?

- (a) The team of Tenzing Norgay and Edmund Hillary climbing Mt. Everest for the first time in human history.
- (b) A national level essay writing competition.
- (c) A decisive war between the armed forces of India and Pakistan over Kashmir.
- (d) Oil Exporters' Union deciding on world oil prices, completely disregarding the countries which have at most minimal oil production.

Directions (Q.Nos. 303-304) Answer the questions based on the following information.

For each of the two questions, indicate which of the statements given with that particular question is consistent with the description of the unreasonable man in the passage below. (1999)

Unreasonableness is a tendency to do socially permissible things at the wrong time. The unreasonable man is the sort of person who comes to confide in you when you are busy. He serenades his beloved when she is ill. He asks a man who has just lost money by paying a bill for a friend to pay a bill for him. He invites a friend to go for a ride just after the friend has finished a long car trip. He is eager to offer services which are not wanted, but which cannot be politely refused. If he is present at an arbitration, he stirs up dissension between the two parties, who were really anxious to agree. Such is the unreasonable man.

- 303)** He tends to

- (a) entertain women.
- (b) be a successful arbitrator when dissenting parties are anxious to agree.
- (c) be helpful when solicited.
- (d) tell a long story to people who have heard it many times before.

- 304)** The unreasonable man tends to

- (a) bring a higher bidder to a salesman who has just closed a deal.
- (b) disclose confidential information to others.
- (c) sing the praises of the bride when he goes to a wedding.
- (d) sleep late and rise early.

Directions (Q.Nos. 305-312) Answer the questions based on the following information.

Read each of the eight short passages given below and answer the question that follow it. (1999)

- 305)** Three airlines IA, JA and SA-operate on the Delhi-Mumbai route. To increase the number of seats sold, SA reduced its fares and this way emulated by IA and JA immediately. The general belief was that the volume of air travel between Delhi and Mumbai would increase as a result. Which of the following, if true, would add credence to the general belief?
- (a) Increase in profitability of the three airlines.
 - (b) Extension of the discount scheme to other routes.
 - (c) A study that shows that air travellers in India are price-conscious.
 - (d) A study that shows that as much as 80 percent of air travel in India is company-sponsored.

- 306)** According to McNeill, a Brahmin priest was expected to be able to recite at least one of the Vedas. The practice was essential for several centuries when the Vedas had not yet been written down. It must have had a selective effect, since priests would have been recruited from those able or willing to memorise long passages. It must have helped in the dissemination of the work, since a memorised passage can be duplicated many times.

Which of the following can be inferred from the above passage?

- (a) Reciting the Vedas was Brahmin's obligation.
- (b) The Vedic priest was like a recorded audio cassette.
- (c) McNeill studied the behaviour of Brahmin priests.
- (d) Vedic hymns had not been scripted.

- 307)** Developed countries have made adequate provisions for social security for senior citizens. State insurers (as well as private ones) offer medicare and pension benefits to people who can no longer earn. In India, with the collapse of the joint family system, the traditional shelter of the elderly has disappeared. And the state faced with a financial crunch is not in a position to provide a social security. So, it is advisable that the working population give serious thought to building a financial base for itself.

Which one of the following, if it were to happen, weaken the conclusions drawn in the above passage the most?

- (a) The investible income of the working population, as a proportion of its total income, will grow in the future.
- (b) The insurance sector is underdeveloped and trends indicate that it will be extensively privatised in the future.
- (c) India is on a path of development that will take it to a developed country status, with all its positive and negative implications.
- (d) If the working population builds a stronger financial base, there will be a revival of the joint family system.

- 308)** Various studies have shown that our forested and hilly regions and, in general, areas where biodiversity (as reflected in the variety of flora) is high, are the places where poverty appears to be high. And these same areas are also the ones where educational performance seems to be poor. Therefore, it may be surmised that, even disregarding poverty status, richness in biodiversity goes hand in hand with educational backwardness.

Which one of the following statements, if true, can be said to best provide supporting evidence for the surmise mentioned in the passage?

- (a) In regions where there is little variety in flora, educational performance is seen to be as good as in regions with high variety in flora when poverty levels are high.
- (b) Regions which show high biodiversity also exhibit poor education performance at low levels of poverty.
- (c) Regions which show high biodiversity reveal high levels of poverty and poor educational performance.
- (d) In regions where there is low biodiversity at all levels of poverty, educational performance is seen to be good.

- 309)** Cigarettes constitute a mere 20 percent of tobacco consumption in India, and fewer than 15 percent of the 200 million tobacco users consume cigarettes. Yet these 15 percent contribute nearly 90 percent of the tax revenues to the exchequer from the tobacco sector. The punitive cigarette taxation regime has

kept the tax base narrow and reducing taxes will expand this base.

Which of the following best bolsters the conclusion that reducing duties will expand the tax base?

- (a) The cigarette manufactures' association has decided to indulge in aggressive promotion.
- (b) There is a likelihood that tobacco consumers will shift to cigarette smoking if cigarette prices were to reduce.
- (c) The cigarette manufactures are lobbying for a reduction on duties.
- (d) An increase in duties on non-cigarette tobacco may lead to a shift in favour of cigarette smoking.

- 310)** Thomas Malthus, the British clergyman turned economist predicted that the planet would not be able to support the human population for long. His explanation was the human population grows at a geometric rate, while the food supply grows only at an arithmetic rate.

Which one of the following, if true, would not undermine the thesis offered by Malthus?

- (a) Population growth can be slowed down by the voluntary choices of individuals and not just by natural disasters.
- (b) The capacity of the planet to feed a growing human population can be enhanced through biotechnological means.
- (c) Human systems and natural systems like food supply, follow natural laws of growth which have remained constant, and will remain unchanged.
- (d) Human beings can colonise other planetary systems on a regular and ongoing basis to accommodate a growing population.

- 311)** The company's coffee crop for 1998-99 totalled 8,079 tonnes, an all time record. The increase over the previous year's, production of 5,830 tonnes was 38.58 percent. The previous highest crop was 6,089 tonnes in 1970-71. The company had fixed a target of 8,000 tonnes to be realised by the year 2000-01, and this has been achieved two years earlier, thanks to the emphasis laid on the key areas of irrigation, replacement of unproductive coffee bushes, intensive refilling and improved agricultural practices. It is now our endeavour to reach the target of 10,000 tonnes in 2001-02.

Which one of the following would contribute most to making the target of 10,000 tonnes in 2001-02 unrealistic?

- (a) The potential of the productivity enhancing measures implemented up to now has been exhausted.
- (b) The total company land under coffee has remained constant since 1969 when an estate in the Nilgiri Hills was acquired.
- (c) The sensitivity of the crop to climatic factors makes predictions about production uncertain.
- (d) The target-setting procedures in the company had been proved to be sound by the achievement of the 8,000 tonnes target.

312) Animals in general are shrewd in proportion as they cultivate society. Elephants and beavers show the greatest signs of this sagacity when they are together in large numbers, but when man invades their communities they lose all their spirit of industry. Among insects, the labours of the bee and the ant have attracted the attention and admiration of naturalists, but all their sagacity seems to be lost upon separation, and a single bee or ant seems destitute of every degree of industry. It becomes the most stupid insect imaginable and it languishes and soon dies.

Which of the following can be inferred from the above passage?

- (a) Human kind is responsible for the destruction of the natural habitat of animals and insects.
- (b) Animals in general are unable to function effectively outside their normal social environment.
- (c) Naturalists have great admiration for bees and ants despite their lack of industry upon separation.
- (d) Elephants and beavers are smarter than bees and ants in the presence of human beings.

Directions (Q.Nos. 313-322) *Answer the questions based on the following information. Read the passage given below and answer the questions that follow. (1998)*

313) Efficiency is all right in its place, in the shop, the factory, the store. The trouble with efficiency is that it wants to rule our play as well as our work; it won't be content to reign in the shop, it follows us home. It can be inferred from the above passage that

- (a) Efficiency can become all-pervading.
- (b) Efficiency does not always pay.
- (c) Efficiency can be more of a torture than a blessing.
- (d) None of the above

314) In order to ease the traffic congestion, the transport planners decided to have a sophisticated system of elevated monorail travel in the city. However, it was pointed out by somebody that a metro rail system would be a more effective solution to the traffic problem. The plan was thus stalled. Moreover, since a budget had not been drawn up for the project, it was deemed fit to stall the work of the monorail for

sometime. In the meanwhile, the traffic planners of the city decided to build an efficient system of subways and flyovers in the city with the aim of easing the same problem. At the instant when the planners were preparing to award the contracts to the concerned parties, the transport planners came up with the contention that the subways interfered with the site of a pillar of the monorail system. The traffic planners had to give up the idea and think of other possible solutions.

We can infer which of the following from the above passage?

- (a) The city authorities felt that the monorail system was essentially impractical.
- (b) There is a strong contention between the two groups of planners in the city.
- (c) The projects would be stalled for an indefinite period.
- (d) None of the above

315) The Company encourages its managers to interact regularly without a pre-set agenda to discuss issues concerning the company and society. This idea has been borrowed from the ancient Indian concept of religious congregation, called satsang. Designations are forgotten during these meetings; hence, it is not uncommon in these meetings to find a sales engineer questioning the CEO on some corporate policy or his knowledge of customers.

Based on the information provided in the above passage, it can be inferred that

- (a) the company is concerned about its reputation with its employees.
- (b) the company believes in fostering the spirit of dialogue without degenerating it into a positioning based debate.
- (c) the company had some inter-personnel problems in the past due to which it felt the need for these corporate satsangs.
- (d) All of the above

316) From Cochin to Shimla, the new culture vultures are tearing down acres of India's architectural treasures. Ancestral owners are often fobbed off with a few hundred rupees for an exquisitely carved door or window, which fetches fifty times that much from foreign dealers, and yet more from the drawing room sophisticates of Europe and the US. The reason for such shameless rape of the Indian architectural wealth can perhaps not wrongly be attributed to the unfortunate blend of activist disunity and the local indifference. It can be inferred from the above passage that

- (a) the environment created by the meeting between activist disunity and local indifference is ideal for antique dealers to strive in India.
- (b) only Indians are not proud of their cultural heritage and are hungry for the foreign currency that is easily available in return of artifacts.
- (c) most Indian families have heirlooms which can be sold at high prices to Europeans and Americans.
- (d) India provides a rich market for unscrupulous antique dealers.

317) Deepa Metha's *Fire* is under fire from the country's self-appointed moral police. Their contention is that the film is a violation of the Indian cultural moral and cannot be allowed to influence the Indian psyche. According to them such films ruin the moral fabric of the nation which must be protected and defended against such intrusions at all cost even at the cost of cultural dictatorship.

Based on the information in the above passage it can be inferred that

- (a) the assumption underlying the moral police's critique of *Fire* is that the Indian audience is vulnerable to all types of influence.
- (b) the assumption underlying the moral police's critique of *Fire* is that Indian audience is impressionable and must be protected against 'immoral' influences.
- (c) the moral police thinks it has the sole authority to pass judgement of films screened in India.
- (d) None of the above

318) The dominant modern belief is that the soundest foundation of peace would be universal prosperity. One may look in vain for historical evidence that the rich have regularly been more peaceful than the poor but then it can be argued that they have never felt secure against the poor, that their aggressiveness stemmed from fear; and that the situation would be quite different if everybody were rich.

It can be inferred from the above passage that

- (a) a lot of aggression in the world stems from the desire of the haves to defend themselves against the have-nots.
- (b) universal prosperity as a foolproof measure of peace can no longer be accepted.
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

319) The effect produced on the mind by travelling depends entirely on the mind of the traveller and on the way in which he conducts himself. The chief idea of one very common type of traveller is to see as many objects of interest as he possibly can. If he

can only after his return home say that he has seen such and such a temple, castle, picture gallery; or museum, he is perfectly satisfied. Far different is the effect of travels upon those who leave their country with mind prepared by culture to feel intelligent admiration for all the beauties of nature and art to be found in foreign lands. When they visit a new place, instead of hurrying from temple to museum to picture gallery; they allow the spirit of the place to sink into their minds, and only visit such monuments as the time they have at their disposal allows them to contemplate without irreverent haste.

It can be inferred from the above passage that

- (a) the writer prefers the second type of traveller.
- (b) the first type of traveller is the lay traveller who does not understand the worth of any place he travels to.
- (c) the objective of the second type of traveller is not to see much, but to see well.
- (d) All of the above

320) Whether we look at the intrinsic value of our literature or at the particular situation of this country, we shall see the strongest reason to think that of all foreign tongues, the English tongue is that which would be the most useful to our native subjects.

It can be inferred that

- (a) the speaker is a die-hard colonist.
- (b) the speaker has the good of the nation at heart.
- (c) the speaker is addressing an issue related to a colonial empire.
- (d) None of the above.

321) Where the film *Bombay* loses out is where every commercial film congenitally goes awry-becoming too simplistic to address serious issues and failing to translate real life to reel.

Which of the following can be inferred from the passage?

- (a) The film's director aimed at recreating real life on the silver screen.
- (b) The film was too simplistic for the audience's taste.
- (c) The film was successful in spite of its shortcomings.
- (d) None of the above.

322) Aspiration is nothing new. Neither is the debate over what the Indian middle class is, what it wants and what it buys. Since the mid-80s, that has been the focus of the economic policy papers so called pro and anti-poor budgets and marketing strategies that have successfully broken the barrier of urban selling and reached deeper into

rural India with increasing income levels and aspirations.

Based on the above passage, it can be inferred that

- (a) the Indian middle class has been the focus of economic policies for a long time.
- (b) the Indian middle class has graduated from being the 'deprived' middle class to the 'pampered' middle class.
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

Directions (Q.Nos. 323-327) Answer the questions based on the following information.

This section contains statements followed by questions based on the statements. Read the statements and select the best option as the answer.

(1995)

- 323)** Unless you decide your whole life to it, you will never learn to speak the language of another country to perfection; you will never know its people and its literature with complete intimacy.

Which of the following is likely to undermine the above argument?

- (a) I can speak 10 foreign languages already.
- (b) I do not travel to foreign countries.
- (c) I am happy with the languages I know and do not need to learn any other language.
- (d) I should spend time to understand my own people and literature first, only then can I appreciate other languages and cultures.

- 324)** The writer can only be fertile if he renews himself and he can only renew himself, if his soul is constantly enriched by fresh experience.

Which of the following is most likely to support the above thought?

- (a) Only out of fresh experience can the writer get germs for new writing.
- (b) The writer can meet new people.
- (c) The writer must see new places .
- (d) None of the above.

- 325)** But because the idea of private property has been permitted to override with its selfishness, the common good of humanity it does not follow that there are not limits within that idea can function for the general convenience and advantage.

Which of the following is most likely to weaken the argument?

- (a) All the people of the society should progress at an equitable rate and there should be no disparities and private property does bring about a tremendous disparity.
- (b) One should not strive for the common good of humanity at all, instead one should be concerned with maximising one's own wealth.
- (c) One should learn from the experiences of former communist nations and should not repeat his mistakes at all.
- (d) Even prosperous capitalist countries like the USA have their share of social problems.

- 326)** Now the audience is a very curious animal. It is shrewd rather than intelligent. Its mental capacity is less than that of its most intellectual members. If these were graded from A to Z, decreasing with succeeding letters to the zero of the hysterical shop-girl, I should say its mental capacity would come around about the letter O. According to the above statement,

- (a) Some members in the audience are more intelligent than any of its other members.
- (b) The net intelligence of the audience is a little less than average.
- (c) Only (a)
- (d) Both (a) and (b)

- 327)** I have been studying it, consciously and subconsciously, for 40 years and I still find men unaccountable; people I know intimately can surprise me by some action of theirs which I never thought them capable of or by the discovery of some trait which exhibit a side of themselves that I never even suspected.

The idea in this sentence can be best summarised as :

- (a) Men are inconsistent and therefore one should not be confident even about one's closest friends.
- (b) Men are unpredictable, one can never tell what they will do next; hence, one should be very careful in one's dealings.
- (c) No matter how closely you know somebody there still exists an unknown facet of his personality.
- (d) None of the above.

One Word Substitution

Directions (Q. Nos. 328-329) Given below is a description. Substitute the expression with one word.

(2015)

- 328)** A learning disorder distinguished by impaired ability to recognise and comprehend written words.

- 329)** Literary theft, using ideas and words of another person presenting them as own.

Analogy

Directions (Q. Nos. 330-332) Read the following information carefully and answer the questions based on that.

Each of five people-A, B, C, D and E owns a different car among Maruti, Mercedes, Sierra, Fiat and Audi and the colours of these cars are Black, Green, Blue, White and Red, not necessarily in that order. No two cars are of the same colour. It is also known that

- (i) A's car is not Black and it is not a Mercedes.
- (ii) B's car is Green and it is not a Sierra.
- (iii) E's car is not White and it is not an Audi.
- (iv) C's car is a Mercedes and it is not Blue.
- (v) D's car is not Red and it is a Fiat. (2012)

330) If A owns a Blue Sierra, then E's car can be a

- (a) Red Maruti
- (b) White Maruti
- (c) Black Audi
- (d) Red Audi

331) If A owns a White Audi, then E's car can be a

- (a) Red Maruti
- (b) Blue Maruti
- (c) Green Audi
- (d) Black Sierra

332) If A's car is a Red Maruti and D's car is White, then E owns a

- (a) Black Audi
- (b) Blue Sierra
- (c) Black Sierra
- (d) Blue Audi

Directions (Q.Nos. 333-338) Answer the questions based on the following information.

In each of the following questions a related pair of words is followed by four pairs of words or phrases. Select the pair that best expresses a relationship similar to the one expressed in the question pair. (1997)

333) Peel : Peel

- (a) Coat : Rind
- (b) Laugh : Bell
- (c) Rain : Reign
- (d) Brain : Cranium

334) Doggerel : Poet

- (a) Symphony : Composer
- (b) Prediction : Astrologer
- (c) Wine : Vintner
- (d) Pulpfiction: Novelist

335) Premise: Conclusion

- (a) Assumption : Inference
- (b) Hypothesis : Theory
- (c) Knowledge : Ideas
- (d) Brand : Marketing

336) Barge : Vessel

- (a) Shovel : Implement
- (b) Book: Anthology
- (c) Rim : Edge
- (d) Training : Preparation

337) Love : Obsession

- (a) Happiness : Joy
- (b) Amity : Harmony
- (c) Enemy : Hatred
- (d) Sorrow : Misery

338) Reptile : Adder

- (a) Skelton : Flesh
- (b) Method : System
- (c) Plant : Genus
- (d) Dinosaur : Tyrannosaurus

Directions (Q.Nos. 339-346) Answer the questions based on the following information.

In each of the following questions, a pair of capitalised words is followed by four pairs of words. You are required to mark as the answer the pair of words which have a relationship between them most similar to the relationship between the capitalised pair. (1996)

339) Liquid : Gaseousness

- (a) Serum : Fume
- (b) Humid : Arid
- (c) Thaw: Distil
- (d) Smoke : Cloud

340) Fission : Fusion

- (a) Implosion : Explosion
- (b) Separation : Combination
- (c) Intrusion : Extrusion
- (d) Enemy : Friend

341) Doubt : Faith

- (a) Atheist : Religion
- (b) Sceptic : Pious
- (c) Iconoclast : Idol
- (d) Apostate: State

342) Brick : Building

- (a) Word : Dictionary
- (b) Alphabet : Letter
- (c) Platoon : Soldier
- (d) Idiom : Language

343) Dulcet : Raucous

- (a) Sweet : Song
- (b) Crazy : Insane
- (c) Palliative : Exacerbating
- (d) Theory: Practical

344) Action : Reaction

- (a) Introvert : Extrovert
- (b) Assault : Defend
- (c) Diseased : Treatment
- (d) Death : Rebirth

345) Malapropism : Words

- (a) Anachronism : Time
- (b) Ellipsis : Sentence
- (c) Jinjanthropism : Apes
- (d) Catechism : Religion

346) Anterior : Posterior

- (a) In : Out
- (b) Top : Bottom
- (c) Head : Tail
- (d) Front: Rear

Directions (Q. Nos. 347-351) Answer the questions based on the following information.

In each of these questions, a related pair of words or phrases is followed by a pair of words or phrases. Select the lettered pair that best expresses a relationship that is least similar to the one expressed in the original pair. (1995)

347) Germane : Pertinent

- (a) Apt: Appropriate
- (b) Quick : Urgent
- (c) Dull : Sluggish
- (d) Excited : Serene

348) Sail: Ship

- (a) Propeller : Aeroplane (b) Radar : Satellite
(c) Hydrogen : Balloon (d) Accelerator : Car

349) Cosmic : Universe

- (a) Terrestrial : Earth (b) Lunar : Moon
(c) Connubial : Youth (d) Annular : Ring

350) Canine : Dog

- (a) Feline : Cat (b) Aquiline : Parrot
(c) Serpentine : Cobra (d) Vilpne : Fox

351) Xenophobia : Foreigners

- (a) Claustrophobia : Height (b) Anglophobia : Englishmen
(c) Bibliophobia : Book (d) Hemophobia : Blood

Directions (Q. Nos. 352-356) Answer the questions based on the following information .

In each of the following questions, a related pair of words or phrases is followed by five lettered pairs of words or phrases. Select the lettered pair that best expresses a relationship similar to the one expressed in the original pair: **(1995)**

352) Limpid : Murky

- (a) Dazed : Clouded (b) Obscure : Vague
(c) Bright : Gloomy (d) Nebulous : Dim

353) Ease : Alleviate

- (a) Hint: Allocative (b) Revolt : Repudiate
(c) Collapse : Rise (d) Question: Interrogate

354) Secret : Clandestine

- (a) Overt : Furtive (b) Covert : Stealthy
(c) Open : Closed (d) News : Dim

355) Drama : Audience

- (a) Brawl : Vagabonds (b) Gamet : Spectators
(c) Art : Critics (d) Movie : Actors

356) Building : Storey

- (a) Book : Chapter (b) Sentence : Adjective
(c) Tree : Stem (d) Elephant : Tusk

Directions (Q.Nos. 357-359) Answer the questions based on the following information.

From the given alternatives, select the one in which the pairs of words have a relationship similar to the one between the bold words. **(1994)**

357) Lying : Perjury

- (a) Statement : Testimony (b) Seeing : Observing
(c) Taking : Stealing (d) Eating : Dining

358) Peer : Contemporary

- (a) Akbar : British (b) Antique : Outdated
(c) Shakespeare : Tennyson (d) Colssus : Elephant

359) Loud : Stentorian

- (a) Mild : Noisy (b) Painful : Prickly
(c) Adjective : Descriptive (d) Bright : Resplendent

Directions (Q.Nos. 360-369) Answer the questions based on the following information.

Each of these questions has a pair of **CAPITALISED** words followed by four pairs of words. Choose the pair of words which best expresses the relationship similar to that in the capitalised pair. **(1993)**

360) ATMOSPHERE : STRATOSPHERE

- (a) Nimbus : Cloud (b) Instrument : Calibration
(c) Aircraft : Jet (d) Climate : Rain

361) FOOD : GOURMET

- (a) Book : Critic (b) Art : Connoisseur
(c) Sports : Fan (d) Craft : Skill

362) NORTH : SOUTH

- (a) Black : White (b) Yellow : Orange
(c) Sports : Fan (d) Craft : Skill

363) BRAND : PRODUCT

- (a) Dalda : Rath
(b) Aircraft : Flying Machine
(c) Shoes : Reebok
(d) Sports car : Automobile

364) DROUGHT : FAMINE

- (a) Poverty : Plenty (b) Drip : Fluid
(c) Camera : Film (d) Training : Skill

365) SALT : SALTY

- (a) Sweet : Sugar (b) Cow : Bovine
(c) Bitter : Sour (d) Taste : Flavour

366) DIVIDE: UNITE

- (a) Split : Apart (b) Marriage : Divorce
(c) Fission : Fusion (d) Chasm : Gap

367) CRIME : PUNISHMENT

- (a) Lawyer : Judge
(b) Court : Room
(c) Accused : Defendant
(d) Homicide : Penalty

368) NUTS : BOLTS

- (a) Nitty : Gritty (b) Bare : Feet
(c) Naked : Clothed (d) Hard : soft

369) JUST : ARBITRARY

- (a) Order : Chaos
(b) Bare : Clothed
(c) Hope : Surprise
(d) Proper : Improper

HINTS & SOLUTIONS

Odd One Out

- 1) (3) Sentence is the odd one out as the other sentences state that man is not the master of nature.
- 2) (4) Sentence is the odd one here as the other sentences talk about car and its name.
- 3) (3) Sentence is the odd one out as it talks about the seeds of the *Impatiens psittacina* plant.
- 4) (b) 'Kin' means relatives, an old-fashioned word, rarely used. Rest of them are synonyms.
- 5) (b) 'Adapt' is to accept. Rest are synonyms of 'very good'/skillful.
- 6) (c) 'Bell' does not fit as others refer to round shape.
- 7) (c) 'Grid' refers to pattern of lines or system of electricity. Rest of them refer to a kind of network.
- 8) (d) 'Withstand' is to be strong enough not to break, it is an opposite to other options.
- 9) (d) All other refer to a kind of gap or wide difference.
- 10) (d) All other options refer to acts done quickly or without thinking.
- 11) (b) 'Intrusion' refers to something that disturbs, rest of them refer to smooth flow.
- 12) (b) All others refer to deceiving or being deceived.
- 13) (b) 'Cruiser' means a 'large war-ship'. Rest are modes of transport.
- 14) (d) All other means a break/pause in continuous work.
- 15) (a) 'Couple' means 'to faster or link'. Rest are synonyms for 'to tear or cut'.
- 16) (b) 'Ruffle' does not suit with group which means 'to disturb'. Other three mean to calm, to quiet.
- 17) (a) 'Cease' means 'to stop'. All other mean to start.
- 18) (b) 'Hub' means 'central part', while 'brink', brim means the edge.
- 19) (c) 'Ignominy' means 'dishonour' or public disgrace while other option means to say something is 'praise'.
- 20) (c) 'Ardour' means 'warmth of affection', while others 'detest' means 'dislike', 'abhor'.
- 21) (d) 'Awkward' means 'clumsy', 'difficult', other means cleverness, proficient.
- 22) (c) 'Clamorous' means 'noisy'. 'Taciturn' means 'silent' and others are synonyms.
- 23) (a) 'Sporadic' means 'scattered here and there', rest are synonyms.
- 24) (d) 'Rational' means 'judicious'. Rest means unreasonably enthusiastic for something.
- 25) (c) 'Material' is no part of group. Rest means forming idea.
- 26) (b) Easily discarded 'shoulder'.
- 27) (d) 'Adept' is well skilled. Rest group is appropriate.
- 28) (d) 'Bark' is used for dog. Rest options are related to 'Horse'.
- 29) (d) Octroi is mentioned on invoice and sales tax is paid on its basis. Quotation is out sourced.

Summarising

- 30) The discomfort you felt with your school fellows was because both sides knew little of each other.
Avoid prejudice and negative thoughts till you encounters bad behaviour from others and then win them over by shunning the faults you have observed.
- 31) Preferential treatment given by the state to agents of resource intensification for an expanding commercial industrial economy infuriates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
- 32) Physical inertia stops your body from moving; mental inertia freezes your energy and stops your mind from responding meaningfully to events, even tragedies, in front of you. You are unable to act even if you want to.
- 33) (b) The paragraph conveys the idea that initially it is natural to be wary of one's school fellows as one know them well. It also says that one needs to avoid prejudice. Further, one must avoid the faults that one sees in others and thus win them over. These ideas are best expressed in choice (b). Choice (a) suggests that one must complain when one finds others prejudiced. This is a distortion of the meaning of the original text. Choice (c) omits the point that one must avoid the faults that one finds in others. Choice (d) implies that one should make enemies with others if they behave badly. This is a misrepresentation.

- 34) (a) The main idea expressed in the paragraph is that the food habits of people ranging from the Arctic to the tropics differ because of the climate and produce of their respective regions. This is best expressed in choice (a). Choice (b) is incomplete as it fails to mention that the produce of the region is a factor in shaping food habits. Choice (c) is incomplete as it does not mention the role that the weather plays in shaping food habits. Finally; choice (d) is a misrepresentation of the idea mentioned in the text. The original text does not say that people eat what they do because of preference. Further, the text does not say that people should change their food habits.
- 35) (b) The paragraph mainly talks about scientists not being sure about the changes in the Earth's climate; whether they happen all at once or at different times in both the hemispheres. A definitive answer will help them to predict future climatic changes. These ideas are best expressed in choice (b).

- 36) (c) The main idea expressed is that the state has given preferential treatment to agents of resource-intensification to intensify an expanding commercial-industrial economy. This action is protested by the local communities which has in turn resulted in class conflict. All these ideas are expressed in choice (c).
- 37) (d) The central idea of the paragraph is that Nietzsche opined that excessive intellectualisation is responsible for the decline of modern society and suggests nurturing creative instincts instead. Choice (d) captures this correctly.
- 38) (a) The use of the word 'circumstances' makes this the best choice.
- 39) (d)
- 40) (b) It is the best worded of all.
- 41) (b)
- 42) (a) The correct sequence of the para is DBC and sentence A is the odd one out.

Paragraph Conclusion/Completion

- 43) (4) captures the essence of the passage.
- 44) (4) Here, gives the appropriate essence of the paragraph.
- 45) (1) Here, is appropriate in this case.
- 46) (d) As we know that sales is the ultimate end of any business activity either it be goods or services. Hence, manager must have sold the car no matter who was the salesman.
- 47) (c) Water is not in plenty and needs to be protected as well as its conservation is also important for the environment. So, both are true.
- 48) (b) In the modern times, what is required is the practising of ethical and moral secularism not the political one.
- 49) (c) Animal management is always desirable to acquaint oneself who aspires to be involved in the work of animal management.
- 50) (b) The loss to the industry be said to be small because the industry's loss due to illegal copying of programs must be valued in terms of the sales lost, the actual loss to the industry is directly related to the legitimate sales opportunities that have been lost.

Would the people illegally copying the programs buy them if they could not otherwise obtain them? If it was true that most of them have no serious interest in the programs, they would be unlikely to purchase them. In this case, few sales would be lost and the loss to the industry could be considered small.

- Option (b) properly identifies the fact that if the illegal copiers were unlikely to purchase the same programs, then the industry has not lost potential sales.
- 51) (a) Religious sects like the 'waiters' with no sexual relationship, hence no children, cannot run beyond two generations, which is option (a) states.
- 52) (a) The reason for the under-estimation in the survey is what is asked in option (a). This can happen if people who are actually dishonest, claim to be honest. Option (b) runs contrary to this logic. The degree of honesty, discussed in option (c) is not relevant to the question. Option (d) is a clever way of saying that you cannot say that you are lying and be speaking the truth. Although, logically correct, but irrelevant to the question asked.
- 53) (a) The previous sentence states labelled by the psychiatric establishment. Option (a) states '... of those considered mentally ill'. Emphasize the words 'labelled' and 'considered' and you will get your answer.
- 54) (a) The second sentence talks about the Jurisprudence Scholars wanting to ...obtain a deeper understanding of the law and its role in society. This understanding can be developed through practical application and experience. Since, option (a) provides a clue in how to understand the law especially in relation to people, it provides the continuity.

- 55) (a) Refer to the first line, it introduces the idea of major change in the corporate world due to PC's. This is matched only by option (a). Options (b), (c), (d) do not match the idea presented.
- 56) (a) Refer to the last line of the given para. The para talks about people and not services or products. Hence, options (b), (c) and (d) can be eliminated.
- 57) (a) The para seems to introduce Fourier and his work and hence is very general in nature. Options (b), (c) and (d) are all very specific and do not fit the context.
- 58) Option (a) is irrelevant as it is neither weakening nor strengthening the argument. Option (c) is beyond the scope of the argument and option (d) is factually wrong as per the question. Option (b) weakens the argument as it explains an effective method to neutralize the free radicals and hence there is no necessity to take anti-oxidants. Hence option (b) is the answer.
- 59) Only option (a) matches the tone and theme of the passage hence is the best conclusion. Option (b) is same as what the passage says but it's only factual in nature whereas the passage is analyzing this issue of doctors not willing to share information.
Option (c) is not supported by the passage hence can be easily eliminated. Option (d) is correct but is incomplete. Hence Option (a) is the answer.
- 60) Option (a) is irrelevant to the passage as other countries and their reaction is out of scope of the passage. Option (b) does nothing to weaken the conclusion drawn by the passage as inequality of income has nothing to do with balance of trade. Option (d) is not sufficient as it does not explain why the quotas may be more regressive than tariffs and also the passage does not compare quotas and tariffs as such. Option (c) weakens the argument as it reiterates the fact that subsidies may benefit the manufacturers but might not necessarily be beneficial to the consumers. Hence option (c) is the answer.
- 61) (b) The paragraph talks about how the hands of the doctor, Perowne, seem to be so important for the patients. It ends with how a certain category of people demonstrate signs of deserting the doctor. Option (c) says Perowne is not concerned but Perowne's concern or the lack of it, cannot be determined as his views on this matter (patients leaving) are not stated. Option (b), however, states that the other category of people, who stick to Perowne, do so because they are not aware of their alternatives. This option sticks to the condition of a surgeon's hands being important to his impression as a surgeon and continues with the thought of how Perowne is only chosen by default. Hence, (b).
- 62) (d) The paragraph discusses climate change being disguised as a reason to implement trade protectionism by powerful industrialized countries. It ends by quoting the example of OECD countries citing lacklustre economic performance and the rapid rise of China and India for trade protectionism. Option (a) is not right as it does not mention the actors involved (evoked by whom?). Option (e) incorrectly states that all those who are 'climate change champions' are perpetrators of global economic inequity. Option (c) relates climatic change to the rise of India and China, while the rise of these countries have only been mentioned viz. OECD countries. This leaves us with options (b) and (d). Option (b) just talks of OECD countries so option (d), being more comprehensive, is a better ending to the passage. Hence, (d).
- 63) (b) The paragraph discusses Mattancherry, Indian Jewry's most famous settlement. It goes on to describe the settlement in some detail and ends with an image of religious tolerance. So it makes sense that religious tolerance in some way should continue to complete the paragraph.
This makes option (e) irrelevant. Option (d) goes against the logic of the passage. Option (a) states peaceful 'coexistence', but coexistence with whom cannot be inferred. It seems that Mattancherry, an almost idyllic settlement, could have only been possible if this particular community wasn't discriminated against and left to its own devices. Hence, (b).
- 64) (e) To paraphrase the passage, we can say: it is hard to pin down, intellectually, what singularly is a Western or Eastern thought. Option (c) changes the focus. Option (d) goes against the logic of the paragraph. Option (b) also goes against the grain of the passage. Between (a) and (e), (e) refers more directly to the last sentence of the paragraph and therefore completes the theme. Hence, (e).
- 65) (e) "The personification of whole organisation is a textual device" is the choice which conflicts the theme in the last two lines of the paragraph is the best possible way. The latter half of the para is talking about personification of whole organisation and this is the choice which completes the para. The choice justifies why whole organisations are personified, even though they cannot speak as characters.
- 66) (a) In the first line of the paragraph the author speaks about the magical allure still retained by photographs. Then he goes on describing the negative effects of technological advancements on the same. Thus in the line with the first idea(s) describes how photographs are still holding out against these negative effects.

- 67) (c) The para starts with listing out the inventory. Option (e) is beyond the scope of the argument. All other options can be easily eliminated, option (c), no inventory would ever include those refers to human intuition and intelligence of Mma Ramotswa .
- 68) (e) The entire paragraph is stressing on how, to fulfil their short term expectations, factories, dealers and consumers are not true to themselves. It is then that both the relationships start becoming strained. This strain leads to feelings of mistrust and lack of commitment.
So, the longer this continues, the more the chances of everyone succeeding to this vicious trap and they would soon realize that they have sacrificed long-term stability and gains for short-term benefits. Hence option (e) is the correct choice. Option (d) is too specific to industry (at the cost of the other players-dealers and customers), option (b) suffer from the same short-comings together with throwing the technical (unexplained) argon, 'supply chain' to us. Option (a) takes into account only 2 players and repeats what is stated in the passage about "dealers adjusting prices and making deals" in the term 'deal making'. Option (c) seems close but can be eliminated as the word 'adversary' is too strong. The passage implies that everyone tries to maximise his benefits-not that they 'oppose' one another.
- 69) (a) The passage heads towards describing the functions that bad/good maps (and therefore theories) serve. Just as 'bad theory' does not help us understand a problem, 'good theory' is invaluable to us. Though it may be simplified. 'Simplified' here implies that less valuable information is left out. According to this logic, options (b), (c) (d) get eliminated. Option (e) is close but more negative in tone than required. The word 'limitation' here indicates a shortcoming whereas the passage implies that it is a simplification as it would not be of much practical use otherwise.
- 70) (b) Going with the direction of the passage, the last line is stating now all players 'profess' to seek only peace. Profess means to mask or to pretend. Thus, the option (b) which talks about the veil being lifted is the most logical completion of the passage. More so this also follows from the sense of the text.
- 71) (c) The style of the author is direct. After the first statement, he puts, care that a rule ? Hence (c) logically follows the second statement.

- 72) (d) In the first part of the passage, the author seeks to explain why one who is young would exploit on entrepreneurial more opportunity. Thus, in the second part of the passage once the 'however' is established, evidence will seek to show how older people will be reluctant to exploit entrepreneurial opportunity. They stress on "novelty, not" new entrepreneurial activities, specifically.
- 73) (a) The passage talks about hubris of civilization and humility is a direct consequence thus... 'humble' is correct. (b), (c) and (d) are not talked about in the passage.
- 74) (b) Option (a) is extreme, (c) is not talked about in the passage. Option (d) is not correct according to the passage. Hence, option (b) is correct.
- 75) (a) Option (a) is a logical corollary to the passage. The paragraph is silent about the audience of sodoku, therefore options (b) and (c) cannot be answers. Option (d) is of exhume nature and hence is ruled out.
- 76) (c) Option (b) talks about humility which is not talked about in the passage, option (c) is an extension of the concept of being a minnow.
- 77) (d) Choice (d) fits into the blank. In choice (a) the usage of the indefinite article is erroneous. Choices (b) and (c) are erroneous due to the incorrect ordering of words.
- 78) (c) Choices (a) and (d) are ruled out because 'suggest' does not go with 'to + verb' form. Choice (b) cannot fit in the blank because of the error in parallelism. The appropriate strucure is "Many people suggest and others advocate".
- 79) (c) The tense in choices (a) and (b) is not consistent. Moreover, choice (a) uses both 'essential' and 'must', thus rendering either one of these words redundant. In choice (d) 'things' the plural form cannot take 'it'.
- 80) (c) To cast the opposite in an feeble light may be fearful or ignorant. It has already heard a better refutation.
- 81) (a) A difficult question as all choices seem to fit, in logical sequence, but (a) seems best as people on different sides argue his or her position sincerely.
- 82) (b) 'Contrariwise, it can be argued', 'is the argument truly fair to animals' is a best suited option.
- 83) (b) Passage begins with mind eye and the option further elaborates it and concludes it well.

Word Usage

- 84) (a) A-4, B-3, C-2, D-1 is correct pairing.
- 85) (d) A-4, B-2, C-1, D-3 is correct pairing.
- 86) (c) A-H, B-G, C-F, D-E
- 87) (b) A-E, B-H, C-F, D-G
- 88) (c) It should be 'slapped his face' and not 'slammed his face'.
- 89) (d) '...prevented by law' is more appropriate than '... stopped by law'.

- 90) (a) The error is in '...very few times'. It should be '...very few occasions'.
- 91) (d) The word 'sombre' means dull, serious, sad. Normally, one, doesn't come across anyone being sombre about having money. It should be 'He is in the happy position ...'.
- 92) (a) (b), (c) and (d) are neglected because the usages are correct and appropriate. (a) is incorrect because the usage 'paid him a call' is used in the context of visiting someone and not when one makes a telephone call.
- 93) (b) Sentence (b) should have been 'it happened upon'.
- 94) (c) should be 'famous star'.
- 95) (b) In Sentence 1 most suitable option is (b) (meaning a decorative accessory) rather than 'broach' (meaning to mention something for the first time), in sentence 2 most suitable is A (meaning, a turning point). Hence option 4 gets eliminated. In sentence 3, B is most suitable (meaning 'unwarranted').
Thus correct option is 'b'.
- 96) (c) In Sentence 1 most suitable option is B (meaning 'a fruit') and in sentence 2 most suitable is B (meaning 'a person who provides advice'). Hence option 4 gets eliminated. In sentence 3, B (a verb) is most suitable hence option 1, 4 also get eliminated. Thus correct option is 'c'.
- 97) (b) Option (b) has a preposition error and should 'of and not 'as'.
- 98) (d) Option (d) should have been 'around' which arrive at a decision.
- 99) (c) In the 1st sentence 'brooch', which means 'a clasp or ornamental pin' is the correct word. Brooch is a verb which means to bring up a topic for discussion. In the 2nd sentence 'councillor', which means 'a member of a council' is the best fit, as people do not complain about the amenities in the neighbourhood to a counsellor (a person who counsels; adviser) but to a councillor who can handle these issues. The 3rd sentence requires a noun, which is 'advice' and not 'advise' which is a verb. In the 4th sentence, 'climactic' means 'pertaining to or coming to a climax' which suits in the context of the play. 'Climatic' means 'of or pertaining to climate', which does not fit in the context. In 5th sentence, 'flare' which means 'a shape that spreads outward' is the correct option. 'Flair', which means talent, is incorrect. Only (c) in the options has all the sequence BAAAB. Hence, (c).
- 100) (b) In the 1st sentence 'currants', which means 'small seedless raisins used in baking', fits best in the context of making a cake. In the 2nd sentence 'exceptionable', which means 'objectionable', is the best fit in this context. In the 3rd sentence 'to consent to' is the correct expression.
- In the 4th sentence, 'obliged', meaning 'required or constrained as by law', suits the context. In the 5th sentence, 'sanguine' which means 'cheerfully optimistic or confident' fits the sentence. 'Genuine' is incorrect because something can be either genuine or not, not 'too genuine'. Only (b) has the required sequence BBAAA. Hence, (b).
- 101) (b) In the 1st sentence 'caustic', which means 'severely critical or sarcastic', fits in the context. In the 2nd sentence cogent, which means 'pertinent' is the appropriate word in the context.
In the 3rd sentence, 'averse', meaning 'having a strong feeling of opposition', is the correct word in the context. In the 4th sentence, 'coupe', which means 'the compartment in a railroad car' fits in the context. 'Peal', which means 'to sound loudly and sonorously' fits in the context of the 4th sentence. Only option (b) has the sequence BBBAB. Hence, (b).
- 102) (a) In the 1st sentence 'diffusing', meaning 'spreading about', fits in the context. In the 2nd sentence, 'baited', which means 'tormented' fits in the context of asking irrelevant questions. In the 3rd sentence, 'horde', which means 'a large group or crowd', fits in the context. In the 4th sentence, 'internment' which means 'confining someone in a prison' fits the sentence. In the 5th sentence, 'unsociable' is the appropriate word and means 'not congenial'. The correct sequence is BABBA. Hence, (a).
- 103) (c) Sentences (a), (b), (d) and (e) use the word 'run' appropriately. Sentence (c) makes no sense, because 'run over' usually means to hit and knock down, especially with a vehicle. Hence, (c).
- 104) (e) Sentences (a), (b), (c) and (d) use the word 'round' in appropriate contexts. In sentence (e) the correct expression should be 'come around' and not 'come round'. Hence, (e).
- 105) (b) The word 'buckle' has been used in correct contexts in sentences (a), (c), (d) and (e). In sentence (b), 'broke into a buckle' does not make any sense. Hence, (b).
- 106) (e) Sentences (a) and (b) use the word 'file' in the most common context. Sentences (c) and (d) also use the word correctly. However, (e) should be 'broke the ranks' and not 'broke the file'. Hence, (e).
- 107) (a) AABBA
- 108) (b) ABBBA
- 109) (c) BBBAB
- 110) (a) It should have been "I have my hands full".
- 111) (c) It should have been "I cannot bear her being angry."
- 112) (b) Option (b) talks about a 'near friend'. Here, is nothing like a near friend. It should have been 'close friend'.

- 113) (a) 'Passing marks' is erroneous. The correction is 'pass marks'. The word has been used correctly in the other choices.
- 114) (b) The word 'bolt' has been used correctly in choices (a), (c) and (d). 'A bolt of silk' refers to silk wound around a long metal tube. 'Bolt' as used in choice (d) means 'to escape'.
However, the usage is inappropriate in choice (b). Bolt means to 'make a dash for'. But how can a person make a bolt for the gate, when he is unable to move?
- 115) (d) 'Fallout' as used in choice (a) refers to the aftereffects of nuclear radiation. The word as used in choices (b) and (c) refers to 'political impact' and 'environmental impact' in the respective sentences. The usage is appropriate in all these choices.
However, it has been used inappropriately in choice (d). The word that should have been used in place of 'fallout' is 'failure'.
- 116) (c) The correct usage is 'help himself to' and not 'help himself with'. Options (a), (b) and (d) use the word correctly.
- 117) (d) The correct usage is 'listen to reason' and not 'listen to a reason'. Options (a), (b) and (c) use the word correctly.
- 118) (a) The correct usage is 'look great on paper' and not 'look great on the paper'. Options (b), (c) and (d) use the word correctly.
- 119) (b) The correct sentence is 'My wife runs a profitable business in this suburb'. Options (a), (c) and (d) use the word correctly.
- 120) (a) The correct usage is 'to serve themselves' and not 'to service themselves'. Options (b), (c) and (d) use the word correctly.
- 121) (a) Opprobrium means criticism/not liking/not agreeing.
- 122) (b) Portend means to feel that something is going to occur.
- 123) (a) Prevaricate means not to explain something directly. It is beating around the bush.
- 124) (c) Restive is being impatient.
- 125) (d) Ostensible means having two motives of accomplishing a task. A purpose to do an act with inner motive of something else.
- 126) (c) It is easier and obvious selection. Size of cricket pitch yielded 22 yards. Standard capacity vessel used to measure a litre oil. Suitable action to prevent outsiders Sheila ascertained the quality of each item delivered.
- 127) (d) Being in so much constraint, Dinesh loses his mind. Vidya's story was a limit. Dinesh moved out when discussion turned to kickback. Jyoti was destined to make career in law.
- 128) (d) Hussain tries to capture spirit of India in his drawing. Sorry, I couldn't get what you are trying to say. The proposal is good but where is hidden point. All decided that Prasad is a good prey to catch.
- 129) (b) I decided not to manage handmade cards business. My brothers deals in cards. Dinesh wanted to deal in card business.
- 130) (a) The old school building has been transformed into museum. Send relates to change in mood. Leena never took a form to a beggar. Opportunity came to the way to Ashish.
- 131) (c) A specious argument is a false one but gives a feel of being true. 'Credible' is a better choice with others.
- 132) (d) Obviate means to remove something while Bolster means to promote.
- 133) (a) Easy to choose, as 'Prevalent' means continue usage.
- 134) (d) 'Altruistic' is being regardful. It has no relation with 'Parsimonious'.
- 135) (a) 'Jovian' means in relation to Jupiter. Facetious means being humorous.
- 136) (a) 'Exceed' here relates extending outside boundaries (banks). Here accomplishments are exceeding/greater than expectations. God's mercy is not easily comprehended. He crossed his limits when he made fraud with trust's money.
- 137) (d) When someone sees 'smoke' he thinks there must be some fire. Listener may make guesses from the utterance (pronunciation). You can judge the eagerness and will like to see the person. It can be understood that she was not excited about debate.
- 138) (c) The wines are to be kept for long time to make them best. He has accepted his age factor. The soil in Gangetic plains is good for cultivation. The violin sounds very good.
- 139) (b) Removal of shoes brought relief. In a disaster, a relief is a necessity for a victim. Playing cards gives a diversion and relief from work. The sentry got relief after shift change.
- 140) (d) He wanted to wipe an offence of being contrary to orthodox opinion. Water has to be cleaned off from foreign particles. The opposition was suppressed. The drugs for bowel (lower stomach) are harmful for brain.

Sentence Correction/Improvement

- 141)** (d) 'Foodstuffs' is a single word, writing it as separate words is wrong. Moreover, the 'Grandmother' is not to be written as 'Grandmother'.
- 142)** (c) Use of adverb after the verb here is not suitable because it has been used to create a stress.
- 143)** (c) 'Way' is superfluous usage here. So, it should be replaced from the text given in option (c).
- 144)** (b) Option (a) and (c) illogically state that some buildings were both destroyed and damaged or in needed to indicate that each of the building suffered either one fate or the other.
In using only one verb tense, were, option (a) fails to indicate that the buildings were constructed before the earthquake occurred.
Option (c) and (d) use the present perfect tense incorrectly, saying in effect that the buildings have been constructed after they were destroyed last year. Only option (b) uses verb tenses correctly to indicate the time when the buildings were constructed and the earthquake happened.
- 145)** (d) Options (a) and (c) are ungrammatical because in this context, requiring employees must be followed by an infinitive. These options display additional faults in A, so as to specify that the workers receiving the leave will be the people caring for the infants and children, in order that they as used in (c), is imprecise and unidiomatic. Option (b) offers the correct infinitive to provide but contains the faulty so as to Option (d) is the best answer.
- 146)** (d) Such a scene should be distressing to a sensitive traveler. Irritating and disgusting are negative options. Option (a) can be ruled out.
- 147)** (d) The one word reply conveys that it is terse. As it has no element of humour we can easily ruled out 'witty.'
- 148)** (c) Resurrecting, i. e. being back to practice is the best choice. (a), (b) and (d) are negative options.
- 149)** (c) Sputtering is a light popping sound of a flame which is dying out. The ideas conveyed are dim and grim so 'shinning, bright and effulgent are out.
- 150)** (c) In this problem, the search for logical sequence has to be made. It is choice (c).
- 151)** (b) One has to trust the options to select the answer. 'A' does not go as 'the politicians' is not able to create relationship with contractors, bureaucracy. 'C' does not suit at all making prepositions and conjunctions a havoc. 'D' makes error with article 'by large number' should be 'by a large number'.
- 152)** (c) When 'difference' is judged it is always 'between' two things. It is not 'at' or 'across'.
- 153)** (b) Any action is always taken 'by' and not 'of', so only 'B' and 'C' are at options 'C' goes wrong by using 'inherent due to'.
154) (d) Use of objective case pronoun 'us' is not correct, instead 'we' being subjective case pronoun is a better choice.
- 155)** (a) "... in her opinion, she thought' and 'passed on' are redundancy errors, incorrect usage. 'rose up' is also same kind one. So answer is (a).
- 156)** (c) Parallel construction in a sentence is a must.
- 157)** (b) Usage of 'took' shows act in past, "has taken" is a correct option for the act of present.
- 158)** (b) Both (b) and (d) begins the sentence correctly with parallel construction but in (d) use of 'them' is incorrect because it is used only for Mencius.
- 159)** (b) Only option (b) is fine as achievement is being done in two weeks, which is important.
- 160)** (d) 'They save' is present tense going correctly with proclaim. Use of 'they are saving' gives present continuous, which is incorrect.
- 161)** (c) 'End would be otherwise delayed' is a correct option available. There could be otherwise frame of sentence but choice is to made from options.
- 162)** (d) 'Focusing on forging' is a better option which means to create lasting relationship.
- 163)** (b) 'Bank deposit swelled' means that deposits increased to an extent at which they were not need to rise.
- 164)** (c) The original phrase itself suitably describes the revival of Byzantine learning.
- 165)** (a) 'It will' fit in line, in contrast to 'freely'.
- 166)** (a) To maintain the meaning of the sentence, 'to write at random' is more convenient instead of 'at random speed'.
- 167)** (a) Sentence remain incomplete with 'will do' it shall be completed by making sense 'will do so'.
- 168)** (a) 'Let go off' means to put an end. Use of 'let go of the reins' complete the meaning.
- 169)** (a) Among the options available (a) should be correct. If it would have been "have mushroomed all over the country" then it would have been a better choice, but word used is 'mushrooming'.
- 170)** (a) The phrase in grammatically correct.
- 171)** (b) An important clause is always noted rather than being noticed.
- 172)** (a) No other option discusses their links with Soviets.

- 173) (a) No other choice discusses involvement of welfare aid by which people are taken care of.
- 174) (b) A good novel can be a good combination of realistic details with romantic temperament.
- 175) (a) The phrase given is an answer to the question of the author.

- 176) (a) The underlined original phrase is best option and gives real feel to the problem of narrator of the novel.
- 177) (c) The sentence if followed by option (c) gives that exercising any other option will lead to failure.

Fillers

- 178) (a) Abandon means no longer in use. Deserting means to leave someone in the lurch. Discard means to get rid of something. All these options do not make sense. So, leaving – struck is the correct option.
- 179) (a) ‘Ceased’ is used when ‘stopping’ becomes unusual. Apart from this, stars twinkle. So, ceased – twinkled is proper usage.
- 180) (c) ‘Unlikely’ means having least possibility of an event to take place. Hence, it is correct option.
- 181) (b)
- 182) (c)
- 183) (c) Only the word ‘metaphorical’ fits in the current context of similarity in comparison.
- 184) (b) The sentence refers to a regulated environment being created and hence the word ‘controlled’ fits the best. Also, none of the options have a befitting word for the first blank. Also none of the second words in the options fits the second blank except option (b).
- 185) (d) The sentence wants to explain USA limitations and hence a synonym of ‘limitations’ needs to be put first blank-Also the second blank needs a word which carries on the theme of limiting. Hence ‘staitjacketing’ fits the second blank the best. Hence option (d) is the answer.
- 186) (c) ‘Disingenuous’ means ‘insincere’ and this best fits the context as the phrase ‘ethnic cleansing’ is marked by apostrophes indicating a misrepresentation. Also, the word ‘victims’ is best in contrast to ‘perpetrators’. Hence, (c).
- 187) (d) ‘Navigators, calendar makers’ are best clubbed under the category of ‘observers’ rather than ‘scrutinizers’, as the latter term is more used to refer to specialists in a particular field. ‘Students’ can also fit to a certain extent and this leaves us with options (b), (d) and (e). ‘Concede’ has more to do with defeat or revision which is more apt in this context than ‘agree’ or ‘conclude’. Hence, (d).
- 188) (e) Since the sentence talks about the life of an individual extending from the first few days to the entire term of his/her life, ‘genetic endowments’ suits the context best. The closest option ‘congenital’ relates to endowments happening at birth and this might not be as pertinent, viz. the entire life-span of an individual. ‘Pedagogy’, which refers to education, fits in the second blank. Hence, (e).

- 189) (d) The first word should combine well with the phrases ‘central’ and ‘education and propaganda’. The first blank is not easy to resolve as many of the options fit in some way or the other. The second blank, however, is easier to resolve as the phrase ‘earlier kind of world’ combines well with the word ‘tradition’. This leaves us with (d), which has the word ‘organs’, which suitably fits the first blank. Hence, (d).
- 190) (b) ‘Blunt’ means ‘very direct’ with respect to a remark. ‘Devious’ in choice (d) means ‘dishonest’ and is incorrect as the statement is a frank one. For the same reason ‘tactful’ in choice (c) is also not appropriate.
- 191) (a) ‘Interest’ is the most appropriate word because the original amount he owed to the department accumulated to the said figure. ‘Taxes’ is redundant while ‘principal’ usually refers to a loan (in this case it isn’t). ‘Returns’ is what one gets rather than pays.
- 192) (d) ‘Sanctions’ is used for an official permission or order that limits trade and is rarely used for an amount. ‘Fees’ are paid for a service and ‘refunds’ are what one gets back. ‘Fines’ is the best choice because of the penalty component.
- 193) (c) ‘Attach’ is the word used for officially taking something away. ‘Impound’ means ‘confiscate’ and is generally used in the context of illegal goods or contraband. Other choices are in no way comparable.
- 194) (b) ‘Smashed’ in choice (a) and ‘dismantled’ in choice (c) are far from being logical. ‘Frozen’ is a wrong choice. ‘Frozen’ is used in the context of making bank accounts inoperable etc. Automobiles are seized.
- 195) (d) Clearly the topic is about a person who has violated income tax regulations and he should be called an ‘offender’ of the law.
- 196) (c) The keywords ‘serene’ and ‘out of season’ suggest that the corridors must be ‘unoccupied’ or ‘empty’. ‘Hollow’ in choice (b) and ‘white’ in choice (d) have no logical connection. ‘Striking’ in choice (a) counters the very essence of the passage.
- 197) (a) Choices (c) and (d) have similar meaning and are misnomers in the given context, as the keywords ‘low-pitched voices’ require a word that is synonymous with ‘quiet’ or ‘calm’. The usage of the adjective ‘faded’ in the sentence to describe men is untenable.

- 198) (d) The given sentence depicts the President as a very angry person as suggested by the keyword 'scowled'. Choices (a), (b) and (c) are either positive or neutral and cannot fit in the sentence.
- 199) (d) 'Paced' in choice (a) is not consistent with the mood of the President as depicted in the first part of the sentence. It means 'to walk fast'. 'Strolled' in (b) means 'walk casually' and hence is discarded. 'Stormed' in the choice (c) refers to 'attack a place suddenly' or 'say something in a loud, angry way'. But here, neither of them fits in. 'Prowled' refers to moving in a restless manner and hence fits.
- 200) (d) Options (a), (b) and (c) are not suitable as they contain mutually opposing words whereas the question demands words with similar meaning. Option (d) has "unimportant" and "trivial" as the similar words.
- 201) (b) The use of the word 'groveled' in the question suggests that the blanks should contain words with negative connotation. Thus options (a), (c) and (d) get eliminated. Option (b) is the best.
- 202) (d) One cannot 'maximize', 'enact' or 'under' a decision. Decisions are 'faced'. Hence options (a), (b) and (c) get eliminated.
- 203) (b) The second blank needs an adjective for 'nerves' which are no longer working properly. So 'damaged' is the best option. Also note that nerves cannot be detrimental or complex or involuntary.
- 204) (c) For the first blank, we need an adjective for the word 'choices'. In the context of Internet, the 'choices' can best be described as 'unlimited'. So option (c) is the correct option.
- 205) (a) Obtrudes means 'become noticeable in an unwelcome or intrusive way', Therefore by meaning it is the option that best fits the first blank. Also since it means to become noticeable in an unwelcome manner, the second blank is rightly filled with the word 'offends'.
- 206) (c) In general, a loose fiscal policy would lead to an increase in demand. So 'assess', 'outstrip' and 'restrain' do not fit the first blank as well as the word 'stimulate' does. So option (c) is the correct option.
- 207) (a) For the first blank 'leisure' and 'time' both can be used. So we eliminate options (c) and (d). However for the second blank-one cannot travel abroad and 'ignore' the world. So option (a) is the correct option.
- 208) (d) Going by options, 'regrettably' doesn't fit as there is nothing to regret. 'Firstly' is no choice and nothing 'secondly' is mentioned. Paragraph has nothing aggressive tone so 'obviously' does not suit. 'Apparently' is only and most suitable option.
- 209) (d) All options are suitable for the space but to choose one, the best, is required here 'Analytically' appears to be best. It expresses to analyse something using statistically proven methods to reach a decision.
- 210) (d) It is a very obvious choice determined from the paragraph giving it an access.
- 211) (c) 'Firing' comes as best suited option as paragraph explains it as a subject of discussion.
- 212) (a) An argument is always 'resolved', it is never thwart, defeat or closed.
- 213) (d) Going by options makes choice easier. Only "how the process allowed suits logically.
- 214) (d) Going by options makes choice easier. Reports or books are not written for tools. 'Practices' are not traded or dye but they fade with time.
- 215) (c) A personality always 'emerges' rather than arises or comes and when two things are together, they combine.
- 216) (b) When something has happened and a face is in discussion, it has to be an 'expression' on face. 'Ascertain' comes with the choice as answer.
- 217) (c) When British Labour Movement is discussed, it must result in something significant rather than gloomy or moving.
- 218) (d) Options gives us clear choice. Being subordinate, does not give boast. Talking about 'current' cannot be ancestors. World do not move with cliques, which mean a gang of some people. So option is (d).
- 219) (b) To 'promote' something means to think of 'future'.
- 220) (d) 'Touts' means middle men and it is clear that 'poor' people are not ones taken care of.
- 221) (a) 'Reconcile' best suits with 'conflicting images'. Decision always succeeds reconciliation.
- 222) (c) Option (a) and (c) could be in choice, rest is rejected as does not go with words. Out of available two options, prices be spiralling rather being escalating.
- 223) (d) 'Morals' go with manners and 'theme' sounds well and suits rather than a story.
- 224) (b) Second blank needed a verb, so 'electrifies' suits best. 'lukewarm' fits fine in first one.
- 225) (d) The blank one is to filled after 'are few of the' and important areas refers very atmosphere of classroom. Emotional reactions are to be in formation rather than growth or basis.
- 226) (b) Sounds are 'audible' as symbols are 'visual'.
- 227) (d) Learning is less efficient when it is drudgery (boring).
- 228) (c) The rulers always had too much of power and those who were ruled had too much obedience.
- 229) (a) Such questions create doubt so shall not be selected in first phase of question selection. Choice (a) goes without arising contradiction is usage.

- 230) (b) When someone protests, he makes an effort to be heard.
- 231) (b) When two agencies are compared, the basis is the 'principle' they work upon.
- 232) (a) Desires are to be motivated to be a leader, i.e., actuated by altruistic desires.
- 233) (c) 'Buy cheap and sell dear' is a success formula for commercials.
- 234) (c) An act of vengeance means starting of misdeeds, so it reopens the first chapter.
- 235) (a) Correct idiomatic usage is 'as far as'.
- 236) (a) One has to 'set out to' achieve something rather than 'went to'.
- 237) (b) The phrase used is 'tough talking'.
- 238) (b) 'Year by year' is correct idiomatic usage.
- 239) (b) For countable nouns such as 'amendments', 'many' shall be used to count.
- 240) (a) The presence of comparison is there. These strategies were important but they are more in need now.
- 241) (a) 'Break down' is correct idiomatic usage. For economic barriers rather than crumble or dismantle.
- 242) (b) This is an only option which sounds logical.
- 243) (a) 'Tears in my eyes, I have to keep smiling' goes perfectly with each other.
- 244) (b) Stock market shows public sentiments.
- 245) (c) People easily forego newspapers headlines so 'few will know' fit into the phrase.
- 246) (d) A well known saying.
- 247) (b) 'Its' refers to haunting images of the movie.
- 248) (b) Only option (a) and (b) can be used in the blank, but option (a) does not make any sense of sentence.
- 249) (c) A product is always 'launched' rather than commissioned or started.
- 250) (d) An unexpected success can easily be connected with 'fortune was made'. No other option goes well.
- 251) (a) The appropriate idiomatic usage is 'something of flames.' 'Smother' means to suppress. No other option can be used for putting off flames.
- 252) 'Secret' always been kept between people, not among people.
- 253) (b) Sentence is an expression best on the fact that Great work sometimes depend on the simple conception. All other options do not support the sentence to express the same sense.
- 254) (a) 'Come in' fits here without grammatical error. Rest options do not complete the verb.
- 255) (b) Privilege easily sets in (A), (B) and (D). However, someone always have advantage over others as in (C).
- 256) (c) Disaster sets in (A), (C) and (D).
- 257) (d) 'Depression' fits in (A), (B), (D). The man who is deeply hurt feels very lonely.
- 258) (b) 'Imagination' fits in A and D. Rest options do not fit in more than one.
- 259) (a) 'State' fits in (A), (B) and (D). In (C) only conditions sets. So (a) is a correct option.

Error Detection

- 260) (a) Sentence (a) should be 'her acceptance speech' ... hence it is incorrect.
- 261) (a) 1 should have 'a' in place of 'the', 4 should be 'upon'.
- 262) (a) Sentence (A) has a wrong idiomatic usage and hence should be 'taking pains'. Sentence (B) also has incorrect idiomatic usage and should be 'efforts bore fruit'. Hence correct option is (a).
- 263) (b) Sentence (A) uses wrong preposition and should be 'into'. Sentence (B) uses the adverb form of the word which is incorrect and should be 'in principle'. Hence option 'b' is correct.
- 264) (c) Sentence (C) has a missing preposition and should be 'from a coup'. Sentence (D) has subject verb agreement error and also incorrect preposition is used and should be 'chances of'. Hence option (c) is correct.
- 265) (a) In sentence (A), there is a spelling error. 'Imigrant' is not the correct spelling, 'immigrant' is the correct spelling.
- Sentence (C) has a punctuation error, as it requires a comma at the end. Sentence (D) needs the article 'the' before 'owner of dry goods business'.
- Sentence (E) has a tense error : it should be 'would later become', not 'would later became'. So only (B) is correct. Hence, (a).
- 266) (d) Sentences (A) and (D) are correct. Sentence (E) uses a wrong article: it should be 'an industry', not 'a industry'. The comma at the end of sentence (C) is incorrect, as it separates the subject from the main verb. (B) uses the incorrect pronoun 'their' instead of 'its'. Hence, (d).
- 267) (d) In sentence (B), the word 'home' should be in the plural, as millions of people cannot share a single home. In (E), the verb should be the singular 'has', because the subject 'death count' is singular. (A), (C) and (D) are correct. Hence, (d).

- 268)** (e) In (B), the verb 'associate' should be in the past tense in keeping with the rest of the sentence. Similarly in (C), 'seem' should also be in the past. In (E), the noun 'effort' is missing an article. Therefore only (A) and (D) are correct. Hence, (e).
- 269)** (c)
- 270)** (e)
- 271)** (c)
- 272)** (b) (B) should be "rarely has...". (C) begins with the.
- 273)** (a) Sentence (B) should be "Since, the Enlightenment. Option (c) should be 'in the Isro's'".
- 274)** (b) The second sentence does not use the article. It should be "As a/the project progresses" in sentence (C) there should be the indefinite article (a) before single-minded which leaves us with option (b) as the correct answer.
- 275)** (c) Sentence (B) should have "making them break apart". Sentence (C) should have "many offending chemicals."
- 276)** (c) Only statements (B) and (C) are grammatically incorrect. In statement (C), the error is 'took shower', the correction is 'took a shower'.
In statement (B), 'what to do' is incorrect. 'What she should do' is correct.
- 277)** (b) There are errors in both (B) and (D). The error in (B) is "pleaded guilty of". The correction is "pleaded guilty to". In (D), the error is "sentenced for three years".
The correction is "sentenced to three years".
- 278)** (c) There are errors in statements B and C.
In statement (B), 'efforts gave fruit' is incorrect. The correction is 'efforts bore fruit'.
In statement (C), 'complimented her for' is incorrect.
The correction is 'complimented her on'.
- 279)** (c) 'The student's conduct' should be replaced by 'his conduct'.
- 280)** (d) (b) part discuss about man/woman, so in (d). it should be his/her (singular pronoun) in place of 'their'.
- 281)** (c) The same pronoun should be used throughout the sentence. In (c) it should be 'one should choose'.
- 282)** (d) 'Assure' being an intransitive verb should be followed by an object, so in place of 'assure' correct usage shall be 'be sure of a successful core'.
- 283)** (c) In this part, 'who' is used for police which is an incorrect usage, in place of it shall be 'whom they believe to be'.
(d) This part of sentence does not give sense and logic, it should have been replaced with 'didn't you'?
- 284)** (d) This part of sentence does not give sense and logic, it should have been replaced with 'didn't you'?
- 285)** (a) 'Whom' have you invited
- 286)** (b) I would have 'shown' you instead of showed you.
- 287)** (b) Prevented should be followed by preposition 'from' instead of 'in'.

Decision Making

- 288)** (c) Statement (1) talks of "...should be switching ..." it is a conclusion based on the earlier fact about the poor quality of service. Option (d) can be eliminated. Statement (2) is clearly factual. The statement (3) is just a conclusion drawn about the unknown. Hence, (c) is the correct option.
- 289)** (b) Looking at 1st statement, if we mark the keywords, they give us a clear idea that it is a point of view of opinion of the author. The second statement is an inference as it is arrived at from a stated premise. The 3rd statement, where the author mentions 'is the only insurance' (although there may be other insurances, that the author negates), qualifies as a judgement. The 4th statement is a pure fact.
- 290)** (c) Statement 3 is obviously a judgement. This eliminates option (a). Statement 2 is an inference as it is a conclusion based on a fact. This eliminates option (e). Statement (1) describes what "we should ..." do. Therefore, it's a judgement. This eliminates option (d). Statement (4) is very close to the fact. This makes option (c) correct.
- 291)** (d) Statement (1) is a judgement as it is based on the author's opinion. This eliminates options (a) and (b). Statement (2) uses the general term 'we'. This makes it a judgement. If it had been about 'I' or 'us', then it would have been a fact. Hence, the correct option is (d).
- 292)** (a) Statement (3) is obviously a fact. This eliminates option (b). The words 'The goal' has to be ..." make statement (4) a judgement. This eliminates options (d) and (e). As "... statistical indications ..." have been referred to in statement (1), it is definitely an inference.
Therefore, option (a) is the answer.
- 293)** (c) The study shows, that children below six years are admitted in class one records. The age interval do not fit into this level, so that this claim supports that ratios might be exaggerated.
- 294)** (b) This finding supports as hired while players did not show good performance, co-relates with paragraph saying, clubs that spend more should finish higher.

- ## One Word Substitution

-
- 418 | **CHAPTER SIXTEEN** | ENGLISH USAGE

Analogy

- 330)** (a) If A owns a Blue Sierra, then B owns Audi (because E cannot own Audi) and hence E owns a Maruti. Similarly, if A's car is Blue, then E's car will be Red or Black. Hence, E will have Red Maruti or Black Maruti.
- 331)** (d) If A owns White Audi, then E will own Sierra (because B cannot own a Sierra). Only choice (d) has Sierra. (also note that if A owns a White car, then the colour of E's car can be Blue, Red or Black).
- 332)** (b) If A's car is Maruti, then E can own only a Sierra. If A's car is red and D's while, then E can own only a Blue car (because C's car cannot be Blue). Hence, E has a Blue Sierra.
- 333)** (c) Option is also a pair of homophones as in question.
- 334)** (d) Doggerel is badly written verse by a poet and Pulp-fiction is badly written verse by a novelist.
- 335)** (b) A premise is an evidence which leads to conclusion. An 'Assumption' can go wrong and will not infer anything. A Hypothesis will lead to a theory.
- 336)** (a) A 'Barge' is a kind of a vessel. A 'shovel' is a kind of an implement.
- 337)** (d) Love when goes to higher level becomes obsession. Misery comes at next level of sorrow.
- 338)** (d) Second word comes from the family tree of first word.
- 339)** (a) First word refers to state of matter. Second word is an example of such state.
- 340)** (b) First word refers to break-up something. Second word refers to join something.
- 341)** (a) Doubt is a antonym of Faith, same as Atheist of Religion.
- 342)** (a) Bricks are combined to make Building same as words are put together to form a Dictionary.
- 343)** (b) 'Raucous' means loud, it is a synonym of Dulcet. Same as crazy/insane.
- 344)** (b) Second word is a follow-up of first one. Reaction comes after action and Assail (attack) is followed by Defence.
- 345)** (a) Malapropism is using words in wrong places. Anachronism placing something in wrong period of time.
- 346)** (d) Anterior means Front and Posterior means Rear.
- 347)** (d) Serene is an antonym to excite. Rest are pair of synonyms.
- 348)** (d) All other go into Air/space.
- 349)** (c) Connubial is used in percontext of marriage. Rest options, one word is an adjective of second word.
- 350)** (b) 'Aquiline' is used for 'eagle'. Rest are adjective used for second word.
- 351)** (a) 'Claustrophobia' is a fear of being in small space. It is a wrong combination. Rest of the words are fear of second word.
- 352)** (c) Both are pair of antonyms.
- 353)** (d) 'Alleviate' is a next stage of being 'Ease', and 'Interrogate' is a next stage of 'question'.
- 354)** (b) Pair of synonyms. All four words mean secret hidden.
- 355)** (b) Audience go for watching drama as spectators go for game.
- 356)** (a) A building can have many storeys, so as a book can have many chapters.
- 357)** (a) 'Perjury' means to swear falsely that is more on next form of lying. Same is 'Testimony' next form higher of statement.
- 358)** (b) Peer belongs to contemporary period i.e. living in the same time. Antique belongs to outdated time.
- 359)** (d) Stentorian is one who speaks loudly. Resplendent is extremely bright.
- 360)** (c) Option (c) is in close relation with each other as the question is.
- 361)** (b) 'Gourmet' is person who has a deep knowledge about 'food'. Likewise 'Connoisseur' is a person who has a sense of judgement about 'Art'.
- 362)** (a) Discussion is of opposites.
- 363)** (d) (a) Both are brands, (b) Both are products, (c) Product: Brand (d) Brand: Product.
- 364)** (d) Both give same sense of meaning.
- 365)** (b) Choice has to be made by eliminating options. (a) pair of opposites, (c) gives two different tastes, (d) Flavour is aroma, it is no pair part. Bovine is always used for cow.
- 366)** (c) 'Fission' is division of cells and 'Fusion' uniting of cells.
- 367)** (d) One is penalised for a homicide (killing human). Other options do not suit at all.
- 368)** (c) 'Material' is no part of group. Rest think of forming ideas.
- 369)** (a) 'Arbitrary' is something which is not based on sound plaining and decision. 'Just' is a word which has similarity in meaning and sense with Arbitrary. Option (a) is the only pair which conforms to this relationship.

CHAPTER SEVENTEEN

PARA JUMBLES

Directions (Q. Nos. 1-4) *Arrange the following sentences in the correct order.* (2016)

- 1)
 1. Kanishka looked at his watch. It was 8 o' clock and he got out of bed quickly.
 2. He ran all the way to the station and he arrived there just in time for the train.
 3. He always said to his friends at the office: "It is nice to have breakfast in the morning, but it is nicer to lie in bed."
 4. Then he washed and dressed.
 5. He was late as usual, so he did not have time for breakfast.
- 2)
 1. When midnight came, I felt that I could not walk much further.
 2. Although, I was weary and hungry, I was not discouraged.
 3. At last, I came to a place where the pavement was raised and had a hollow underneath.
 4. I searched for my friend all day.
 5. I crept in and lay on the ground with my bag for the pillow and went to sleep.
- 3)
 1. He was thus caught by the hunters.
 2. From what he saw, he liked his horns, but he was rather unhappy about his legs.
 3. A stag was drinking water at a pool and admiring his shadow in the water.
 4. His legs helped him in getting away from the hunters, but his horns were caught in a bush.
 5. All of a sudden, some hunters came to the pool.
- 4)
 1. This early atmosphere was not one in which we could have survived.
 2. In the course of time it cooled and acquired an atmosphere.

3. Because it contained no oxygen.
4. The Earth was initially very hot and without an atmosphere.
5. The atmosphere came from the emission of gases from the rocks.

Directions (Q. Nos. 5-9) *In the given question a paragraph has been jumbled up. Rewrite and making it into a meaningful paragraph.* (2015)

- 5)
 1. Lack of funding is a large impediment to implementing adaptation plans. The scale and magnitude of the financial support required by developing countries to enhance their domestic mitigation and adaptation actions are a matter of intense debate in the multilateral negotiations under the United Nation Framework Convention Climate Change (UNFCCC).
 2. Global funding through the multilateral mechanism of the convention will enhance their domestic capacity to finance the mitigation efforts.
 3. Climate change is a complex policy issue with major implications in terms of finance. All actions to address climate change ultimately involve costs. Funding is vital for countries like India to design and implement adaptation and mitigation plans and projects.
 4. The convention squarely puts the responsibility for provision of financial support on the developed countries taking into account their contribution to the stock of green house gases in the atmosphere. Given the magnitude of the task and the funds required, domestic finances are likely to fall short of the current and the projected needs of the developing countries.

- 6) 1. Such access is not always available to all people in developing countries like India and more so in rural areas.
 2. To save individuals need access to safe reliable financial institutions such as banks and to appropriate financial instruments and reasonable financial incentives.
 3. Savings help poor households manage volatility in cash flow, smoothen consumption and build working capital.
 4. Poor households without access to a formal savings mechanism encourage immediate spending temptations.
 5. The existence/establishment of formal financial institutions that offer safe, reliable and alternative financial instrument is fundamental in mobilising savings.
- 7) 1. It also results in destruction of rainforests, reduced nutritional content, increased demand for preservation and packaging.
 2. Food insecurity also increases as the produce comes from regions that are not feeding their own population properly.
 3. Foods travel more than the people who eat them. Grocery stores and supermarkets are loaded with preserved and processed foods.
 4. This however, often leads to environmental threats such as pollution generated by long distance food transportation and wastage of food during processing and transportation.
- 8) 1. The object of government is not to change men form rational beings into beast or puppets.
 2. In other words to strengthen his natural right to exist and work without injury to himself or others.
 3. The ultimate aim of government is not to rule or control by fear, not to demand obedience, but conversely to free every man from fear that he may live in all possible security.
 4. It should enable them to develop their minds and bodies in security and to employ their reason unshackled.
- 9) 1. Further, an unbalanced emphasis on growth is often associated with negative environmental consequences and adverse distributional effects.
 2. Individuals groups and leaders who promote human development operate under strong institutional structural and political constraints that affect policy options.

3. The experience of China, with its impressive growth record, reflects these broader concerns and underlines the importance of balanced approaches that emphasise investments in the non-income aspects of human development.
 4. One important finding from several decades of human development experience is that focusing exclusively on economic growth is problematic. While we have good knowledge about how to advance health and education, the causes of growth are much less certain and growth is often elusive.

Directions (Q. Nos. 10-13) *In the given questions, a paragraph has been jumbled up. It is followed by four options. Pick the option which is correct.* (2014)

- 10) 1. Add other relevant statistics, such as the number of cold calls made versus the number of resulting sales. Discuss any challenges that hindered sales for the week, such as rainy weather keeping your staff from selling outdoor equipment.
 2. Give the week's sales numbers, then compare them. After giving the week's biggest accomplishment, break down the sales numbers for the week. This could be broken down by product or salesperson or whatever makes sense for the product or service you're selling. Then, include a summary of how this week's numbers compare to this time last year, to last week's numbers or how much closer you are to your quarterly sales goal.
 3. Start the sales report with the date. Include the dates, the report covers, the specific department and other pertinent information, such as the sales region covered or specific product.
 4. Lead with the main accomplishment or most significant number of the week. e.g. if you exceeded sales goals for the week, start with a sentence describing how much you exceeded the goals. If you increased sales 10% over the previous week, share that information.
 (a) 1, 4, 2, 3 (b) 3, 1, 4, 2 (c) 4, 3, 2, 1 (d) 1, 4, 3, 2
- 11) 1. After you fill the online form, you will be taken to page where you will be given the options to make payment. You can make a payment of ₹ 470 using your credit card, prepaid card and net banking. After payment confirmation, you will be taken to a page where you will have to fill in authentication details.

2. In case, you fail the authentication questions do not worry, you will have to send the hard copy of the application for CIBIL score generated online with the CIBIL transaction ID along with hard copy of your ID and address proof to CIBIL. CIBIL on verification will send you the hard copy of the CIBIL credit report to your address mentioned indicated in the address proof.
3. The first step in the process of getting your personalised credit score is to fill an online form that you can find on CIBIL site. You will have to mention details like name, date of birth, address, phone number, income, identity proof and address and also loans taken by you in the past.
4. To authenticate your identity you will have to answer a minimum of three questions of the five questions asked. The questions will be based on your credit history like credit cards held and loans being serviced in your name. After a successful authentication your, personalised credit score will be e-mailed to you on the same day by CIBIL.

- (a) 3, 1, 2, 4 (b) 1, 3, 2, 4
(c) 1, 3, 4, 2 (d) 3, 1, 4, 2

- 12)** 1. It is, however desirable that you hold securities in demat form as physical securities carry the risk of being fake, forged or stolen.
2. Just as you have to open an account with a bank if you want to save your money, make cheque payments, etc. Now-a-days, you need to open a demat account if you want to buy or sell stocks.
3. Demat refers to a dematerialised account. Though the company is under obligation to offer the securities in both physical and demat mode, you have the choice to receive the securities in either mode.
4. If you wish to have securities in demat mode, you need to indicate the name of the depository and also of the depository participant with whom you have depository account in your application.

- (a) 2, 3, 4, 1 (b) 3, 4, 2, 1
(c) 1, 2, 3, 4 (d) 1, 4, 3, 2

- 13)** 1. The next list you'll need to make outlines your business' opportunities and threats. Think of both as external to your business -- factors that you can't control but can try to predict. Opportunities can include new markets, new products and trends that favour your business. Threats include competition and advances in technology that put you at a disadvantage.

2. Think of your company as if it was a person with its own unique personality and identity. With that in mind, create separate lists that identify your business's strengths, weaknesses and goals. Put everything down and create big lists. Don't edit or reject anything.
3. Get down to the details that are concrete and measurable. Your marketing strategy should become a plan that includes monthly review, tracking and measurement, sales forecasts, expense budgets and non-monetary metrics for tracking progress. These can include leads, presentations, phone calls, links, blog posts, page views, conversion rates, proposals and trips, among others.
4. Now, it's time to pull your lists together. Look for the intersection of your unique identity and your target market. In terms of your business offerings, what could be your drop off the list because it's not strategic. Then, think about dropping those who aren't in your target market.

- (a) 2, 1, 3, 4 (b) 2, 3, 1, 4
(c) 2, 1, 4, 3 (d) 2, 3, 4, 1

Directions (Q.Nos. 14-16) Five sentences are given below, labelled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph / passage. From the given options, choose the most appropriate one. (2013)

- 14)** A. His newest persona, Oscar the Swoon—Inducing singer.
B. Oscar's debut album is a collection of love ballads in English and Spanish.
C. It's not enough that Oscar won the world welter weight championship six times or any Olympic gold medal in 1992.
D. Or that the dairy industry's untested milk moustache model was the only presenter at last month's Latin Grammy's to inspire louder girlie screams from the audience than N sync.
E. Oscar, 27, wants more.
- (a) ABDCE (b) ACDBE
(c) CADBE (d) CDEAB

- 15)** A. In Fact, the opposite is true—more nuclear weapons means more danger.
B. There is increasing evidence that first—strike strategies are no longer a military option but have become central to American defense policy. In such a situation each new missile makes nuclear war more likely.

- C. Over the past few years an alarming change in American defense policy has been noticeable, a trend towards a nuclear arsenal aimed not at retaliation but at a first strike.
- D. Nuclear weapons do not increase our security, as the military establishment would have us believe; they merely increase the likelihood of global destruction. The threat of nuclear war is the greatest danger humanity is facing today, but it is by no means the only one.
- E. In the United States, where the military—industrial complex has become an integral part of government, the Pentagon tries to persuade us that building more and better weapons will make the country safer.
- (a) EACBD (b) CBDEA
(c) DBCAE (d) ECDAB

- 16) A. Then he set the mixer's two 20 blades-revolving round a 1.2 m horizontal shaft to start churning up the powder at a steady 30 revolutions a minute.
- B. Two employees who should have been with paul **Kellytaht day** in his small tile-adhesive factor in Northern England had phoned in sick, so he was entirely on his own.
- C. But the trim, six foot, 47 years old still had a business to run and he'd never been one to worry about getting his own hands dirty.
- D. On the mezzanine level of his factory, he began shoveling half a tonne of cement mixed with a dry chemical powder into a rectangular opening in the floor the mouth of a large mixing machine.
- E. It had been a hectic morning.
- (a) ABCDE (b) BCDAE
(c) DABCE (d) EBCDA

Directions (Q.Nos. 17-18) *Sentences given in the question, when properly sequenced form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.* (2011)

- 17) 1. Paucity of serious thought is no surprise in the government, but one would have thought that the considerably educated PM, who at one time did research of some quality, would have tried to answer of some quality, would have tried to answer for his own satisfaction how effective reservation policies have been.

2. In his approach to Pakistan, he has gone about enthusiastically looking for out of the box solutions.
3. Assuming that he came to the above conclusion-it is hard to imagine how he would come to any other?
4. My question is why should they be confined to the Pak policy only? SC/ST's deserve them more.
- (a) ABCD (b) CDBA (c) DABC (d) ACBD

- 18) 1. Overcoming the handicap of crushing poverty, he has had a phenomenal run thus far.
2. Soon enough, the mentor faced exploitation charges, with a government agency taking objection to the manner on which the boys grooming is being handed.
3. When his widowed mother was reportedly on the verge of giving up on it all, a martial arts coach descended on stage like a *deux ex machina*.
4. The controversy even found its way to the court.
- (a) ACDB (b) BDAC
(c) ACBD (d) BACD

Directions (Q.Nos. 19-20) *Given below are sets of four sentences that form part of a paragraph. Arrange the four sentences so that the given sentences constitute a coherent paragraph.* (2010)

- 19) A. 1917 war changed the political geography of the subcontinent.
- B. Despite the significance of the event, there has been no serious book about the conflict.
- C. Surrender at Dhaka aims to fill this gap.
- D. It also profoundly altered the geo-strategic situation in South-East Asia.
- (a) ACBD (b) CADB (c) BADC (d) ADBC
- 20) A. Thus begins the search for relief: painkillers, ice, yoga, herbs, even surgery.
- B. Most computer users develop disorders because they ignore warnings like tingling fingers, a numb hand or a sore shoulder.
- C. They keep pointing and dragging until tendons chafe and scar tissue forms, along with bad habits that are almost impossible to change.
- D. But cures are elusive, because repetitive injuries present a bag of ills that often defy easy diagnosis.
- (a) BDAC (b) BADC
(c) BCAD (d) ABCD

Directions (Q.Nos. 21-24) *In each question, there are five sentences/paragraphs. The sentence/paragraph labelled A is in its correct place. The four that follow are labelled B, C, D and E, and need to be arranged in the logical order to form a coherent paragraph / passage. From the given options choose the most appropriate option.* (2007)

- 21)** A. In America, highly educated women, who are in stronger position in the labour market than less qualified ones, have higher rates of marriage than other groups.
 B. Some work supports the Becker thesis and some appears to contradict it.
 C. And, as with crime, it is equally inconclusive.
 D. But regardless of the conclusion of any particular piece of work, it is hard to establish convincing connections between family changes and economic factors using conventional approaches.
 E. Indeed, just as with crime, an enormous academic literature exists on the validity of the pure economic approach to the evolution of family structures.
 (a) BCDE (b) DBEC (c) BDCE (d) ECBD
 (e) EBCD
- 22)** A. Personal experience of mothering and motherhood are largely framed in relation to two discernible or 'official' discourses: the 'medical discourse and natural childbirth discourse'. Both of these tend to focus on the 'optimistic stories', of birth and mothering and underpin stereotypes of the 'good mother'.
 B. At the same time, the need for medical expert guidance is also a feature for contemporary reproduction and motherhood. But constructions of good mothering have not always been so conceived-and in different contexts may exist in parallel to other equally dominant discourses.
 C. Similarly, historical work has shown how what are now taken-for-granted aspects of reproduction and mothering practices results from contemporary 'pseudo scientific directives' and 'managed constructs'. These changes have led to a reframing of modern discourses that pattern pregnancy and motherhood leading to an acceptance of the need for greater expert management.
 D. The contrasting, overlapping, and ambiguous strands within these frameworks focus to varying degrees on a woman's biological tie to

her child and predisposition to instinctively know and be able to care for her child.

- E. In addition, a third, 'unofficial popular discourse' comprising 'old wives' tales and based on maternal experiences of childbirth has also been noted. These discourses have also been acknowledged in work exploring the experiences of those who apparently do not 'conform' to conventional stereotypes of the 'good mother'.
 (a) EDBC (b) BCED (c) DBCE
 (d) EDCB (e) BCDE
- 23)** A. Indonesia has experienced dramatic shifts in its formal governance arrangements since the fall of President Soeharto and the close of his centralized, authoritarian 'New Order' regime in 1997.
 B. The political system has taken its place in the nearly 10 years since Reformasi began. It has featured the active contest for political office among a proliferation of parties at central, provincial and district levels; direct elections for the presidency (since 2004); and radical changes in centre-local government relations towards administrative, fiscal and political decentralisation.
 C. The mass media, once tidily under Soeharto's thumb, has experienced significant liberalization, as has the legal basis for non-governmental organizations, including many dedicated to such controversial issues as corruption control and human rights.
 D. Such developments are seen optimistically by a number of donors and some external analysts, who interpret them as signs of Indonesia's political normalisation.
 E. A different group of analysts paint a picture in which the institutional forms have changed, but power relations have not. Vedi Hadiz argues that Indonesia's 'democratic transition' has been anything but linear.
 (a) BDEC (b) CBDE (c) CEBD
 (d) DEBC (e) BCDE
- 24)** A. I had six thousand acres of land, and had thus got much spare land besides the coffee plantation. Part of the farm was native forest, and about one thousand acres were squatters, land what (the Kikuyu) called their *shambas*.
 B. The squatters' land was more intensely alive than the rest of the farm, and was changing with the seasons the year round.

The maize grew up higher than your head as you walked on the narrow hard-trampled footpaths in between the tall green rustling regiments.

- C. The squatters are natives, who with their families hold a few acres on a white man's farm, and in return have to work for him a certain number of days in the year. My squatters, I think, saw the relationship in a different light, for many of them were born on the farm, and their fathers before them, and they very likely regarded me as a sort of superior squatter on their estates.
- D. The Kikuyu also grew the sweet potatoes that have a vine like leaf and spread over the ground like a dense entangled mat, and many varieties of big yellow and green speckled pumpkins.
- E. The beans ripened in the fields, were gathered and thrashed by the women, and the maize stalks and coffee pods were collected and burned, so that in certain seasons thin blue columns of smoke rose here and there all over the farm.

(a) CBDE (b) CBED (c) BCDE (d) DBCE
(e) EDBC

Directions (Q.Nos. 25-26) *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.* (2006)

- 25) A. But this does not mean that death was the Egyptians' only preoccupation.
B. Even papyri come mainly from pyramid temples.
C. Most of our traditional sources of information about the Old Kingdom are monuments of the rich like pyramids and tombs.
D. Houses in which ordinary Egyptians lived have not been preserved, and when most people died they were buried in simple graves.
E. We know infinitely more about the wealthy people of Egypt than we do about the ordinary people, as most monuments were made for the rich.
- (a) CDBEA (b) ECDAB (c) EDCBA (d) DECAB
- 26) A. Experts such as Larry Burns, head of research at GM, reckon that only such a full hearted leap will allow the world to cope with the mass motorisation that will one day come to China or India.

- B. But once hydrogen is being produced from biomass or extracted from underground coal or made from water, using nuclear or renewable electricity, the way will be open for a huge reduction in carbon emissions from the whole system.
- C. In theory, once all the bugs have been stored out, fuel cells should deliver better total fuel economy than any existing engines.
- D. That is twice as good as the internal combustion engine, but only five percentage points better than a diesel hybrid.
- E. Allowing for the resources needed to extract hydrogen from hydrocarbon, oil, coal or gas, the fuel cell has an efficiency of 30%.

(a) CEDBA (b) CEBDA (c) AEDBC (d) ACEBD

Directions (Q.Nos. 27-29) *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.* (2005)

- 27) A. This is now orthodoxy to which I subscribe-up to a point.
B. It emerged from the mathematics of chance and statistics.
C. Therefore, the risk is measurable and manageable.
D. The fundamental concept: Prices are not predictable, but the mathematical laws of chance can describe their fluctuations.
E. This is how what business schools now call modern finance was born.
- (a) ADCBE (b) EBDCA (c) ABDCE (d) DCBEA
- 28) A. Similarly, turning to caste, even though being lower caste is undoubtedly a separate cause of disparity, its impact is all the greater when the lower-caste families also happen to be poor.
B. Belonging to a privileged class can help a woman to overcome many barriers that obstruct women from less thriving classes.
C. It is the interactive presence of these two kinds of deprivation-being low class and being female-that massively impoverishes women from the less privileged classes.
D. A congruence of class deprivation and gender discrimination can blight the lives of poorer women very severely.

E. Gender is certainly a contributor to societal inequality, but it does not act independently of class.

(a) EABDC (b) EBDCA (c) DAEBC (d) BECDA

- 29)** A. When identity is thus 'defined by contrast', divergence with the West becomes central.
 B. Indian religious literature such as the Bhagavad Gita or the Tantric texts, which are identified as differing from secular writings seen as 'western', elicits much greater interest in the West than do other Indian writings, including India's long history of heterodoxy.
 C. There is a similar neglect of Indian writing on non-religious subjects, from mathematics, epistemology and natural science to economics and linguistics.
 D. Through selective emphasis that point up differences with the West, other civilizations can, in this way, be redefined in alien terms which can be exotic and charming or else bizarre and terrifying or simple strange and engaging.
 E. The exception is the Kamasutra in which western readers have managed to cultivate an interest.

(a) BDACE (b) DEABC (c) BDECA (d) BCEDA

Directions (Q.Nos. 30-32) *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.* (2005)

- 30)** A. He felt justified in bypassing Congress altogether on a variety of moves.
 B. At time he was fighting the entire Congress.
 C. Bush felt he had a mission to restore power to the presidency.
 D. Bush was not fighting just the democrats.
 E. Representative democracy is a messy business, and a CEO of the White House does not like a legislature of second guessers and time wasters.
 (a) CAEDB (b) DBAEC (c) CEADB (d) ECDBA
- 31)** A. The two neighbours never fought each other.
 B. Fights involving three male fiddler crabs have been recorded, but the status of the participants was unknown.
 C. They pushed or grappled only with the intruder.
 D. We recorded 17 cases in which a resident that was fighting an intruder was joined by an immediate neighbour, an ally.

E. We therefore tracked 268 intruder males until, we saw them fighting a resident male.

(a) BEDAC (b) DEBAC
 (c) BDCAE (d) BCEDA

- 32)** A. In the West, Allied Forces had fought their way through southern Italy as far as Rome.
 B. In June 1944 Germany's military position in world war-Two appeared hopeless.
 C. In Britain, the task of amassing the men and materials for the liberation of northern Europe had been completed.
 D. The Red Army was poised to drive the Nazis back through Poland.
 E. The situation on the eastern front was catastrophic.
 (a) EDACB (b) BEDAC
 (c) BDECA (d) CEDAB

Directions (Q.Nos. 33-40) *The sentences given in each question, when properly sequenced, form coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.* (2003)

- 33)** A. To much of the labour movement, it symbolises the brutality of the upper classes.
 B. And to everybody watching, the current mess over foxhunting symbolises the government's weakness.
 C. The foxhunting's supporters, Labour's 1991 manifesto commitment to ban it symbolises the party's metropolitan roots and hostility to the countryside.
 D. Small issues sometimes have large symbolic power.
 E. To those who enjoy thundering across the countryside in red coats after foxes, foxhunting symbolises the ancient roots of rural lives.
 (a) DEACB (b) ECDBA
 (c) CEADB (d) DBAEC
- 34)** A. In the case of King Merolchazzar's courtship of the princess of the Outer Isles, there occurs a regrettable hitch.
 B. She acknowledges the gifts, but no word of a meeting date follows.
 C. The monarch, hearing good reports of a neighbouring princess, dispatches messengers with gifts to her court, be seaching an interview.
 D. The princess names a date and a formal meeting takes place; after that everything buzzes along pretty smoothly.

- E. Royal love affairs in olden days were conducted on the correspondence method.
(a) ACBDE (b) ABCDE (c) ECDAB (d) ECBAD
- 35)** A. Who can trace to its first beginnings the love of Damon for Pythias, of David for Jonathan, of Swan for Edgar?
B. Similarly with men.
C. There is about great friendships between man and man a certain inevitability that can only be compared with the age old association of ham and eggs.
D. One simply feels that it is one of the things that must be so.
E. No one can say what was the mutual magnetism that brought the deathless partnership of these wholesome and palatable foodstuffs about.
(a) ACBED (b) CEDBA
(c) ACEBD (d) CEABD
- 36)** A. Events intervened, in the late 1930s and 1940s, Germany suffered from “over-branding”.
B. The British used to be fascinated by the home of Romanticism.
C. But reunification and the federal government’s move to Berlin have prompted Germany to think again about its image.
D. The first foreign package holiday was a tour of Germany organised by Thomas Cook in 1855.
E. Since then, Germany has been understandably nervous about promoting itself abroad.
(a) ACEBD (b) DECAB (c) BDAEC (d) DBAEC
- 37)** A. The wall does not simply divide Israel from a putative Palestinian state on the basis of the 1967 borders.
B. A chilling omission from the road map is the gigantic ‘separation wall’ now being built in the West Bank by Israel.
C. It is surrounded by trenches, electric wire and moats; there are watch towers at regular intervals.
D. It actually takes in new tracts of Palestinian land, sometimes five or six kilometre at a stretch.
E. Almost a decade after the end of South African apartheid, this ghastly racist wall is going up with scarcely a peep from Israel’s American allies who are going to pay for most of it.
(a) BCADE (b) BADCE
(c) AEDCB (d) ECADB
- 38)** A. Luckily the tide of battle moved else where after the American victory at Midway and an Australian victory over Japan at Milne Bay.
B. It could have been no more than a delaying tactic.
C. The Australian military, knowing the position was hopeless, planned to fall back to the South-East in the hope of defending the main cities.
D. They had captured most of the Solomon Islands and much of New Guinea and seemed poised for an invasion.
E. Not many people outside Australia realize how close the Japanese got.
(a) EDCBA (b) ECDAB
(c) ADCBE (d) CDBAE
- 39)** A. Call it the third wave sweeping the Indian media.
B. Now, they are starring in a new role, as suave dealmakers who are in a hurry to strike alliances and agreements.
C. Look around and you will find a host of deals that have been inked or are ready to be finalized.
D. Then the media barons wrested back control from their editors and turned marketing warriors with the brand as their missile.
E. The first came with those magnificent men in their mahogany chambers who took on the world with their mighty fountain pens.
(a) ACBED (b) CEBDA
(c) CAEBD (d) AEDBC
- 40)** A. The celebrations of economic recovery in Washington may be as premature as that “Mission Accomplished” banner hung on the USS Abraham Lincoln to hail the end of the Iraq war.
B. Meanwhile, in the real world, the struggles of families and communities continue unabated.
C. Washington responded to the favourable turn in economic news with enthusiasm.
D. The celebrations and high-fives up and down Pennsylvania Avenue are not to be found beyond the Belt way.
E. When the third quarter GDP showed growth of 72% and the monthly unemployment rate dipped to 6%, euphoria gripped the US capital.
(a) ACEDB (b) CEDAB
(c) ECABD (d) ECBDA

Directions (Q.Nos. 41-50) *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.* (2002)

- 41) A. Branded disposable diapers are available at many supermarkets and drug stores.
 B. If one supermarket sets a higher price for a diaper, customers may buy that brand elsewhere.
 C. By contrast, the demand for private-label products may be less price sensitive since, it is available only at our corresponding supermarket chain.
 D. So, the demand for branded diapers at any particular store may be quite price sensitive.
 E. For instance, only Save On Drugs stores sell Save On Drugs diapers.
 F. Then, stores should set a higher incremental margin percentage for private label diapers.
- (a) ABCDEF (b) ABCEDF
 (c) ADBCEF (d) AEDBCF

- 42) A. Having a strategy is a matter of discipline.
 B. It involves the configuration of a tailored value chain that enables a company to offer unique value.
 C. It requires a strong focus on profitability and a willingness to make tough trade offs in choosing what not to do.
 D. Strategy goes far beyond the pursuit of best practices.
 E. A company must stay the course even during time of upheaval, while constantly improving and extending its distinctive positioning.
 F. When a company's activities fit together as a self-reinforcing system, any competitor wishing to imitate a strategy must replicate the whole system.
- (a) ACEDBF (b) ACBDEF
 (c) DCBEFA (d) ABCEDF

- 43) A. As officials, their vision of a country shouldn't run too far beyond that of the local people with whom they have to deal.
 B. Ambassadors have to choose their words.
 C. To say what they feel they have to say, they appear to be denying or ignoring part of what they know.

- D. So, with ambassadors as with other expatriates in black Africa, there appears at a first meeting a kind of ambivalence.
 E. They do a specialized job and it is necessary for them to live ceremonial lives.
- (a) BCEDA (b) BEDAC
 (c) BEADC (d) BCDEA

- 44) A. "This face off will continue for several months given the strong convictions on either side," says a senior functionary of the high-powered task force on drought.
 B. During the past week-and-half, the Central Government has sought to deny some of the earlier apprehensions over the impact of drought.
 C. The recent revival of the rains had led to the emergence of a line of divide between the two.
 D. The State Governments, on the other hand allege that the Centre is downplaying the crisis only to evade its full responsibility of financial assistance that is required to alleviate the damage.
 E. Shrill alarm about the economic impact on an inadequate monsoon had been sounded by the centre as well as most of the states, in late July and early August.
- (a) EBCDA (b) DBACE
 (c) BDCAE (d) ECBDA

- 45) A. This fact was established in the 1730s by French survey expeditions to Equator near the Equator and Lapland in the Arctic, which found that around the middle of the Earth the arc was about a kilo metre shorter.
 B. One of the unsettled scientific questions in the late 18th century was the exact nature of the shape of the Earth.
 C. The length of one-degree arc would be less near the equatorial altitudes than at the poles.
 D. One way of doing what is to determine the length of the arc along a chosen longitude or meridian at one degree latitude separation.
 E. While it was generally known that the Earth was not a sphere but an 'oblate spheroid' more curved at the equator and flatter at the poles, the question of 'how much more' was yet to be established.
- (a) BECAD (b) BEDCA
 (c) BDACB (d) EBDCA

- 46) A. Although there are regional variations, it is not infrequent to find a large number of people sitting here and there and doing nothing.
 B. Once in office, they receive friends and relatives who feel to call any time without prior appointment.
 C. While working, one is struck by the slow and clumsy action and reactions, indifferent attitudes, procedure rather than outcome orientation and the lack of consideration for others.
 D. Even those who are employed often come later to the office and leave early unless, they are forced to be punctual.
 E. Work is not intrinsically valued in India.
 F. Quite often people visit ailing friends and relatives or go out of their way to help in their personal matters even during office hours.
 (a) ECADBF (b) EADCFB
 (c) EADBFC (d) ABFCBE
- 47) A. But in the industrial era, destroying the enemy's productive capacity means bombing the factories which are located in the cities.
 B. So, in the agrarian era, if you need to destroy the enemy's productive capacity, what do you want to do its burn his fields or if you're really vicious, salt them.
 C. Now, in the information era, destroying the enemy's productive capacity means destroying the information infrastructure.
 D. How do you do battle with your enemy?
 E. The idea is to destroy the enemy's productive capacity and depending upon the economic foundation, that productive capacity is different in each case.
 F. With regard to defence, the purpose of the military is to defend the nation and be prepared to do battle with its enemy.
 (a) FDEBAC (b) FCABED
 (c) DEBACF (d) DFEBAC
- 48) A. Michael Hofman, a poet and translator, accepts this sorry fact without approval or complaint.
 B. But hanklessness and impossibility do not daunt him.
 C. He acknowledge to-in fact he returen to the point often that best translators of poetry always fail at some level.
 D. Hofman feels passionately about his work and this is clear form his writings.
 E. In terms of the gap between warth and rewards, translators come some where near nurses and street-cleaners.
 (a) EACDB (b) ADEBC
 (c) EACBD (d) DCEAB
- 49) A. Passivity is not, of course, universal.
 B. In areas where there are no lords or laws or in frontier zones where all men go armed, the attitude of the peasantry may well be different.
 C. So indeed it may be on the fringe of the unsubmitive.
 D. However, for most of the soil bound peasants, the problem is not whether to be normally passive or active, but when to pass from one state to another.
 E. This depends on an assessment of the political situation.
 (a) BEDAC (b) CDABE
 (c) EDBAC (d) ABCDE
- 50) A. The situations in which violence occurs and the nature of that violence tends to be clearly defined at least in theory, as in the proverbial Irishman's question, 'Is this a private fight or can anyone join in?'
 B. So the actual risk to outsiders, though no doubt higher than our societies, is calculable.
 C. Probably the only uncontrolled applications of force are those of social superiors to social inferiors and even here there are probably some rules.
 D. However, binding the obligation to kill, members of feuding families engaged in mutual massacre will be genuinely appalled if by some mischance a bystander or outsider is killed.
 (a) DABC (b) ACDB (c) CBAD (d) DBAC
- Directions (Q.Nos. 51-55)** *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.* (2002)
- 51) A. If caught in the act, they were punished, not for the crime, but for allowing themselves to be caught another lash of the whip.
 B. The bellicose Spartans sacrificed all the finer things in life for military expertise.
 C. Those fortunate enough to survive babyhood were taken away from their mothers at the age of seven to undergo rigorous military training.

- D. This consisted mainly of beatings and deprivations of all kinds like going around barefoot in winter and worse, starvation so that they would be forced to steal food to survive.
- E. Male children were examined at birth by the city council and those deemed too weak to become soldiers were left to die of exposure.
- (a) BECDA (b) ECADB
(c) BCDAE (d) ECDAB
- 52)** A. This very insatiability of the photographing eye changes the terms of confinement in the cave, our world.
- B. Humankind lingers unregenerately in Plato's cave, still revelling, its age-old habit, in mere images of truth.
- C. But being educated by photographs is not like being educated by older images drawn by hand; for one thing, there are a great many more images around, claiming our attention.
- D. The inventory started in 1839 and since then just about everything has been photographed or so it seems.
- E. In teaching us a new visual code, photographs alter and enlarge our notions of what is worth looking at and what we have a right to observe.
- (a) EABCD (b) BDEAC
(c) BCDAE (d) ECDAB
- 53)** A. To be culturally literate is to possess the basic information needed to thrive in the modern world.
- B. Nor is it confined to one social class; quite the contrary.
- C. It is by no means confined to 'culture' narrowly understood as an acquaintance with the arts.
- D. Cultural literacy constitutes the only sure avenue of opportunity for disadvantaged children, the only reliable way of combating the social determinism that now condemns them.
- E. The breadth of that information is great, extending over the major domains of human activity from sports to science.
- (a) AECBD (b) DECBA
(c) ACBED (d) DBCAE
- 54)** A. Both parties use capital and labour in the struggle to secure property rights.
- B. The thief spends time and money in his attempt to steal (he buys wire cutters) and the legitimate property owner expends resources to prevent the theft (he buys locks).

- C. A social cost of theft is that both the thief and the potential victim use resources to gain or maintain control over property.
- D. These costs may escalate as a type of technological arms race unfolds.
- E. A bank may purchase more and more complicated and sophisticated safes, forcing safecrackers to invest further in safecracking equipment.

(a) ABCDE (b) CABDE
(c) ACBED (d) CBEDA

- 55)** A. The likelihood of an accident is determined by how carefully the motorist drives and how carefully the pedestrian crosses the street.
- B. An accident involving a motorist and a pedestrian is such a case.
- C. Each must decide how much care to exercise without knowing how careful the other is.
- D. The simplest strategic problem arises when two individuals interact with each other, and each must decide what to do without knowing what the other is doing.
- (a) ABCD (b) ADCB
(c) DBCA (d) DBAC

Directions (Q.Nos. 56-60) *Sentences given in each question, when properly sequenced, form a coherent paragraph. The first and last sentences are 1 and 6, and the four in between are labelled A, B, C and D. Choose the most logical order of these four sentences from among the four given choices to construct a coherent paragraph from sentences 1 to 6. (2002)*

- 56)** 1. Security inks exploit the same principle that causes the vivid and constantly changing colours of a film of oil on water.
- A. When two rays of light meet each other after being reflected from these different surfaces, they have each travelled slightly different distances.
- B. The key is that the light is bouncing of two surfaces, that of the oil and that of the water layer below it.
- C. The distance the two rays travel determines which wavelengths, and hence colours, interfere constructively and look bright.
- D. Because lights, an electromagnetic wave, the peaks and troughs of each ray then interfere either constructively, to appear bright or destructively, to appear dim.

6. Since the distance the rays travel changes with the angle as you look at the surface, different colours look bright from different viewing angles.
- (a) ABCD (b) BADC (c) BDAC (d) DCAB
- 57)** 1. Commercially reared chicken can be unusually aggressive, and are often kept in darkened sheds to prevent them pecking at each other.
- A. The birds spent far more of their time—up to a third—pecking at the inanimate objects in the pens, in contrast to birds in other pens which spent a lot of time attacking others.
- B. In low light conditions, they behave less belligerently, but are more prone to ophthalmic disorders and respiratory problems.
- C. In an experiment, aggressive head-pecking was all but eliminated among birds in the enriched environment.
- D. Altering the birds' environment, by adding bales of wood-shavings to their pens, can work wonders.
6. Bales could diminish aggressiveness and reduce injuries; they might even improve productivity, since a happy chicken is a productive chicken.
- (a) DCAB (b) CDBA
(c) DBAC (d) BDCA
- 58)** 1. The concept of a 'nation-state' assumes a complete correspondence between the boundaries of the nation and the boundaries of those who live in a specific state.
- A. Then, there are members of national collectivities who live in other countries, making a mockery of the concept.
- B. There are always people living in particular states who are not considered to be (and often do not consider themselves to be) members of the hegemonic nation.
- C. Even worse, there are nations which never had a state or which are divided across several states.
- D. Thus, of course, has been subject to severe criticism and is virtually everywhere a fiction.
6. However, the fiction has been, and continues to be, at the basis of nationalist ideologies.
- (a) DBAC (b) ABCD (c) BACD (d) DACB
- 59)** 1. In the sciences, even questionable examples of research fraud are harshly punished.
- A. But no such mechanism exists in the humanities—much of what humanities researches call research does not lead to results that are replicable by other scholars.
- B. Given the importance of interpretation in historical and literary scholarship, humanities researches are in a position where they can explain away deliberate and even systematic distortion.
- C. Mere suspicion is enough for funding to be cut off; publicity guarantees that careers can be effectively ended.
- D. Forgeries which take the form of pastiches in which the forger intersperses fake and real parts can be defended as mere mistake funding data have no such defences.
6. Scientists fuding data have no such defences.
- (a) BDCA (b) ABDC
(c) CABD (d) CDBA
- 60)** 1. Horses and communism were, on the whole, a poor match.
- A. Fine horses bespoke the nobility the party was supposed to despise.
- B. Communist leaders, when they visited villages, preferred to see cows and pigs.
- C. Although a working horse was just about tolerable, the communists were right to be wary.
- D. Peasants from Poland to the Hungarian Pustza preferred their horses to party dogma.
6. "A farmer's pride is his horse; his cow may be thin but his horse must be fat", went a Slovak saying.
- (a) ACDB (b) DBCA
(c) ABCD (d) DCBA
- Directions (Q.Nos. 61-65) Arrange the sentences A, B, C and D to form a logical sequence between sentences 1 to 6. (1999)**
- 61)** 1. Making people laugh is tricky.
- A. At times, the intended humour may simply not come off.
- B. Making people laugh while trying to sell them something is a tougher challenge, since the commercial can fall flat on two grounds.
- C. There are many advertisements which do not even begin to set the cash till ringing.
- D. Again, it is rarely sufficient for an advertiser simply to amuse the target audience in order to reap the sales benefit.
6. There are indications that in substituting the hard sell for a more entertaining approach, some agencies have rather thrown out the baby with the bath water.
- (a) CDBA (b) ABCD
(c) BADC (d) DCBA

- 62)** 1. Picture a termite colony, occupying a tall mud hump on an African plain.
- Hungry predators often invade the colony and unsettle the balance.
 - The colony flourishes only if the proportion of soldiers to workers remains roughly the same, so that the queen and workers can be protected by the soldiers and the queen and soldiers can be serviced by the workers.
 - But its fortunes are presently restored, because the immobile queen, walled in well below the ground level, lays eggs not only in large enough numbers, but also in the varying proportions required.
 - The hump is alive with worker termites and soldier termites going about their distinct kinds of business.
6. How can we account for mysterious ability to respond like this to events on the distant surface?
- (a) BADC (b) DBAC (c) ADCB (d) BDCA
- 63)** 1. According to recent research, the critical period for developing language skills is between the age of three and five years.
- The read-to child already has a large vocabulary and a sense of grammar and sentence structure.
 - Children who are read-to in these years have a far better chance of reading well in school, indeed, of doing well in all their subjects.
 - And the reason is actually quite simple.
 - This correlation is far and away the highest yet found between home influences and school success.
6. Their comprehension of language is therefore very high.
- (a) DACB (b) ADCB (c) ABCD (d) BDCA
- 64)** 1. High-powered outboard motors were considered to be one of the major threats to the survival of the Beluga whales.
- With these, hunters could approach Belugas within hunting range and profit from its inner skin and blubber.
 - To escape an approaching motor, Belugas have learned to dive to the ocean bottom and stay there for up to 20 min., by which time the confused predator has left.
 - Today, however, even with much more powerful engines, it is difficult to come close, because the whales seem to disappear suddenly just when you thought you had them in your sights.

- When the first outboard engines arrived in the early 1930s, one came across 4 and 8 HP motors.
- Belugas seem to have used their well-known sensitivity to noise to evolve an 'avoidance' strategy to outsmart hunters and their powerful technologies.

(a) DACB (b) ACDB (c) ADCB (d) DBAC

- 65)** 1. The reconstruction of history by post-revolutionary science texts involves more than a multiplication of historical misconstructions.
- Because they aim quickly to acquaint the student with what the contemporary scientific community thinks it knows, text books treat the various experiments, concepts, laws and theories of the current normal science as separately and as nearly seriatim as possible.
 - Those misconstructions render revolution invisible; the arrangement of the still visible material in science texts implies a process that, if it existed, would deny revolutions a function.
 - But when combined with the generally unhistorical air of science writing and with the occasional systematic misconception, one impression is likely to follow.
 - As pedagogy, this technique of presentation is unexceptionable.
6. Science has reached its present state by a series of individual discoveries and inventions that, when gathered together, constitute the modern body of technical knowledge.

(a) BADC (b) ADCB
(c) DACB (d) CBDA

Directions (Q.Nos. 66-70) Sentences given in each question when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the four given choices to construct a coherent paragraph. (1999)

- 66)** A. We lived in a succession of small towns in the South, never remaining at the same address for more than two years.
- In my case, I think it was a combination of family circumstances and physical peculiarities.
 - I have often been asked what attracts someone to myrmecology, the study of anti-biology.
 - My father, a federal accountant, was exceptionally peripatetic.
- (a) CBDA (b) CADB
(c) CBAD (d) DABC

- 67) A. Group decision making, however, does not necessarily fully guard against arbitrariness and anarchy, for individual capriciousness can get substituted by collusion of group members.
 B. Nature itself is an intricate system of checks and balances, meant to preserve the delicate balance between various environmental factors that affect our ecology.
 C. In institutions also, there is a need to have in place a system of checks and balances which inhibits the concentration of power in the hands of only some individuals.
 D. When human interventions alter this delicate balance, the outcomes have been seen to be disastrous.
- (a) CDAB (b) BCAD
 (c) CABD (d) BDCA

- 68) A. He was bone-weary and soul-weary, and found himself muttering, "either I can't manage this place or it's unmanageable."
 B. To his horror, he realised that he had become the victim of an amorphous, unwitting, unconscious conspiracy to immerse him in routine work that had no significance.
 C. It was one of those nights in the office when the office clock was moving towards four in the morning and Bennis was still not through with the incredible mass of paper stacked before him.
 D. He reached for his calendar and ran his eyes down each hour, half-hour, and quarter-hour, to see where his time had gone that day; the day before, the month before.
- (a) ABCD (b) CADB (c) BDCA (d) DCBA

- 69) A. With that, I swallowed the shampoo, and obtained the most realistic results almost on the spot.
 B. The man shuffled away into the back regions to make up prescription, and after a moment I got through on the shop-telephone to the consulate, intimating my location.
 C. Then, while the pharmacist was wrapping up a six-ounce bottle of the mixture, I groaned and inquired whether he could give me something for acute gastric cramp.
 D. I intended to stage a sharp gastric attack, and entering an old-fashioned pharmacy, I asked for a popular shampoo mixture, consisting of olive oil and flaked soap.
- (a) DCBA (b) DACB
 (c) BDAC (d) BCDA

- 70) A. Since then, intelligence tests have been mostly used to separate dull children in school from average or bright children, so that special education can be provided to the dull.
 B. In other words, intelligence tests gives us a norm for each age.
 C. Intelligence is expressed as intelligence quotient, and tests and developed to indicate what an average child of a certain age can do... what a five-year-old can answer, but a four-year-old cannot, for instance.
 D. Binet developed the first set of such tests in the early 1990s to find out which children in school needed special attention.
 E. Intelligence can be measured by tests.
- (a) CDABE (b) DECAB
 (c) EDACB (d) CBADE

Directions (Q.Nos. 71-81) *In each of the following questions, a paragraph has been split into four parts. You have to rearrange these parts to form a coherent paragraph.* (1998)

- 71) A. He was carrying his jacket and walked with his head thrown back.
 B. As Anette neared the lamp, she saw a figure walking slowly.
 C. For a while Michael walked on and she followed 20 paces behind.
 D. With a mixture of terror and triumph of recognition, she slackened her pace.
- (a) ABCD (b) BADC
 (c) BCDA (d) ACBD
- 72) A. However, the real challenge today is in unlearning which is much harder.
 B. But the new world of business behaves differently from the world in which we grew up.
 C. Learning is important for both people and organisations.
 D. Each of us has 'mental model' that we've used over the years to make sense.
- (a) CADB (b) BDAC (c) CDAB (d) ACBD
- 73) A. There was nothing quite like a heavy downpour of rain to make life worthwhile.
 B. We reached the field, soaked to the skin and surrounded it.
 C. The wet as far as he was concerned was ideal.
 D. There, sure enough, stood Claudius, looking like a debauched Roman emperor under a shower.
- (a) DCBA (b) BDAC (c) BADC (d) BACD

- 74) A. Alex had never been happy with his Indian origins.
 B. He set about rectifying this grave injustice by making his house in his own image of a country manor.
 C. Fate had been unfair to him; if he had his wish, he would have been a court or an Earl on some English estate or a medieval monarch in a chateau in France.
 D. This illusion of misplaced grandeur, his wife felt, would be Alex undoing.
 (a) ACDB (b) ABDC (c) ACBD (d) CABD
- 75) A. The influence is reflected the most in beaded evening wear.
 B. Increasingly the influence of India's colour and cuts can be seen on western styles.
 C. And even as Nehru jackets and Jodhpur's remain staples of the fashion world, designers such as Armani and Mc Fadden have turned to the sleek silhouette of the churidar this year.
 D. Indian hot pink, paprika and saffron continue to be popular colours, year in and year out.
 (a) BADC (b) ABCD
 (c) BCAD (d) DABC
- 76) A. Such a national policy will surely divide and never unite the people.
 B. In fact, it suits the purpose of the politicians; they can drag the people into submission by appealing to them in the name of religion.
 C. In order to inculcate the unquestioning belief they condemn the other states, which do not follow their religion.
 D. The emergence of the theocratic states where all types of crimes are committed in the name of religion, has revived the religion of the Middle Ages.
 (a) ABCD (b) DBCA
 (c) DBAC (d) CDAB
- 77) A. His left-hand concealed a black jack, his right-hand groped for the torch in his pocket.
 B. The meeting was scheduled for 9 o'clock, and his watch showed the time to be a quarter to nine.
 C. The man lurked in the corner, away from the glare of light.
 D. His heart thumped in his chest, sweat beads formed themselves on his forehead his mouth was dry.
 (a) CABD (b) BDAC
 (c) BADC (d) ABCD
- 78) A. The director walked into the room and took a look around the class.
 B. Mitch wanted to scream—the illogicality of the entire scene struck him dumb.
 C. The managers started at him with the look of fear that no democratic country should tolerate in its people.
 D. He walked out of the room—it was his irrevocable protest against an insensible and insensitive situation.
 (a) ACBD (b) BDAC
 (c) BCAD (d) ABCD
- 79) A. The establishment of the Third Reich influenced events in American history by starting a chain of events which culminated in war between Germany and the United States.
 B. The Neutrality Acts of 1935 and 1936 prohibited trade with an belligerents or loans to them.
 C. While speaking out against Hitler's atrocities, the American people generally favoured isolationist policies and neutrality.
 D. The complete destruction of democracy, the persecution of jews, the war on religion, the cruelty and barbarism of the allies, caused great indignation in this country and brought on fear of another world war.
 (a) ABCD (b) CBDA
 (c) CDBA (d) ADCB
- 80) A. An essay which appeals chiefly to the intellect is *Francis Bacon's 'Of Studies'*.
 B. His careful tripartite division of studies expressed succinctly in aphoristic prose demands the complete attention of the mind of the reader.
 C. He considers studies as they should be; for pleasure, for self-improvement, for business.
 D. He considers the evils of excess study: laziness, affectation and preciosity.
 (a) DCBA (b) ABCD
 (c) CDBA (d) ACBD
- 81) A. By reasoning we mean the mental process of drawing an inference from two or more statements or going from the inference to the statements, which yield that inference.
 B. So logical reasoning covers those types of questions, which imply drawing as inference from the problems.
 C. Logic means, if we take its original meaning, the science of valid reasoning.

D. Clearly, for understanding arguments and for drawing the inference correctly, it is necessary that we should understand the statements first.

- (a) ACBD (b) CABD
(c) ABCD (d) DBCA

Directions (Q.Nos. 82-86) *Arrange sentences A, B, C and D between sentences numbered 1 and 6 to form a logical sequence of six sentences.* (1998)

82) 1. Buddhism is a way to salvation.

- A. But Buddhism is more severely analytical.
B. In the Christian tradition, there is also a concern for the fate of human society conceived as a whole, rather than merely as a sum or network of individuals.
C. Salvation is a property or achievement of individuals.
D. Not only does it dissolve society into individuals, the individual in turn is dissolved into component parts and instants a stream of events.
6. In modern terminology, Buddhist doctrine is reductionist.

- (a) ABDC (b) CBAD (c) BDAC (d) ABCD

83) 1. The problem of improving Indian agriculture is both a sociological and an administrative one.

- A. It also appears that there is a direct relationship between the size of a state and development.
B. The issues of Indian development and the problem of India's agricultural sector, will remain with us long into the next century.
C. Without improving Indian agriculture, no liberalisation and licensing will be able to help India.
D. At the end of the day, there has to be a ferment and movement of life and action in the vast segment of rural India.

6. When it starts marching, India will fly.

- (a) DABC (b) CDBA (c) ACDB (d) ABCD

84) 1. Good literary magazines have always been good because of their editors .

- A. Furthermore to edit by committee, as it were, would prevent any magazine from finding its own identity.
B. The more quirky and idiosyncratic they have been, the better the magazine is, at least as a general rule.
C. But the number of editors one can have for a magazine should also be determined by the number of contributions to it.

D. To have four editors for an issue that contains only seven contributions it is a bit silly to start with.

6. However, in spite of this anomaly, the magazine does acquire merit in its attempt to give a comprehensive view of the Indian literary scene as it is today.

- (a) ABCD (b) BCDA
(c) ABDC (d) CBAD

85) 1. It is the successful story of the Indian expatriate in the US which today hogs much of the media coverage in India.

- A. East and West, the twain have met quite comfortably in their person, thank you.
B. Especially in its more recent romancing-the-NRI phase.
C. Seldom does the price of getting there more like not getting there-or what's going on behind those sunny smiles get so much media hype.
D. Well-groomed with their perfect Colgate smiles, and hair in place, they appear the picture of confidence which comes from having arrived.

6. The festival of features films and documentaries made by Americans of Indian descent being screened this fortnight, goes a long way in filling those gaps.

- (a) ACBD (b) DABC
(c) BDAC (d) ABCD

86) 1. A market for Indian art has existed ever since the international art scene sprang to life.

- A. But interest in architectural conceits is an unanticipated fallout of the festivals of India of the 80s, which were designed to increase exports of Indian crafts.
B. Simultaneously, the Indian elite discarded their synthetic sarees and kitsch plastic furniture and a market came into being.
C. Western dealers, unhappy in a market afflicted by violent price fluctuations and unpredictable profit margins, began to look East, and found cheap antiques with irresistible appeal.
D. The fortunes of the Delhi supremos, the Jew Towndealers in Cochin and myriad others around the country were made.

6. A chain of command was established, from the local contacts to the provincial dealers and upto the big boys, who entertain the Italians and the French, cutting deals worth lakhs in warehouses worth crores.

- (a) ABCD (b) DCAB
(c) CBAD (d) CABD

Directions (Q.Nos. 87-96) *Arrange sentences A, B, C and D in a proper sequence so as to make a coherent paragraph.* (1997)

- 87) A. It begins with an ordinary fever and a moderate cough.
 B. India could be under attack from a class of germs that cause what are called a typical pneumonias.
 C. Slowly a sore throat progresses to bronchitis and then pneumonia and respiratory complications.
 D. It appears like the ordinary flu but baffled doctors find that the usual drugs don't work.

(a) ABCD (b) BDAC
 (c) ADCB (d) BCDA

- 88) A. Chemists mostly don't stock it: only a few government hospitals do but in limited quantities.
 B. Delhi's building boom is creating a bizarre problem: snakes are increasingly biting people as they emerge from their disturbed underground homes.
 C. There isn't enough anti-snake serum largely because there is no centralised agency that distributes the product.
 D. If things don't improve more people could face paralysis and even death.

(a) BCAD (b) DBCA
 (c) ABCD (d) CABD

- 89) A. But the last decade has witnessed greater voting and political participation by various privileged sections.
 B. If one goes by the earlier record of mid-term elections, it is likely that the turnout in 1998 will drop by anything between four and six percentage points over the already low polling of 58 percent in 1996.
 C. If this trend offsets the mid-term poll fatigue, the fall may not be so steep.
 D. Notwithstanding a good deal of speculation on this issue it is still not clear as to who benefits from a lower turnout.

(a) BACD (b) ABCD
 (c) DBAC (d) CBDA

- 90) A. After several routine elections, there comes a 'critical' election which redefines the basic pattern of political loyalties, redraws political geography and opens up political space.
 B. In psephological jargon, they call it realignment.
 C. Rather since 1989 there have been a series of semi-critical elections.

D. On a strict definition none of the recent Indian elections qualifies as a critical election.

(a) ABCD (b) ABDC
 (c) DBAC (d) DCBA

- 91) A. Trivial pursuits marketed by the Congress is a game imported from Italy.
 B. The idea is to create an imaginary saviour in times of crisis so that the party doesn't fall flat on its collective face.
 C. Closest contenders are Mani Shankar Aiyar who still hears His Master's Voice and V.George who is frustrated by the fact that his political future remains Sonia and yet so far.
 D. The current champion is Arjun for whom all roads lead to Rome or in this case 10 Janpath.

(a) ABDC (b) ABCD
 (c) DCBA (d) CDBA

- 92) A. Good advertising can make people buy your products even if it sucks.
 B. A dollar spent on brain-washing is more cost-effective than a dollar spent on product improvement.
 C. That's important because it takes pressure off you to make good products.
 D. Obviously,there is a minimum quality that every product has to achieve, it should be able to withstand the shipping process without becoming unrecognizable.

(a) BACD (b) ACBD
 (c) ADCB (d) BCDA

- 93) A. Almost a century ago, when the father of the modern automobile industry, Henry Ford, sold the first model T car, he decided that only the best would do for his customers.
 B. Today,it is committed to delivering the finest quality with over six million vehicles a year in over 200 countries across the world.
 C. And for over ninety years this philosophy has endured in the Ford Motor Company.
 D. Thus, a vehicle is ready for the customer only if it passes the Ford 'Zero Defect Programme'.

(a) ABCD (b) ACDB
 (c) ACBD (d) CDAB

- 94) A. But, clearly, the government still has the final say.
 B. In the past few years, the Reserve Bank of India might have wrested considerable powers from the government when it comes to monetary policy.

- C. The RBI's announcements on certain issues become effective only after the government notifies them.
- D. Isn't it time the government vested the RBI with powers to sanction such changes, leaving their ratification for later?

(a) ACDB (b) ACBD (c) BACD (d) DACB

- 95) A. I sat there frowning at the checkered table-cloth, chewing the bitter cud of insight.
- B. That wintry afternoon in Manhattan, waiting in the little French restaurant, I was feeling frustrated and depressed.
- C. Even the prospect of seeing a dear friend failed to cheer me as it usually did.
- D. Because of certain miscalculations on my part, a project of considerable importance in my life had fallen through.

(a) ADBC (b) BCDA (c) BDCA (d) ABCD

- 96) A. Perhaps the best known is the Bay Area writing Project founded by James Gray in 1974.
- B. The decline in writing skills can be stopped.
- C. Today's back-to-basics movement has already forced some schools to place renewed emphasis on the three R's.
- D. Although the inability of some teachers to teach writing successfully remains a big stumbling block, a number of programmes have been developed to attack this problem.

(a) BCDA (b) ADCB (c) ACBD (d) CABD

Directions (Q.Nos. 97-101) Arrange sentences A, B, C and D between sentences 1 and 6, so as to form a logical sequence of six sentences. (1997)

- 97) 1. Whenever technology has flowered, it has put man's language-developing skills into overdrive.
- A. Technical terms are spilling into the main stream almost as fast as junk-mail is slapped into e-mail boxes.
- B. The era of computers is no less.
- C. From the wheel with its axle to the spinning wheel with its bobbins to the compact disc and its jewel box inventions have trailed new words in their wake.
- D. "Cyberslang is huge but it's parochial, and we don't know what will filter into the large culture," said Tom Dalzell, who wrote the slang dictionary 'Flappers 2 Rappers'.
6. Some slangs already have a pedigree.
- (a) BCAD (b) CBAD (c) ABCD (d) DBCA

- 98) 1. Until the MBA arrived on the scene the IIT graduate was king.
- A. A degree from one of the five IITs' was a passport to a well-paying job, great prospects abroad and for some a decent dowry to boot.
- B. From the day he or she cracked the Joint Entrance Examination, the IIT student commanded the awe of neighbours and close relatives.
- C. IIT students had, meanwhile, also developed their own special culture, complete with lingo and attitude, which they passed down.
- D. True, the success stories of IIT graduates are legion and they now constitute the cream of the Indian diaspora.
6. But not many alumni would agree that the IIT undergraduate mindset merits a serious psychological study, let alone an interactive one.
- (a) BACD (b) ABCD (c) BADC (d) ABDC

- 99) 1. Some of the maharajas, like the one at Kapurthala, had exquisite taste.
- A. In 1902, the Maharaja of Kapurthala gave his civil engineer photographs of the Versailles Place and asked him to replicate it right down to the gargoyles.
- B. Yeshwantrao Holkar of Indore brought in Bauhaus aesthetics and even works of modern artists like Brancusi and Duchamp.
- C. Kitsch is the most polite way to describe them.
- D. But many of them as the available light photographs show had execrable taste.
6. Like Ali Baba's caves some of the palaces were like warehouses with the downright ugly next to the sublimely aesthetic.
- (a) BACD (b) BDCA (c) ABCD (d) ABDC

- 100) 1. There, in Europe, his true gifts unveiled.
- A. Playing with Don Cherie, blending Indian music and jazz for the first time, he began setting the pace in the late 70s for much of present-day fusion is.
- B. John McLaughlin, the legendary guitarist, whose soul has always had an Indian stamp on it, was seduced immediately.
- C. Fusion by Gurtu had begun.
- D. He partnered Gurtu for four years and 'natured' him as a composer.
6. But, for every experimental musician there's a critic nestling nearby.
- (a) ABCD (b) BCAD (c) ADBC (d) ABDC

- 101)** 1. India, which has two out of every five TB patients in the world is on the brink of a major public health disaster.
- A. If untreated, a TB patient can die within five years.
- B. Unlike AIDS the great curse of modern sexuality the TB germ is airborne which means there are no barriers to its spread.
- C. The dreaded infection ranks fourth among major killers worldwide.
- D. Every minute a patient falls prey to the infection in India, which means that over five lakh people die of the disease annually.
6. Anyone, anywhere can be affected by this disease.
- (a) CADB (b) BACD (c) ABCD (d) DBAC

Directions (Q.Nos. 102-107) *Arrange the four sentences in their proper order so that they make a logically coherent paragraph. (1996)*

- 102)** A. Still, Sophie might need an open heart surgery later in life and now be more prone to respiratory infections.
- B. But with the news that infant daughter Sophie has a hole in her heart, he appears quite vulnerable.
- C. While the condition sounds bad it is not life threatening and frequently corrects itself.
- D. Sylvester Stallone has made millions and built a thriving career out of looking invincible.
- (a) DCAB (b) DBAC
(c) DBCA (d) DCBA
- 103)** A. However, the severed head could not growback if fire could be applied instantly to the amputated part.
- B. To get rid of this monstrosity was truly a Herculean task for as soon as one head was cut off two new ones replaced it.
- C. Hercules accomplished this labour with the aid of an assistant who cauterized the necks as fast as Hercules cut off the heads!
- D. One of the twelve labours of Hercules was the killing of hydra, a water monster with nine heads.
- (a) DCBA (b) ABCD (c) DBAC (d) BDCA
- 104)** A. That Hollywood is a man's world is certainly true but it is not the whole truth.
- B. Even Renaissance film actress Jodie Foster, who hosts this compendium of movie history, confesses surprise at this.
- C. She says that she had no idea that women were so active in the industry even in those days.
- D. During the silent era, for example, female script writers outnumbered males 10 to 1.
- (a) ADBC (b) ABDC (c) DCAB (d) ABCD
- 105)** A. Its business decisions are made on the timely and accurate flow of information.
- B. It has 1,700 employees in 13 branches and representative offices across the Asia-Pacific region.
- C. For employees to maintain a competitive edge in a fast-moving field, they must have quick access to JP Morgan's proprietary trade related data.
- D. JP Morgan's is one of the largest banking institutions in the US and a premier international trading firm.
- (a) DBAC (b) DCBA (c) CDAB (d) DCAB
- 106)** A. The Saheli Programme run by the US Cross-Cultural Solutions is offering a three week tour of India that involves a lot more than frenzied sightseeing.
- B. Participants interested in women's issues will learn about arranged marriages, dowry and infanticide.
- C. Holiday packages include all sorts of topics but female infanticide must be the first for tourism.
- D. Interspersed with these talks and meetings are visits to cities like New Delhi and Agra, home to the Taj Mahal.
- (a) ACBD (b) CDBA (c) ADBC (d) CABD
- 107)** A. Something magical is happening to our planet.
- B. Some are calling it a paradigm shift.
- C. It's getting smaller.
- D. Others call it business transformation.
- (a) ABDC (b) ACDB (c) ABCD (d) ACBD
- Directions (Q.Nos. 108-117)** *In each of the following questions four sentences are given between the sentences numbered 1 and 6. You are required to arrange the four sentences so that all six together make a logical paragraph. (1996)*
- 108)** 1. It doesn't take a highly esteemed medical expert to conclude that women handle pain better than men.
- A. First the men would give birth and then take six months to recover.
- B. As for labour pains the human species would become extinct if men had to give birth.

- C. They do, however, make life hell for everyone else with their non-stop complaining about how bad they feel.
- D. The men in my life including my husband and my father would not take a Tylenol for pain even if their lives depend on it.
6. And by the time they finish sharing their excruciating experience with their buddies all reproduction would come to a halt.
- (a) ABDC (b) DCBA
(c) CDBA (d) BACD
- 109)** 1. A few years ago hostility towards Japanese-Americans was so strong that I thought they were going to reopen the detention camps here in Kolkata.
- A. Today, Asians are a success story.
- B. I cannot help making a comparison to the anti-Jewish sentiment in Nazi Germany, when Jewish people were successful in business.
- C. But do people applaud President Clinton for improving foreign trade with Asia?
- D. Now, talk about the 'Arkansas-Asia Connection' is broadening that hatred to include all Asian-Americans.
6. No, blinded by jealousy, they complain that it is the Asian-American who are reaping the wealth.
- (a) DBAC (b) ABDC
(c) DABC (d) ACBD
- 110)** 1. Michael Jackson, clearly no admirer of long engagements, got married abruptly for the second time in three years.
- A. The latest wedding took place in a secret midnight ceremony in Sydney, Australia.
- B. It is also the second marriage for the new missus about whom little is known.
- C. The wedding was attended by the groom's entourage and staff, according to Jackson's publicist.
- D. The bride, 37-years old Debbie Rowe, who is carrying Jackson's baby, wore white.
6. All that is known is that she is a nurse for Jackson's dermatologist.
- (a) ACDB (b) BDCA
(c) DABC (d) CDBA
- 111)** 1. Liz Taylor isn't just unlucky in love.
- A. She, and husband Larry Fortensky, will have to pay the tab-\$4, 32,600 in court costs.
- B. The duo claimed that a 1993 story about a property dispute damaged their reputations.
- C. Taylor has just filed a defamation suit against the National Enquirer.
- D. She is unlucky in law too.
6. Alas, all levels of the California court system disagreed.
- (a) CDAB (b) DCAB (c) DABC (d) CDBA
- 112)** 1. Hiss was serving as Head of the Endowment on August 3, 1948, when Whittaker Chambers reluctantly appeared before the House Un-American Activities Committee.
- A. Chambers, a portly rumpled man with a melodramatic style, had been Communist courier but had broken with the party in 1938.
- B. When Nixon arranged a meeting of the two men in New York, Chambers repeated his charges and Hiss his denials.
- C. Summoned as a witness, Hiss denied that he had ever been a Communist or had known Chambers.
- D. He told the Committee that among the members of a secret Communist cell in Washington during the 1930s was Hiss.
6. Then, bizarrely, Hiss asked Chambers to open his mouth.
- (a) CBAD (b) ADBC (c) ADCB (d) ACDB
- 113)** 1. Since its birth, rock has produced a long string of guitar heroes.
- A. It is a list that would begin with Chuck Berry and continue with Hendrix, Page and Clapton.
- B. These are musicians celebrated for their sheer instrumental talent, and their flair for expansive, showy and sometimes self-indulgent solos.
- C. It would also include players of more recent vintage, like Van-Halen and Living Colour's Vernon Ried.
- D. But with the advent of alternative rock and grunge, guitar heroism became uncool.
6. Guitarists like Peter Dinklage and Kurt Cobain shy away from exhibitionism.
- (a) ACBD (b) ABCD (c) BCAD (d) BADC
- 114)** 1. For many scientists oceans are the cradle of life.
- A. But all over the world chemical products and nuclear waste continue to be dumped into them.
- B. Coral reefs, which are known to be the most beautiful places of the submarine world are fast disappearing.
- C. The result is that many species of fish die because of this pollution.

D. Of course man is the root cause behind these problems.

6. Man has long since ruined the places he visits—continents and oceans alike.

- (a) ACBD (b) BACD
(c) ABDC (d) BCAD

115) 1. Am I one of the people who are worried that Bill Clinton's second term might be destroyed by the constitutional crisis?

- A. On the other hands, ordinary citizens have put the campaign behind them.
B. In other words, what worries me is that Bill Clinton could exhibit a version of what George Bush used to refer to as Big Mo.
C. That is he might have so much campaign momentum that he may not be able to stop campaigning.
D. Well, it's true that I've been wondering whether a President could be impeached for refusing to stop talking about the bridge we need to build to the 21st century.

6. They now prefer to watch their favourite soaps and ads on TV rather than senators.

- (a) DBCA (b) ABDC
(c) BACD (d) CBDA

116) 1. So how big is the potential market?

- A. But they end up spending thousands more each year on hardware overhaul and software upgradation.
B. Analysts say the new machines will appeal primarily to corporate users.
C. An individual buyer can pick up a desktop computer for less than \$2,000 in America.
D. For them, the NCs best-drawing card is its promise of much lower maintenance costs.
6. NCs, which automatically load the latest version of whatever software they need could put an end to all that.

- (a) BCAD (b) DABC (c) BDCA (d) DCAB

117) 1. Historically, stained glass was almost entirely reserved for ecclesiastical spaces.

- A. By all counts, he has accomplished that mission with unmistakable style.
B. "It is my mission to bring it kicking and screaming out of that milieu," says Clarke.
C. The first was the jewel-like windows he designed for a Cistercian Church in Switzerland.
D. Two recent projects show his genius in the separate world of the sacred and the mundane.

6. The second was a spectacular, huge skylight in a shopping complex in Brazil.

- (a) CBAD (b) BADC
(c) ABDC (d) DBAC

Directions (Q.Nos. 118-127) Arrange sentences A, B, C and D between sentences 1 and 6 so as to form a logical sequence of six sentences. (1995)

118) 1. Currency movements can have a dramatic impact on equity returns for foreign investors.

- A. This is not surprising as many developing economies try to peg their exchange rates to the US dollar or to a basket of currencies.
B. Many developing economies manage to keep exchange rate volatility lower than that in the industrial economies.
C. India has also gone in for the full float on the current account and abolished the managed exchange rate.

D. Dramatic exceptions are Argentina, Brazil and Nigeria.

6. Another emerging market specific risk is liquidity risk.

- (a) ADBC (b) CDAB
(c) BDAC (d) CABD

119) 1. All human beings are aware of the existence of a power greater than that of the mortals—the name given to such a power by individuals is an outcome of birth, education and choice.

- A. This power provides an anchor in times of adversity, difficulty and trouble.
B. Industrial organizations also contribute to the veneration of this power by participating in activities such as religious ceremonies and festivities organised by the employees.
C. Their other philanthropic contributions include the construction and maintenance of religious places such as temples or gurdwaras.

D. Logically, therefore, such a power should be remembered in good times also.

6. The top management/managers should participate in all such events, irrespective of their personal choice.

- (a) ADBC (b) BCAD (c) CADB (d) DACB

120) 1. Total forgiveness for a mistake generates a sense of complacency towards target achievement among the employees.

- A. In such a situation, the work ethos gets distorted and individuals get a feeling that they can get away with any lapse.

- B. The feeling that they develop is whether I produce results or not, the management will not punish me or does not have the guts to punish me.
- C. Also, excess laxity damages management credibility because for a long time the management has maintained that dysfunctional behaviour will result in punishment and when something goes wrong, it fails to take specific punitive action.
- D. The severity of the punishment may be reduced by modifying it but some action must be taken against the guilty so as to serve as a remainder for all others in the organization.
6. Moreover it helps to establish the management's images of being firm, fair and yet human.
- (a) DCBA (b) BACD (c) DBCA (d) CABD

121) 1. But the vessel kept going away.

- A. He looked anxiously around.
- B. There was nothing to see but the water and empty sky.
- C. He could now barely see her funnel and masts when heaved up on a high wave.
- D. He did not know for what.
6. A breaking wave slapped him in the face choking him.
- (a) DBCA (b) ACDB (c) CADB (d) ABCD

122) 1. Managers must lead by example they should not be averse to giving a hand in manual work; if required.

- A. They should also update their competence to guide their subordinates; this would be possible only if they keep in regular touch with new processes, machines, instruments, gauges, systems and gadgets.
- B. Work must be allocated to different groups and team members in clear, specific terms.
- C. Too much of wall-building is detrimental to the exercise of the 'personal charisma' of the leader whose presence should not be felt only through notices, circulars or memos, but by being seen physically.
- D. Simple, clean living among one's people should be insisted upon.
6. This would mean the maintaining of an updated organization chart; laying down job descriptions; identifying key result areas; setting personal targets; and above all monitoring of performance to meet organizational goals.
- (a) BDAC (b) BCDA (c) ADCB (d) ACDB

123) 1. The top management should perceive the true worth of people and only then make friends.

- A. Such 'true friends' are very few and very rare.
- B. Factors such as affluence, riches, outward sophistication and conceptual abilities are not prerequisites for genuine friendship.
- C. Such people must be respected and kept close to the heart.
- D. Business realities call for developing a large circle of acquaintances and contacts; however, all of them will be motivated by their own self-interest and it would be wrong to treat them as genuine friends.
6. There is always a need for real friends to whom one can turn for balanced, unselfish advice, more so when one is caught in a dilemma.

(a) ABCD (b) ADBC (c) ACDB (d) ACBD

124) 1. Managers, especially the successful ones, should guard against ascribing to themselves qualities and attributes which they may not have, or may have in a measure much less than what they think they have!

- A. External appearances can be deceptive.
- B. To initiate action without being in possession of full facts can lead to disastrous results.
- C. Also one should develop confidants who can be used as sounding boards in order to check one's own thinking against that of the others.
- D. It is also useful to be receptive to feedback about oneself so that a real understanding of the 'self' exists.
6. A false perception can be like wearing coloured glasses—all facts get tainted by colour of the glass and the mind interprets them wrongly to fit into the perception.

(a) DCAB (b) BADC (c) DABC (d) BCAD

125) 1. Conflicting demands for resources are always voiced by different functions/departments in an organisation.

- A. Every manager examines the task entrusted to him and evaluates the resources required.
- B. Availability of resources in full measure makes task achievement easy because it reduces the effort needed to somewhat make do.
- C. A safety cushion is built into demand for resources to offset the adverse impact of any cut imposed by the seniors.
- D. This aspect needs to be understood as a reality.

6. Dynamic, energetic, growth-oriented and wise managements are always confronted with the inadequacy of resources with respect to one of the four Ms (men, machines, money and materials) and the two Ts (time and technology).

(a) DABC (b) ACBD
(c) ABCD (d) BCDA

- 126)** 1. Despite the passage of time, a large number of conflicts continue to remain alive, because the wronged parties, in reality or in imagination, wish to take revenge upon each other, thus creating a vicious circle.
- A. At times, managers are called upon to take ruthless decisions in the long-term interests of the organisation.
- B. People hurt others, at times knowingly; to teach them a lesson and at other times because they lack correct understanding of the other person's stand.
- C. The delegation of any power to any person is never absolute.
- D. Every ruthless decision will be accepted easily if the situation at the moment of committing the act is objectively analysed, shared openly and discussed rationally.
6. Power is misused; its effects can last only for a while, since employees are bound to confront it some day.
- (a) BCAD (b) ADBC
(c) DABC (d) BADC

- 127)** 1. Managers need to differentiate among those who commit an error once, those who are respectively errant but can be corrected, and those who are basically wicked.
- A. The persons in this category will resort to sweet-talk and make all sorts of promises on being caught, but, at the first opportunity will revert to their bad ways.
- B. Managers must take ruthless action against the basically wicked and ensure their separation from the organisation at the earliest.
- C. The first category needs to be corrected softly and duly counselled; the second category should be dealt with firmly and duly counselled till they realise the danger of persisting with their errant behaviour.
- D. It is the last category of whom the managers must be most wary.

6. The punishment must be fair and based on the philosophy of giving all the possible opportunities and help prior to taking ruthless action.

(a) ADCB (b) CDAB
(c) CADB (d) BDAC

Directions (Q.Nos. 128-132) *Answer the questions based on the following information. Each of the questions consists of four sentences marked A, B, C and D. You are required to arrange the sentences in a proper sequence so as to make a coherent paragraph. (1995)*

- 128)** A. Where there is division, there must be conflict not only division between man and woman but also division on the basis of race, religion and language.
- B. We said the present condition of racial divisions, linguistic divisions has brought out so many wars.
- C. Also, we went into the question as to why does this conflict between man and woman exist.
- D. May we continue with what we were discussing last evening?
- (a) ABCD (b) DBCA (c) BCAD (d) BDAC
- 129)** A. No other documents gives us so intimate a sense of the tone and temper of the first generation poets.
- B. Part of the interest of the journal is course historical.
- C. And the clues to Wordsworth's creative processes which the journal are of decisive significance.
- D. No even in their own letters do Wordsworth and Coleridge stand so present before us than they do through the references in the journal.
- (a) BACD (b) BDAC (c) CBAD (d) DABC
- 130)** A. These high plans died, slowly but definitely; and were replaced by the dream of a huge work on philosophy.
- B. In doing whatever little he could of the newplan, the poet managed to write speculations on theology; and political theory.
- C. The poet's huge ambitions included writing a philosophic epic on the origin of evil.
- D. However, not much was done in this regard either with only fragments being written.
- (a) ABCD (b) CBAD (c) CDAB (d) DACB
- 131)** A. We can never leave off wondering how that which has ever been should cease to be.
- B. As we advance in life, we acquire a keener sense of the value of time.

- C. Nothing else, indeed, seems to be of any consequence; and we become misers in this sense.
 D. We try arrest its few last tottering steps, and to make it linger on the brink of the grave.
 (a) ACDB (b) BCDA (c) BDCA (d) ABCD

- 132)** A. There is no complete knowledge about anything.
 B. Our thinking is the outcome of knowledge and knowledge is always limited.
 C. Knowledge always goes hand in hand with ignorance.
 D. Therefore, our thinking which is born out of knowledge, is always limited under all circumstances.
 (a) BCAD (b) BCDA (c) DABC (d) CBDA

Directions (Q.Nos. 133-137) *In each question, four parts of a sentence have been given. From the alternatives find the combination which best gives a meaningful sentence. (1994)*

- 133)** A. there was the hope that in another existence a greater happiness would reward one.
 B. previous existence, and the effort to do better would be less difficult too when
 C. it would be less difficult to bear the evils of one's own life if
 D. one could think that they were but the necessary outcome of one's errors in a
 (a) CABD (b) BDCA (c) BADC (d) CDBA
- 134)** A. he can only renew himself if his soul
 B. he renews himself and
 C. the writer can only be fertile if
 D. is constantly enriched by fresh experience
 (a) CBAD (b) CADB (c) BDCA (d) BACD

- 135)** A. but a masterpiece is
 B. untaught genius
 C. a laborious career than as the lucky fluke of
 D. more likely to come as the culminating point of
 (a) CDAB (b) ADCB (c) CDBA (d) ACDB

- 136)** A. what interests you is the way in which you have a created the illusion
 B. they are angry with you, for it was
 C. the public is easily disillusioned and then
 D. the illusion they loved; they do not understand that
 (a) ACBD (b) BDCA
 (c) CBDA (d) BCAD

- 137)** A. an adequate physical and social infrastructure level
 B. the pattern of spatial growth in these towns as also to
 C. the failure of the government to ensure
 D. the roots of the riots are related to
 (a) ACBD (b) DBCA (c) ABDC (d) CBDA

Directions (Q. Nos. 138-142) *In each of the following questions, the answer choices suggest alternative arrangements of four sentences A, B, C and D. Choose the alternative which suggests a coherent paragraph. (1994)*

- 138)** A. To have settled one's affairs is a very good preparation to leading the rest of one's life without concern for the future.
 B. When I have finished this book I shall know where I stand.
 C. One does not die immediately after one has made one's will; one makes one's will as a precaution.
 D. I can afford then to do what I choose with the years that remain to me.
 (a) DBAC (b) CABD (c) BDAC (d) CBDA
- 139)** A. It is said that India has always been in a hurry to conform to the western thought especially the American.
 B. Even the smaller countries have the guts to take a firm contrarian stand if they feel the policies happen to compromise their country's interest.
 C. It's one thing to sprout theories on liberalization and entirely another to barter the interests of the nation in its name.
 D. In this case too, while a large number of countries are yet to ratify the GATT, India has not only ratified the treaty, but is also preparing to amend the Patents Act.
 (a) CABD (b) DCAB (c) CBDA (d) BDCA
- 140)** A. But instead you are faced with another huge crag and the weary trail continues.
 B. No, the path winds on and another mountain bars your way.
 C. When for days you have been going through a mountain pass a moment comes when you are sure that after winding around the great mass of rock in front of you, you will come upon the plain.
 D. Surely after this you will see the plain.
 (a) CDBA (b) BADC
 (c) CADB (d) BCAD

- 141) A. During one exhibition, however, some air became mixed with the hydrogen, and in the words of the shaken performer:
 "The explosion was so dreadful that I imagined all my teeth had been blown out!"
 B. An entertainer would finished his acts by blowing the hydrogen he had inhaled towards a lighted candle; as the hydrogen caught fire, flames would shoot menacingly from his lips.
 C. A paper bag filled with hydrogen amazed guests by zooming off into space.
 D. when people learned about its unique lighter-than-air property, they began to use it in all sorts of parlour stunts.
- (a) DCBA (b) DBAC
 (c) CABD (d) ACBD

- 142) A. It is exciting and various.
 B. I am a writer as I might have been a doctor or a lawyer.
 C. The writer is free to work in what he believes.
 D. It is so pleasant a profession that it is not surprising if a vast number of persons adopt it who have no qualifications for it.
- (a) CADB (b) ABDC
 (c) DBCA (d) BDAC

Directions (Q.Nos.143-147) *Arrange sentences A, B, C and D between sentence 1 and 6 to form a logical sequence of six sentences.* (1994)

- 143) 1. It is often said that good actors can get out of a play more than the author has put into it.
 A. A good actor, bringing to a part his own talent, often gives it a value that the layman on reading the play had not seen in it, but at the utmost he can do no more than reach the ideal that the author has seen in his mind's eye.
 B. In all my plays, I have been fortunate enough to have some of the parts acted as I wanted; but in none have I had all the parts so acted.
 C. That is not true.
 D. He has to be an actor of address to do this; for the most part the author has to be satisfied with an approximation of the performance he visualised.
6. This is so obviously inevitable for the actor who is suited to a certain role may well be engaged and you have to put up with the second or third best because there is no help for it.
- (a) BACD (b) DACB
 (c) CADB (d) DCBA

- 144) 1. I can think of no serious prose play that has survived the generation that gave it birth.
 A. They are museum pieces.
 B. They are revived now and then because a famous part tempts a leading actor or a manager in want of a stop gap thinks he will put on a play on which he has no loyalties to pay.
 C. A few comedies have haphazardly travelled down a couple of centuries or so.
 D. The audience laugh at their wit with politeness and at their farce with embarrassment.
6. They are not held nor taken out of themselves.
- (a) CDBA (b) CABD
 (c) ABDC (d) BACD

- 145) 1. The wind had savage allies.
 A. If it had not been for my closely fitted helmet, the explosions might have shattered my eardrums.
 B. The first clap of thunder came as a deafening explosion that literally shook my teeth.
 C. I did not hear the thunder I actually felt it-an almost unbearable physical experience.
 D. I saw lightning all around me in every shape imaginable.
6. It was raining so torrentially that I thought I would drown in mid air.
- (a) BCAD (b) CADB
 (c) CBDA (d) ACDB

- 146) 1. All human beings are aware of the existence of a power greater than that of the mortals-the name given to such a power by individuals is an outcome of birth, education and choice.
 A. Logically,therefore such a power should be remembered in good times also.
 B. Their other philanthropic contributions include the construction and maintenance of religious places such as temples or gurdwaras.
 C. Industrial organizations also contribute to the veneration of this power by participating in activities such as religious ceremonies and festivities organized by the employees.
 D. This power provides an anchor in times of adversity, difficulty and trouble.
6. The top management/managers should participate in all such events, irrespective of their personal choice.
- (a) CADB (b) BCAD
 (c) DACB (d) DBCA

- 147)** 1. A thorough knowledge of the path or course to be followed is essential for achieving success.
- A. Seniors must show the path clearly by laying down the precise expectations of the management in terms of job description, key result areas and personal targets.
- B. 'They should also 'light the path' by personal example.
- C. Advice tendered or help offered must be objectively evaluated for its effectiveness in achieving the desired goal.
- D. A display of arrogance and a false sense of 'self-worth', in order to be little those who come to help, prove dysfunctional.
6. The individuality of each employee must be respected.
- (a) CDAB (b) CADB (c) BADC (d) ABCD

Directions (Q. Nos.148-153) *A number of sentences are given below which, when properly sequenced, form a coherent paragraph choose the most logical order of sentences from among the four given choices to construct a coherent paragraph.*
(1993)

- 148)** A. Realists believe that there is an objective reality 'out there' independent of ourselves.
- B. This reality exists solely by virtue of how the world is and it is in principle discoverable by application of the methods of science.
- C. They believe in the possibility of determining whether or not a theory is indeed really true or false.
- D. I think it is fair to say that this is the position to which most working scientists subscribe.
- (a) ABCD (b) CDBA (c) DCBA (d) BCAD
- 149)** A. There is a strong manufacturing base for a variety of products.
- B. India has come a long way on the technology front.
- C. But the technology adopted has been largely of foreign origin.
- D. There are, however, areas such as atomic energy, space, agriculture, and defence where significant strides have been made in evolving relevant technologies within the country.
- (a) ADCB (b) DBAC
(c) BACD (d) CBAD

- 150)** A. In emission trading, the government fixes the total amount of pollution that is acceptable to maintain a desired level of air quality.
- B. Economists argue this approach makes air pollution control more cost-effective than the current practice of fixing air pollution standards and expecting all companies to pollute below these standards.
- C. USA uses emission trading to control air pollution.
- D. It then distributes emission permits to all companies in the region, which add up to the overall acceptable level of emission.
- (a) BADC (b) ACDB
(c) CBAD (d) DBAC
- 151)** A. The individual companies vary in size, from the corner grocery to the industrial giant.
- B. Policies and management methods within firms range from formal, well-planned organization and controls to slipshod day-to-day operations.
- C. Various industries offer a wide array of products or services through millions of firms largely independent of each other.
- D. Variation in the form of ownership contributes to diversity in capital investment, volume of business, and financial structure.
- (a) DBCA (b) CADB
(c) BADC (d) ADCB
- 152)** A. All levels of demand, whether individual, aggregate, local, national or international are subject to change.
- B. At the same time science and technology add new dimensions to products, their uses and the methods used to market them.
- C. Aggregate demand fluctuates with changes in the level of business activity, GNP and national income.
- D. The demand of individuals tends to vary with changing needs as rising income.
- (a) CBDA (b) DCAB (c) BCAD (d) ADCB
- 153)** A. Secret persons shall strike with weapons, fire or poison.
- B. Clans mutually supporting each other shall be made to strike at the weak points.
- C. He shall destroy their caravans, herds, forests and troop reinforcements.
- D. The conqueror shall cause enemy kingdom to be destroyed by neighbouring kings, jungle tribes, pretenders or unjustly treated princes.
- (a) DCBA (b) ABCD
(c) BDCA (d) ADCB

Directions (Q. Nos. 154-166) *Arrange the sentences A, B, C and D to form a logical sequence between sentences 1 and 6.* (1993)

- 154)** 1. What does the state do in a country where tax morality is very low?
 A. It tries to spy upon the tax payers.
 B. It investigates income sources and spending patterns.
 C. Exactly what the tax authority tries to do now even if inconsistently.
 D. It could also encourage people to denounce to the tax authorities any conspicuously prosperous neighbours why may be suspected of not paying their taxes properly. .
 6. The ultimate solution would be an Orwellian System.
 (a) BACD (b) DBAC (c) ABCD (d) DCBA
- 155)** 1. The fragile Yugoslav State has uncertain future.
 A. Thus there will surely be chaos and uncertainty if the people fail to settle their differences.
 B. Sharp ideological differences already exist in the country.
 C. Ethnic, regional, linguistic and material disparities are profound.
 D. The country will also lose the excellent reputation it enjoyed in the international arena.
 6. At worst, it will once more become vulnerable to international conspiracy and intrigue.
 (a) BCAD (b) ADCB (c) ACBD (d) DBCA
- 156)** 1. India's experience of industrialisation is characteristic of the difficulties faced by a newly-independent developing country.
 A. In 1947 India was undoubtedly as underdeveloped country with one of the lowest per capita incomes in the world.
 B. Indian industrialisation was the result of a conscious deliberate policy of growth by an indigenous political elite.
 C. Today, India ranks fifth in the international community of nations if measured in terms of purchasing power.
 D. Even today, however, the benefits of Indian industrialisation since independence have not reached the masses.
 6. In India has been a limited success; one more example of growth without development.
 (a) CDAB (b) DCBA (c) CABD (d) BACD

- 157)** 1. The New Economic Policy comprises the various policy measures and changes introduced since July 1991.
 A. There is a common thread running through all these measures.
 B. The objective is simple - to improve the efficiency of the system.
 C. The regulator mechanism involving multitude of controls has fragmented the capacity and reduced competition even in the private sector.
 D. The thrust of the new policy is towards creating a more competitive environment as a means to improving the productivity and efficiency of the economy.
 6. This is to be achieved by removing the barriers and restriction on the entry and growth of firms.
 (a) DCAB (b) ABCD
 (c) BDAC (d) CDBA
- 158)** 1. It is significant that one of the most common objections to competition is that it is blind.
 A. This is important because in a system of free enterprise based on private property chances are not equal and there is indeed a strong case for reducing that inequality of opportunity.
 B. Rather it is a choice between a system where it is the will of a few persons that decides who is to get what and one where it depends at least partly on the ability and the enterprise of the people concerned.
 C. Although competition and justice may have little else in common, it is as much a commendation of competition as of justice that it is no respecter of persons.
 D. The choice today is not between a system in which everybody will get what he deserves according to some universal standard and one where individual shares are determined by chance or goodwill.
 6. The fact that opportunities open to the poor in a competitive society are much more restricted than those open to the rich, does not make it less true that in such a society, the poor are more free than a person commanding much greater material comfort in a different type of society.
 (a) CDBA (b) DCBA
 (c) ABCD (d) BADC

159) 1. The necessity for regional integration in South Asia is underlined by the very history of the last 45 years since the liquidation of the British Empire in this part of the world.

- A. After the partition of the Indian Subcontinent, Pakistan was formed in that very area which the imperial powers had always marked out as the potential base for operations against the Russian power in Central Asia.
- B. Because of the disunity and ill-will among the South Asian neighbours, particular India and Pakistan, the great powers from outside the area could meddle into their affairs and thereby keep neighbours apart.
- C. It needs to be added that it was the bountiful supply of sophisticated arms that emboldened Pakistan to go for war like bellicosity towards India.
- D. As a part of the cold war strategy of the U.S., Pakistan was sucked into Washington's military alliance spreading over the years.

6. Internally too, it was the massive induction of American arms into Pakistan which empowered the military junta of that country to stuff out the civilian government and destroy democracy in Pakistan.

- (a) ACBD (b) ABDC (c) CBAD (d) DCAB

160) 1. Commercial energy consumption shows an increasing trend and poses a major challenge for the future.

- A. The demand for petroleum during 1996-97 and 2006-07 is anticipated to be 81 million tonnes and 125 million tonnes respectively.
- B. According to the projections of the 14th Power Survey Committee Report, the electricity generation requirements from utilities will be about 415 billion units by 1996-97 and 824 billion units by 2006-07.
- C. The production of coal should reach 303 million tonnes by 1996-97 to achieve plan targets and 460 million tonnes by 2006-07.
- D. The demand for petroleum products has already outstripped indigenous production.

6. Electricity is going to play a major role in the development of infrastructural facilities.

- (a) DACB (b) CADB (c) BADC (d) ABCD

161) 1. The success of any unit in a competitive environment depends on prudent management sources.

- A. In this context it would have been more appropriate if the concept of accelerated depreciation together with additional incentives towards capital allowances for recouping a portion of the cost of replacements out of the current generations had been accepted.
- B. Added to this are the negligible retention of profits because of inadequate capital allowances are artificial disallowances of genuine outflows.
- C. One significant cause for poor generation of surpluses is the high cost of capital and its servicing cost.
- D. The lack of a mechanism in India tax laws for quick recovery of capital costs has not received its due attention.

6. While this may apparently look costly from the point of view of the exchequer, the ultimate cost to the government and the community in the losses suffered through poor viability will be prohibitive.

- (a) ADBC (b) BCDA
(c) CBDA (d) DBAC

162) 1. Count Rumford is perhaps best known for his observations on the nature of heat.

- A. He undertook several experiments in order to test the theories of the origin of frictional heat.
 - B. According to the Calorists, the heat was produced by the 'caloric' squeezed out of the chips in the process of separating them from the larger pieces of metal.
 - C. Lavoisier had introduced the term 'caloric' for the weightless substance heat, and had included it among the chemical elements alongwith carbon, nitrogen and oxygen.
 - D. In the ammunitions factory in Munich, Rumford noticed that a considerable degree of heat developed in a brass gun while it was being bored .
6. Rumford could not believe that the amount of heat generated could have come from the small amount of dust created.

- (a) ABCD (b) CBDA
(c) ACDB (d) CDAB

- 163)** 1. The death of cinema has been predicted annually.
- A. It hasn't happened.
 - B. It was said that the television would kill it off and indeed audiences plummeted, reaching a low in 1984.
 - C. Film has enjoyed a renaissance, and audiences are now roughly double of what they were a decade ago.
 - D. Then the home computer became the projected nemesis followed by satellite television.
6. Why? Probably because even in the most atomised of societies, we human beings feel the need to share out fantasies and our excitement.
- (a) CADB (b) BDAC
(c) ABDC (d) DABC

- 164)** 1. The idea of sea-floor spreading preceded the theory of plate tectonics.
- A. The hypothesis was soon substantiated by the discovery that periodic reversals of the Earth's magnetic field are recorded in the oceanic crust.
 - B. In its original version, it described the creation and destruction of the ocean floor, but it did not specify rigid lithospheric plates.
 - C. An explanation of this process devised by E.J. Vine and D.H. Matthews of Princeton is now generally accepted.
 - D. The sea-floor spreading hypothesis was formulated chiefly by Harry H. Hess of Princeton University in the early 1960s.
6. As magma rises under the mid-ocean ridge, ferromagnetic minerals in the magma become magnetised in the direction of the geomagnetic field.
- (a) DCBA (b) ABDC
(c) CBDA (d) DBAC

- 165)** 1. Visual recognition involves string and retrieving of memories.
- A. Psychologists of the Gestalt school maintain that objects are recognised as a whole in a parallel procedure.
 - B. Neural activity, triggered by the eye, forms an image in the brain's memory system that constitutes an internal representation of the viewed object.
 - C. Controversy surrounds the question of whether recognition is a single one-step procedure or a serial step-by-step one.
 - D. When an object is encountered again, it is matched with its internal recognition and thereby recognised.
6. The internal representation is matched with the retinal image in a single operation.
- (a) DBAC (b) DCAB (c) BDCA (d) CABD

- 166)** 1. The history of mammals dates back at least to Triassic time.
- A. Miocene and Pliocene time was marked by culmination of several groups and continued approach towards modern characters.
 - B. Development was retarded, however, until the sudden acceleration of evolutionary change that occurred in the oldest Paleocene.
 - C. In the Oligocene Epoch, there was further improvement, with appearance of some new lines and extinction of theories.
 - D. This led in Eocene time to increase in average size, larger mental capacity, and special adaptations for different modes of life.
6. The peak of the career of mammals in variety and average large size was attained in this epoch.
- (a) BDCA (b) ACDB (c) BCDA (d) ACBD

HINTS & SOLUTIONS

- 1) 1, 4, 5, 2, 3
2) 4, 2, 1, 3, 5
3) 3, 2, 5, 4, 1
4) 4, 2, 1, 3, 5
- 5) 3. Climate change is a complex policy issue with major implications in terms of finance. All actions to address climate change ultimately involve costs. Funding is vital for countries like India to design and implement adaptation and mitigation plans and projects.
1. Lack of funding is a large impediment to implementing adaptation plans. The scale and magnitude of the financial support required by developing countries to enhance their domestic mitigation and adaptation actions are a matter of intense debate in the multilateral negotiations under the United Nations Framework Convention Climate Change (UNFCCC).
4. The Convention squarely puts the responsibility for provision of financial support on the developed countries, taking into account their contribution to the stock of Green House Gases (GHGs) in the atmosphere. Given the magnitude of the task and the funds required, domestic finances are likely to fall short of the current and projected needs of the developing countries.
2. Global funding through the multilateral mechanism of the convention will enhance their domestic capacity to finance the mitigation efforts.
So, the correct sequence is (3, 1, 4, 2).
- 6) 5. The existence/establishment of formal financial institutions that offer safe, reliable and alternative financial instrument is fundamental in mobilising savings.
2. To save, individuals need access to safe and reliable financial institutions, such as banks and to appropriate financial instruments and reasonable financial incentives.
1. Such access is not always available to all people in developing countries like India and more so in rural area.
3. Savings help poor households manage volatility in cash flow, smoothen consumption and build working capital.
4. Poor households without access to a formal savings mechanism encourage immediate spending temptations.
So, the correct sequence is (5, 2, 1, 3, 4).
- 7) 3. Foods travel more than the people who eat them. Grocery stores and supermarkets are loaded with preserved and processed foods.
4. This however, often leads to environmental threats such as pollution generated by long distance food transportation and wastage of food during processing and transportation.
1. It also results in destruction of rainforests, reduced nutritional content, increased demand for preservation and packaging.
2. Food insecurity also increases as the produce comes from regions that are not feeding their own population properly.
So, the correct sequence is (3, 4, 1, 2).
- 8) 3. The ultimate aim of government is not to rule or control by fear, not to demand obedience, but conversely, to free every man from fear that he may live in all possible security.
2. In other words to strengthen his natural right to exist and work without injury to himself or others.
1. The object of government is not to change men from rational beings into beast or puppets.
4. It should enable them to develop their minds and bodies in security and to employ their reason unshackled.
So, the correct sequence is (3, 2, 1, 4).
- 9) 2. Individuals groups and leaders who promote human development operate under strong institutional, structural and political constraints that affect policy options. But experience suggests broad principles for shaping an appropriate agenda for human development.
4. One important finding from several decades of human development experience is that focusing exclusively on economic growth is problematic. While we have good knowledge about how to advance health and education, the causes of growth are much less certain and growth is often elusive.
1. Further, an unbalanced emphasis on growth is often associated with negative environmental consequences and adverse distributional effects.
3. The experience of China, with its impressive growth record, reflects these broader concerns and underlines the importance of balanced approaches that emphasise investments in the non-income aspects of human development.
So, the correct sequence is (2, 4, 1, 3).
- 10) (b) 3, 1, 4, 2 is correct sequence.
- 11) (d) 3, 1, 4, 2 is correct sequence.

- 12) (a) 2, 3, 4, 1 is correct sequence.
- 13) (c) 2, 1, 4, 3 is correct sequence.
- 14) (d) CD is a mandatory pair with 'it's not enough that' and 'or that' AB again is a, mandatory pair with 'singer' and 'debut album.'
- 15) (a) In E, it is stated that nuclear weapons will make the country safer. In A, it says the opposite is true. So, these two sentences are related. EA is a set.
E also may be a good start as it introduces the Pentagon's policy. Option (d) has E as the start but it is followed by C. So, (d) is eliminated. Option (a) seems to be good as it has E as the opening followed by A.
- 16) (d) Statement (E) introduces the subject of discussion. It is the obvious opener.
- 17) (d)
- 18) (c)
- 19) (d) We can see that sentence (A) is most likely the starting sentence. Now that we know that A is the starting sentence we can eliminate choice (c) and (d) as they start with C and B respectively and not option (a). This narrows down our possibilities to option (a) and option (d). Now, we can see in option (a), C follows sentence A but the gap spoken of in sentence C has no correlation with political geography of the sub-continent spoken of in sentence A, so we can rule out option (a). Therefore, answer has to be option (d) as we can also see it elaborates on the change mentioned in sentence A.
- 20) (c) Here, we can make out that sentence B is will be the starting sentence as it introduces the subject matter which is 'computer users and related problems'. Option (d) automatically get eliminated as its start with sentence A. Option (a) can be ruled out as there is no correlation between sentence B and sentence D. Sentence B talks of warnings where as sentence D talks of cures for illness and hence, no correlation exists. Hence, option (c) is the best answer.
- 21) (d) The word crime connects lines 'E' and 'C' EC is available in option (b) and (d). Now, 'D' cannot follow as 'particular piece of work' is mentioned in 'B'. Thus, 'D' should follow 'B' Hence, option (d) is the correct choice.
- 22) (a) E must follow 'A' as it talks about the third discourse.
BC is mandatory pair as 'C' contains the thought that there is a need for greater expert management.
- 23) (e) B and 'C' explain the positive development after "The fall of President Soeharto and the close of his centralised in 1997". DE is mandatory pair as 'D' speaks about the opinion of analysis and 'E' speaks about another group of analysis.
- 24) (b) A talks about squatters land. 'C' describes who the squatters were, 'B' follows 'C' as it gives the description of squatters land. 'E' carries on the idea of what happens in the squatters land (ripening, gathering, thrashing, collecting etc.) and finally 'D' gives additional information about what is grown in these fields which is indicated by the word also.
- 25) (c) The paragraph starts with 'E' as it launches the topic of how much is know about the rich and the poor in Egypt. The sentence ends with the statement that 'monuments were made for the rich'. This should be logically followed by what was made for the poor. Hence 'D' should follow. Hence CD. Then the discussion moves on to sources of information. Hence EDC. 'Papyri' in B and 'sources of information' in 'C' are linked as 'papyri' refer to documents which are sources of information. Hence EDCB. 'A' rounds up the discussion by stating that notwithstanding the discussion in the preceding statements, death is not the only pre-occupation of the Egyptians. Hence EDCBA.
- 26) (a) 'C' begins the paragraph. There is a reference to 'fuel cells' in 'C'. 'E' continues the idea of 'total fuel economy' which is expressed in 'C.' Hence CE go together. 'D' is the continuation as it says that the 30% efficiency is twice as good as the efficiency of the internal combustion engine. Hence CED. 'B' introduces another fact i.e., reducing carbon emissions. 'A' continues, as it talks about a full-hearted leap, which is a reference to what is mentioned in 'B.' Hence CEDBA.
- 27) (b) After reading statement (B) the first question that comes to mind is what does 'it' stand for. The question is answered by statement (E) which should be the logical antecedent. This makes EB a mandatory pair and that is present only in option (b).
- 28) (b) DC is mandatory pair, which makes (c) and (d) in correct, 'E' is the opening statement. A concludes the argument by substantiating the argument in EBCD. Therefore, the analogy from the previous argument is being extended in 'A' (Keyword —similarly).
- 29) (d) 'F'rom the option, it can be ascertained that 'B'is the opening statement. Also, 'B' explains "greater interest... than". Hence, 'C' is the natural antecedent to 'B', where in "a similar neglect" has been talked, about. Hence option (d) is the correct option.
- 30) (c) 'C' is the opening statement as it introduces the topic of the paragraph i.e. Bush's mission to restore power to the presidency. Statement 'E' presents the problem that he must tackle i.e. a legislature of second guessers and time wasters. Hence CE. Further, A tells us what Bush did not tackle the problem. He bypassed the Congress (the U.S. legislative house).
Thus CEA also DB tells us that he wasn't merely fighting the entire Congress. Hence CEADB.

- 31) (a) 'B' opens the paragraph. The words "the status of the participants was unknown" in 'B' give a hint that E should follow it i. e. the words "we therefore tracked" continue the idea in 'B'. The words 'resident male' in 'E' find a continuation in 'D'. The words 'the two neighbours' and 'they' in A and 'C' respectively are linked. Hence BEDAC.
- 32) (b) 'B' opens the paragraph as it launches the topic - "Germany's military position in World War-Two". 'E' follows 'B'; the word 'catastrophic' in 'E' gives continuation to the idea expressed in 'B'. Further, 'E' talks about the eastern front. 'D' talks about Poland and A talks about the western front. Hence EDA go together. Finally 'C' concludes.
- 33) (a) The link is AC and 'D' should be the opening statement.
- 34) (c) The link is ECD and 'E' should be the opening statement. AB is a strong link.
- 35) (b) The link is CE and ED. BA is also a strong link.
- 36) (d) 'D' is a good opening statement. AE is also a good link.
- 37) (b) The link is 'AD' and 'B' is the opening statement.
- 38) (a) Answer cannot start with 'A' or 'C', hence options (c) and (d) are ruled out. 'A' strong link is ED. The best option is (a).
- 39) (d) The link is EDB. This is present only in option (d) and hence that is the best choice.
- 40) (d) The link is EC, CB and BDA.
- 41) (b) AB are to be attached together, they say about branded diapers. 'C' comes after 'B' as they correlate with supermarkets and 'C' and 'E' stand together as demand of branded diapers, Save On. 'D' concludes the issue and 'F' being last gives a lines of action to be adopted.
- 42) (c) DC come together, with 'C' defining about strategy 'strong focus... tough trade offs'. 'B' goes into specifying strategy. E'F' gives reason to company to follow. 'A' ends the talk giving a reason for thought.
- 43) (d) B begins the paragraph giving a reason. No other option can start a new paragraph. 'C' tells what they 'say.....deny'. 'D' follows with 'ambivalence' mix of emotions. EA specifies their job full of problems.
- 44) (d) E is the most appropriate, rather only choice to begin paragraph. Making sequence of action, 'C' tells about rains happening. BD tells the point of view by centre and State Governments. An expert comment in 'A' ends the issue peacefully.
- 45) (b) 'B' starts a paragraph with raising a question at a point of time. 'E' defines the problem. 'D' suggests an answer following 'E'. 'C' gives a fact in question so CA is a pair.
- 46) (c) 'E' starts the paragraph giving a comment. ADB relates in order by unemployed, employed, no will to work being employed. 'F' elaborates problem. 'C' concludes satisfactorily.
- 47) (d) You may like to begin a para with 'D' or 'F'. Sequence DF sounds fine rather than FD being 'F' an assertion. 'E' gives a 'modus operandi', 'B' telling how AC follow with new era giving sequence.
- 48) (c) 'E' is an only available choice to begin. AC follows in line with 'E'. 'B' Hofman's approach. 'D' suitably ends with positive approach to work.
- 49) (d) The para can begun with 'A' or 'B'. A is a better option being broader in concept with 'B' using 'areas'. 'C' and 'D' successively supports 'B' and 'C'. DE falls in line with 'one state' and 'assessment'.
- 50) (a) A very good question to clear your views. In fact, BC is a obvious pair, correlating each other. What is to be decided is, how to begin between 'A' and 'D'. Going by instincts 'D' suits better and 'A' follows. *Vice-versa* does not give better sense.
- 51) (a) 'B' is the only choice to begin a paragraph, explaining spartans. 'E' follows explaining what was being done. 'C' continues with what happens. 'D' clearly follows how the training was being conducted. 'A' concludes by telling the final scene.
- 52) (c) 'B' begins the paragraph by telling about 'human drawings in caves'. 'C' tells about new method of art photography. 'D' follows 'C' by revealing facts about photography. 'A' picks where 'D' drops about photographs changing idea of caving art. 'E' leaves us to conclude clearly.
- 53) (a) 'A' explains a concept of 'culture literacy'. EC follows in order (not CE) being 'breadth of information' and 'It by no means.....' 'B' falls in line after 'C', 'D' ends.
- 54) (b) 'C' begins paragraph giving a statement about two classes of people. 'A' follows by what is done by both parties. 'B' clearly follows 'A' by how it is done. 'D' states hikes in cost. 'E' concludes by example putting bank in place of 'potential victim'.
- 55) (d) Paragraph can be begun with 'A' or 'D', but start with 'A' does not allow logical sequence so 'D' is a choice. 'B' takes an example in support of statement in 'D'. 'A' continues the incident. 'C' concludes by what is trying to say in 'D', so DBAC.

- 56) (b) 'B' clearly follows (1) with 'oil and water'. A continues to explain the concept. 'C' has to be preceded by (6) by 'rays and colour'. 'D' has to settle in between, after 'A'.
- 57) (d) 'B' has to succeed (1) as 'low light' with 'darkened sheds'. 'D' gives an alternate option, for problems in 'B'. 'C' and 'A' precedes (6) connected by 'head-pecking' and describing how situation can be improved.
- 58) (a) 'D' is an only available solution to (1), falling in line. 'B' logically succeeds 'B' explaining why criticism has been done. 'A' follows 'B' with clearly 'then, there are' after 'there are'. 'C' comes after 'A' being conditions 'even worse'. (6) concludes the paragraph.
- 59) (c) An easy one, 'C' clearly and logically follows (1) with suspicion. 'A' succeeds 'C' by comparing humanities. 'B' and 'D' describe how humanities research are different. (6) conclude by scientists have no such help.
- 60) (c) AB logically follows (1). 'B' succeeds because 'preferred to see. 'D' has to precede (6) being 'peasants' and 'farmers' co-related. Thus, ABCD is logical sequence.
- 61) (c) (1) and 'B' are logical mandatory. 'B' begins the para by explaining marketeers trickiness. AD explain how the advertisers prepare its customers. 'C' concludes by commenting on the nature of advertisements.
- 62) (b) 'D' starts the para by explaining business of worker and soldier termites. 'B' pays attention on need of proportionating soldier to worker 'A' describes role of predator. 'C' concludes telling quantity of eggs laid by queen.
- 63) (d) (1) and 'B' is a mandatory pain. 'B' starts the para commenting on chances of education in school. DC tell correlation between home influence and 'school success'. 'A' ends commenting on knowledge of children.
- 64) (a) 'D' begins the para and follows. 'A' describing the invention of outboard engines in 1930's and their profit to hunters. CB comments on the clevermen of whales and Belugas.
- 65) (a) (1) states reconstruction of history involves more than a multiplication of historical misconstruction 'B' clears misconstruction renders revolution invisible 'A' explains the technique of presentation. 'D' states such technique to be unexceptionable. 'C' states result on combination of science writing with occasional systematic misconstruction. (6) follows telling science as outcome of individual discoveries and inventions.
- 66) (b) 'C' begins the paragraph by telling about the scientific study of ants. 'A' tells about the persons who change their accommodation timely where as DB ends by commenting on family conditions.
- 67) (a) 'C' explains the system of work followed at institutions. 'D' reveals intervention by telling nature's significance in maintaining the balance between environmental factors.
- 68) (b) 'C' starts the paragraph and tells us about the busy schedule. 'A' continues by defining the place unfit for working. DB ends the para surprisingly indicating author victim of conspiracy.
- 69) (a) 'D' starts the para by entering in the pharmacy. 'C' continues by inquiring a product 'B' explains author's terrificness. 'A' ends by giving most realistic results.
- 70) (c) ED explains tests as the main tool for measuring intelligence. AC explains the differences between dull, bright and average students. 'B' concludes by providing significance of tests.
- 71) (b) 'B' starts the passage indicating a figure walking slowly. 'A' explaining the significance of that figure. 'D' states Anetee following that figure 'C' concludes by telling the name of figure.
- 72) (a) 'C' begins the para by explaining the significance of 'LEARNING' to people and organizations. 'A' states the deal challenge as 'UNLEARNING'.
- 73) (b) 'B' starts the para telling 'we' reached the field, soaked to the skin and surrounded it. 'D' tells claudious starting under a shower. 'A' tells that claudious became wet. 'C' shows the affect of being wet on claudious.
- 74) (c) 'A' initiates the passage explaining reason for unhappiness of Alex as Indian origins 'C' explains what he would rather have been 'B' tells how alex rectify his grave injustice. 'D' concludes the passage by explaining the wife's reaction.
- 75) (a) 'B' starts the passage explaining the impact of Indian colours and cuts on western style. 'A' tells influence mostly seen in breaded evening wears. 'D' emphasises pink, paprika and saffron. 'C' states how international fashion scene is being affected by Indian outfits.
- 76) (b) 'D' begins the paragraph by explaining the meaning and emergence of theocratic states. 'B' explains the trick followed by politicians. 'C' shows how politicians act 'A' concludes the para by explaining the impact of such a national policy.

- 77) (a) 'C' introduces with the subject of the passage. 'A' describes him 'B' shows the actual time and the reason of stopping at that place. 'D' concludes by explaining his mental state.
- 78) (a) 'A' begins the para explaining director's behaviour. 'C' shows that manager was staring at him with a look of fear. 'B' states Mitch's reaction. 'D' explains how he reacted at the situation.
- 79) (d) 'A' states influence of Third Reich establishment. 'D' states the list of events that accompanied the Third Reich. 'C' shows American people favour isolationist policies and neutrality. 'B' elaborates on such policies.
- 80) (b) 'A' tells the subject of essay. 'B' states that essay requires complete attention of the mind of the reader. 'C' tells studies are for pleasure self improvement and for business. 'D' continues with the same.
- 81) (b) 'C' explains the meaning of logic. 'A' states the meaning of reasoning. 'B' tells what logical reasoning covers. 'D' states that how we can understand argument and draw inferences correctly.
- 82) (b) 'C' clearly follows (1) commenting on salvation. 'B' tells about the fate of human society in the christian tradition. AD explains Buddhism as analytical dissolving individuals into component parts.
- 83) (d) 'A' starts the para explaining the relationship between the size of a state and development. 'B' tells about the problems in India's agriculture sector. CD concludes the para explaining the need to improve agriculture. (6) continues the idea.
- 84) (b) 'B' clearly follows (1) telling editors play a great role in making magazines. CD emphasis the method to determine the editors required for magazines. 'A' conclude the need to be edited by committee.
- 85) (c) 'B' follows (1) explaining success of Indian expatriate in US. 'D' falls the appearance of expatriate. 'A' emphasis the persons melting of East and West. 'C' states the fact that has been overlooked. (6) tells that the festival of feature films and documentaries is trying to fill this gap.
- 86) (c) 'C' follows (1) with long existence of market for Indian art. 'B' explains synthetic sarees and Kitsch plastic furniture being discarded by Indian elite. 'A' continues the festivals of India of 80s, 'D' describes the dealers of the Jew Town etc and around the country. (6) concludes the paragraph.
- 87) (b) 'B' begins by introducing 'Typical Pneumonia' as the subject of passage. DA states the symptoms of the diseases. 'C' concludes by explaining how these symptoms work to give rise to complications.
- 88) (a) 'B' introduces us with the subject of the passage. 'C' states the problem caused in the absence of agencies. 'A' elaborates availability only antsnake serum's at government hospitals. 'D' concludes explaining disastrous effect of paralysis.
- 89) (a) 'B' states the statistic about mid-term election which results dropping in 1998 as compared to 1996. 'A' introduces last decade where voting was higher. 'C' states implication of above fact. 'D' concludes the passage.
- 90) (b) 'A' starts the passage introducing 'critical election' as the subject of the passage. 'B' suggests realignment as another name. 'D' states none of Indian election have been so far a critical election. 'C' concludes explaining concept of semi-critical election since 1989.
- 91) (a) 'A' explains the subject of passage as trivial pursuits. 'B' elaborates it. 'D' states 'ARJUN' as current champion. 'C' states other contenders.
- 92) (b) 'A' starts the para explaining the advantage of good advertising. 'C' states why this benefit is important. 'B'elaborates dollar spent on brain washing to be more cost effective. 'D' concludes by saying that inspite of this a minimum quality has to be maintained.
- 93) (c) 'A' begins the passage stating Henry Ford as the father of modern automobile industry. (CB) is a Mandatory pair. 'D' concludes by telling vehicle becomes ready by passing 'Zero Defect Programme'.
- 94) (c) 'B' begins the passage stating RBI wrested considerable powers from government. 'A' tells government. Still acquires power. 'C' explains the significance of government. notification at RBI announcement. 'D' questions his state of affairs.
- 95) (c) 'B' starts the passage explaining frustrated and depressed mood of author at French Restaurant. 'D' gives the reason for depressed mood of author. 'C' explains failure in change of his mood. 'A' concludes the passage.
- 96) (a) 'B' starts the passage indicating decline in writing skills. 'E' indicates how declination can be stopped. 'D' explains inability of teachers to teach writing skills. 'A' concludes telling by area writing projects as a programme to attack this problem.

- 97) (b) 'C' gives examples to support (1). 'B' explains era of computers as an example. 'A' states technical terms to be spilling into main stream by giving the example of junk mail. 'D' concludes by explaining the importance of Cyberslang.
- 98) (c) 'B' follows (1) stating the importance of IIT. 'A' explains the degree of five IIT's as a passport for different creative jobs. 'D' speaks about the success stories of IIT graduates. 'C' explains the special culture developed by IIT students.
- 99) (d) 'A' begins by explaining the taste of Maharaja of Kapurthala. 'B' introduces Yeshwantrao Holkar of Indore. 'D' states light photographs show execrable taste. 'C' concludes the idea mentioned in (6).
- 100) (d) 'A' follows (1) introducing us with 'He' who played Indian music and jazz. 'B' states the effect it had on MC Laughlin, 'D' states his reaction to the same. 'C' concludes by stating the outcome.
- 101) (a) 'C' follows (1) stating the rank of TB worldwide. 'A' states the disastrous effect of TB. 'D' highlights the statistics. 'B' concludes by explaining its cure.
- 102) (c) 'D' starts the passage highlighting Sylvester Stallone successful career. 'B' states his daughter have hole in her heart. 'C' states her condition might correct itself. 'A' tells Sophie might suffer in future also.
- 103) (c) 'D' begins the passage stating one of the twelve labours as the killing of hydra. 'B' states the problem that as soon as one head was cut two new ones replaced it. 'A' tells the solution of above problem. 'C' concludes stating how Hercules accomplished the task with the help of assistant.
- 104) (a) 'A' starts the para stating hollywood as a man's world to be certainly true. 'D' gives an example. 'B' states the reaction of Jodie Foster. 'C' concludes continuing it.
- 105) (a) 'D' begins the para stating 'JP Morgan as largest Banking Institution and International Trading firm. 'B' tells uptill where the area is extended. 'A' elaborates that business decisions are taken timely. 'C' states the importance of JP Morgan's proprietary trade related data.
- 106) (a) 'A' introduces us with Saheli Programme and its three week tour of India. 'C' elaborates holiday packages by programmes. 'B' states the topics for participants on women's issue. 'D' concludes stating that tour would also include some sight seeing.
- 107) (d) 'A' states that something magical is happening to our planet. 'C' elaborates that it is getting smaller. 'B' states some are calling it a paradigm shift. 'D' concludes telling it a business transformation.
- 108) (a) 'A' follows (1) explaining women handle pains better than men. 'B' elaborates extinction of human species in case men gave birth. 'D' explains the carelessness of men in taking medicines. 'C' concludes the passage explaining their complaints.
- 109) (b) 'A' follows (1) explaining Asians as a success story. 'B' makes a comparison with anti-Jewish. 'D' states 'Arknsas-Asia connection' is broadening hotred. 'C' asks question that is answered by (6).
- 110) (a) 'A' tells latest wedding of Jackson took place in Sydney. 'C' tells groom's entourage and staff attended the wedding. 'D' elaborates the bride 37 years old was carrying Jackson's baby. 'B' concludes telling little is known about her.
- 111) (b) 'D' follows (1) explaining Liz Taylor unlucky in Law and love. 'C' explains reason for that observation. 'A' elaborates tab- \$ 4,32,600 to be paid by Liz and Larry.
- 112) (c) 'A' follows (1) telling who chambers was 'D' elaborates Hiss as a members of secret communist cell in Washington in 1930s. 'C' states Hiss rejecting the above information. 'B' states that Nixon arranged a meeting between the two (6) continues with what happened at meeting.
- 113) (a) 'A' follows (1) stating guitar heroes produced by Rock. 'C' states heroes also include players of more recent vintage. 'B' elaborates reason of their popularity. 'D' concludes stating advent of alternative grunge and Rock as harmful for popularity.
- 114) (a) 'A' follows (1) stating that although oceans are cradle of life but chemical products and wastes are dumped into them. 'C' states harmful impact of dumping waste. 'B' elaborates extinction of coral reefs. 'D' concludes indicating man to be the root cause for behind these problems.
- 115) (a) 'D' follows (1) giving the answer of question asked in (1). 'B' simplifies the statement. 'C' further simplifies the statement. 'D' talks about the position of ordinary citizens regarding the issue which is continued in 6.
- 116) (c) 'B' answers the question raised in (1). 'D' elaborate NCs best drawing card to be the promise of lower maintenance cost. 'C' states the rates of computers in America. 'A' states the disadvantage of computers.

- 117) (b) 'B' starts the passage stating Clarke mission to make stained glass popular. 'A' states fulfillment of the mission. 'D' talks about his two recent projects. 'C' highlights first project in Switzerland while (6) highlights the second one.
- 118) (d) 'C' follows (1) stating that India has abolished managed exchange rate. 'A' tells why India's position is not surprising. 'B' explains the developing economies keep exchange rate volatility lower than in the industrial economies. 'D' introduces the dramatic exceptions and (6) continues the idea.
- 119) (d) 'D' follows (1) explaining the power greater than that of mortals which is remembered in good times. 'A' tells power provides an anchor in times of difficulty. 'C' tells us the work done by organizations. 'B' concludes contribution of industrial organizations and (6) continues the idea.
- 120) (b) 'B' explains the feeling generated by employees in absence of punishment. 'A' states in such situation work ethos get distorted. 'C' adds to it by using 'ALSO' 'D' concludes what can be done instead.
- 121) (c) 'C' follows (1) stating vessel kept going away. 'A' tells 'He' looked anxiously. 'D' tells it was of no use. 'B' concludes that there was nothing to see except 'WATER' and 'EMPTY SKY'.
- 122) (d) 'A' follows (1) stating managers must set an example before employees by helping them at the time of work. 'C' states that leaders should be personally seen. 'D' tells that clean living should be insisted. 'B' concludes stating allocation of work to be made between each and every individual individually.
- 123) (d) 'A' follows (1) pointing top management to make 'TRUE' 'FRIENDS' 'C' tells that true friends. 'C' tells that true friends must be respected and kept close to heart 'B' states the factors not necessary for genuine friendship. 'D' states that in business, realities all the acquaintances are motivated by self interest and thus cannot be treated as genuine friends.
- 124) (a) 'D' follows (1) stating that managers should not keep on counting their qualities moreover they should be receptive to the feedback made. 'C' continues using 'ALSO'. 'A' states that external appearances could be deceptive. 'B' concludes stating disastrous results on initiating action without being in possession of full facts and (6) continues and follows logically.
- 125) (b) 'A' follows (1) explaining conflicting demand for 'RESOURCES' being voiced by different organizations. 'C' tells safety cushion being built to offset the adverse impact of any cut imposed by seniors. 'B' states the importance of availability of adequate resources. 'D' concludes and emphasizes the point of 'B'.
- 126) (d) 'B' follows (1) explaining the concept followed after conflicts which results in taking revenge on each other. 'A' states managers being called to take ruthless decision. 'D' explains that every ruthless decision will be accepted if the situation is analysed, shared openly and discussed rationally. 'C' concludes the passage.
- 127) (b) 'C' states how the two categories be dealt and hence follows (1). 'D' talks about the last category. 'A' states the behaviour one will do in the last category. 'B' states how wicked be dealt with and leads to (6).
- 128) (b) 'D' starts the passage raising a question. 'B' states racial and linguistic division to be the reason for wars. 'C' raises another question. 'A' concludes stating division leads to conflicts.
- 129) (a) 'B' states part of interest of the journal as course historical. 'A' comments on the first generation poets. 'C' tells Wordsworth's creative processes of decisive significance and 'D' concludes and continues.
- 130) (d) 'C' starts the passage and tells us about poet's ambitions to write a philosophic epic based on origin of evil. 'A' explains that the high plans died and were replaced by huge work on philosophy. 'D' tells about fragments being written. 'B' concludes telling the poet managed to write speculations on theology and political theory.
- 131) (b) 'B' starts the passage and tells us the value of time as we advance in life. 'C' introduces that we become misers in this sense. 'D' says how we become misers. 'A' concludes the passage.
- 132) (d) 'C' introduces that knowledge and ignorance are inter-related. 'B' stipulates thinking is outcome of knowledge. 'D' states that the thinking is always limited. 'A' concludes that nobody keeps complete knowledge about anything.
- 133) (d) 'C' starts the passage stipulating less difficult to bear the evils of one's own life. 'D' explains them to be necessary outcome's of one's error. 'B' tells efforts to do better as less difficult. 'A' follows logically.
- 134) (a) 'C' starts the passage explaining how can the writer be 'fertile' 'B' starts the way as 'Renewing' 'A' and 'D' tells how writer can renew.
- 135) (b) 'A' introduces the subject as 'MASTER PIECE' 'D' follows explaining its coming as culminating point of a laborious career 'C' and 'B' conclude Okay, saying its coming will not be as the lucky fluke of untought genius.
- 136) (c) 'C' starts the passage explaining disillusioned of public as 'easy'. 'B' tells public angry with 'you'. 'D' tells the reason for being angry. 'A' logically follows.

- 137) (b) 'D' starts the passage stating to 'whom' roots of riots are related 'B' and 'C' show the relation with spatial growth in towns and failure of government respectively. 'A' concludes telling reason of riots as adequate physical and social infrastructure level.
- 138) (b) 'C' introduces that one does not die after one has made one's will. 'A' gives the reason for doing so. 'B' states the author's anxiousness to know the result 'D' exemplify it through an example from author's life.
- 139) (c) 'C' introduces the topic of the passage. 'B' tells how India is following the path which 'C' has warned against. 'D' states India's ratification on the treaty 'GATT' and preparation of amending the Patent Act. 'A' concludes pointing India's confirmation of western thoughts.
- 140) (c) 'C' introduces us with a situation. 'A' tells about more terrific situation of huge crack and weary trail. 'D' tells after facing such situation we will be able to see plains. 'B' shows that this hope is not fulfilled.
- 141) (a) 'D' states that after knowing about its property its use was seen in parlour stunts. 'C' tells a paper bag filled with hydrogen amazed by zooming off into space. 'B' explains what trick will entertainer use to entertain. 'A' concludes explaining such a thing that happened in a show.
- 142) (d) 'B' introduces that the author has been a 'writer'. 'D' explains that being a writer is so pleasant that everyone would like to be in this profession 'A' calls it exciting and various. 'C' continues the sentence.
- 143) (c) 'C' represents that the point mentioned in (1) is not true. 'A' and 'D' talk about qualities of good actor. 'B' talks about author's own play and (6) continues with his observation in 'B'.
- 144) (a) 'C' introduces the idea that some comedies have survived over many years. 'D' states that audience laugh at their wit with politeness and at their force with embarrassment. 'B' gives a reason for it and 'A' continues with the reason.
- 145) (a) 'B' states that first clap of thunder was a deafening explosion. 'C' tells it a unbearable physical experience. 'D' concludes lightning in every shape as imaginable.
- 146) (c) 'D' follows (1) explaining the power greater than that of mortals which is remembered in good times. 'A' tells power provides an anchor in times of difficulty. 'C' tells us the work done by organizations. 'B' concludes contribution of Industrial Organizations and (6) continues with the reason.
- 147) (d) 'A' states seniors should show the path to their juniors. 'B' states 'lighting of path' be done by seniors. 'C' tells advice given must be evaluated for its effectiveness in achieving desired result. 'D' concludes and tells that one should accept the help provided to him.
- 148) (a) 'A' begins explaining objective reality 'out there' which is independent of ourselves. 'B' explains how this reality exists. 'C' talks about the possibility determining whether or not a theory is true or false. 'D' concludes stating this position as one to which most working scientists subscribe.
- 149) (c) 'B' begins highlighting India's success at technological front. 'A' states strong manufacturing base for variety of products. 'C' relates for technology to foreign origin. 'D' concludes stating areas where significant strides are made to evolve relevant technologies within the country.
- 150) (c) 'C' begins stating USA's use of emission trading to control air pollution. 'B' states argumentation by economists makes air pollution control more cost-effective. 'A' explains the process followed during emission trading. 'D' states the process followed of afterwards and concludes.
- 151) (b) 'C' starts saying various industries in a firm offer wide array of products or services. 'A' explains size of each company differ from that of other. 'D' explains the contribution by variation in form of ownership. 'B' follows logically.
- 152) (d) 'A' states every kind of demand subjects to change. 'D' explains demand changes with changing need and income. 'C' explains reason for fluctuation in aggregate demand. 'B' emphasises the contribution made by science and technology.
- 153) (a) 'D' starts the passage pointing the possibility that conqueror shall destroy enemy kingdom. 'C' explains what 'he' can destroy. 'B' states clans may strike to the weak point. 'A' concludes telling what secret persons may do.
- 154) (a) 'B' answers the question asked in (1) and hence introduces the subject 'A' tells that state tries to spy on tax payers when tax morality is low. 'C' comments on the role of tax authority. 'D' concludes and (6) states ultimate reason.
- 155) (a) 'B' follows (1) stating the future of fragile Yugoslav State as uncertain because of sharp ideological differences. 'C' tells the disparities are profound. 'A' explains the impact of such differences. 'D' concludes stating loss of excellent international reputation.

- 156)** (d) 'B' stipulates Indian Industrialisation as the result of policy of growth by political lite. 'A' states India's position in 1947 as of underdeveloped country. 'C' states India's fifth rank in terms of purchasing power. 'D' follows (6) stating India's achievement of limited success.
- 157)** (b) 'A' follows (1) stating what new economic policy comprises of. 'B' states the objective as improvement in efficiency of system. 'C' explains the role of regulator mechanism. 'D' concludes explaining the purpose of new policy. (6) continues explaining the way in which purpose can be achieved.
- 158)** (a) (1) states objection to competition. 'C' tells that competition and justice are related. 'D' states the subjects among which there is no choice. 'B' explains the subject of choice. 'D' concludes explaining importance of making such a choice. (6) continues logically.
- 159)** (b) (1) emphasises need of regional integration in South Asia, whereas 'A' starts the para explaining Pakistan's formation in area marked as potential base for operations. 'B' states disunity between India and Pakistan makes outside powers to meddle into their affairs. 'D' states the impact of 'COLD WAR STRATEGY' on Pakistan. 'C' continues.
- 160)** (a) 'D' follows (1) emphasis increasing trend in demand for Petroleum Products 'A' states the demand of petroleum in 1996-97 and 2006-07. 'C' hints the production of coal in 1996-97 and in 2006-07. 'B' concludes stating the statistics for electricity generation requirements from utilities.
- 161)** (c) (1) states the factor on which success of any unit depends. 'C' starts the passage explaining cause for poor generation of surpluses. 'B' explains another reason. 'D' tells that lack of mechanism has not been paid due attention. 'A' concludes the passage and follows (6).
- 162)** (c) 'A' follows (1) stating Count Rumford and his experiment in order to test the theory of 'NATURE OF HEAT'. 'C' emphasises Lavoisier's introduction of the term 'CALORIC'. 'D' states what Rumford noticed. 'B' follow and (6) continues.
- 163)** (c) 'A' states that the statement mentioned in (1) has not happened yet. 'B' tells that television has not been able to make people avoid cinema. 'D' states development of home computers. 'C' states increasing number of audiences. (6) continues explaining the reason for 'C'.
- 164)** (a) (1) states how plate tectonics theory was developed. 'D' explains who formulated sea-floor hypothesis. 'C' tells explanation of the process is accepted. 'B' states 'it' describes creation and destruction of ocean floor. 'A' follows it.
- 165)** (d) 'C' starts the passage putting question on the procedure of 'RECOGNITION'. 'A' explains how objects are recognised. 'B' emphasises the procedure followed in recognition. 'D' ends up the procedure whereas (6) continues logically.
- 166)** (a) (1) states history of mammals was very old. 'B' starts and tells their development was retarded. 'D' explains the impact of such development. 'C' states improvement during Oligocene Epoch. 'A' concludes explaining miocene and pliocene time being marked by culmination several groups and continued approach towards modern characters.

READING COMPREHENSION

Directions (Q. Nos. 1-24) *Read the following passage carefully and answer the questions given below it. (2016)*

PASSAGE 1

Despite the economic crunch worldwide that saw pulverisation of some of the largest banking and finance giants, Indian banking houses have managed to show positive growth this quarter. Some of India's leading national banks have posted a net profit rise of more than 40% over the last quarter amid global turmoil. This would come as a big shot in the arm for the investors and consumers of these banks even though apprehension is mounting on other banking and broking firms worldwide. One of the main reasons behind the success of these banks this quarter, would be their direct backing by the Government of India. People take solace in their investments in public sector watching the bailout packages being cashed out by governments all over the world to save big business houses.

Other private banks in India have also reported a substantial net profit over the last quarter. Given the international and domestic scenario one cannot put this down as a mundane achievement. While others are on a cost cutting spree and firing employees, Indian companies are actually working on boosting staffing in banking and broking sectors. This can be seen as a big boon in the days to come when the current recession eases and the economy gradually comes back on to the fast track. The finance minister has assured Indian public about the sound health of all Indian banks. This could also be evident from the fact that there have been no mergers and takeovers in Indian banking sector in contrast to world scenario where finance houses are looking for mergers to cut costs on operations. We definitely are not looking to thrive; rather we are looking for growth. It is just that the pace of growth is a little slow now as compared to a year or two before. These are hard times to test the hard. The weak in business and career will be weeded out and it is sometimes very beneficial for business on the long run.

- 1) What, according to the author, is the reason for the success of Indian national banks in this quarter?
 - (a) Indian national banks do not have any commitments in troubled foreign markets
 - (b) These banks can never face financial crisis because of their sheer size
 - (c) These banks are ready to give loans at a very low rate of interest
 - (d) The public is ready to invest in these banks because of the knowledge that these banks get strong support from the government
- 2) Which of the following statements is definitely true in the context of the passage?
 - A. India has not been affected by the economic slowdown.
 - B. Indian banks are showing growth in this quarter despite the recession.
 - C. While banking industry in the West was severely affected by recession in the past, it is now gradually recovering and showing a positive growth.
 - (a) Only A
 - (b) Only B
 - (c) Only C
 - (d) Both A and B
- 3) What, according to the author, will be a big boon in the days to come?
 - (a) The economy coming back on the fast track
 - (b) The slowing down of the economy
 - (c) Increased hiring in Indian financial sector in times of economic slowdown
 - (d) The cost cutting carried out by all the companies

PASSAGE 2

We are living in the midst of a great chemical experiment and some serious consequences are becoming apparent to scientists. More than two billion pounds of chemicals are spewed into the air, each year which are brewing a disastrous stew. The greatest consequences of the atmosphere crisis may be global warming and the ozone depletion. The Earth appears to be warming due to the

greenhouse effect. Scientists estimate that average temperature could climb about 2 degrees celsius in 20 years. Global warming is the predicted result of the greenhouse effect, created by the greenhouse gases, such as Carbon dioxide and Methane, in the atmosphere. This change in the global climate would have disastrous results, including drought, coastal flooding and increased species extinction. Also, the scientists have discovered a hole in the ozone layer. The ozone layer is the only protection for life on Earth against deadly ultraviolet radiation from the Sun. Once the ozone layer is completely destroyed, all life on Earth will cease to exist, killed by the deadly radiation. The planet will become a barren rock devoid of all life. And when this happens the process of industrialisation would have to take the blame which has resulted in increased use of fossil fuels such as coal, petroleum and diesel.

- 4) Which of the following can be inferred from the given passage?
- A. The use of all chemical products should be immediately stopped.
 - B. Scientists will have a hard time to estimate the rate of change of temperature in the years to come due to enormous changes in the environment.
 - C. The environmental disaster in the future will happen as a result of increased usage of fossil fuels.
- (a) Only A (b) Only C
(c) Both A and C (d) Both B and C
- 5) Which of the following best explains the usage of the phrase 'brewing a disastrous stew' ?
- (a) The continuous rise in Earth's temperature has proved to be very dangerous
 - (b) Lack of efforts to curb the greenhouse effects would degrade the environment in the near future
 - (c) The harmful ultraviolet radiations are slowly destroying the life on Earth
 - (d) The increased discharge of chemicals in the air is resulting in an atmosphere crisis
- 6) Global warming would have a disastrous effect. This can lead to
- (a) drought (b) coastal flooding
 - (c) extinction of species (d) All of these

PASSAGE 3

The current global food situation is very serious and hence, we need to understand the reasons for such a dramatic increase in food prices in a short period. It is argued the increases in energy costs are resulting in cost push inflation but contribution of energy costs to overall

costs in agriculture may not explain the huge increase in food prices.

Related to the current elevated energy prices, there has been a diversion of corn and edible to bio-fuels, which is significantly influenced by policy mandates. Very clearly this diversion to bio-fuel is a policy induced new reality, which coincide with price escalation in precisely those products and hence, is noteworthy.

The financialisation of commodity trade and current extraordinary conditions in global financial markets could have influenced the spurt in prices. The recent reductions in interest rates in the US and the injection of liquidity have resulted in investors seeking new avenues such as commodity markets, in view of the turbulence in financial markets and the low returns in treasuries. The relatively easy liquidity and low interest rates by themselves make holding of inventories attractive and thus induce greater volatility in commodity markets. The weakening of the US dollar is also advanced as a reason for the recent volatility in commodity markets, including food items. It is evident that this phenomenon is now also coinciding with the across the board rise in food prices.

In brief, while there are demand and supply side pressures on food items, there is considerable merit in the argument that the recent extra-ordinary increases in food prices are closely linked to public policy responses to high energy costs in advanced economies and the turbulence in financial markets and financial institutions. It is said that the impact of such policy induced diversion of food to bio-fuels is significant at this juncture and reflects a preference to fill the fuel tank of automobiles rather than fill the empty stomachs of people. Similarly, it is sometimes held that the weight accorded to financial stability in public may now be at the expense of stability in real sector especially of sensitive commodities like food. At the same time, there is a general consensus that public policy in regard to food in many economies around the world has not provided adequate incentive to farmers to increase the supply of food and other agricultural products to comfortably match the growing demand over the medium term.

- 7) In what way are bio-fuels responsible for the increasing cost of food?
- A. It is a policy mandate to use bio-fuel in place of petroleum products especially in developing countries.
 - B. Certain essential food commodities are being used for manufacturing alternative fuels.
 - C. The low cost of bio-fuels has created fluctuation in prices of other agricultural commodities.
- (a) Only A (b) Only B
(c) Only C (d) A and B

- 8) Which of the following situation (s) has/have prompted investors to look towards commodity markets?
- A. Dip in rates of interest in the US
 - B. Easy liquidity
 - C. Volatility in commodity prices
 - (a) Both A and B (b) B and C
 - (c) A and C (d) All of these
- 9) The passage lays emphasis on which of the following central theme (s)?
- A. The abysmally throw away prices offered for food commodities.
 - B. The worldwide acute shortage of food commodities.
 - C. Promoting the use of bio-fuel for automobiles.
 - (a) Only A (b) Only B
 - (c) Only C (d) All of these
- 10) Which of the following statements is **false** in the context of the passage?
- A. Unusual conditions in global financial markets have aggravated the food price.
 - B. No government would prefer fueling vehicles to feeding the hungry.
 - C. Maintenance of financial stability in public policy will be at the cost of stability in the real sector.
 - (a) Both A and B (b) B and C
 - (c) Only B (d) Only C
- 11) Which of the following shows a cause-effect relationship between its two components?
- (a) Reduction in interest rates and abundance of food commodities
 - (b) Reduction in energy prices and increase in food commodity prices
 - (c) Turbulence in financial markets and escalation in production of food commodities
 - (d) Dipping of US dollar value and volatility in commodity markets
- 12) Which of the following statements is **true** in the context of the passage?
- (a) Commodity markets have become erratic due to easy liquidity and low interest rate
 - (b) Governments of many countries have begun paying better prices for food commodities to ensure their farmers are taken care of
 - (c) Farmers in developing countries have to compulsorily produce a certain quantity of bio-fuels annually
 - (d) The financialisation of commodity trade has resulted in a dip in prices of food products

PASSAGE 4

Hiero, King of Syracuse, had commissioned from a goldsmith of the town a crown of pure gold, but, having taken delivery of the finished article, he was suspicious. There was reason to believe that the craftsman had mixed with the gold a certain amount of other metal of inferior value. But how to find out ? There was no direct evidence and it was therefore obviously a case for the learned men of the city. And who more learned than Archimedes?

The mathematician was, therefore, charged with the task which would now-a-days be considered a simple one, but was then a matter for serious thought. Nothing known to science could be brought forward to prove fraud or otherwise on the part of the goldsmith.

It is more than probable that the human side of the problem interested Archimedes not at all, but the scientific puzzle worried him intensely. This worry pursued him everywhere he went for days and persisted through the routine acts of his daily round.

In the normal course of that routine, he went to the public baths. We can imagine him standing at the edge of the bath tub as he prepares to enter it, absently allowing the water to flow until he cannot help noticing it. Suddenly, he splashed out of his tub, shouting at the top of his voice : “Eureka! Eureka! (I have found it! I have found it!) Without waiting or even thinking of such a detail” as clothes, he tore out of the building and rushed through the streets of Syracuse, still shouting : “Eureka! Eureka!”

Arrived at his house, the mathematician put his newly found discovery to a practical test and found indeed that a body plunged in a fluid loses an amount of its weight which is equal to the weight of the fluid displaced by it. With this as a starting point—as it was to prove the starting point of many subsequent discoveries of importance—Archimedes was able to tell his king how much pure gold was his crown, this was the first fundamental law in hydrostatics enunciated.

Archimedes was by this time well-known to his fellow townsmen and his sometimes strange appearance and unusual actions probably met with indulgent smiles.

He came from a good family: his father Pheidias was an astronomer; he was on intimate terms with and — according to some—was even a kinsman of king Hiero himself.

13) Why could the king not punish the fraudulent goldsmith?

- (a) By that time Archimedes had not discovered the law of hydrostatics
- (b) The king did not have concrete evidence to prove the fraud
- (c) The finishing of the crown was perfect but deceptive
- (d) The king had lot of faith in the goldsmith

- 14) Why was Archimedes charged with the task of finding out if there was any impurity in the crown?
- (a) Archimedes was famous as the most learned man and mathematician
 - (b) The king was worried that the goldsmith will tell the truth of Archimedes
 - (c) The finishing of the crown was perfect but deceptive
 - (d) The king had lot of faith in the goldsmith
- 15) What was the king's suspicion?
- (a) The goldsmith had made a crown with some inferior metal instead of gold
 - (b) The craftsman had replaced gold with a cheaper metal
 - (c) The goldsmith had mixed a cheaper metal with gold in the crown
 - (d) The finishing of the crown was not upto the mark
- 16) Which of the following statements is definitely true in the context of the passage?
- (a) Archimedes' action of running nude through public places was not taken lightly by the onlookers
 - (b) Archimedes' eccentric actions used to create anguish among the public
 - (c) The goldsmith has mixed inferior quality metal in the crown
 - (d) Archimedes could measure the purity of gold in the king's crown
- 17) When Archimedes was entrusted with the task, he was curious because
- (a) he was thrilled by the human side of the problem
 - (b) he used to forget all his routine matters and concentrate on the problem
 - (c) he had never worked on such scientific challenged in the past
 - (d) it was challenge to unearth scientific fact
- 18) "Tore out" choose the word which is most nearly the same in meaning as the word/group of words.
- (a) Came out gently
 - (b) Pushed out
 - (c) Walked out
 - (d) Rushed out

PASSAGE 5

Off the coast near Jeddah, about six years ago I slipped a pair of flippers onto my feet, put on a face mask and gingerly poked my head beneath the placid surface of the Red Sea. I am not sure, now, exactly what I saw in that first glimpse; shafts of sunlight, probably, slanting off through clear blue water : a coral reef of fantastic beauty and, no doubt, many fish. But I do recall that by the time I surfaced I had already developed a need to return to that incredibly lovely world below. So I did. Indeed, it would not be much of an exaggeration to say

that except for such periods as were necessary to earn a living , I have rarely been anywhere else. Diving became a passion and then a way of life one, as you will gather, I totally endorse.

For the first year after that initial experience I amused myself by hunting fish with a spear gun. It was not at all difficult. Fish are so abundant there that divers do not need to use tanks to get down to where the fish are; they find them near the surface. Furthermore, the water of the Red Sea like the Caribbean, the South Seas and parts of the Indian Ocean, is so transparent that you can see so to 150 feet away. Thus, all you really need are a mask, a snorkel tube to breathe through, flippers and a spear gun. Hunting, however, began to pall on me. I began to wonder if it wouldn't be more interesting— and more sporting—to photograph some of these magnificent creatures rather than kill them. It was certainly an ideal place for underwater photography. In addition to hundreds of species of fish, the Red Sea coast offers thousands of miles of what they call 'fringing reefs'—great barriers of coral 10 to 200 miles wide that wind along the African shore from Egypt to Djibouti and down the Asian shore from Aqaba to the Bab-al-Mandab at the gate of the Indian Ocean. Although, no more than the accumulation of billions of coral polyps—minute creatures that produce a calcareous deposits—the reef have grown to fantastic sizes, the largest being the 1200 mile-long Great Barrier Reef in Australia.

- 19) What made the author revisit the underwater reef?
- (a) Placid surface of the Red Sea
 - (b) Glimpses of the sunlight
 - (c) Clear blue sea water
 - (d) Scenic beauty of the underwater world
- 20) What does the sentence "So I did" convey ? The author
- (a) wore a face mask
 - (b) slipped a pair of flippers onto his feet
 - (c) saw glimpses of sunlight
 - (d) None of the above
- 21) What did the author do at the coast near Jeddah?
- (a) He drowned in a minor accident
 - (b) He drowned into the Red Sea
 - (c) Dived into the Red Sea
 - (d) He walked on the sandy coast
- 22) In what way, is the Red Sea similar to the Caribbean Sea, the South Sea etc?
- (a) Variety of fish
 - (b) Fantastic reefs
 - (c) Clear and transparent water
 - (d) Both (a) and (b)

23) What are 'fringing reefs'?

- (a) Calcareous deposit formation
- (b) Collection of fish
- (c) Sea-food accumulation
- (d) Collection of minute creatures other than fish

24) Fishing in the Red Sea off the coast near Jeddah was

- (a) difficult because the water was transparent
- (b) risky because tanks are needed to spot the fish
- (c) easy because the fish are clearly visible near the surface itself
- (d) cumbersome because of the tools like mask, snorkel tube, flippers etc

Directions (Q. Nos. 25-30) Read the following passage carefully and answer the questions that follow. (2015)

PASSAGE 6

How many really suffer as a result of labour market problems? This is one of the most critical yet contentious social policy questions. In many ways, our social statistics exaggerate the degree of hardship. Unemployment does not have the same dire consequences today as it did in the 1930's when most of the unemployed were primary breadwinners, when income and earnings were usually much closer to the margin of subsistence and when there were no countervailing social programmes for those failing in the labour market. Increasing affluence, the rise of families with more than one wage earner, the growing predominance of secondary earners among the unemployed and improved social welfare protection have unquestionably mitigated the consequences of joblessness, earnings and income data also overstate the dimensions of hardship. Among the millions with hourly earnings at or below the minimum wage level, the overwhelming majority are from multiple-earner, relatively affluent families. Most of those counted by the poverty statistics are elderly or handicapped or have family responsibilities which keep them out of the labour force, so the poverty statistics are by no means an accurate indicator of labour market pathologies. Yet there are also many ways our social statistics underestimate the degree of labour-market-related hardship. The unemployment counts exclude the millions of fully employed workers whose wages are so low that their families remain in poverty. Low wages and repeated or prolonged unemployment frequently interact to undermine the capacity for self-support. Since the number experiencing joblessness at some time during the year is several times the number unemployed in any

month, those who suffer as a result of forced idleness can equal or exceed average annual unemployment, even though only a minority of the jobless in any month really suffer. For every person counted in the monthly unemployment tallies, there is another working part-time because of the inability to find full-time work or else outside the labour force, but wanting a job. Finally, income transfers in our country have always focused on the elderly, disabled and dependent, neglecting the needs of the working poor, so that the dramatic expansion of cash and in-kind transfers does not necessarily mean that those failing in the labour market are adequately protected.

As a result of such contradictory evidence, it is uncertain whether those suffering seriously as a result of labour market problems number in the hundreds of thousands or the tens of millions and hence whether high levels of joblessness can be tolerated or must be countered by job creation and economic stimulus. There is only one area of agreement in this debate that the existing poverty, employment and earnings statistics are inadequate for their primary applications, measuring the consequences of labour market problems.

25) The author uses 'labour market problems' in the beginning of the passage to refer to which of the following?

- (a) The over all causes of poverty
- (b) Deficiencies in the training of the work force
- (c) Trade relationships among producers of goods
- (d) Shortage of jobs providing inadequate income

26) The author contrasts the 1930s with the present in order to show that

- (a) more people were unemployed in the 1930's
- (b) unemployment now has less severe effects
- (c) social programmes are more needed now
- (d) there is now a greater proportion of elderly and handicapped people among those in poverty

27) Which of the following proposals best responds to the issues raised by the author?

- (a) Innovative programmes using multiple approaches should be set-up to reduce the level of unemployment
- (b) A compromise should be found between the positions of those who view joblessness as an evil greater than economic control and those who hold the opposite view
- (c) New statistical indices should be developed to measure the degree to which unemployment and inadequately paid employment cause suffering
- (d) Consideration should be given to the ways in which statistics can act as partial causes of the phenomena that they purport to measure

- 28) The author's purpose in citing those who are repeatedly unemployed during a twelve-month period is most probably to show that
- there are several factors that cause the payment of low wages to some members of the labour force
 - unemployment statistics can underestimate the hardship resulting from joblessness
 - recurrent inadequacies in the labour market can exist and can cause hardships for individual workers
 - a majority of those, who are jobless at any one time to not suffer severe hardship
- 29) The author states that the mitigating effect of social programmes involving income transfers on the income level of low-income people is often not felt
- the employed poor
 - dependent children in single-earner families
 - workers who become disabled
 - full time workers who become unemployed
- 30) According to the passage, one factor that causes unemployment and earnings figures to over predict the amount of economic hardship is the
- recurrence of periods of unemployment for a group of low-wage workers
 - possibility that earnings may be received from more than one job per worker
 - fact the unemployment counts do not include those who work for low wages and remain poor
 - prevalence, among low-wage workers and the unemployed, of members of families in which others are employed

Directions (Q. Nos. 31-36) Read the following passage carefully and answer the questions that follow. (2015)

PASSAGE 7

We have witnessed several disasters in recent times-some natural, others man-made. The **frequency** of such calamities has inured us and deadened our collective sensitivity, but that does not reduce the enormity of the personal tragedy of each victim's family and community. The economic loss is only secondary to the human suffering, but is also substantial. The Government, whether State or Central, has standardised its response. This consists of reacting late, blaming others, visits by VIPs announcing a relief package including compensation for those affected and then forgetting all about it. There seems to be little attempt at drawing lessons from each disaster, storing the knowledge for future use and long-term planning for possible **pre-emptive** action. Preparedness for disasters thus falls short of what is possible using today's technologies.

Floods in many parts of India like the States of Bihar and Assam are a yearly **phenomenon**. Yet the government seems to be caught by surprise year after year. It is obvious that tarpaulins, vaccines and other medicines, clothes, satellite phones, large numbers of doctors and paramedical staff, etc., will be needed as will boats and buses for evacuation. This is known to all those who have combated emergencies, yet the non-availability of these essential services and commodities occurs. Worse, the organisational structure and mechanisms for dealing with disasters are **lethargic** and ill-defined. The National Disaster Management Agency set-up a short time ago, being a Central Government agency, has its limitations relating to **infringing** the jurisdiction of states. It could have aggregated and disseminated experiences and knowledge, stocked many of the essential items required in an emergency or worked with agencies to ensure sufficient stocks, but hasn't.

While the reaction to major disasters is **dismal**, the response to emergencies like accident is equally sad. Victims lie unattended since passers by are wary of getting caught in a labyrinthine of police and legal systems. The resulting delay in treatment converts injuries into deaths. Of late, unique and free service to provide assistance in emergency cases is operational. Emergency Management and Research Institute (EMRI) is a professionally managed operation - initiated by the vision and grant from Ramalinga Raju. The service, which is a successful example of public-private partnership, is likely to become operational in a few states in the near future. Given the sad failure of conventional government organisations in handling disasters, it is time we looked at the PPP model as an alternative without the government seeking in any way to abdicate its responsibility. While the state provides the funding, private organisations will provide the drive, professionalism, competent management and output-linked efficiency of a good corporate organisation. Combining the sensitivity and purpose of an NGO with private entrepreneurial drive to handle disasters together is thus a worthwhile challenge for both corporates and the government.

- 31) What is the author's view of the government's current reaction to natural disasters?
- The government has not been able to handle disasters and should seek foreign aid
 - A Central Government agency should be set-up to speed up coordination in rescue efforts
 - It has failed to utilise donations effectively to provide relief
 - The government is apathetic and has not managed to handle disasters effectively

- 32) Which of the following is not true in the context of the passage?
- Man-made disasters occur more frequently than natural disasters
 - The Public Private Participation model has been successful in handling emergencies
 - Floods occur every year in some Indian states
 - Analysis of previous disasters will help us cope with future ones
- 33) Why is there a lack of medical care at disaster sites?
- Inadequate transportation facilities
 - Lack of disaster management training for medical staff
 - Loss of medical supplies due to dangerous conditions
 - None of the above
- 34) What does the author consider “a worthwhile challenge for both corporates and the government”?
- Governments should gradually transfer disaster management to corporates
 - Their working together to manage disasters competently, keeping public interests in mind
 - Reducing the incidence of man-made disasters
 - Mitigating the financial losses sustained during natural disasters
- 35) According to the author what pre-emptive actions have been avoided by our policy planners of disaster management.
- Drawing lesson from each disaster
 - Storing the knowledge for future safety actions
 - In sensitivity of our leaders towards any disasters
 - None of the above
- 36) What is author’s view about Public Private Partnership (PPP)?
- PPP can be the best solution in the face of government’s sad failure in handling disasters
 - For funding the PPP will still rely on states which can delay the operations
 - Public Private Partnership can provide the professionalism, competent management and output linked efficiency of a good corporate organisation
 - It is a unique and free service to provide assistance in emergency cases

Directions (Q. Nos. 37-42) Read the following passage and answer the questions that follow. (2015)

PASSAGE 8

Woodrow Wilson was referring to the liberal idea of the economic market when he said that the free enterprise system is the most efficient economic system. Maximum freedom means maximum productiveness; our ‘openness’ is to be the measure of our stability. Fascination with

this ideal has made Americans defy the ‘Old World’ categories of settled possessiveness *versus* unsettling deprivation, the cupidity of retention *versus* the cupidity of seizure, a ‘status quo’ defended or attacked. The United States, it was believed, had no status quo ante. Our only ‘station’ was the turning of a stationary wheel, spinning faster and faster. We did not base our system on property, but opportunity—which meant we based it not on stability but on mobility. The more things changed, that is, the more rapidly the wheel turned, the steadier we would be. The conventional picture of class politics is composed of the Haves, who want a stability to keep what they have and the Have-Nots, who want a touch of instability and change in which to scramble for the things they have not. But Americans imagined a condition in which speculators, self-makers, runners are always using the new opportunities given by our land. These economic leaders (front-runners) would thus be mainly agents of change. The non-starters were considered the ones who wanted stability, a strong referee to give them some position in the race, a regulative hand to calm manic speculation; an authority that can call things to a halt, begin things again from compensatorily staggered ‘starting lines’.

‘Reform’ in America has been sterile because it can imagine no change except through the extension of this metaphor of a race, wider inclusion of competitors, ‘a piece of the action,’ as it were, for the disenfranchised. There is no attempt to call off the race. Since our only stability is change, America seems not to honour the quiet work that achieves social interdependence and stability. There is, in our legends, no heroism of the office clerk, no stable industrial work force of the people who actually ‘make the system work’. There is no pride in being an employee (Wilson asked for a return to the time when everyone was an employer). There has been no boasting about our social workers—they are merely signs of the system’s failure, of opportunity denied or not taken, of things to be eliminated. We have no pride in our growing interdependence, in the fact that our system can serve others, that we are able to help those in need; empty boasts from the past make us ashamed of our present achievements, make us try to forget or deny them, move away from them. There is no honour, but in the Wonderland race we must all run, all trying to win, none winning in the end (for there is no end).

37) The primary purpose of the passage is to

- criticise the inflexibility of American economic mythology
- contrast ‘Old World’ and ‘New World’ economic ideologies
- challenge the integrity of traditional political leaders
- champion those Americans whom the author deems to be neglected

- 38) The author sets off the word 'Reform' (second para) with quotation marks in order to
- emphasise its departure from the concept of settled possessiveness
 - show his support for a systematic programme of change
 - underscore the flexibility and even amorphousness of United States society
 - assert that reform in the United States has not been fundamental
- 39) It can be inferred from the passage that the author most probably thinks that giving the disenfranchised 'a piece of the action' (second para) is
- a compassionate, if misdirected, legislative measure
 - an example of American's resistance to profound social change
 - an innovative programme for genuine social reform
 - a monument to the efforts of industrial reformers
- 40) It can be inferred from the passage that Woodrow Wilson's ideas about the economic market
- encouraged those who 'make the system work' (second para)
 - perpetuated traditional legends about America
 - revealed the prejudices of a man born wealthy
 - foreshadowed the stock market crash of 1929
- 41) The passage contains information that would answer which of the following questions?
- What techniques have industrialists used to manipulate a free market?
 - In what ways are "New World" and "Old World" economic policies similar?
 - Has economic policy in the United States tended to reward independent action?
- Select the correct answer using the codes given below.*
- | | |
|------------|------------------|
| (a) Only 1 | (b) Only 2 |
| (c) Only 3 | (d) Both 1 and 2 |
- 42) Which of the following best expresses the author's main point?
- Americans' pride in their jobs continues to give them stamina today
 - The absence of a *status quo ante* has undermined United States economic structure
 - The free enterprise system has been only a useless concept in the United States
 - The myth of the American free enterprise system is seriously flawed

Directions (Q. Nos. 43-45) *Read the following passage and answer the questions that follow.* (2015)

PASSAGE 9

The majority of successful senior managers do not closely follow the classical rational model of first clarifying goals, assessing the problem, formulating options, estimating likelihoods of success, making a decision and only then taking action to implement the decision. Rather, in their day-by-day tactical maneuvers, these senior executives rely on what is vaguely termed 'intuition' to manage a network of interrelated problems that require them to deal with ambiguity, inconsistency, novelty and surprise and to integrate action into the process of thinking.

Generations of 'writers on management' have recognised that some practicing managers rely heavily on intuition. In general, however, such writers display a poor grasp of what intuition is. Some see it as the opposite of rationality; others view it as an excuse for capriciousness.

Isenberg's recent research on the cognitive processes of senior managers reveals that managers' intuition is neither of these. Rather, senior managers use intuition in at least five distinct ways. First, they intuitively sense when a problem exists. Second, managers rely on intuition to perform well-learned behaviour patterns rapidly. This intuition is not arbitrary or irrational, but is based on years of painstaking practice and hands-on experience that build skills. A third function of intuition is to synthesise isolated bits of data and practice into an integrated picture, often in an 'Aha!' experience. Fourth, some managers use intuition as a check on the results of more rational analysis. Most senior executives are familiar with the formal decision analysis models and tools and those who use such systematic methods for reaching decisions are occasionally leery of solutions suggested by these methods which run counter to their sense of the correct course of action. Finally, managers can use intuition to bypass in-depth analysis and move rapidly to engender a plausible solution. Used in this way, intuition is an almost instantaneous cognitive process in which a manager recognises familiar patterns. One of the implications of the intuitive style of executive management is that 'thinking' is inseparable from acting. Since, managers often 'know' what is right before they can analyse and explain it, they frequently act first and explain later. Analysis is inextricably tied to action in thinking/acting cycles, in which managers develop thoughts about their companies and organisations not by

analysing a problematic situation and then acting, but by acting and analysing in close concert. Given the great uncertainty of many of the management issues that they face, senior managers often instigate a course of action simply to learn more about an issue. Then, they use the results of the action to develop a more complete understanding of the issue. One implication of thinking/acting cycles is that action is often part of defining the problem, not just of implementing the solution.

- 43) The passage suggests which of the following about the 'writers on management' mentioned in line 6?
- (a) They have criticised managers for not following the classical rational model of decision analysis
 - (b) They have not based their analyses on a sufficiently large sample of actual managers
 - (c) They have relied in drawing their conclusions on what managers say rather /than on what managers do
 - (d) They have misunderstood how managers use intuition in making business decisions
- 44) Which of the following best exemplifies 'an 'Aha!' experience' (line 13) as it is presented in the passage?
- (a) A manager risks taking an action whose outcome is unpredictable to discover whether the action changes the problem at hand
 - (b) A manager performs well-learned and familiar behaviour patterns in creative and uncharacteristic ways to solve a problem
 - (c) A manager suddenly connects seemingly unrelated facts and experiences to create a pattern relevant to the problem at hand
 - (d) A manager rapidly identifies the methodology used to compile data yielded by systematic analysis
- 45) It can be inferred from the passage that which of the following would most probably be one major difference in behaviour between Manager X, who uses intuition to reach decisions and Manager Y, who uses only formal decision analysis.
- (a) Manager X analyses first and then acts; Manager Y does not
 - (b) Manager X checks possible solutions to a problem by systematic analysis; Manager Y does not
 - (c) Manager X takes action in order to arrive at the solution to a problem; Manager Y does not
 - (d) Manager Y draws on years of hands-on experience in creating a solution to a problem; Manager X does not

Directions (Q. Nos. 46-48) *Read the following passage and answer the questions that follow.* (2015)

PASSAGE 10

Changes in the volume of unemployment are governed by three fundamental forces: the growth of the labour force, the increase in output per man-hour and the growth of total demand for goods and services. Changes in the average hours of work enter in exactly parallel fashion but have been quantitatively less significant. As productivity rises, less labour is required per dollar of national product or more goods and services can be produced with the same number of man-hours. If output does not grow, employment will certainly fall; if production increases more rapidly than productivity (less any decline in average hours worked), employment must rise. But the labour force grows, too. Unless Gross National Product (total final expenditure for goods and services corrected for price changes) rises more rapidly than the sum of productivity increase and labour force growth (again modified for any change in hours of work), the increase in employment will be inadequate to absorb the growth in the labour force. Inevitably the unemployment rate will increase. Only when total production expands faster than the rate of labour force growth plus the rate of productivity increase and minus the rate at which average annual hours fall does the unemployment rate fall. Increases in productivity were more important than growth of the labour force as sources of the wide gains in output experienced in the period from the end of World War II to the mid-sixties. These increases in potential production simply were not matched by increases in demand adequate to maintain steady full employment. Except for the recession years of 1949, 1954 and 1958, the rate of economic growth exceeded the rate of productivity increase. However, in the late 1950s productivity and the labour force were increasing more rapidly than usual, while the growth of output was slower than usual. This accounted for the change in employment rates. But if part of the national purpose is to reduce and contain unemployment, arithmetic is not enough. We must know which of the basic factors we can control and which we wish to control. Unemployment would have risen more slowly or fallen more rapidly if productivity had increased more slowly or the labour force had increased more slowly or the hours of work had fallen more steeply or total output had grown more rapidly. These are not independent factors, however and a change in any of them might have caused changes in the others.

A society can choose to reduce the growth of productivity and it can probably find ways to frustrate its own creativity. However, while a reduction in the growth of productivity at the expense of potential output might result in higher employment in the short-run, the long-run effect on the national interest would be disastrous.

We must also give consideration to the fact that hidden beneath national averages in continuous movement into, out of, between and within labour markets. e.g. 15 years ago, the average number of persons in the labour force was 73.4 million, with about 66.7 million employed and 3.9 million unemployed. Yet 14 million experienced some term of unemployment in that year. Some were new entrants to the labour force; others were laid off temporarily. The remainder were those who were permanently or indefinitely severed from their jobs. Thus, the average number unemployed during a year understates the actual volume of involuntary displacement that occurs. Our economy has grown as a slow pace so there is no cause of complacency. Positive fiscal, monetary and manpower policies will be needed in the future.

- 46)** The primary purpose of the passage is to
- define the economic terms used in the discussion of employment
 - criticise the decisions of past administrations during recession years
 - call for the application of positive economic control policies in the years that lie ahead
 - allay current fears about increasing unemployment
- 47)** It can be inferred from the passage that during the recession years of 1949, 1954 and 1958, which of the following most likely occurred?
- The labour force increased more rapidly than it did in any other year between 1945 and 1965
 - More labour was required per dollar of national product than in any other year between 1945 and 1965
 - Full employment was attained
 - The rate of unemployment increased
- 48)** Which of the following proposals best responds to the author's concerns?
- The government should manipulate the size of the labour force to prevent future recessions
 - The government should maintain some controls over the economy, but it should allow the employment rate to rise and fall with the Gross National Product, as a check on labour costs
 - People should accept that unemployment is undesirable but unavoidable
 - The government should manage the economy carefully

Directions (Q. Nos. 49-64) Read the following passages carefully and answer the questions that follow.

(2014)

PASSAGE 11

There are important differences in the situation models constructed for narrative and expository texts. A situation model for a narrative text is likely to refer to the characters in it and their emotional states, the setting, the action and sequence of events. A situation model for a scientific text, on the other hand, is likely to concentrate on the components of a system and their relationships, the events and processes that occur during the working of the system and the uses of the system. Moreover, scientific discourse is rooted in an understanding of cause and effect that differs from our everyday understanding.

Our everyday understanding which is reflected in narrative text, sees cause and effect in terms of goal structures. This is indeed the root of our superstitious behaviour - we (not necessarily consciously) attribute purposefulness to almost everything! But this approach is something we have to learn not to apply to scientific problems (and it requires a lot of learning). This is worth emphasising: science texts assume a different way of explaining events from the way we are accustomed to use - a way that must be learned.

In general, narrative text (and 'ordinary' thinking) is associated with goal structures and scientific text with logical structures. However, it's not quite as clear-cut a distinction as all that. While the physical sciences certainly focus on logical structure, both the biological sciences and technology often use goal structures to frame their discussions. Nevertheless, as a generalisation, we may say that logical thinking informs experts in these areas, while goal structures are what novices focus on. This is consistent with another intriguing finding.

In a comparison of two types of texts - one discussing human technology and other discussing forces of nature, it was found that technological texts were more easily processed and remembered. Indications were that different situation models were constructed - a goal-oriented representation for the technological text and a causal chain representation for the force of nature text. The evidence also suggested that people found it much easier to make inferences (whether about agents or objects) when human agents were involved. Having objects as the grammatical subject was clearly more difficult to process.

There are several reasons why goal-oriented, human-focused discourse might be more easily

processed (understood, remembered) than texts describing inanimate objects linked in a cause-effect chain and they come down to the degree of similarity to narrative. As a rule of thumb, we may say that to the degree that scientific text resembles a story, the more easily it will be processed. Inference making is crucial to comprehension and the construction of a situation, because a text never explains every single word and detail, every logical or causal connection.

In the same way that narrative and expository texts have different situation models, they also involve a different pattern of inference making. e.g. Narratives involve a lot of predictive inferences, expository texts typically involve a lot of backward inferences. The number of inferences required may also vary.

A study found that readers made nine times as many inferences in stories as they did in expository texts. This may be because there are more inferences required in narratives. Narratives involve the richly complex world of human beings, as opposed to some rigidly specified aspect of it, described according to a strict protocol. But it may also reflect the fact that readers don't make all (or indeed, anywhere near) the inferences needed in expository text. And indeed, the evidence indicates that students are poor at noticing coherence gaps (which require inferences).

49) Which of these statements is not associated with the 'situation models'?

- (a) Situation model refers to characters and their emotional states
- (b) Situation model refers to the setting, the action and the sequence of events
- (c) Situation model concentrates on the components of a system and their relationships
- (d) It does not show the events and processes that occur during the working of a system

50) In the comparison of two types of texts - one discussing human technology and the other discussing forces of nature, which is the best statement to support the view?

- (a) Logical thinking informs experts
- (b) Goal-structured thinking may be done by the novices even
- (c) Technological texts are processed easily and remembered
- (d) Force of nature needs a causal chain

51) Which is the most optimal reason for easy processing of the scientific text?

- (a) Scientific text deals with the phenomenon that are general to the normal course of life
- (b) Scientific text when resembles with that of a story then it procures lot more sense to the processing

- (c) Scientific texts involve a different pattern of inference making which is possessed by the experts only
- (d) Predictive and backward inferences make the scientific text more processed

52) How does inferences affect the processing of a scientific text?

- (a) Inference gives the readers an idea of the rich and complex human world
- (b) It lets the readers away from the definite protocol of an expository text
- (c) Inference arms you with the understanding of coherency
- (d) All of the above

PASSAGE 12

Endowed with significant natural resources, including ample fertile land, regular rainfall and mineral deposits, it is thought that Uganda could feed all of Africa if it was commercially farmed. The economy of Uganda has great potential and it appeared Uganda subsequently began implementing economic policies designed to restore price stability and sustainable balance of payments, improve capacity utilisation, rehabilitate infrastructure, restore producer incentives through proper price policies and improve resource mobilisation and allocation in the public sector. These policies produced positive results. Inflation, which ran at 240% in 1987 and 42% in June 1992, was 5.4% for fiscal year 1995-96 and 7.3% in 2003 poised for rapid economic growth and development. The industrial sector is being rehabilitated to resume production of building and construction materials, such as cement, reinforcing rods, corrugated roofing sheets and paint.

Domestically produced consumer goods include plastics, soap, cork and soft drinks. Major cement manufacturers like 'Tororo Cement Limited' caters to the need of building and construction material consumers across East Africa.

Uganda will host its first biggest international Mining Conference in the first week of October as the country tries to revive the industry to its full potential. The Uganda Chamber of Mines and Petroleum (UCMP), the body that links investors to government departments will hold the Mineral Wealth Conference from 1st to 2nd October, drawing participants from East Africa and beyond.

In late 2012, the Government of Uganda was taken to court over Value Added Tax (VAT) that it placed on goods and services purchased by a foreign oil company operating in the country, Tullow Oil. The court case will be heard at an international court based in the United States and could have serious ramifications for Uganda if

lost; Uganda's membership at the World Bank depends on its maintenance of 'multi-lateral investments treaties and associated guarantees'.

There is also a possibility that the country could not be sanctioned any financial help by the World Bank if found in breach of trade and the Uganda Government insists that Tullow cannot claim taxes on supplies as recoverable costs before oil production starts.

Sources from within the government reveal that the main concern at present is the manner in which millions of dollars have been lost in the past decade, money that could allegedly have stayed in Uganda for investment in the public sector; a Global Financial Integrity Report recently revealed that illicit money flows from Uganda between 2001 and 2012 totaled \$ 680 million. The investment agreements signed Tullow Oil is being represented in the court case by Kampala Associated Advocates, whose founder is Elly Karuhanga, the President of Tullow Uganda's. A partner at Kampala Associated Advocates, Peter Kabatsi, was also Uganda's Solicitor General between 1990 and 2002 and he has denied claims that he negotiated contracts with foreign oil firms during his time in this role. The Uganda Government has yet to see any result from another tax dispute involving the Canadian oil firm Tullow Oil and British company Heritage Oil, this dispute dates back to Heritage Oil's sale of rights to two oil blocks in Uganda's Lake Albert region to Tullow Oil in July 2010. Uganda claims that Heritage Oil owes USD \$ 435 million in capital gains tax arising from this sale, a claim that Heritage is currently disputing in a London-based court.

53) According to the author, how could Uganda feed the whole Africa?

- (a) It has much natural resources, ample fertile land, proper rainfall and deposits of minerals
- (b) It needs to change the economic policy with stability in price, personnel utilisation
- (c) Both 'a' and 'b'
- (d) None of the above

54) What consequence do you foresee, if Uganda lost the case against the Tullow Oil regarding the VAT?

- (a) Tullow Oil will occupy the two oil blocks immediately after the positive verdict of the court
- (b) Uganda may lose its membership from the World Bank and then may face very severe financial crisis
- (c) Uganda will sign a new investment treaty along with the associated guarantee
- (d) Tullow Oil will recover all the previous taxes it has paid to the government

55) Downfall in the rate of inflation could be controlled by

- (a) economic policy to restore price stability, sustainable balance of payments, proper utilisation of capacity
- (b) infrastructure development, giving producer a proper incentive by a reasonable pricing strategy
- (c) mobility and allocation of the resources in public sector efficiently
- (d) All of the above

56) With what viewpoint, UCMP will hold meeting in the first days of October?

- (a) Country needs to display the success of their industry at large
- (b) Country tries to procure some funds for its industry through investment
- (c) Country has a political and industrial vow with their investors
- (d) None of the above

PASSAGE 13

Business is changing and with it elite business, education is also changing. As a recent article in the New York Times suggests, MBA students in the 'data age' are seeking something more than traditional corporate strategy and finance. Increasingly, the business school brand seems to have fallen under the sway of Silicon Valley. With MBA applicants reportedly shrinking by 1% in 2013 and applicants to graduate programmes in computer science and mathematics growing by 11%, the article makes the case that business educators will need to seek out inventive ways of keeping a pace with technology. More and more applicants to business school now possess undergraduate training in science, technology, engineering or mathematics.

David B Yoffie, a professor at Harvard Business School (HBS) has observed 'an extraordinary change in the talent pool,' estimating that one-third of HBS's incoming class of 900 MBA students have programming experience. **Cornell Tech in New York City** is one example of a top-ranked school attempting to hybridise business with computer science. 'Business schools (B-schools) are a legacy industry that is trying to adapt to a digital world,' explained as associate Dean at the school. At the core of Cornell Tech's innovative curriculum is a recognition that data-driven skills now hold relevance across industries.

A similar outlook has been adopted at other top-ranked programmes in the United States with the introduction

of dual-degree programmes, entrepreneurship centres, start-up competitions and digitally focused courses. Of the 150 elective courses offered at the Stanford Graduate School of Business (SGSB) this year, for instance, 28% are new. 'We are responding to the best practices we see in the outside world like A/B testing and working with massive data sets,' commented Stanford GSB Dean, Garth Saloner. 'We are adapting'.

Maintaining a competitive edge in the digital economy may demand a 'pivot' toward hard technical skills, but as Greg Pass, Chief Entrepreneurial Officer at Cornell Tech and former chief technology officer at Twitter, observes, demand also exists for 'a more integrated, broader view of things.' Pass added that interdisciplinary MBA programmes such as the one Cornell Tech offers are well positioned to 'nurture people with those wider horizons, technical know-how and quick business reflexes,' according to the Times article.

With MBA admissions offices releasing second-round interview invitations in a few weeks, we thought we should explore an issue that brings endless paranoia to business school candidates scheduling interviews. Many programmes will give applicants a significant window in which they schedule their interview.

So, does scheduling an interview early convey that you are being too aggressive and do not have any other irons in the fire or instead that you are eager to act and impress the admission committee? Does scheduling an interview later imply that you are less interested in the programmes or rather that you are highly sought after and are interviewing at multiple schools? The reality is that scheduling your interview to occur during the early days of the school's set time frame is really not different from scheduling it near the end. Neither option confers any advantage or disadvantage (nor does any day in between). The MBA admission committees recognise that you like all candidates, are busy and that your schedule is in flux as a result of work, community and personal commitments. The committees focus on the interviews themselves, not on when they are scheduled. So pick a date that works for you a day and/or time when you know you can be comfortable and relaxed, not distracted and start preparing.

- 57)** How it is relevant or irrelevant in being choosy with the timings of an interview?
- (a) Picking a date earlier means you are too eager and a date posterior means you are sought after
 - (b) Picking an earlier or posterior date does not have to do anything with attitude of candidate
 - (c) Committee wants that candidates choose a date that may have an implication mentally
 - (d) Committee wants to know the interest in taking admission to the course for which they are to be interviewed

- 58)** Digital age and digital economy are best explained by which of the following?
- (a) Both of them speaks of the use of e-commerce and their popularity which generate optimal revenue
 - (b) Both are the integral part of the modern day B-schools and need to be given another thought
 - (c) Both shows a boom in the choice of the people that have its roots in the expanding use of computers
 - (d) None of the above
- 59)** Why do the B-schools need to adapt a new policy in their teaching manual?
- (a) To check the situation of lower admission rates that are going for different streams
 - (b) To maintain the smooth flow of revenue for their usual operations
 - (c) To upgrade the professional skills that the educators are having with them
 - (d) All of the above
- 60)** 'Data age' refers to
- (a) mobile data
 - (b) corporate database
 - (c) data associated with B-schools
 - (d) modern age where facts are manipulated for deriving conclusions

PASSAGE 14

India, a country of more than 1 billion population, is emerging as the economic superpower of the world. According to a forecast of the World Bank, the country will emerge as the fastest growing economy of the world by 2012 with a projected growth rate of 8.7%. Rapid growth in the middle class population provides a necessary impetus to this process. A report of McKinsey Global Institute estimates that the spending power of the bourgeoisie population shall rise from US \$ 380 Billion in 2008 to US \$1.5 trillion by 2025. It can be expected that a part of this increased spending will be directed towards sports and other forms of entertainment. Moreover, according to an estimate of the Planning Commission of India, the country will be the home of nearly 510 Million people in the age group of 15 to 35 years by 2016. Hence, there is a possibility to enhance the passion for sports in this country. These two factors may play a significant role in creating a sustainable stream of revenue for sports in India. The trend has already been in Indian Premier League (IPL). The objective of this article is to discuss the various avenues for generating revenue in sports. Today, sports have become a multi-billion dollar industry throughout the world and sponsorship becomes an important drive to run the business of sports. The importance of sponsorship is evident from the fact that most of the sporting entities arrange sponsors for their

survival. e.g. New Castle United, a Premier League Club, entered into a 4 years agreement with Northern Rock Plc in 2010, according to which the sponsorship entitlement would vary from US \$ 2.8 million to US \$ 18.5 million depending on the performance of the team. One of the leading real estate developers of India, DLF, bagged the title sponsorship rights of IPL for a period of 5 years at a whopping amount of ₹ 200 crore. Most of the I-League Clubs of India receive ₹ 3-5 crore from sponsorship. High attendance of these leagues attracts the advertisers to invest in these properties.

For example advertisers are ready to spend US\$ 2.5-3 million for a 30 seconds TV spot in a National Football League (NFL) or a Super Bowl match. This willingness of the advertisers lures the broadcasters to purchase the broadcasting rights of such leagues. The British TV broadcasting rights of the English Premier League (EPL) was sold to BSkyB and Setanta at US \$ 3.30 billion for three seasons covering 414 matches. The broadcasters, on the other hand, earn revenue from ad. sales and gate attendance is another important source of revenue which depends on two factors i.e. the popularity of the discipline of sports in a specific region and the comfort available at the venue. The teams, participating in EPL, NFL, own stadiums and constantly upgrade the facilities to attract fans towards the stadiums. e.g. Arsenal generated a huge revenue of £ 93,108,000 in 2011 through gate only and other match day revenue. However, in India, most of the stadiums lack basic amenities and thus fail to attract fans. For better maintenance, a Public Private Partnership model can be adopted where the government will provide land and other facilities and the infrastructure will be developed and maintained by corporate entities subscriptions.

61) Why the sponsors of the sporting events are important?

- (a) They advertise the use, importance and legacy of sports in the country
- (b) They are important because they incur all the cost of a sporting league
- (c) They procure the best sources of revenue by running the commercial ads
- (d) They pay the team heavily and thus important for the players

62) What is the core concern of this article?

- (a) To discuss the revenue generation spots from sports
- (b) To discuss the Indian economy with the viewpoint of the World Bank
- (c) To discuss the impact of population upon the country's economy
- (d) To discuss the role of IPL and EPL in the emerging India

63) What is behind the unpopularity and less attendance of people in sporting event as per the passage?

- (a) TV channels broadcast the ads more than the sporting event
- (b) Sponsors are unwilling to invest in a sporting event in India
- (c) There are lack of basic amenities for the spectators in the sporting venue
- (d) No attention is paid by the government on the sports as these are not giving out proper revenue to them

64) What are the prospects of sports high in India?

- (a) India is emerging as economic superpower
- (b) Indian middle-class is growing tremendously
- (c) Sports liking age group (15-35) will be plenty
- (d) All of the above

Directions (Q. Nos. 65-73) Read the following passages carefully and answer the questions based on that. (2013)

PASSAGE 15

Climate change and its imperatives across the globe have moved beyond the immediate compulsions of rising mercury levels on planet Earth. It is today a debate among nations on geo-politics and the shift in economic balance from the developed countries to the emerging economies. The rhetoric by global leaders thus needs to be taken with a pinch of salt for it is not all about climate change concerns.

The changing axis of economic power to the East and emerging countries of Asia will perhaps take a while to sink in. Developing economies like India are just beginning to take baby steps on the global stage and industry and entrepreneurship will have to go a long way. Millions of households in India still have to depend on firewood and kerosene to light up their homes even as scores of Indians die every year for want of basic health amenities. The priority for such a nation is meeting basic needs, providing food, health and education rather than spending large portions of its GDP on importing technologies to cut emissions, scientists argue, India needs to do its bit, but on its own terms and at its own pace.

65) Why does the author want the talks about climate change by the global leaders “to be taken with a pinch of salt”?

- (a) The global leaders are not responsible for the climate change
- (b) The talks about the climate change by the global leaders have little to do with developing countries
- (c) The developed countries are more concerned with exporting their technologies that cut emissions
- (d) The talks are sometimes directed towards political and economic gains rather than climate change

- 66) According to the passage, what should be the stand of India on matters of climate change?
- (a) India should reject any demand for emission cut by the developed countries
 - (b) The scientists should be asked to develop indigenous technologies for cutting emissions rather than importing them
 - (c) Measures should be taken to cut down emissions but not at the cost of development
 - (d) India should ban the use of firewood and kerosene and opt for cleaner fuels
- 67) What is the thematic centre of the passage?
- (a) The dual standards of the global leaders
 - (b) The climate change and its impact
 - (c) Problems faced by the developing economies
 - (d) The stand of India on climate change

PASSAGE 16

Since, the collective culture of an organisation is an aggregate of what is common to all of its group and individual mindsets organisation transformation entails changing the minds of hundreds or thousands of people. Consultants lawson and price, listed four conditions as essential for changing mindsets, the employees must believe in the overall purpose behind the change, reporting structures, operational processes and measurement procedures must be consistent with the behaviour that people are asked to embrace, employees need to be trained to adopt to new environment and apart from top management; 'role models' at every level also need to embrace the new dogma. Considering the difficulties in changing mindset of existing people, most Indian organisations have found it prudent to drop them under Voluntary Retirement Schemes (VRS) and recruit new people with positive attitude to change. But this cannot be a pattern to manage change, one day or other, existing people need to be retrained to manage change. Dwelling further on our reluctance to change, Foster and Kaplan referred to 'Cultural lock-in', the inability to change the corporate culture even in the face of clear market threats. The heart of the problem is the formation of hidden sets of rules or 'mental models', that once formed are extremely difficult to change. 'Mental models' are the core concepts of the corporation, the beliefs and assumption, the cause and effect relationships, the guidelines for interpreting language and signals, the stories repeated within the corporate walls. 'Mental models' are invisible in the corporation, they are neither explicit nor examined but they are pervasive. When well crafted, 'mental models' allow management to anticipate the future and solve problems. But once constructed, "mental models" become self-reinforcing, self-sustaining and self-limiting.

- 68) According to the passage,
- A. For an organisation to be successful, it is essential to hire like minded people.
 - B. The best way to deal with staff who refuse to change their mindset is by not touting them as role models for the organisation.
- Which of the statements given above is /are correct?*
- (a) Only A
 - (b) Only B
 - (c) Both A and B
 - (d) Neither A nor B
- 69) On the basis of the passage,
- A. For an organisation to redefine itself, it has to first re-evaluate its employees.
 - B. For an employee to become an integral part of an organisation, he has to subscribe to the views and ideology of the organisation.
 - C. Top management executives are the sole drivers for reinventing an organisation.
 - D. Now-a-days, employees can function without depending on a 'key figure' to emulate.
- Which of the statements given above is /are correct?*
- (a) Both A and B
 - (b) C and D
 - (c) Only B
 - (d) Only C
- 70) Consider the following with regards to resistance to change.
- A. It is difficult for some people to think out of the box.
 - B. Some people resist new information and prefer to rely on past practices to conduct business.
 - C. Their cultural background predisposes them to shy away from risks.
 - D. Radical thinkers are not rewarded in today's corporate culture.
 - E. The Voluntary Retirement Scheme is used by some organisations to breathe new life into the organisation.
- Which of the statements given above is /are correct?*
- (a) A, B and E
 - (b) A, B, C, D and E
 - (c) B, C and D
 - (d) C, D and E

PASSAGE 17

I came reluctantly to the conclusion that the British connection had made India more helpless than she ever was before, politically and economically. A disarmed India has no power of resistance against any aggressor if she wanted to engage, in an armed conflict with him. So much is this the case that some of our best men consider that India must take generations, before she can achieve Dominion Status. She has become so poor that she has little power of resisting famines. Before the British

advent India spun and wove in her millions of cottages, just the supplement she needed for adding to her meager agricultural resources. This cottage industry, so vital for India's existence, has been ruined by incredibly heartless and inhuman processes as described by English witness. Little do town dwellers know how the semi starved masses of India are slowly sinking to lifelessness. Little do they know that their miserable comfort represents the brokerage they get for their work they do for the foreign exploiter, that the profits and the brokerage are sucked from the masses. Little do they realise that the Government established by law in British India is carried on for this exploitation of the masses? No sophistry, no jugglery in figures, can explain away the evidence that the skeletons in many villages present to the naked eye. I have no doubt what so ever that both England and the town dweller of India will have to answer, if there is a God above, for this crime against humanity, which is perhaps unequalled in history. The law itself in this country has been used to serve the foreign exploiter.

71) What does the Author imply by 'the profits and the brokerage and sucked from the masses'?

- (a) The profit is being generated due to the mass production of goods in the industry
- (b) The industries generate profits by taking a share of income from the common man of India
- (c) The profits generated by British rule has affected cottage industries on which Indian masses depended
- (d) The masses of India have a share in the profits of the industries

72) Consider the following statement with reference to the passage.

The deterioration of cottage industries in India can best be proved by

- A. Poverty in the villages of India.
- B. Comfort of the town dweller.
- C. In human processes of British industries.
- (a) Only B
- (b) Both B and C
- (c) Only A
- (d) Both A and C

73) Why does the Author use the word 'miserable' to describe comfort?

- (a) This comfort has been achieved by the exploitation of the masses and is based on their miseries
- (b) This comfort of town dwellers has been achieved by serving the foreign industries
- (c) The industries which generate the profits for a comfortable life are based in a foreign land
- (d) This comfort of the town dwellers is helping the British to make India politically weak

Directions (Q. Nos.74-75) Read the following passage carefully and answer the questions that follow.

(2012)

PASSAGE 18

It is essential to rid ourselves of the false impressions of time, which our human limitations seem to impose upon us. Above all, we must rid ourselves of the belief that the future is in some way less determined than the past, if the borderline between past and future is illusory, then so must be the distinction between the two regions of time which it is supposed to separate. The only reason we believe the future to be still undecided while the past is immutable is that we can remember the one and not the other. To avoid these prejudices we must picture the history of the universe not as a three-dimensional stage on which things change but as a static four-dimensional space time structure of which we are a part. We believe that events are not real until they "happen", whereas in reality past, present and future are all frozen in the four dimensions of space time. Unfortunately even if all this is accepted, we have to continue using the language of a "moving" time, for we have no other but we must try to interpret this language always as a description of the unchanging space time structure of the universe.

Contemplating the history of the universe in this way, it is attractive to believe that the periods of expansion and contraction could be related to each other by symmetry. Both points of view merit serious consideration and that we cannot say with any certainty that the contracting universe will or will not, differ fundamentally from the expanding phase that we observe today.

74) According to the author of the passage,

- (a) the time value called 'now' is most essential to the understanding of the universe
- (b) the impression of a moving time is not a false imposition of human limitation
- (c) there is nothing with respect to which time could move
- (d) the future is better determined than the past

75) Which of the following best exemplifies the author's attitude to time?

- (a) The impression of a moving time is false
- (b) 'Now' is a purely subjective phenomenon existing only within the human mind
- (c) The future is not in any way less determined than the past
- (d) All of the above

Directions (Q.Nos. 76-80) *Read the following passage carefully and answer the questions that follow. (2012)*

PASSAGE 19

Amidst the increasing clamour for a discourse on educational improvement, on budgetary allocations and retention rates, there is one crucial question which is insufficiently discussed. And the question is this: what is the purpose of education today? At various times, over the past 100 years, that question has been answered differently - In colonial India, the official answer would have been, "to create a cadre of clerks and officials to run the colonial state", while in a newly decolonized India, the official answer could be, "to create a nationalist sensibility and the national citizen".

Today, I suspect the official answer to the question about the purpose of education would-be, "to give people jobs." Increasingly, the emphasis in education is towards vocationalisation and skills development. In a recent private conversation, the Education Minister of a North Indian state said, "we have a lot of jobs. We just don't have the people skilled enough to do them. We need bio-technologists, fitters, crane operators, nurses and lab assistants. But our education does not prepare young people for what we need. We need to change that."

Similarly, we find that the Confederation of Indian Industry is showing increasing interest in school education. The CII recently commissioned a study to look at the challenges and opportunities which face the Indian industry and this is its thesis that in the year 2025, there will be about 40 million jobs worldwide, which need to be filled. India will be one of the few countries in the world to have a labour surplus of the right age group. It, therefore believes that we need to think about the kinds of education system necessary to develop skills whereby our children will be best equipped to function in this scenario. Public consensus on the way to improve educational access is increasingly moving towards a public-private partnership. But we must be concerned about the terrible narrowness of the vision for educational improvement which characterizes our discourse. Education, in this picture, is about the implanting of useful skills - the assumption being that it will ultimately lead to both personal and national enrichment but as Martha Nussbaum writes, education is not simply a producer of wealth; it is a producer of citizens. Citizens in a democracy need, above all, freedom of mind - to learn to ask searching questions; to reject shoddy historical argument; to imagine alternative possibilities from a globalizing, service and market-driven economy, to think what it might be like to be in others' shoes. Recently, the Israeli novelist, Amos Oz, spoke about the importance of

reading novels as what he calls an antidote to hate. He said, "I believe in literature as a bridge between people's. I believe curiosity can be a moral quality. I believe imagining the other can be an antidote to fanaticism. Imagining the other will make you not only a better businessperson or a better lover but even a better person. Part of the tragedy between Jew and Arab is the inability of so many of us, Jews and Arabs, to imagine each other—really imagine each other; the loves, the terrible fears, the anger, the passion. There is too much hostility between us, too little curiosity."

The skills and thought processes which engender the curiosity, the imagining are associated with the humanities, the arts and literature and despite the splendid interventions in the NCERT's new textbooks for History and Political Science, these areas are terribly neglected. Our dominant conception of worthwhile education is increasingly technical and mechanistic. The thinking processes engendered by the social sciences are today seen as quaint, vaguely lefty-intellectual, a kind of quixotic idealism - which has very little to do with the real business of life. It is a strange irony that in the educational world of Gandhi, Tagore and Aurobindo, there are tragically few voices which assert a more holistic vision.

- 76) The true purpose of education in India as inferred from the passage**
 - (a) is to create a nationalist sensibility in every citizen
 - (b) has been a topic of debate since independence
 - (c) is a concept that has been changing from time to time
 - (d) is to teach an individual the necessary skills to earn his livelihood
- 77) In the author's perception, our vision for educational improvement is narrow because our system**
 - (a) gives importance only to vocationalisation and skills development
 - (b) believes in making people earn more so that they can stand up to the challenges of a globalizing economy
 - (c) does not acknowledge the importance of humanist concepts
 - (d) does not support a public-private partnership is improving educational access to everyone
- 78) Amos Oz believes that the World will become a peaceful place, if people**
 - (a) become less hostile
 - (b) become less narrow minded
 - (c) become less fanatic
 - (d) empathise with each other

79) The Indian concept of worthwhile education is that which

- I. gives technical training.
 - II. makes people think.
 - III. has a measurable outcome.
 - IV. kindles our curiosity and imagination.
 - V. helps people become wealthy.
- (a) I and V (b) II and III
(c) I, II and IV (c) I, III and IV

80) Which of the following is not an attribute of a good citizen in a democracy?

- (a) Learning to ask searching questions
- (b) Most accepting inadequate reasons from history
- (c) Thinking out of the box
- (d) Learning to negotiate with people

PASSAGE 20

Directions (Q. Nos. 81-89) *Read the paragraphs given below and answer the questions that follows. (2011)*

The Nostradamus fad might have been just that, a short-lived blip that would evaporate when the next big thing came along. And it might have been dismissed as nothing more than a few whackos' nutty obsession with doomsday. But a lot of un-nutty Japanese take it seriously and its influence has persisted for nearly three decades. The most alarming development occurred when certain cults including Shoko Asaharas Aum got in the act. Aum which allegedly masterminded the deadly sarin gas attacks to attract followers already bitten by the Nostradamus bug. Other groups did likewise while also providing avenues for surviving doomsday.

Writers like Goto fanned a sense of fear. The books sells but they do not have any answer and the cult steps in and generates followers in mere sensationalism.

These days Nostradamus has become such an ingrained part of Japanese pop culture that most people are well versed with his doomsday scenario. Even many skeptics pause to consider his predictions when confronted with the real world dangers. Ever since pyongyang sent a missile flying over Japan last August, North Korea has been considered as the most plausible source of apocalyptic of the yen, Martina Hingis loss at Wimbledon would suffice among the faithful as evidences that Nostradamus was on to something.

This fever in Japan tends to skew towards young people like 18 years old Inoue, who wanted to feel as if she had achieved something before the world ends. The goal she decided would be to create fashion. She promoted beach clothes, cosmetics and drugs that would enhance a woman's bust. Here it is not sure whether she was using

Nostradamus to promote a career in marketing and she is a perfect example of how fact and fantasy can coexist in today's Japan. Nishimoto on other hand has made full preparations and needs no convincing. He has outfitted his home in Habikino, a suburb of Osaka with a personal bomb shelter. It has 30 cm thick concrete walls reinforced with steel escape hatches, a hand cranked battery operated generator and a ventilation system that pumps in air while filtering out radioactive elements and biological and chemical contaminants.

81) What is the author's view on Japan?

- (a) People in Japan are great believers of Nostradamus
- (b) People of Japan depend on sensationalism
- (c) Fact and fantasy coexist in Japan
- (d) Both (b) and (c)

82) "Here it is not sure whether she was using Nostradamus to promote a career in marketing." What is the underlying tone in this line?

- (a) Appreciation (b) Sarcasm
- (c) Criticism (d) Both (a) and (b)

83) Which of the following can be implied from the passage?

- (a) Nostradamus' prophecies have been influencing the people of Japan for the past thirty years.
- (b) Nostradamus' prophecies have been the inspiration for various pop songs in Japanese.
- (c) Nostradamus' predicted about Korean missile, Hingis would lose, weakness of the yen and the European chicken.
- (d) Both (a) and (b)

84) What according to the passage is probably the most deadly effect of the Nostradamus fad?

- I. Silliness of the Japanese people.
 - II. The sarin gas attack.
 - III. The cult culture that demands blind following.
 - IV. Sensationalism that generates a lot of followers.
- (a) Only I (b) II, III and IV
(c) Only II (d) All of these

PASSAGE 21

"Let me," cried Shakespeare's Julius Caesar, "have men about me that are fat, sleek-headed men and asleep o' nights." One can see his point. There something such infinitely reassuring about a rounded, even cherubic, countenance: something sound and trustworthy about a man of bulk.

Now this may, of course, be merely an optical illusion But the lean and hungry look does not, in general inspire confidence. Perhaps that's why, when a fat man is proved to be a villain, he's very villainous indeed.

We feel sadly let down.

Ramblings such as this occurred to me in considering the case of the television presenter. In recent weeks, the nature of my work has brought me face to face with many forms of the genus interlocutor. As you know, they come in many shapes and sizes. Any consideration of their merits must begin with the visual impression that they make. Let us disregard the disembodied ones, the out-of-vision narrators, those known in the trade as “voice-overs”. Our business is with the front men and women in corporeal view, upon the producer pins all his hopes of an audience joining and staying with his product. And, while it’s a television truism that the strengths of a chat show or a magazine is often the strength of its weakest link, it’s equally true that a presenter can make or mar the best-intentioned programme.

It is no easy task. Far too often presenters and producers forget that the box is essentially an intimate medium. It is not a market place, nor a Speaker’s Corner. And as in those two public arenas the louder the voice the more strident the appeal, the more dubious appear the goods for sale. No, your good presenter must get on intimate terms with his viewer-singular, not plural. He may in numerical terms be talking to millions but it is still a one-to-one business.

So, the essence of the craft is the quiet, conversational buttonholing of the viewer. This is precisely the point at which good TV Presentation Parts company with show business. Introducing the next item or personality in a steady crescendo of spurious excitement is no more than rabble rousing, to elicit audience applause. Often what follows falls flat on its face, despite the bolstering of audience reaction, for the viewer at home is solitary before his set.

The ground rules of presentation are pretty obvious—a friendly face and manner, a persona one can like on first impression or warm to as the one-way conversation continues. It was no accident that the archetypal presenter, Richard Dimbleby, was so good at his job. He was a large man, voice and personality projected effortlessly into the home. Always the keynote was a quiet sincerity. In a lighter fashion, the ever-green Cliff Michelmores continues the tradition. He’s another rounded person, in several senses, with whom the viewer finds instant rapport. Of course, there are dangers in the large personality. It can be allowed to grow so that it fills the screen, allowing only a peep over the shoulder of the famous front man at what the programme’s really about.

85) What is the “optical illusion” referred to in the passage?

- (a) A rounded man looking villainous
- (b) A rounded man looking hungry
- (c) A rounded man looking cherubic
- (d) A rounded man looking more trustworthy than the lean man

86) How can an interlocutor be ‘disembodied’?

- (a) Because the telecasts are poor
- (b) Because the frames are edited haphazard
- (c) Because the viewer never sees them physically
- (d) None of the above

87) What are the two public arenas referred to by writer?

- (a) Market place and speakers corner
- (b) Television and presentations
- (c) Interlocution and television
- (d) Political speech and presenters on television

PASSAGE 22

Last November, I organized a seminar about terrorism in aviation. In order to drive home the potential hazards to the students, we visited a large eastern U.S airport with the intention of acting like a terrorist group looking for targets of opportunity. What we discovered was, at times fascinating and at other frightening.

In general US airports have two areas where the visitors have access : a public area with little active security measures and a more secure area in the airport waiting and boarding areas. The less secure areas usually contain ticket counters, baggage claim, gift shops, restaurants and other airport services. Getting into the main areas involves going through a screening process that includes X-ray inspection of carry-on items and walking through metal detectors. Other security measures include limiting curbside parking at the terminal, securing unattended luggage and requiring that all passengers be identified by the airlines by use of a picture identification. In the academic exercise, the group made several notable security observations.

Most of the trash bins in the terminal areas were set within larger concrete containers. An explosive set within one of these containers would likely be directed upward. However, in several cases there were metal and fiberglass containers, sometimes adjacent to the concrete ones; also located around the terminal.

During visit, there were numerous announcements about how untended baggage would be collected by the airport

authority. At one point, our part observed an unattended umbrella propped against a wall near one of the screening areas. The umbrella was plain in view and in close proximity to constant foot traffic. It was over 45 minutes before an airport staff member removed the umbrella. Most areas of the terminal were designed such that it was difficult to leave a bag unattended in heavily travelled areas of the terminal without it being seen. Our group specifically observed custodial staff going about their duties to see they were security conscious.

In general, we were quite impressed with the level of security. The most worrisome aspects of what we saw were that the effectiveness of active and passive security measures varied greatly and that a group of people unschooled in the ways of terrorism could very quickly discover numerous opportunities for committing mayhem without being detected.

88) Which statement is correct?

- (a) Ticket countries are more secure than boarding areas.
- (b) Boarding areas are as secure as ticket counters.
- (c) Boarding areas less secure than ticket counters.
- (d) Boarding areas are more secure than ticket counters.

89) Which statement(s) is/are incorrect?

- I. US airports have two insecure areas where the visitors have access.
- II. The effectiveness of active and passive security measures varied greatly.
- III. The US airport authorities were quick in collecting the unattended baggage.

- (a) Only I
- (b) Both I and II
- (c) I and III
- (d) None of these

Directions (Q. Nos. 90-93) *The passage given below is followed by a set of three questions. Choose the most appropriate answer to each questions. (2010)*

PASSAGE 23

Bruce Robbins's excellent article points up the paradox of cosmopolitanism - that it seems 'perpetually torn between an empirical dimension and a normative dimension'. For Robbins, the paradox of cosmopolitanism is rooted in the limited empirical sense of political community. For genuine democracy people need to belong to the same-community of fate' and there is at present little evidence of such a sense of cosmopolitan consciousness. Although leading (Western) governments make claims in support of cosmopolitan human rights established by virtue of membership of a common humanity, their practice is often limited by the 'communitarian' reality. The lack of 'shared fate' leads to

inequalities in practice as governments are often reluctant to sacrifice either treasury resources or military lives in the cause of others and citizens appear unwilling to shoulder the tax burdens involved in any potential cosmopolitan redistribution of wealth and opportunities.

Robbins suggests that it would be wrong to use the empirical limits to cosmopolitan practices as an argument against normative cosmopolitan claims. He asserts that there is 'no possibility of simply choosing the actual over the normative' and instead suggests that we should accept that the 'contradiction' exists.

A solution to the problem lies in political change which seeks 'to bring abstraction and actuality together'. A 'Left cosmopolitanism' is one that denies 'the past authority over the present' - the empirical reality that 'there is as yet little evidence of transnational solidarity' should be the justification for engagement and struggle on the side of the progressive cosmopolitan cause. This campaigning perspective is advocated by several cosmopolitan theorists who, in different ways, seek to develop ideas and mechanisms whereby global civil society can encourage and further cosmopolitan practices against the communitarian inclinations of national governments and their electorates. This article suggests that the 'cosmopolitan paradox' - the gap between universal aspiration and hierarchical practice - is not merely one of the cosmopolitan 'consciousness' lagging behind an immanent cosmopolitan 'reality'. Rather, the paradox is rooted in the essence of the cosmopolitan thesis itself. The limitations of abstract normative cosmopolitan conceptions of 'rights' and 'responsibilities', in a world structured by economic and social inequalities, raise major questions over the progressive claims made by cosmopolitan theorists.

In fact, rather than challenging existing international structures of power, there is a real danger that the cosmopolitan impulse will legitimise a much more hierarchical set of international relationships.

Whether the cosmopolitan aspiration takes the form of Robbins's call for a transnational welfare safety net or claims for the protection and promotion of a more extensive range of human rights, all cosmopolitan perspectives reflect the increasing prominence of individual rights claims in the international sphere. Leading cosmopolitan theorists seek to challenge the restrictions of the UN Charter framework, imposed by the major powers in the aftermath of the Second World War, which formally prioritised the 'state-based' principles of sovereignty and non-intervention. They argue that these principles need to be replaced by a new set of cosmopolitan principles, which make the universal individual rights of members of 'global society' the primary focus.

- 90) In which of the following is a part of the empirical dimension as per the passage?
- (a) Shared fate
 - (b) Universal aspiration
 - (c) Inequalities in practices
 - (d) The cosmopolitan paradox
- 91) Which of the following can be inferred from the passage?
- (a) Cosmopolitan theorists seek to legitimise a much more hierarchical set of international relationships
 - (b) Cosmopolitan theorists feel that the principles of sovereignty and non-intervention need to be implemented at a global level
 - (c) The theories and conceptions of cosmopolitanism are responsible for the cosmopolitan paradox
 - (d) Cosmopolitan consciousness does not really lag behind and immanent cosmopolitan reality
- 92) The author is primarily concerned with
- (a) exploring the cosmopolitan paradox and solutions and reasons for the same
 - (b) exploring the tussle between advocates of nationalism and cosmopolitanism
 - (c) arguing that the cosmopolitan paradox will continue to exist
 - (d) enthusing that 'empirical reality' is not an excuse to do away with cosmopolitan aspirations
- 93) For the question word below, a contextual usage is provided. Pick the word from the alternatives given that is closest, in meaning, in the given context.
- Amortise** It was a rude shock to witness the sober, usually docile child in a DIOK, fighting ferociously while the parents amortised his insatiable demands.
- (a) Servile
 - (b) Deliberate
 - (c) Abort
 - (d) Decant

Directions (Q. Nos. 94-97) Read the passage given below and answer the questions that follow based on the information given in the passage. (2010)

PASSAGE 24

First AOL and Time Warner announced their intention to combine. Then came Time Warner/EMI and Tribune/Times Mirror. Even more significant, however, has been the speculation that these mergers have caused: If these transactions are consummated, a large number of additional media mergers are expected. There is even the possibility of a nightmare scenario—a wave of media mergers so large that within a decade most of our information will be supplied by perhaps six of these huge conglomerates and a fringe of much smaller firms.

It's time to ask two critical questions. Is this kind of media oligopoly what we, as a society, want? And if not, can the anti-trust laws effectively prevent the threatened merger wave? The answer to the first question is clear. We do not want a media oligopoly. The answer to the second question, however, is far less certain. We should distrust a media oligopoly because it would give undue control to a small number of individuals. This need not manifest itself in a price rise for the daily newspaper or AOL's monthly fee. Rather, it could consist of a change in editorial viewpoints, a shift in the relative prominence of links to certain websites or a decision not to cover certain topics, because they are not 'newsworthy'. These problems could exist without any improper intent on the part of the media barons. Even if they try to be fair and objective, they will necessarily bring their own worldview to the job. And in time some of these conglomerates may be controlled by people who are not fair or objective.

At first, it might appear that the anti-trust laws can be of little help in grappling with the issues presented by large media mergers. The anti-merger laws are commonly understood as protecting price competition and a relatively small number of firms—to greatly oversimplify, let's say at most half a dozen—are normally thought to be enough to keep a market price-competitive. In industry after industry firms merge until there is only a handful left and the anti-trust enforcers are normally unable to do anything to prevent this. (In former years, mergers were governed by an 'incipiency' standard that prevented mergers and merger waves well before they would have led to very large or likely anti-competitive problems). Even if a handful of firms are enough to insure effective competition in most industries, would six conglomerate media firms be sufficient for the diversity of viewpoints necessary to democracy? Would we be reassured if they could somehow guarantee that they would sell their magazines and Internet advertisements at competitive prices? I am hopeful that the anti-trust laws, if correctly and vigorously interpreted, are adaptable enough to meet this challenge. This is because anti-trust is not exclusively about price. It is essentially about Choice—about giving consumers a competitive range of options in the market place so that they can make their own, effective selection from the market's offerings. Consumers should be able to make their choices along any dimension important to them—including price, variety and editorial viewpoint.

Communications media compete in part by offering independent editorial viewpoints and an independent gatekeeper function. Six media firms cannot effectively respond to the demand for choice or diversity competition by extending their product lines, because new media products will inevitably bear, to some degree, the perspective of their corporate parent. For these reasons, competition in terms of editorial viewpoint or

gate-keeping can be guaranteed only by insuring that media market contains a significantly larger number of firms than is required for price competition in other, conventional markets.

It is unclear, however, whether this interpretation of the anti-trust laws will be applied by the enforcement agencies and the courts. What is needed, therefore, is a much more careful look at the challenges that will be raised by future media mergers.

This could best be accomplished if Congress created a Temporary Committee to Study Media Mergers and media Convergence. This committee could include members of Congress; the heads of the Federal Trade Commission, the Federal Communications Commission and the Justice Department's anti-trust division; CEOs of media companies and representatives of consumer groups. The committee would identify problems that may be caused by large media mergers and by media convergence. If the committee concludes that existing anti-trust laws are inadequate, it should recommend to Congress that new anti-merger legislation be enacted. This may be the only way to prevent the nightmare scenario of a **Misprint** media oligopoly.

94) A wave of media mergers could

- (a) be a threat to a democracy
- (b) result in limiting editorial viewpoints
- (c) result in misuse of certain laws
- (d) Both (a) and (b)

95) According to the passage, what could be the most significant outcome of media oligopoly?

- (a) An increase in the cost of newspapers
- (b) The fact that in the long run, there will be a shift of power to people who might not be balanced and fair in the way they deal with the media
- (c) Certain websites may get more prominence than others
- (d) There will be no competition among the newspapers

96) Which of the following statements, according to the author, are true?

- A. Half a dozen firms are enough to keep the market price-competitive.
 - B. Half a dozen companies are not enough to provide a democratic media.
 - C. Enforcement agencies may not interpret the anti-trust laws correctly.
 - D. Half a dozen companies will be inadequate to meet the consumer demand for product diversity.
- (a) Both A and B (b) A, B and C
(c) A, B, C and D (d) B, C and D

97) To get a clear picture of the challenges posed by media mergers, the author recommends

- (a) creation of strict laws
- (b) strengthening the enforcement agencies
- (c) creation of a study committee by the Congress
- (d) None of the above

Directions (Q. Nos. 98-101) Read the passage given below and answer the questions that follow based on the information given in the passage. (2010)

PASSAGE 25

One major obstacle in the struggle to lower carbon dioxide emissions, which are believed to play a role in climate change, is the destruction of tropical rainforests. Trees naturally store more carbon dioxide as they age and the trees of the tropical rain forest in the Amazon, for example, store an average of 500 tonnes of Carbon dioxide per hectare (10, 000 square miles). When such trees are harvested, they release their carbon dioxide into the atmosphere. This release of carbon dioxide through the destruction of tropical forests, which experts estimate accounts for 20% of global carbon dioxide emissions annually, traps heat in the earth's atmosphere, which leads to global warming.

The Kyoto treaty set forth a possible measure to curtail the rate of deforestation. In the treaty, companies that exceed their Carbon dioxide emission limits are permitted to buy the right to pollute by funding reforestation projects in tropical rainforests. Since forests absorb carbon dioxide through photosynthesis, planting such forests helps reduce the level of atmospheric carbon dioxide, thus balancing out the companies' surplus of Carbon dioxide emissions. However, attempts at reforestation have so far been unable to keep up with the alarming rate of deforestation and it has become increasingly clear that further steps must be taken to curtail deforestation and its possible deleterious effects on the global environment.

One possible solution is to offer incentives for governments to protect their forests. While this solution could lead to a drastic reduction in the levels of carbon dioxide, such incentives would need to be tied to some form of verification, which is extremely difficult, since most of the world's tropical forests are in remote areas, like Brazil's Amazon basin or the island of New Guinea, which makes on-site verification logistically difficult. Furthermore, heavy cloud cover and frequent heavy rain make conventional satellite monitoring difficult.

Recently, scientists at the Japan Aerospace Exploration Agency have suggested that the rates of deforestation could be monitored using new technology to analyse radar waves emitted from a surveillance satellite. By

analysing multiple radar microwaves sent by a satellite, scientists are able to prepare a detailed, high resolution map of remote tropical forests. Unlike photographic satellite images, radar images can be measured at night and during days of heavy cloud cover and bad weather. Nevertheless, critics of government incentives argue that radar monitoring has been employed in the past with little success, citing the Global Rainforest Mapping Project which was instituted in the mid 1990s amid concern over rapid deforestation in the Amazon. However, the limited data of the Mapping Project was due only to the small amount of data that could be sent from the satellite. Modern satellites can send and receive 10 times more data than their predecessors of the mid 1990s, obviating past problems with radar monitoring. Furthermore, recent technological advances in satellite radar that allow for more accurate measurements to be made, even in remote areas, make such technology a promising step in monitoring and controlling global climate change.

- 98) Which one of the following most accurately expresses the main point of the passage?
- (a) Although scientists continue to search for a solution, there is, as yet, no good solution for the problem of rain forest deforestation
 - (b) One major obstacle to lessening the contribution of atmospheric carbon dioxide caused by deforestation may be removed through satellite radar monitoring
 - (c) Recent increases in the rate of deforestation of tropical rainforests have caused serious concern and spurred efforts to curb such deforestation
 - (d) Although an excellent first step, the solutions set forth by the Kyoto treaty will not significantly curb the rate of deforestation unless companies begin to lessen their carbon dioxide emissions
- 99) It can be inferred from the passage that photographic satellite images
- (a) are impervious to bad weather
 - (b) cannot be used efficiently at night
 - (c) are less expensive than radar monitoring
 - (d) can send only a small amount of data from a satellite to a base
- 100) Which one of the following most accurately describes the author's attitude toward radar monitoring as expressed in the passage?
- (a) Wary Skepticism
 - (b) Cautious ambivalence
 - (c) Grudging respect
 - (d) Reasoned optimism
- 101) The information presented in the passage implies which one of the following about the Mapping Project?

- (a) The project was unsuccessful because it used only satellite radar monitoring
- (b) If the satellite had been able to send more data, the project may have been successful
- (c) It was established by the Kyoto treaty in response to widespread concern over deforestation
- (d) The project used only conventional satellite monitoring and on-site verification visits

Directions (Q. Nos. 102-104) Read the passage given below and answer the questions that follow based on the information given in the passage. (2009)

PASSAGE 26

In an unfinished but highly suggestive series of essays, the late Sarah Eisenstein has focused attention on the evolution of working women's values from the turn of the century to the First World War. Eisenstein argues that turn-of-the-century women neither wholly accepted nor rejected what she calls the dominant "ideology of domesticity," but rather took this and other available ideologies-feminism, socialism, trade unionism-and modified or adapted them in light of their won experiences and needs. In thus maintaining that wages-work helped to produce a new "consciousness" among women, Eisenstein to some extent challenges the recent, controversial proposal by Leslie Tentler that for women the work experience only served to reinforce the attractiveness of the dominant ideology. According to the Tentler, the degrading conditions under which many female wage earners worked made them view the family as a source of power and esteem available nowhere else in their social world. In contrast, Eisenstein's study insists that wage-work had other implications for women's identities and consciousness. Most importantly, her work aims to demonstrate that wage-work enabled women to become aware of themselves as a distinct social group capable of defining their collective circumstance. Eisenstein insists that as a group working-class women were not able to come to collective consciousness of their situation until they began entering the labour force, because domestic work tended to isolate them from one another.

Unfortunately, Eisenstein's unfinished study does not develop these ideas in sufficient depth or detail, offering tantalizing hints rather than an exhaustive analysis. Whatever Eisenstein's overall plan may have been, in its current form her study suffers from the limited nature of the sources she depended on. She use the speeches and writings of reformers and labour organizers, who she acknowledges were far from representative, as the voice of the typical woman worker. And there is less than adequate attention given to the differing values of immigrant groups that made up a significant proportion

of the population under investigation. While raising important questions, Eisenstein's essays do not provide definitive answer and it remains for others to take up the challenges they offer.

- 102)** It can be inferred from the passage that, in Eisenstein's view, working women at the turn of the century had which of the following attitudes toward the dominant ideology of their time?
- (a) They resented the dominant ideology as degrading.
 - (b) They preferred the dominant ideology to other available ideologies.
 - (c) They began to view the dominant ideology to other available ideologies.
 - (d) They accepted some but not all aspects of the dominant ideology.
- 103)** Which of the following best describes the organization of the first paragraph of the passage?
- (a) A chronological account of a historical development is presented and then future development are predicted.
 - (b) A term is defined according to several different schools of thought and then a new definition is formulated.
 - (c) A theory is presented, an alternative viewpoint is introduced and then the reasoning behind the initial theory is summarised.
 - (d) A tentative proposal is made, reasons for and against it are weighed and then a modified version of the proposal is offered.
- 104)** Which of the following would the author of the passage be most likely to approve as a continuation of Eisenstein's study?
- (a) An oral history of promotion women labour organizers
 - (b) An analysis of letters and diaries written by typical female wage earners at the turn of the century
 - (c) An assessment of what different social and political groups defined as the dominant ideology in the early twentieth century
 - (d) A theoretical study of how socialism and feminism influenced one another at the turn of the century

Directions (Q. Nos. 105-106) Read the passage given below and answer the questions that follow based on the information given in the passage. (2009)

Passage 27

Neotropical coastal mangrove forests are usually "zonal", with certain mangrove species found predominantly in the seaward portion of the habitat and other mangrove species on the more landward portions of the coast. The earliest research on mangrove forests produced

descriptions of species distribution from shore to land, without exploring the causes of the distributions.

The idea that zonation is caused by plant succession was first expressed by JH Davis in a study of Florida Mangrove forests. According to Davis' Scheme, the shoreline is being extended in a seaward direction because of the "land-building" role of mangroves, which a habitat by trapping sediments over time, extend the shore. As a habitat gradually becomes more inland as the shore extends, the "land-building" species are replaced. This continuous process of accretion and succession would be interrupted only by hurricanes or storm flushings.

Recently the universal application of Davis' succession paradigm has been challenged. It appears that in areas where weak currents and weak tidal energies allow the accumulation of sediments, mangroves will follow land formation and accelerate the rate of soil accretion; succession will proceed according to Davis' scheme. But on stable coastlines, the distribution of mangrove species results in other patterns of zonation; "land building does not occur.

To find a principle that explains the various distribution patterns, several researchers have looked to salinity its effects on mangrove. While mangroves can develop in fresh water, they can also thrive in salinities as high as 2.5 times that of seawater. However, those mangrove species found in freshwater habitats do well only in the absence of competition, thus suggesting that salinity tolerance is a critical factor in competitive success among mangrove species. Research suggests that mangroves will normally dominate highly saline regions, although not because they require salt. Rather, they are metabolically efficient (and hence grow well) in portions of an environment whose high salinity excludes plants adapted to lower salinities. Tides create different degrees of salinity along a coastline; The characteristic mangrove species of each zone should exhibit a higher metabolic efficiency at that salinity than will any potential invader, including other species of mangrove.

- 105)** According to the passage, the earliest research on mangrove forest produced which of the following?
- (a) Data that implied random patterns of mangrove species distribution
 - (b) Descriptions of species distributions suggesting zonation
 - (c) Descriptions of the development of mangrove forests over time
 - (d) Reclassification of species formerly thought to be identical

- 106)** It can be inferred from the passage that Davis' paradigm does NOT apply to which of the following?
- (a) The shoreline of Florida mangrove forests first studies by Davis
 - (b) A shoreline in an area with weak currents
 - (c) A shoreline in an area with weak tidal energy
 - (d) A shoreline in which few sediments can accumulate

Directions (Q. Nos. 107-109) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (2009)

PASSAGE 28

Modern manufacturers, who need reliable sources of materials and technologically advanced components to operate profitably, face an increasingly difficult choice between owning the producers of these items (a practice known as backward integration) and buying from independent producers. Manufacturers who integrate may reap short-term rewards, but they often restrict their future capacity for innovative product development.

Backward integration removes the need for some purchasing and marketing functions, centralizers overhead and permits manufacturers to eliminate duplicated efforts in research and development. Where components are commodities (ferrous metals or petroleum, for example), backward integration almost certainly boosts profits. Nevertheless, because product innovation means adopting the most technologically advanced and cost-effective ways of making components, backward integration may entail a serious risk for a technologically active company—for example, a producer of sophisticated consumer electronics.

A company that decides to make rather than buy important parts can lock itself into an outdated technology. Independent suppliers may be unwilling to share innovations with assemblers with whom they are competing. Moreover, when an assembler sets out to master the technology of producing advanced components, the resulting demands on its resources may compromise its ability to assemble these components successfully into end products. Long-term contracts with suppliers can achieve many of the same cost benefits as backward integration without compromising a company's ability to innovate.

However, moving away from backward integration is not a complete solution either. Developing innovative technologies requires independent suppliers of components to invest huge sums in research and development.

The resulting low profit margins on the sale of components threaten the long-term financial stability of

these firms. Because the ability of end-product assemblers to respond to market opportunities depends heavily on suppliers of components, assemblers are often forced to integrate by purchasing the suppliers of components just to keep their suppliers in business.

- 107)** According to passage, when an assembler buys a firm that makes some important component of the end product that the assembler produces, independent suppliers of the same component may

- (a) withhold technological innovations from the assembler
- (b) experience improved profit margins of on sales of their products
- (c) lower their prices to protect themselves from competition
- (d) suffer financial difficulties and go out of business.

- 108)** Which of the following best describes the way the last paragraph functions in the context of the passage?

- (a) The last in a series of arguments supporting the central argument of the passage is presented.
- (b) A viewpoint is presented which qualifies one presented earlier in the passage.
- (c) Evidence is presented in support of the argument developed in the preceding paragraph.
- (d) Questions arising from the earlier discussion are identified as points of departure for further study of the topic.

- 109)** According to the passage, which of the following relationships between profits and investments in research and development holds true for producers of technologically advanced components?

- (a) Modest investments are required and the profit margins on component sales are low.
- (b) Modest investments are required but the profit margins on component sales are quite high.
- (c) Despite the huge investments that are required, the profit margins on components sales are high.
- (d) Because huge investments are required, the profit margins on component sales are low.

Directions (Q. Nos. 110-121) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (2007)

PASSAGE 29

The difficulties historians face in establishing cause-and-effect relations in the history of human societies are broadly similar to the difficulties facing astronomers, climatologists, ecologists, evolutionary biologists, geologists and palaeontologists. To varying degrees each of these fields is plagued by the impossibility of performing replicated, controlled

experimental interventions, the complexity arising from enormous numbers of variables, the resulting uniqueness of each system, the consequent impossibility of formulating universal laws and the difficulties of predicting emergent properties and future behaviour. Predictions in history, as in other historical sciences, is more feasible on large spatial scales and over long times, when the unique features of millions of small-scale brief events **become averaged out**. Just as I could predict the sex ratio of the next 1,000 newborns but not the sexes of my **own two children**, the historian can recognise factors that made inevitable the broad outcome of the collision between American and Eurasian societies after 13,000 years of separate developments, but not the outcome of the 1960 US presidential election. The details of which candidate said what during a single televised debate in October 1960 could have given the electoral victory to Nixon instead of to Kennedy, but no details of who said what could have blocked the European conquest of Native Americans.

How can students of human history profit from the experience of scientists in other historical sciences? A **methodology** that has proved useful involves the **comparative method and so-called natural experiments**. While neither astronomers studying **galaxy formation nor human historians can** manipulate their systems in controlled laboratory experiments, they both can take advantage of natural experiments, by comparing systems differing in the presence or absence (or in the strong or weak effect) of some putative causative factor. For example, epidemiologists, forbidden to **feed large amounts of salt to people experimentally**, have still been able to identify effects of high salt intake by comparing groups of humans who already differ greatly in their salt intake and cultural anthropologists, unable to provide human groups experimentally with varying resource **abundances for many centuries**, still study long-term effects of **resource abundance on human societies by comparing recent Polynesian populations** living on islands differing naturally in resources abundance.

The student of human history **can draw on many more natural experiments than just comparisons among the five inhabited continents**. Comparisons can also utilize large island that have developed complex societies in a considerable degree of isolation (such as Japan, Madagascar, Native American Hispaniola, New Guinea, Hawaii and many others), as well as societies on hundreds of smaller islands and regional societies **within each of the continents**. Natural experiments in any field, whether in ecology or human history are inherently open to potential methodological criticisms.

Those include confounding effects of natural variation in additional variables besides the one of interest, as well as problems in inferring chains of causation from observed correlations between variables. Such methodological problems have been discussed in great detail for some of the historical sciences. In particular, epidemiology, the science of drawing inferences about human diseases by comparing groups of people (often by retrospective historical studies), has for a long time successfully employed formalised procedures for dealing with problems similar to those facing historians of human societies.

In short, I acknowledge that it is much more difficult to understand human history **than to understand problems in fields of Science** where history is **unimportant** and where fewer individual variables operate. Nevertheless, successful methodologies for analysing historical problems have been worked out in several fields. As a result, the histories of dinosaurs, nebulae and glaciers are generally acknowledged to belong to fields of science rather than to the humanities.

110) Why do islands with considerable degree of isolation provide valuable insights into human history?

- (a) Isolated islands may evolve differently and this difference is of interest of us.
- (b) Isolated island increase the number of observations available to historians.
- (c) Isolated islands, differing in their endowments and size may evolve differently and this difference can be attributed to their endowments and size.
- (d) Isolated islands, differing in their endowments and size, provide a good comparison to large islands such as Eurasia, Africa, America and Australia.
- (e) Isolated islands, in so far as they are inhabited, arouse curiosity about how human beings evolved there.

111) According to the author, why is prediction difficult in history?

- (a) Historical explanations are usually broad so that no prediction is possible.
- (b) Historical outcomes depend upon a large number of factors and hence prediction is difficult for each case.
- (c) Historical sciences, by their very nature, are not interested in a multitude of minor factors, which might be important in a specific historical outcome.
- (d) Historians are interested in evolution of human history and hence are only interested in long-term predictions.
- (e) Historical sciences suffer from the inability to conduct controlled experiments and therefore have explanations based on a few long-term factors.

- 112) According to the author, which of the following statements would be true?
- (a) Students of history are missing significant opportunities by not conducting any natural experiments.
 - (b) Students of history are missing significant opportunities by not studying an adequate variety of natural experiments.
 - (c) Complex societies inhabiting large islands provide great opportunities for natural experiments.
 - (d) A unique problem faced by historians is their inability to establish cause and effect relationships.
 - (e) Cultural anthropologists have overcome the problem of confounding variables through natural experiments.

PASSAGE 30

To discover the relation between rules, paradigms and normal science, consider first how the historian isolates the particular **loci of commitment** that have been **described as accepted rules**. Close historical investigation of a given speciality at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational and instrumental applications. These are the **community's paradigms, revealed in its textbooks, lectures and laboratory exercises**. By studying them and by practicing with them, the members of the **corresponding community** learn their trade. The historian, of course, will discover in addition a penumbral area occupied by achievements whose status is still in doubt, but the core of solved problems and techniques will usually be clear. Despite occasional ambiguities, the paradigms of a mature scientific community can be determined with relative ease.

That demands a second step and **one of a somewhat different kind. When undertaking it, the historian must compare the community's paradigms with each other and with its current research reports**. In doing so, his object is to discover what isolable elements, explicit or implicit, the members of that community may have abstracted from their more **global paradigms** and **deploy it as rules in their research**. Anyone who has attempted to describe or analyse the evolution of a particular scientific tradition will necessarily have sought accepted principles and rules of this sort. Almost certainly, he will have met with at least partial success. But, if his experience has been at all like my own, he will have found the search for rules both more difficult and less satisfying than the search for paradigms. Some of the generalizations he employs to describe the

community's **shared beliefs will present more problems**. Others, however, will seem **a shade too strong**. Phrased in just that way or in any other way he can imagine, they would almost certainly have been rejected by some members of the group he studies. Nevertheless, if the coherence of the research tradition is to be understood in terms of rules, some specification of common ground in the **corresponding area is needed**. As a result, the search for a body of rules competent to constitute a given normal research tradition becomes a source of continual and deep frustration.

Recognizing that frustration, however, makes it possible to diagnose its source. **Scientists can agree** that a Newton, Lavoisier, Maxwell or Einstein has produced an apparently permanent solution to a group of **outstanding problems** and still **disagree, sometimes without being aware of it, about the particular abstract characteristics that make those solutions permanent**. They can, that is, agree in their identification of a paradigm without agreeing on or even attempting to produce, a full interpretation or rationalisation of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumption. Indeed, the existence of a paradigm need not even imply that any full set of rules exists.

- 113) What is the author attempting to illustrate through this passage?
- (a) Relationships between rules, paradigms and normal science
 - (b) How a historian would isolate a particular 'loci of commitment'
 - (c) How a set of shared beliefs evolves into a paradigm
 - (d) Ways of understanding a scientific tradition
 - (e) The frustrations of attempting to define a paradigm of a tradition
- 114) The term 'loci of commitment' as used in the passage would most likely correspond with which of the following?
- (a) Loyalty between a group of scientists in a research laboratory
 - (b) Loyalty between groups of scientists across research laboratories
 - (c) Loyalty to a certain paradigm of scientific inquiry
 - (d) Loyalty to global patterns of scientific inquiry
 - (e) Loyalty to evolving trends of scientific inquiry

115) The author of this passage is likely to agree with which of the following?

- (a) Paradigms almost entirely define a scientific tradition.
- (b) A group of scientists investigating a phenomenon would benefit by defining a set of rules.
- (c) Acceptance by the giants of a tradition is a *sine qua non* for a paradigm to emerge.
- (d) Choice of isolation mechanism determines the type of paradigm that may emerge from a tradition.
- (e) Paradigms are a general representation of rules and beliefs of a scientific tradition.

PASSAGE 31

Every civilized society lives and thrives on a silent but **profound agreement as to what is to be accepted as the valid mould of experience**. Civilization is a complex system of **dams, dykes and canals warding off, directing and 'articulating the influx of the surrounding fluid element**; a fertile fenland, elaborately drained and protected from **the high tides of chaotic, unexercised and inarticulate experience**. In **such a culture**, stable and sure of itself within the frontiers of **'naturalized' experience**, the arts wield their creative power not **so much in width as in depth**. They do **not create new** experience, but deepen and purify the old. Their works do not differ from one another like a new horizon from a new horizon, but like a madonna from a madonna.

The periods of art which are most vigorous in creative passion **seem to occur when the established** pattern of experience loosens its rigidity without as yet losing its force. Such a period was the Renaissance and Shakespeare **its poetic consumption**. Then it was as though the discipline of the old order gave depth to the excitement of the breaking away, the depth of job and tragedy, of incomparable conquests and irredeemable losses. **Adventurers of experience set out as though in lifeboats to rescue and bring back to the shore treasures of knowing** and feeling which the old order **had left floating on the high seas**. The works of the early Renaissance and the poetry of Shakespeare vibrate with the compassion for live experience in danger of dying from exposure and neglect. In this compassion was the creative genius of the age. Yet, it was a genius of courage, not of desperate audacity. For, however elusively, it still knew of harbours and anchors, of homes to which to return and of barns in which to store the harvest. The exploring spirit of art was in the depths of its consciousness still aware of a scheme of things into which to fit its exploits and creations.

But the more this scheme of things loses its stability, the more boundless and uncharted appears the ocean of

potential exploration. In the blank confusion of infinite potentialities floatsam of significance gets attached to jetsam of experience for everything is sea, everything is at sea :

... The sea is all about us;

The sea is the land's edge also, the granite

Into which it reaches, the beaches where it tosses

Its hints of earlier and other creation ...

—and Rilke tells a story in which, as in TS Eliot's poem, it is again the sea and the distance of 'other creation' that becomes the image of the poet's reality. A rowing boat sets out on a difficult passage. The oarsmen labour in exact rhythm. There is no sign yet of the destination. Suddenly a man, seemingly idle, breaks out into song. And if the labour of the oarsmen meaninglessly defeats the real resistance of the real waves, it is the idle single who magically conquers the despair of apparent aimlessness. While the people next to him try to one to grips with the element that is next to them, his voice seems to bind the boat to the farthest distance so that the farthest distance draws it towards itself, 'I don't know why and how,' is Rilke's conclusion, "but suddenly I understood the situation of the poet, his place and function in this age. It does not matter if one denies him every place-except this one. There one must tolerate him."

116) In the passage, the expression 'like a madonna from a madonna' alludes to

- (a) The difference arising as a consequence of artistic license.
- (b) The difference between two artistic interpretations.
- (c) The difference between 'life' and 'interpretation of life'.
- (d) The difference between 'width' and 'depth' of creative power.
- (e) The difference between the legendary character and the modern day singer.

117) The sea and 'other creation' leads Rilke to

- (a) Define the place of the poet in his culture.
- (b) Reflect on the role of the oarsman and the singer.
- (c) Muse on artistic labour and its aimlessness.
- (d) Understand the elements that one has to deal with.
- (e) Delve into natural experience and real waves.

118) According to the passage, the term 'adventurers of experience' refers to

- (a) Poets and artists who are driven by courage.
- (b) Poets and artists who create their own genre.
- (c) Poets and artists of the Renaissance.
- (d) Poets and artists who revitalize and enrich the past for us.
- (e) Poets and artists who delve in flotsam and jetsam in sea.

PASSAGE 32

Human Biology does nothing **to structure human society**. Age may enfeeble us all, **but cultures vary considerably in the prestige and power they accord to the elderly**. Giving birth is a necessary **condition** for being a mother, **but it is not sufficient**. We expect mothers to behave in **maternal ways and to display appropriately maternal sentiments**. We prescribe a clutch of norms or rules that govern the role of a mother. That the social role is independent of the **biological base can be demonstrated by going back three sentences**. Giving birth is certainly not sufficient to be a mother but, as adoption and fostering show, it is not even necessary!

The fine detail of what is expected of a mother or a father or a dutiful son differs from culture to culture, but everywhere **behaviour is coordinated by the reciprocal nature of roles**. Husbands and wives, parents and children, employers and employees, waiters and customers, teachers and pupils, warlords and followers; each makes sense **only in its relation to the other**. The term 'role' is an **appropriate one**, because the metaphor of an actor in a play neatly expresses the rule-governed nature or scripted nature of much of social life and the sense that society is a joint production. Social life occurs only because **people play their parts** (and that is as true for war and conflicts as for peace and love) and those parts make sense only in the **context of the overall show**. The drama metaphor also reminds us of the artistic licence available to the players. We can play a part straight or, as the following from JP Sartre conveys, we can ham it up.

Let us consider this waiter in the cafe. His movement is quick and forward, a little too precise, a little too rapid. He comes towards the patrons with a step a little too quick. He bends forward a little too eagerly; his voice, his eyes express an interest a little too solicitous for the order of the customer. Finally there he returns, trying to imitate in his walk the inflexible stiffness of some kind of automation while carrying his tray with the recklessness of a tightrope-walker ... All his behaviour seems to us a game ... But what is he playing? We need not watch long before we can explain it : he is playing at being a waiter in a cafe.

The American sociologist Erving Goffman built an influential body of social analysis **on elaborations of the metaphor of social life as drama**. Perhaps his most telling point was that it is only **through acting out a part that we express character**. It is not enough to be **evil or virtuous**; we have to **be seen to be evil or virtuous**.

There is distinction between the roles we play and some underlying self. Here **we might note that some roles**

are more absorbing than others. We would not be surprised by the waiters who plays the part in such a way as to signal to us that she is much more than her occupation. We would be surprised and offended by the father who played his part 'tongue in cheek'. Some roles are broader and more far-reaching than others. Describing someone as a clergyman or faith healer would say far more about that person than describing someone as a bus driver.

119) What is the thematic highlight of this passage?

- (a) Human behaviour depends on biological linkages and reciprocal roles.
- (b) In the absence of reciprocal roles, biological linkages provide the mechanism for coordinating human behaviour.
- (c) Human behaviour is independent of biological linkages and reciprocal roles.
- (d) In the absence of strong biological linkages, reciprocal roles provide the mechanism for coordinating human behaviour.
- (e) Reciprocal roles determine normative human behaviour in society.

120) Which of the following would have been true if biological linkages structured human society?

- (a) The role of mother would have been defined through her reciprocal relationship with her children.
- (b) We would not have been offended by the father playing his role 'tongue in cheek'.
- (c) Women would have adopted and fostered children rather than giving birth to them.
- (d) Even if warlords were physically weaker than their followers, they would still dominate them.
- (e) Waiters would have stronger motivation to serve their customers.

121) It has been claimed in the passage that "some roles are more absorbing than others" According to the passage, which of the following seem(s) appropriate reason(s) for such a claim?

- A. Some roles carry great expectations from the society preventing manifestation of the true self.
 - B. Society ascribes so much importance to some roles that the conception of self may get aligned with the roles being performed.
 - C. Some roles require development of skill and expertise leaving little time for manifestation of self.
- (a) Only A
 - (b) Only B
 - (c) Only C
 - (d) A and B
 - (e) B and C

Directions (Q. Nos. 122-136) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (2006)

PASSAGE 33

Fifteen years after communism was officially pronounced dead, its spectre seems once again to be haunting Europe. Last month, the Council of Europe's parliamentary assembly voted to condemn the "crimes of totalitarian communist regimes," linking them with Nazism and complaining that communist parties are still "legal and active in some countries." Now, Goran Lindblad, the conservative Swedish MP behind the resolution, wants to go further. Demands that European Ministers launch a continent-wide anti-communist campaign-including school textbook revisions, official memorial days and museums-only narrowly missed the necessary two-thirds majority. Mr. Lindblad pledged to bring the wider plans back to the Council of Europe in the coming months.

He has chosen a good year for his ideological offensive: this is the 50th anniversary of Nikita Khrushchev's denunciation of Josef Stalin and the subsequent Hungarian uprising, which will doubtless be the clue for further excoriation of the communist record. Paradoxically, given that there is no communist government left in Europe outside Moldova, the attacks have if anything, become more extreme as time has gone on. A clue as to why that might be can be found in the rambling report by Mr. Lindblad that led to the Council of Europe declaration. Blaming class struggle and public ownership, he explained "different elements of communist ideology such as equality or social justice still seduce many" and "a sort of nostalgia for communism is still alive." Perhaps the real problem for Mr. Lindblad and his right-wing allies in Eastern Europe is that communism is not dead enough and they will only be content when they have driven a stake through its heart. The fashionable attempt to equate communism and Nazism is in reality a moral and historical nonsense. Despite the cruelties of the Stalin terror, there was no Soviet Treblinka or Sobibor, no extermination camps built to murder millions. Nor did the Soviet Union launch the most devastating war in history at a cost of more than 50 million lives-in fact it played the decisive role in the defeat of the German war machine. Mr. Lindblad and the Council of Europe adopt as fact the wildest estimates of those "killed by communist regimes" (mostly in famines) from the fiercely contested Black Book of Communism, which also underplays the number of deaths attributable to Hitler. But, in any case, none of

this explains why anyone might be nostalgic in former communist states, now enjoying the delights of capitalist restoration. The dominant account gives no sense of how communist regimes renewed themselves after 1956 or why Western leaders feared they might overtake the capitalist world well into the 1960s. For all its brutalities and failures, communism in the Soviet Union, Eastern Europe and elsewhere delivered rapid industrialisation, mass education, job security and huge advances in social and gender equality. Its existence helped to drive up welfare standards in the West and provided a powerful counterweight to Western global domination.

It would be easier to take the Council of Europe's condemnation of communist state crimes seriously, if it had also seen fit to denounce the far bloodier record of European colonialism-which only finally came to an end in the 1970s. This was a system of racist despotism, which dominated the globe in Stalin's time. And while there is precious little connection between the ideas of fascism and communism, there is an intimate link between colonialism and Nazism. The terms *lebensraum* and *konzentrationslager* were both first used by the German colonial regime in South-West Africa (now Namibia), which committed genocide against the Herero and Nama peoples and bequeathed its ideas and personnel directly to the Nazi party.

Around 10 million Congolese died as a result of Belgian forced labour and mass murder in the early twentieth century; tens of millions perished in avoidable or enforced famines in British-ruled India; up to a million Algerians died in their war for independence, while controversy now rages in France about a new law requiring teachers to put a positive spin on colonial history. Comparable atrocities were carried out by all European colonialists, but not a word of condemnation from the Council of Europe. Presumably, European lives count for more.

No major twentieth century political tradition is without blood on its hands, but battles over history are more about the future than the past. Part of the current enthusiasm in official Western circles for dancing on the grave of communism is no doubt about relations with today's Russia and China. But it also reflects a determination to prove there is no alternative to the new global capitalist order-and that any attempt to find one is bound to lead to suffering. With the new imperialism now being resisted in the Muslim world and Latin America, growing international demands for social justice and ever greater doubts about whether the environmental crisis can be solved within the existing economic system, the pressure for alternatives will increase.

122) Among all the apprehensions that Mr. Goran Lindblad expresses against communism, which one gets admitted, although indirectly, by the author?

- (a) There is nostalgia for communist ideology even if communism has been abandoned by most European nations.
- (b) Notions of social justice inherent in communist ideology appeal to critics of existing systems.
- (c) Communist regimes were totalitarian and marked by brutalities and large scale violence.
- (d) The existing economic order is wrongly viewed as imperialistic by proponents of communism.
- (e) Communist ideology is faulted because communist regimes resulted in economic failures.

123) What, according to the author, is the real reason for a renewed attack against communism?

- (a) Disguising the unintended consequences of the current economic order such as social injustice and environmental crisis.
- (b) Idealising the existing ideology of global capitalism.
- (c) Making communism a generic representative of all historical atrocities, especially those perpetrated by the European imperialists.
- (d) Communism still survives, in bits and pieces, in the minds and hearts of people.
- (e) Renewal of some communist regimes has led to the apprehension that communist nations might overtake the capitalists.

124) The author cites examples of atrocities perpetrated by European colonial regimes in order to

- (a) compare the atrocities committed by colonial regimes with those of communist regimes.
- (b) prove that the atrocities committed by colonial regimes were more than those of communist regimes.
- (c) prove that, ideologically, communism was much better than colonialism and Nazism.
- (d) neutralise the arguments of Mr Lindblad and to point out that the atrocities committed by colonial regimes were more than those of communist regimes.
- (e) neutralise the arguments of Mr Lindblad and to argue that one needs to go beyond and look at the motives of these regimes.

125) Why, according to the author, is Nazism closer to colonialism than it is to communism?

- (a) Both colonialism and Nazism were examples of tyranny of one race over another.
- (b) The genocides committed by the colonial and the Nazi regimes were of similar magnitude .
- (c) Several ideas of the Nazi regime were directly imported from colonial regimes.
- (d) Both colonialism and Nazism are based on the principles of imperialism.
- (e) While communism was never limited to Europe, both the Nazis and the colonialists originated in Europe.

126) Which of the following cannot be inferred as a compelling reason for the silence of the Council of Europe on colonial atrocities ?

- (a) The Council of Europe being dominated by erstwhile colonialists.
- (b) Generating support for condemning communist ideology.
- (c) Unwillingness to antagonise allies by ranking up an embarrassing issue.
- (d) Greater value seemingly placed on European lives.
- (e) Portraying both communism and Nazism as ideologies to be condemned.

PASSAGE 34

My aim is to present a conception of justice which generalises and carries to a higher level of abstraction the familiar theory of the social contract. In order to do this, we are not to think of the original contract as one to enter a particular society or to set up a particular form of government. Rather, the idea is that the principles of justice for the basic structure of society are the object of the original agreement. They are the principles that free and rational persons concerned to further their own interests would accept in an initial position of equality. These principles are to regulate all further agreements; they specify the kinds of social co-operation that can be entered into and the forms of government that can be established. This way of regarding the principles of justice, I shall call justice as fairness. Thus, we are to imagine that those who engage in social co-operation choose together, in one joint act, the principles which are to assign basic rights and duties and to determine the division of social benefits. Just as each person must decide by rational reflection what constitutes his good, i.e. is, the system of ends which it is rational for him to pursue, so a group of persons must decide once and for all what is to count among them as just and unjust. The choice which rational men would make in this hypothetical situation of equal liberty determines the principles of justice. In 'justice as fairness', the original position is not an actual historical state of affairs. It is understood as a purely hypothetical situation characterized so as to lead to a certain conception of justice. Among the essential features of this situation is that no one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength and the like. I shall even assume that the parties do not know their conceptions of the good or their special psychological propensities. The principles of justice are chosen behind a veil of ignorance. This ensures that no one is advantaged or disadvantaged in the choice of principles by the outcome of natural chance or the contingency of social circumstances. Since, all are

similarly situated and no one is able to design principles to favour his particular condition, the principles of justice are the result of a fair agreement or bargain.

Justice as fairness begins with one of the most general of all choices which persons might make together, namely with the choice of the first principles of a conception of justice which is to regulate all subsequent criticism and reform of institutions. Then, having chosen a Conception of justice, we can suppose that they are to choose a constitution and a legislature to enact laws and so, on all in accordance with the principles of justice initially agreed upon. Our social situation is just if it is such that by this sequence of hypothetical agreements we would have contracted into the general system of rules which defines it. Moreover, assuming that the original position does determine a set of principles, it will, then be true that whenever social institutions satisfy these principles, those engaged in them can say to one another that they are co-operating on terms to which they would agree if they were free and equal persons whose relations with respect to one another were fair. They could all view their arrangements as meeting the stipulations which they would acknowledge in an initial situation that embodies widely accepted and reasonable constraints on the choice of principles. The general recognition of this fact would provide the basis for a public acceptance of the corresponding principles of justice. No society can, of course, be a scheme of co-operation which men enter voluntarily in a literal sense; each person finds himself placed at birth in some particular position in some particular society and the nature of this position materially affects his life prospects. Yet a society satisfying the principles of justice as fairness comes as close as a society can to being a voluntary scheme, for it meets the principles which free and equal persons would assent to under circumstances that are fair.

- 127)** A just society, as conceptualised in the passage, can be best described as
- a Utopia in which everyone is equal and no one enjoys any privilege based on their existing positions and powers
 - a hypothetical society in which people agree upon principles of justice which are fair
 - a society in which principles of justice are not based on the existing positions and powers of the individuals
 - a society in which principles of justice are fair to all.
 - a hypothetical society in which principles of justice are not based on the existing positions and powers of the individuals
- 128)** The original agreement or original position in the passage has been used by the author as
- a hypothetical situation conceived to derive principles of justice which are not influenced by position, status and condition of individuals in the society
 - a hypothetical situation in which every individual is equal and no individual enjoys any privilege based on the existing positions and powers
 - a hypothetical situation to ensure fairness of agreements among individuals in society
 - an imagined situation in which principles of justice would have to be fair
 - an imagined situation in which fairness is the objective of the principles of justice to ensure that no individual enjoys any privilege based on the existing positions and powers
- 129)** Which of the following best illustrates the situation that is equivalent to choosing 'the principles of justice' behind a 'veil of ignorance'?
- The principles of justice are chosen by businessmen, who are marooned on an uninhabited island after a shipwreck, but have some possibility of returning
 - The principles of justice are chosen by a group of school children whose capabilities are yet to develop
 - The principles of justice are chosen by businessmen, who are marooned on an uninhabited island after a shipwreck and have no possibility of returning
 - The principles of justice are chosen assuming that such principles will govern the lives of the rule makers only in their next birth, if the rule makers agree that they will be born again
 - The principles of justice are chosen by potential immigrants who are unaware of the resources necessary to succeed in a foreign country
- 130)** Why, according to the passage, do principles of justice need to be based on an original agreement?
- Social institutions and laws can be considered fair only if they conform to principles of justice
 - Social institutions and laws can be fair only if they are consistent with the principles of justice as initially agreed upon
 - Social institutions and laws need to be fair in order to be just
 - Social institutions and laws evolve fairly only if they are consistent with the principles of justice as initially agreed upon
 - Social institutions and laws conform to the principles of justice as initially agreed upon
- 131)** Which of the following situations best represents the idea of justice as fairness, as argued in the passage?
- All individuals are paid equally for the work they do
 - Everyone is assigned some work for his or her livelihood
 - All acts of theft are penalised equally
 - All children are provided free education in similar schools
 - All individuals are provided a fixed sum of money to take care of their health

PASSAGE 35

Our propensity to look out for regularities and to impose laws upon nature, leads to the psychological phenomenon of dogmatic thinking or, more generally, dogmatic behaviour; we expect regularities everywhere and attempt to find them even where there are none; events which do not yield to these attempts we are inclined to treat as a kind of 'background noise' and we stick to our expectations even when they are inadequate and we ought to accept defeat. This dogmatism is to some extent necessary. It is demanded by a situation which can only be dealt with by forcing our conjectures upon the world. Moreover, this dogmatism allows us to approach a good theory in stages, by way of approximations; if we accept defeat too easily, we may prevent ourselves from finding that we were very nearly right.

It is clear that this dogmatic attitude, which makes us stick to our first impressions, is indicative of a strong belief; while a critical attitude, which is ready to modify its tenets, which admits doubt and demands tests, is indicative of a weaker belief. Now, according to Hume's theory and to the popular theory, the strength of a belief should be a product of repetition; thus, it should always grow with experience and always be greater in less primitive persons. But dogmatic thinking, an uncontrolled wish to impose regularities, a manifest pleasure in rites and in repetition as such, is characteristic of primitives and children and increasing experience and maturity sometimes create an attitude of caution and criticism rather than of dogmatism.

My logical criticism of Hume's psychological theory and the considerations connected with it, may seem a little removed from the field of the philosophy of science. But the distinction between dogmatic and critical thinking or the dogmatic and the critical attitude, brings us right back to our central problem. For the dogmatic attitude is clearly related to the tendency to verify our laws and schemata by seeking to apply them and to confirm them, even to the point of neglecting refutations, whereas the critical attitude is one of readiness to change them-to test them, to refute them; to falsify them, if possible. This suggests that we may identify the critical attitude with the scientific attitude and the dogmatic attitude with the one which we have described as pseudo scientific. It further suggests that genetically speaking the pseudo-scientific attitude is more primitive than and prior to, the scientific attitude; that it is a pre-scientific attitude. And this primitivity or priority also has its logical aspect. For the critical attitude "is not so much opposed to the dogmatic attitude as super-imposed upon it : criticism must be directed against existing and influential beliefs in need of critical revision-in other words, dogmatic beliefs. A critical attitude needs for its

raw material, as it were, theories or beliefs which are held more or less dogmatically.

Thus, science must begin with myths and with the criticism of myths; neither with the collection of observations, nor with the invention of experiments, but with the critical discussion of myths and of magical techniques and practices. The scientific tradition is distinguished from the pre-scientific tradition in having two layers. Like the latter, it passes on its theories; but it also passes on a critical attitude towards them. The theories are passed on, not as dogmas, but rather with the challenge to discuss them and improve upon them. The critical attitude, the tradition of free discussion of theories with the aim of discovering their weak spots so that they may be improved upon, is the attitude of reasonableness or rationality. From the point of view here developed, all laws, all theories, remain essentially tentative or conjectural or hypothetical, even when we feel unable to doubt them any longer. Before a theory has been refuted we can never know in what way it may have to be modified.

- 132)** In the context of science, according to the passage, the interaction of dogmatic beliefs and critical attitude can be best described as
- (a) a duel between two warriors in which one has to die
 - (b) the effect of a chisel on a marble stone while making a sculpture
 - (c) The feedstock (natural gas) in fertilizer industry being transformed into fertilizers
 - (d) A predator killing its prey
 - (e) The effect of fertilizers on a sapling
- 133)** According to the passage, the role of a dogmatic attitude or dogmatic behaviour in the development of science is
- (a) critical and important, as, without it, initial hypotheses or conjectures can never be made
 - (b) positive, as conjectures arising out of our dogmatic attitude become science
 - (c) negative, as it leads to pseudo-science
 - (d) neutral, as the development of science is essentially because of our critical attitude
 - (e) inferior to critical attitude, as a critical attitude leads to the attitude of reasonableness and rationality
- 134)** Dogmatic behaviour, in this passage, has been associated with primitives and children. Which of the following best describes the reason why the author compares primitives with children?
- (a) Primitives are people who are not educated and hence can be compared with children, who have not yet been through school
 - (b) Primitives are people who, though not modern, are as innocent as children

- (c) Primitives are people without a critical attitude, just as children are
- (d) Primitives are people in the early stages of human evolution; similarly, children are in the early stages of their lives
- (e) Primitives are people who are not civilised enough, just as children are not

135) Which of the following statements best supports the argument in the passage that a critical attitude leads to a weaker belief than a dogmatic attitude does?

- (a) A critical attitude implies endless questioning and therefore, it cannot lead to strong beliefs
- (b) A critical attitude, by definition, is centred on an analysis of anomalies and 'noise'
- (c) A critical attitude leads to questioning everything and in the process generates 'noise' without any conviction.
- (d) A critical attitude is antithetical to conviction, which is required for strong beliefs
- (e) A critical attitude leads to questioning and to tentative hypotheses

136) According to the passage, which of the following statements best describes the difference between science and pseudo-science?

- (a) Scientific theories or hypotheses are tentatively true whereas pseudo-sciences are always true
- (b) Scientific laws and theories are permanent and immutable whereas pseudo-sciences are contingent on the prevalent mode of thinking in a society
- (c) Science always allows the possibility of rejecting a theory or hypotheses, whereas pseudo-sciences seek to validate their ideas or theories
- (d) Science focuses on anomalies and exceptions so that fundamental truths can be uncovered, whereas pseudo-sciences focus mainly on general truths
- (e) Science progresses by collection of observations or by experimentation, whereas pseudo-sciences do not worry about observations and experiments

Directions (Q. Nos. 137-157) Read the passage given below and answer the questions that follow based on the information given in the passage.

PASSAGE 36

A game of strategy, as currently conceived in game theory, is a situation in which two or more 'players' make choices among available alternatives (moves). The totality of choices determines the outcomes of the game and it is assumed that the rank order of preferences for the outcomes is different for different players. Thus, the 'interests' of the players are generally in conflict. Whether these interests are diametrically opposed or only partially opposed depends on the type of game.

Psychologically, most interesting situations arise when the interests of the players are partly coincident and partly opposed, because then one can postulate not only a conflict among the players but also inner conflicts within the players. Each is torn between a tendency to cooperate, so as to promote the common interests and a tendency to compete, so as to enhance his own individual interests.

Internal conflicts are always psychologically interesting. What we vaguely call 'interesting' psychology is in very great measure the psychology of inner conflict. Inner conflict is also held to be an important component of serious literature as distinguished from less serious genres. The classical tragedy, as well as the serious novel, reveals the inner conflict of central figures.

The superficial adventure story, on the other hand, depicts only external conflict; i.e. the threats to the person with whom the reader (or viewer) identifies stem in these stories exclusively from external obstacles and from the adversaries who create them. On the most primitive level, this sort of external conflict is psychologically empty. In the fisticuffs between the protagonists of good and evil, no psychological problems are involved or, at any rate, none are depicted in juvenile representations of conflict.

The detective story, the 'adult' analogue of a juvenile adventure tale, has at times been described as a glorification of intellectualised conflict. However, a great deal of the interest in the plots of these stories is sustained by withholding the unraveling of a solution to a problem. The effort of solving the problem is in itself not a conflict it the adversary (the unknown criminal) remains passive, like Nature, whose secrets the scientist supposedly unravels by deduction. If the adversary actively puts obstacles in the detective's path toward the solution, there is genuine conflict. But the conflict is psychologically interesting only to the extent that it contains irrational components such as a tactical error on the criminal's part or the detective's insight into some psychological quirk of the criminal or something of this sort. Conflict conducted in a perfectly rational manner is psychologically no more interesting than a standard Western. e.g. Tic-tac-toe, played perfectly by both players, is completely devoid of psychological interest. Chess may be psychologically interesting but only to the extent that it is played not quite rationally. Played completely rationally, chess would not be different from Tic-tac-toe.

In short, a pure conflict of interest (what is called a zero-sum game) although it offers a wealth of interesting conceptual problems, is not interesting psychologically, except to the extent that its conduct departs from rational norms.

- 137) Which, according to the author, would qualify as interesting psychology?
- (a) A statistician's dilemma over choosing the best method to solve an optimisation problem
 - (b) A chess player's predicament over adopting a defensive strategy against an aggressive opponent
 - (c) A mountaineer's choice of the best path to Mt Everest from the base camp
 - (d) A finance manager's quandary over the best way of raising money from the market
- 138) The problem solving process of a scientist is different from that of a detective because
- (a) scientists study inanimate objects, while detectives deal with living criminals or law offenders
 - (b) scientists study known objects, while detectives have to deal with unknown criminals or law offenders
 - (c) scientists study phenomena that are not actively altered, while detectives deal with phenomena that have been deliberately influenced to mislead
 - (d) scientists study psychologically interesting phenomena, while detectives deal with "adult" analogues of juvenile adventure tales
- 139) According to the passage, internal conflicts are psychologically more interesting than external conflicts because
- (a) internal conflicts, rather than external conflicts, form an important component of serious literature as distinguished from less serious genres
 - (b) only juveniles or very few 'adults' actually experience external conflict, while internal conflict is more widely prevalent in society
 - (c) in situations of internal conflict, individuals experience a dilemma in resolving their own preferences for different outcomes
 - (d) there are no threats to the reader (or viewer) in case of external conflicts
- 140) According to the passage, which of the following options about the application of game theory to a conflict-of-interest situation is true?
- (a) Assuming that the rank order of preferences for options is different for different players
 - (b) Accepting that the interests of different players are often in conflict
 - (c) Not assuming that the interests are in complete disagreement
 - (d) All of the above

PASSAGE 37

Crinoline and croquet are out. As yet, no political activists have thrown themselves in front of the royal horse on Derby Day. Even so, some historians can spot the parallels. It is a time of rapid technological change. It is a period when the dominance of the world's

superpower is coming under threat. It is an epoch when prosperity masks underlying economic strain. And, crucially, it is a time when policy-makers are confident that all is for the best in the best of all possible worlds. Welcome to the Edwardian Summer of the second age of globalisation. Spare a moment to take stock of what's been happening in the past few months. Let's start with the oil price, which has rocketed to more than \$ 65 a barrel, more than double its level 18 months ago. The accepted wisdom is that we shouldn't worry our little heads about that, because the incentives are there for business to build new production and refining capacity, which will effortlessly bring demand and supply back into balance and bring crude prices back to \$ 25 a barrel. As Tommy Cooper used to say just like that.

Then there is the result of the French referendum on the European Constitution, seen as thick-headed luddites railing vainly against the modern world. What the French needed to realise, the argument went, was that there was no alternative to the reforms that would make the country more flexible, more competitive, more dynamic. Just the sort of reforms that allowed Gate Gourmet to sack hundreds of its staff at Heathrow after the sort of ultimatum that used to be handed out by Victorian mill owners. An alternative way of looking at the French 'non' is that our neighbours translate 'flexibility' as 'you're fired'.

Finally, take a squint at the United States. Just like Britain a century ago, a period of unquestioned superiority is drawing to a close. China is still a long way from matching America's wealth, but it is growing at a stupendous rate and economic strength brings geo-political clout. Already, there is evidence of a new scramble for Africa as Washington and Beijing compete for oil stocks. Moreover, beneath the surface of the US economy, all is not well. Growth looks healthy enough, but the competition from China and elsewhere has meant the world's biggest economy now imports far more than it exports. The US is living beyond its means, but in this time of studied complacency a current account deficit worth 6 per cent of gross domestic product is seen as a sign of strength, not weakness.

In this new Edwardian summer, comfort is taken from the fact that dearer oil has not had the savage inflationary consequences of 1973-74, when a fourfold increase in the cost of crude brought an abrupt end to a postwar boom that had gone on uninterrupted for a quarter of a century. True, the cost of living has been affected by higher transport costs, but we are talking of inflation at 2.3 per cent and not 27 per cent. Yet the idea that higher oil prices are of little consequence is fanciful. If people are paying more to fill up their cars it leaves them with less to spend on everything else, but there is a

reluctance to consume less. In the 1970s, unions were strong and able to negotiate large, compensatory pay deals that served to intensify inflationary pressure. In 2005, that avenue is pretty much closed off, but the abolition of all the controls on credit that existed in the 1970s means that households are invited to borrow more rather than consume less. The knock-on effects of higher oil prices are thus felt in different ways—through high levels of indebtedness, inflated asset prices and in balance of payments deficits.

There are those who point out, rightly, that modern industrial capitalism has proved mightily resilient these past 250 years and that a sign of the enduring strength of the system has been the way it apparently shrugged off everything a stock market crash, 9/11, rising oil prices—that have been thrown at it in the half decade since the millennium. Even so, there are at least three reasons for concern. First, we have been here before. In terms of political economy, the first era of globalisation mirrored our own. There was a belief in unfettered capital flows, in free trade and in the power of the market. It was a time of massive income inequality and unprecedented migration. Eventually, though, there was a backlash, manifested in a struggle between free traders and protectionists and in rising labour militancy. Second, the world is traditionally at its most fragile at times when the global balance of power is in flux. By the end of the 19th century, Britain's role as the hegemonic power was being challenged by the rise of the United States, Germany and Japan while the Ottoman and Hapsburg empires were clearly in rapid decline. Looking ahead from 2005, it is clear that over the next two or three decades, both China and India—which together account for half the world's population—will flex their muscles.

Finally, there is the question of what rising oil prices tell us. The emergence of China and India means global demand for crude is likely to remain high at a time when experts say production is about to top out. If supply constraints start to bite, any declines in the price are likely to be short-term cyclical affairs punctuating a long upward trend.

141) Which of the following best represents the key argument made by the author?

- (a) The rise in oil prices, the flux in the global balance of power and historical precedents should make us question our belief that the global economic prosperity would continue
- (b) The belief that modern industrial capitalism is highly resilient and capable of overcoming shocks will be belied soon
- (c) Widespread prosperity leads to neglect of early signs of underlying economic weakness, manifested in higher oil prices and a flux in the global balance of power

- (d) A crisis is imminent in the West given the growth of countries like China and India and the increase in oil prices

142) What can be inferred about the author's view when he states, 'As Tommy Cooper used to say 'just like that'?

- (a) Industry has incentive to build new production and refining capacity and therefore oil prices would reduce
- (b) There would be a correction in the price levels of oil once new production capacity is added
- (c) The decline in oil prices is likely to be short-term in nature
- (d) It is not necessary that oil prices would go down to earlier levels

143) By the expression 'Edwardian Summer', the author refers to a period in which there is :

- (a) unparalleled luxury and opulence
- (b) a sense of complacency among people because of all-round prosperity
- (c) a culmination of all-round economic prosperity
- (d) an imminent danger lurking behind economic prosperity

144) What, according to the author, has resulted in a widespread belief in the resilience of modern capitalism?

- (a) Growth in the economies of Western countries despite shocks in the form of increase in levels of indebtedness and inflated asset prices
- (b) Increase in the prosperity of Western countries and China despite rising oil prices
- (c) Continued growth of Western economies despite a rise in terrorism, an increase in oil prices and other similar shocks
- (d) The success of continued reforms aimed at making Western economies more dynamic, competitive and efficient

PASSAGE 38

While complex in the extreme, Derrida's work has proven to be a particularly influential approach to the analysis of the ways in which language structures our understanding of ourselves and the world we inhabit, an approach he termed deconstruction. In its simplest formulation, deconstruction can be taken to refer to a methodological strategy which seeks to uncover layers of hidden meaning in a text that have been denied or suppressed. The term 'text', in this respect, does not refer simply to a written form of communication, however. Rather, texts are something we all produce and reproduce constantly in our everyday social relations, be they spoken, written or embedded in the construction of material artifacts. At the heart of Derrida's

deconstructive approach is his critique of what he perceives to be the totalitarian impulse of the Enlightenment pursuit to bring all that exists in the world under the domain of a representative language, a pursuit he refers to a logocentrism. Logocentrism is the search for a rational language that is able to know and represent the world and all its aspects perfectly and accurately. Its totalitarian dimension, for Derrida at least, lies primarily in its tendency of marginalize or dismiss all that does not neatly comply with its particular linguistic representations, a tendency that, throughout history, has all too frequently been manifested in the form of authoritarian institution. Thus, logo centrism has, in its search for the truth of absolute representation, subsumed difference and oppressed that which it designates as its alien 'other'. For Derrida, western civilization has been built upon such a systematic assault on alien cultures and ways of life, typically in the name of reason and progress. In response to logocentrism, deconstruction posits the idea that the mechanism by which this process of marginalization and the ordering of truth occurs is through establishing systems of binary opposition. Oppositional linguistic dualisms, such as rational/irrational, culture/nature and good/bad are not, however, construed as equal partners as they are in, say, the semiological structuralism of Saussure. Rather, they exist, for Derrida, in a series of hierarchical relationships with the first term normally occupying a superior position. Derrida defines the relationship between such oppositional terms using the neologism difference. This refers to the realization that in any statement, oppositional terms differ from each other (for instance, the difference between rationality and irrationality is constructed through oppositional usage) and at the same time, a hierarchical relationship is maintained by the deference of one term to the other (in the positing of rationality over irrationality, for instance). It is this latter point which is perhaps the key to understanding Derrida's approach to deconstruction.

For the fact that at any given time one term must defer to its oppositional 'other', meant that the two terms are constantly in a state of interdependence. The presence of one is dependent upon the absence or 'absent-presence' of the 'other', such as in the case of good and evil, whereby to understand the nature of one, we must constantly relate it to the absent term in order to grasp its meaning. That is to do good. We must understand that our act is not evil for without that comparison the term becomes meaningless. Put simply, deconstruction represents an attempt to demonstrate the absent-presence of this oppositional 'other', to show that what we say or write is in itself not expressive simply of what is present, but also

of what is absent. Thus, deconstruction seeks to reveal the interdependence of apparently dichotomous terms and their meanings relative to their textual context; i.e. within the linguistic power relations which structure dichotomous terms hierarchically. In Derrida's own words, a deconstructive reading "must always aim at a certain relationship, unperceived by the writer, between what he commands and what he does not command of the patterns of a language that he uses (It) attempts to make the not-seen accessible to sight."

Meaning, then, is never fixed or stable, whatever the intention of the author of a text. For Derrida, language is a system of relations that are dynamic, in that all meanings we ascribe to the world are dependent not only on what we believe to be present but, also on what is absent. Thus, any act of interpretation must refer not only to what the author of a text intends, but also to what is absent from his or her intention. This insight leads, once again, to Derrida's further rejection of the idea of the definitive authority of the intentional agent or subject. The subject is decentred it is conceived as the outcome of relations of difference. As author of its own biography, the subject thus becomes the ideological fiction of modernity and its logocentric philosophy, one that depends upon the formation of hierarchical dualisms, which repress and deny the presence of the absent 'other'. No meaning can, therefore, ever be definitive, but is merely an outcome of a particular interpretation.

145) According to the passage, Derrida believes that the system of binary opposition

- (a) represents a prioritisation or hierarchy
- (b) reconciles contradictions and dualities
- (c) weakens the process of marginalisation and ordering of truth
- (d) deconstructs reality

146) Derrida rejects the idea of 'definitive authority of the subject' because

- (a) interpretation of the text may not make the unseen visible
- (b) the meaning of the text is based on binary opposites
- (c) the implicit power relationship is often ignored
- (d) any act of interpretation must refer to what the author intends

147) According to the passage, Derrida believes that

- (a) reality can be construed only through the use of rational analysis
- (b) language limits our construction of reality
- (c) a universal language will facilitate a common understanding of reality
- (d) we need to uncover the hidden meaning in a system of relations expressed by language

148) To Derrida, 'logocentrism' does not imply

- (a) a totalitarian impulse
- (b) a domain of representative language
- (c) interdependence of the meanings of dichotomous terms
- (d) a strategy that seeks to suppress hidden meanings in a text

PASSAGE 39

The painter is now free to paint anything he chooses. There are scarcely any forbidden subjects and today everybody is prepared to admit that a painting of some fruit can be as important as a painting of a hero dying. The impressionists did as much as anybody to win this previously unheard of freedom for the artist. Yet, by the next generation, painters began to abandon the subject altogether and began to paint abstract pictures. Today the majority of pictures painted are abstract.

Is there a connection between these two developments? Has art gone abstract because the artist is embarrassed by his freedom? Is it that, because he is free to paint anything, he doesn't know what to paint? Apologists for abstract art often talk of it as the art of maximum freedom. But could this be the freedom of the desert island? It would take too long to answer these questions properly. I believe there is a connection. Many things have encouraged the development of abstract art. Among them has been the artists' wish to avoid the difficulties of finding subjects when all subjects are equally possible. I raise the matter now because I want to draw attention to the fact that the painter's choice of a subject is a far more complicated question than it would at first seem. A subject does not start with what is put in front of the easel or with something which the painter happens to remember. A subject starts with the painter deciding he would like to paint such-and-such because for some reason or other he finds it meaningful. A subject begins when the artist selects something for special mention. (What makes it special or meaningful may seem to the artist to be purely visual—its colours or its form). When the subject has been selected, the function of the painting itself is to communicate and justify the significance of that selection.

It is often said today that subject matter is unimportant. But this is only a reaction against the excessively literary and moralistic interpretation of subject matter in the 19th century. In truth the subject is literally the beginning and end of a painting. The painting begins with a selection (I will paint this and not everything else in the world); it is finished when that selection is justified (now you can see all that I saw and felt in this and how it is more than merely itself).

Thus, for a painting to succeed it is essential that the painter and his public agree about what is significant. The subject may have a personal meaning for the painter or individual spectator; but there must also be the possibility

of their agreement on its general meaning. It is at this point that the culture of the society and period in question precedes the artist and his art. Renaissance art would have meant nothing to the Aztecs and *vice-versa*. If, to some extent, a few intellectuals can appreciate them both today it is because their culture is an historical one: its inspiration is history and therefore it can include within itself, in principle if not in every particular, all known developments to date.

When a culture is secure and certain of its values, it presents its artists with subjects. The general agreement about what is significant is so well established that the significance of a particular subject accrues and becomes traditional. This is true, for instance, of reeds and water in China, of the nude body in Renaissance, of the animal in Africa. Furthermore, in such cultures the artist is unlikely to be a free agent: he will be employed for the sake of particular subjects and the problem, as we have just described it, will not occur to him.

When a culture is in a state of disintegration or transition the freedom of the artist increases but the question of subject matter becomes problematic for him: he, himself, has to choose for society. This was at the basis of all the increasing crises in European art during the 19th century. It is too often forgotten how many of the art scandals of that time were provoked by the choice of subject (Gericault, Courbet, Daumier, Degas, Lautrec, Van Gogh etc.).

By the end of the 19th century there were, roughly speaking, two ways in which the painter could meet this challenge of deciding what to paint and so choosing for society. Either he identified himself with the people and so allowed their lives to dictate his subjects to him; or he had to find his subjects within himself as painter. By people I mean everybody except the bourgeoisie. Many painters did of course work for the bourgeoisie according to their copy-book of approved subjects, but all of them, filling the Salon and the Royal Academy year after year, are now forgotten, buried under the hypocrisy of those they served so sincerely.

149) In the sentence, "I believe there is a connection" (second paragraph), what two developments is the author referring to?

- (a) Painters using a dying hero and using a fruit as a subject of painting
- (b) Growing success of painters and an increase in abstract forms
- (c) Artists gaining freedom to choose subjects and abandoning subjects altogether
- (d) Rise of Impressionists and an increase in abstract forms

- 150) When a culture is insecure, the painter chooses his subject on the basis of
- (a) the prevalent style in the society of his time
 - (b) its meaningfulness to the painter
 - (c) what is put in front of the easel
 - (d) past experience and memory of the painter
- 151) In the context of the passage, which of the following statements would not be true?
- (a) Painters decided subjects based on what they remembered from their own lives
 - (b) Painters of reeds and water in China faced no serious problem of choosing a subject
 - (c) The choice of subject was a source of scandals in 19th century European art
 - (d) Agreement on the general meaning of a painting is influenced by culture and historical context
- 152) Which of the following views is taken by the author?
- (a) The more insecure a culture, the greater the freedom of the artist
 - (b) The more secure a culture, the greater the freedom of the artist
 - (c) The more secure a culture, more difficult the choice of subject
 - (d) The more insecure a culture, the less significant the choice of the subject
- 153) Which of the following is not necessarily among the attributes needed for a painter to succeed?
- (a) The painter and his public agree on what is significant
 - (b) The painting is able to communicate and justify the significance of its subject selection
 - (c) The subject has a personal meaning for the painter
 - (d) The painting of subjects is inspired by historical developments

PASSAGE 40

Recently I spent a several hours sitting under a tree in my garden with the social anthropologist William Ury; a Harvard University professor in the art of negotiation and wrote the bestselling book, *Getting to Yes*. He captivated me with his theory that tribalism protects people from their fear of rapid change. He explained that the pillars of tribalism that humans rely on for security would always counter any significant cultural or social change. In this way, he said, change is never allowed to happen too fast. Technology, e.g. is a pillar of society. Ury believes that every time technology moves in a new or radical direction, another pillar such as religion or nationalism will grow stronger - in effect, the traditional and familiar will assume greater importance to compensate for the new and untested. In this manner,

human tribes avoid rapid change that leaves people insecure and frightened .

But we have all heard that nothing is a permanent as change. Nothing is guaranteed. Pithy expressions, to be sure, but no more than cliches. As Ury says, people don't live that way from day-to-day. On the contrary; they actively seek certainty and stability. They want to know they will be safe.

Even so, we scare ourselves constantly with the idea of change. An IBM CEO once said, "We only re-structure for a good reason," and if we haven't re-structure in a while, that's a good reason." We are scared that competitors, technology and the consumer will put us out of business - so we have to change all the time just to stay alive. But if we asked our fathers and grandfathers, would they have said that lived in a period of little change? Structure may not have changed much. It may just be the speed with which we do things.

Change is over-rated, anyway. Consider the automobile. It's an especially valuable example, because the auto industry has spent tens of billions of dollars on research and product development in the last 100 years. Henry Ford's first car had a metal chasis with an internal combustion, gasoline-powered engine, four wheels with rubber tyres, a foot operated clutch assembly and brake system, a steering wheel and four seats and it could safely do 18 miles per hour. A hundred years and tens of thousands of research hours later, we drive cars with a metal chasis with an internal combustion, gasoline-powered engine, four wheels with rubber tyres, a foot operated clutch assembly and brake system, a steering wheel, four seats - and the average speed in London in 2001 was 17.5 miles per hour !

That's not a hell of a lot of return for the money. Ford evidently doesn't have much to teach us about change. The fact that they're still manufacturing cars is not proof that Ford Motor Co. is a sound organisation, just proof that it takes very large companies to make cars in great quantities - making for an almost impregnable entry barrier.

Fifty years after the development of the jet engine, planes are also little changed. They've grown bigger, wider and can carry more people. But those are incremental, largely cosmetic changes. Taken together, this lack of real change has come to mean that in travel-whether driving or flying - time and technology have not combined to make things much better. The safety and design have of course accompanied the times and the new volume of cars and flights, but nothing of any significance has changed in the basic assumptions of the final product.

At the same time, moving around in cars or aeroplanes becomes less and less efficient all the time. Not only has there been no great change, but also both forms of

transport have deteriorated as more people clamour to use them. The same is true for telephones, which took over hundred years to become mobile or photographic film, which also required an entire century to change. The only explanation for this is anthropological. Once established in calcified organisations, humans do two things: sabotage changes that might render people dispensable and ensure industry-wide emulatin. In the 1960s, German auto companies developed plans to scarp the entire combustion engine for an electrical design. (The same existed in the 1970s in Japan and in the 1980s in France.) So for 40 years we might have been free of the wasteful and ludicrous dependence on fossil fuels. Why didn't it go anywhere? Because auto executives understood pistons and carburettors and would be loath to cannibalise their expertise, along with most of their factories.

- 154)** Which of the following views does the author fully support in the passage?
- (a) Nothing is as permanent as change
 - (b) Change is always rapid
 - (c) More money spent on innovation leads to more rapid change
 - (d) Over decades, structural change has been incremental
- 155)** According to the passage which of the following statements is true?
- (a) Executive of automobile companies are inefficient and ludicrous
 - (b) The speed at which an automobile is driven in a city has not changed much in a century
 - (c) Anthropological factors have fostered innovation in automobiles by promoting use of new technologies
 - (d) Further innovation in jet engines has been more than incremental
- 156)** Which of the following best describes one of the main ideas discussed in the passage?
- (a) Rapid change is usually welcomed in society
 - (b) Industry is not as innovative as it made out to be
 - (c) We should have less change than what we have now
 - (d) Competition spurs companies into radical innovation
- 157)** According to the passage, the reason why we continued to be dependent on fossil fuels is that
- (a) auto executives did not wish to change
 - (b) no alternative fuels were discovered
 - (c) change in technology was not easily possible
 - (d) German, Japanese and French companies could not come up with new technologies

Directions (Q. Nos. 158-169) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (2004)

PASSAGE 41

Fifty feet away three male lions lay by the road. They didn't appear to have a hair on their heads. Nothing the colour of their noses (leonine noses darken as they age, from pink to black), Craig estimated that they were six years old-young adults. "This is wonderful!" he said, after staring at them for several moments. "This is what we came to see. They really are maneless" Craig, a professor at the University of Minnesota, is arguably the leading expert on the majestic Serengeti lion, whose head is mantled in long, thick hair. He and Peyton West, a doctoral student who has been working with him in Tanzania, had never seen the Tsavo lions that live some 200 miles East of the Serengeti. The scientists had partly suspected that the maneless males were adolescents mistaken for adults by amateur observers. Now they knew better.

The Tsavo research expedition was mostly Peyton's show. She had spent several years in Tanzania, compiling the data she needed to answer a question that ought to have been answered long ago: Why do lions have manes? It's the only cat, wild or domestic, that displays such ornamentation. In Tsavo she was attacking the riddle from the opposite angle. Why do its lions not have manes? (Some 'maneless' lions in Tsavo East do have partial manes, but they rarely attain the regal glory of the Serengeti lions. Does environmental adaptation account for the trait? Are the lions of Tsavo, as some people believe, a distinct subspecies of their Serengeti cousins?

The Serengeti lions have been under continuous observation for more than 35 years, beginning with George Schaller's pioneering work in the 1960s. But the lions in Tsavo, Kenya's oldest and largest protected ecosystem, have hardly been studied. Consequently, legends have grown up around them. Not only do they look different according to the myths, they behave differently, displaying greater cunning and aggressiveness, "Remember too," Kenya: The Rough Guide warns, "Tsavo's lions have a reputation of ferocity". Their fearsome image became well-known in 1898, when two males stalled construction of what is now Kenya Railways by allegedly killing and eating 135 Indian and African labourers. A British Army Officer in charge of building a railroad bridge over the Tsavo river, Lt Col JH Patterson, spent nine months pursuing the pair before he brought them to bay and killed them. Stuffed and

mounted, they now glare at visitors to the Field Museum in Chicago. Patterson's account of the leonine region of terror, *The Man-Eaters of Tsavo*, was an international best-seller when published in 1907. Still in print, the book has made Tsavo's lions notorious. That annoys some scientists. "People don't want to give up on mythology," Dennis King told me one day. The zoologist has been working in Tsavo off and on for four years. "I am so sick of this man-eater business. Patterson made a helluva lot of money off that story, but Tsavo's lions are no more likely to turn man-eater than lions from elsewhere."

But tales of their savagery and wiliness don't all come from sensationalist authors looking to make a buck. Tsavo lions are generally larger than lions elsewhere, enabling them to take down the predominant prey animal in Tsavo, the Cape buffalo, one of the strongest, most aggressive animals of Earth. The buffalo don't give up easily. They often kill or severely injure an attacking lion and a wounded lion might be more likely to turn to cattle and humans for food.

And other prey is less abundant in Tsavo than in other traditional lion haunts. A hungry lion is more likely to attack humans. Safari guides and Kenya Wildlife Service rangers tell of lions attacking land rovers, raiding camps, stalking tourists. Tsavo is a tough neighbourhood, they say and it breeds tougher lions. But are they really tougher? And if so, is there any connection between their manelessness and their ferocity? An intriguing hypothesis was advanced two years ago by Gnoske and Peterhans: Tsavo lions may be similar to the unmaned cave lions of the Pleistocene. The Serengeti variety is among the most evolved of the species-the latest model, so to speak-while certain morphological differences in Tsavo lions (bigger bodies, smaller skulls and may be even lack of a mane) suggest that they are closer to the primitive ancestor of all lions. Craig and Peyton had serious doubts about this idea, but admitted that Tsavo lions pose a mystery to science.

158) The sentence which concludes the first paragraph, 'Now they knew better', implies that

- (a) the two scientists were struck by wonder on seeing maneless lions for the first time
- (b) though Craig was an expert on the Serengeti lion, now he also knew about the Tsavo lions
- (c) earlier, Craig and West thought that amateur observers had been mistaken
- (d) Craig was now able to confirm that darkening of the noses as lions aged applied to Tsavo lions as well

159) The book *Man-Eaters of Tsavo* annoys some scientists because

- (a) it revealed that Tsavo lions are ferocious
- (b) Patterson made a helluva lot of money from the book by sensationalism
- (c) it perpetuated the bad name Tsavo lions had
- (d) it narrated how two male Tsavo lions were killed

160) Which of the following, if true, would weaken the hypothesis advanced by Gnoske and Peterhans most?

- (a) Craig and Peyton develop even more serious doubts about the idea that Tsavo lions are primitive
- (b) The maneless Tsavo East lions are shown to be closer to the cave lions
- (c) Pleistocene cave lions are shown to be far less violent than believed
- (d) The morphological variations in body and skull size between the cave and Tsavo lions are found to be insignificant

161) According to the passage, which of the following has not contributed to the popular image of Tsavo lions as savage creatures?

- (a) Tsavo lions have been observed to bring down one of the strongest and most aggressive animals-the Cape buffalo
- (b) In contrast to the situation in traditional lion haunts, scarcity of non-buffalo prey in the Tsavo makes the Tsavo lions more aggressive
- (c) The Tsavo lion is considered to be less evolved than the Serengeti variety
- (d) Tsavo lions have been observed to attack vehicles as well as humans

PASSAGE 42

Throughout human history the leading causes of death have been infection and trauma. Modern medicine has scored significant victories against both and the major causes of ill health and death are now the chronic degenerative diseases such as coronary artery disease, arthritis, osteoporosis, Alzheimer's, macular degeneration, cataract and cancer. These have a long latency period before symptoms appear and a diagnosis is made. It follows that the majority of apparently healthy people are pre-ill.

But are these conditions inevitably degenerative? A truly preventive medicine that focused on the pre-ill, analysing the metabolic errors which lead to clinical illness, might be able to correct them before the first symptom. Genetic risk factors are known for all the chronic degenerative diseases and are important to the individuals who possess them. At the population level, however, migration studies confirm that these illnesses are linked for the most part to lifestyle factors-exercise, smoking and nutrition. Nutrition is the easiest of these to change and the most versatile tool for affecting the metabolic changes needed to tilt the balance away from disease.

Many national surveys reveal the malnutrition is common in developed countries. This is not the calorie and/or micronutrient deficiency associated with

developing nations (Type A-malnutrition); but multiple micronutrient depletion, usually combined with calorific balance or excess (Type B-malnutrition). The incidence and severity of Type B-malnutrition will be shown to be worse if newer micronutrient groups such as the essential fatty acids, xanthophylls and flavonoids are included in the surveys. Commonly ingested levels of these micro nutrients seem to be far too low in many developed countries.

There is now considerable evidence that Type B-malnutrition is a major cause of chronic degenerative disease. If this is the case, then it is logical to treat such disease not with drugs but with multiple micronutrient repletion or 'pharmaco- nutrition'. This can take the form of pills and capsules-'nutraceuticals' or food formats known as 'functional foods'. This approach has been neglected hitherto because it is relatively unprofitable for drug companies-the products are hard to patent-and it is strategy which does not sit easily with modern medical interventionism. Over the last 100 years, the drug industry has invested huge sums in developing a range of subtle and powerful drugs to treat the many diseases we are subject to. Medical training is couched in pharmaceutical terms and this approach has provided us with an exceptional range of therapeutic tools in the treatment of disease and in acute medical emergencies. However, the pharmaceutical model has also created an unhealthy dependency culture, in which relatively few of us accept responsibility for maintaining our own health. Instead, we have handed over this responsibility to health professionals who know very little about health maintenance or disease prevention.

One problem for supporters of this argument is lack of the right kind of hard evidence. We have a wealth of epidemiological data linking dietary factors to health profiles/disease risks and a great deal of information on mechanism: how food factors interact with our biochemistry. But almost all intervention studies with micronutrients, with the notable exception of the omega 3 fatty acids, have so far produced conflicting or negative results. In other words, our science appears to have no predictive value. Does the invalidate the science? Or are we simply asking the wrong questions?

Based on pharmaceutical thinking, most intervention studies have attempted to measure the impact of a single micronutrient on the incidence of disease. The classical approach says that if you give a compound formula to test subjects and obtain positive results, you cannot know which ingredient is exerting the benefit, so you must test each ingredient individually. But in the field of nutrition, this does not work. Each intervention on its

own will hardly make enough difference to be measured. The best therapeutic response must therefore combine micro nutrients to normalise our internal physiology. So, do we need to analyse each individual's nutritional status and then tailor a formula specifically for him or her? While we do not have the resources to analyse millions of individual cases, there is no need to do so. The vast majority of people are consuming suboptimal amounts of most micronutrients and most of the micronutrients concerned are very safe. Accordingly, a comprehensive and universal programme of micronutrient support is probably the most cost- effective and safest way of improving the general health of the nation.

162) Tailoring micronutrient-based treatment plans to suit individual deficiency profiles is not necessary because

- (a) it is very likely to give inconsistent or negative results
- (b) it is a classic pharmaceutical approach not suited to micronutrients
- (c) most people are consuming suboptimal amounts of safe-to-consume micronutrients
- (d) it is not cost effective to do so

163) The author recommends micronutrient-repletion for large-scale treatment of chronic degenerative diseases because

- (a) it is relatively easy to manage
- (b) micronutrient deficiency is the cause of these diseases
- (c) it can overcome genetic risk factors
- (d) it can compensate for other lifestyle factors

164) Why is a large number of apparently healthy people deemed pre-ill?

- (a) They may have chronic degenerative diseases
- (b) They do not know their own genetic risk factors which predispose them to diseases
- (c) They suffer from Type B-malnutrition
- (d) There is lengthy latency period associated with chronically degenerative diseases

165) Type B-malnutrition is a serious concern in developed countries because

- (a) developing countries mainly suffer from Type A-malnutrition
- (b) it is a major contributor to illness and death
- (c) pharmaceutical companies are not producing drugs to treat this condition
- (d) national surveys on malnutrition do not include newer micronutrient groups

PASSAGE 43

The viability of the multinational corporate system depends upon the degree to which people will tolerate the unevenness it creates. It is well to remember that the 'New Imperialism' which began after 1870 in a spirit of Capitalism Triumphant, soon became seriously troubled and after 1914 was characterised by war, depression, breakdown of the international economic system and war again, rather than Free Trade, Pax Briannica and Material Improvement. A major reason was Britain's inability to cope with the by-products of its own rapid accumulation of capital; i.e. a class-conscious labour force at home; a middle class in the hinterland and rival centres of capital on the Continent and in America. Britain's policy tended to be atavistic and defensive rather than progressive-more concerned with warding off new threats than creating new areas of expansion. Ironically, Edwardian England revived the paraphernalia of the landed aristocracy it had just destroyed. Instead of embarking on a 'big push' to develop the vast hinterland of the Empire, colonial administrators often adopted policies to arrest the development of either a native capitalist class or a native proletariat which could overthrow them.

As time went on, the centre had to devote an increasing share of government activity to military and other unproductive expenditures: they had to rely on alliances with an inefficient class of landlords, officials and soldiers in the hinterland to maintain stability at the cost of development. A great part of the surplus extracted from the population was thus wasted locally.

The New Mercantilism (as the Multinational Corporate System of special alliances and privileges aid and tariff concessions is sometimes called) faces similar problems of internal and external division. The centre is troubled; excluded groups revolt and even some of the affluent are dissatisfied with the roles. Nationalistic rivalry between major capitalist countries remains an important divisive factor. Finally, there is the threat presented by the middle classes and the excluded groups of the underdeveloped countries.

The national middle classes in the underdeveloped countries came to power when the centre weakened but could not, through their policy of import substitution manufacturing, establish a viable basis for sustained growth. They now face a foreign exchange crisis and an unemployment (or population) crisis-they first indicating their inability to function in the international economy and the second indicating their alienation from the people they are supposed to lead. In the immediate future, these national middle classes will gain a new lease of life as they take advantage of the spaces created

by the rivalry between American and non-American and non-American oligopolists striving to establish global market positions. The native capitalists will again become the champions of national independence as they bargain with multinational corporations. But the conflict at this level is more apparent than real, for in the end the fervent nationalism of the middle class asks only for promotion within the corporate structure and not for a break with that structure. In the last analysis, their power derives from the metropolis and they cannot easily afford to challenge the international system. They do not command the loyalty of their own population and cannot really compete with the large, powerful, aggregate capitals from the centre. They are prisoners of the taste patterns and consumption standards set at the centre. The main threat comes from the excluded groups. It is not unusual in underdeveloped countries for the top 5 per cent to obtain between 30 and 40 per cent of the total national income and for top one-third to obtain anywhere from 60 to 70 per cent. At most, one-third of the population can be said to benefit in some sense from the dualistic growth that characterises development in the hinterland. The remaining two-thirds, who together get only one-third of the income, are outsiders, not because they do not contribute to the economy, but because they do not share in the benefits. They provide a source of cheap labour which helps keep exports to the developed world at a low price and which has financed the urban-biased growth of recent years. In fact, it is difficult to see how the system in most underdeveloped countries could survive without cheap labour since removing it (e.g. diverting it to public works projects as is done in socialist countries) would raise consumption costs to capitalists and professional elites.

166) According to the author, the British policy during the 'New Imperialism' period tended to be defensive because

- (a) it was unable to deal with the fallouts of a sharp increase in capital
- (b) its cumulative capital had undesirable side-effects
- (c) its policies favoured developing the vast hinterland
- (d) it prevented the growth of a set-up which could have been capitalistic in nature

167) In the sentence, "they are prisoners of the taste patterns and consumption standards set at the centre." (fourth paragraph), what is the meaning of 'centre' ?

- (a) National government
- (b) Native capitalists
- (c) New capitalists
- (d) None of these

168) The author is in a position to draw parallels between New Imperialism and New Mercantilism because

- (a) both originated in the developed Western capitalist countries
- (b) new Mercantilism was a logical sequel to New Imperialism
- (c) they create the same set of outputs—a labour force, middle classes and rival centres of capital
- (d) both have comparable uneven and divisive effects

169) Under New Mercantilism, the fervent nationalism of the native middle classes does not create conflict with the multinational corporations because they (the middle classes)

- (a) negotiate with the multinational corporations
- (b) are dependent on the international system for their continued prosperity
- (c) are not in a position to challenge the status quo
- (d) do not enjoy popular support

Directions (Q. Nos. 170-194) Read the passage given below and answer the questions that follow based on the information given in the passage. (2003)

PASSAGE 44

The endless struggle between the flesh and the spirit found an end in Greek art. The Greek artists were unaware of it. They were spiritual materialists, never denying the importance of the body and ever seeing in the body a spiritual significance. Mysticism on the whole was alien to the Greeks, thinkers as they were. Thought and mysticism never go well together and there is little symbolism in Greek art. Athena was not a symbol of wisdom but an embodiment of it and her statues were beautiful grave women, whose seriousness might mark them as wise, but who were marked in on other way. The Apollo Belvedere is not a symbol of the sun, nor the Versailles Artemis of the moon. There could be nothing less akin to the ways of symbolism than their beautiful, normal humanity. Nor did decoration really interest the Greeks. In all their art, they were preoccupied with what they wanted to express, not with ways of expressing it and lovely expression, merely as lovely expression, did not appeal to them at all.

Greek art is intellectual art, the art of men who were clear and lucid thinkers and it is therefore plain art. Artists than whom the world has never seen greater, men endowed with the spirit's best gift, found their natural method of expression in the simplicity and clarity which are the endowment of the unclouded reason. 'Nothing in excess' the Greek axiom of art is the dictum of men who would brush aside all obscuring,

entangling superfluity and see clearly: plainly, unadorned, what they wished to express. Structure belongs in an especial degree to the province of the mind in art and architectonics were eminently a mark of the Greek. The power that made a unified whole of the trilogy of a Greek tragedy, that envisioned the sure, precise, decisive scheme of the Greek statue, found its most conspicuous expression in Greek architecture. The Greek temple is the creation, par excellence, of mind and spirit in equilibrium.

A Hindu temple is a conglomeration of adornment. The lines of the building are completely hidden by the decorations. Sculptured figures and ornaments crowd its surface, stand out from it in thick masses, break it up into a bewildering series of irregular tiers. It's not a unity but a collection, rich, confused. It looks like something not planned but built this way and that as the ornament required. The conviction underlying it can be perceived: each bit of the exquisitely wrought detail had a mystical meaning and the temple's exterior was important only as a means for the artist to inscribe thereon the symbols of the truth. It is decoration not architecture.

Again, the gigantic temples of Egypt, those massive immensities of granite which look as if only the power that moves in the earthquake were mighty enough to bring them into existence, are something other than the creation of geometry balanced by beauty. The science and the spirit are there, but what is there most of all is force, unhuman force, calm but tremendous overwhelming. It reduces to nothingness all that belongs to man. He is annihilated. The Egyptian architects were possessed by the consciousness of the awful, irresistible domination of the ways of nature; they had no thought to give to the insignificant atom that was man.

Greek architecture of the great age is the expression of men who were, first of all, intellectual artists, kept firmly within the visible world by their mind, but, only second to that, lovers of the human world. The Greek temple is the perfect expression of the pure intellect illumined by the spirit. No other great buildings anywhere approach its simplicity. In the parthenon straight columns rise to plain capitals; a pediment is sculptured in bold, relief; there is nothing more. And yet—here is the Greek miracle—this absolute simplicity of structure is alone in majesty of beauty among all the temples and cathedrals and palaces of the world. Majestic but human, truly Greek. No superhuman force as in Egypt; no strange supernatural shapes as in India; the Parthenon is the home of humanity! at ease, calm ordered, sure of itself and the world. The Greeks flung a challenge to nature in the fullness of their joyous strength. They set their temples on the summit of a hill overlooking the wide sea,

outlined against the circle of the sky. They would 'build what was more beautiful than hill and sea and sky and greater than all these. It matters not at all if the temple is large or small; one never thinks of the size. It matters not how much it is in ruins. A few white columns dominate the lofty height at Sunion as securely as the great mass of the Parthenon dominates all the sweep of sea and land around Athens. To the Greek architect man was the master of the world. His mind could understand its laws; his spirit could discover its beauty.

- 170)** From the passage, which of the following combinations can be inferred to be correct?
- Hindu temple–power of nature
 - Parthenon–simplicity
 - Egyptian temple–mysticism
 - Greek temple–symbolism
- 171)** Which of the following is not a characteristic of Greek architecture, according to the passage?
- A lack of excess
 - Simplicity of form
 - Expression of intellect
 - Mystic spirituality
- 172)** According to the passage, what conception of man can be inferred from Egyptian architecture?
- Man is the centre of creation
 - Egyptian temples save man from unhuman forces
 - Temples celebrate man's victory over nature
 - Man is inconsequential before the tremendous force of nature
- 173)** According to the passage, which of the following best explains why there is little symbolism in Greek art?
- The Greeks focused on thought rather than mysticism
 - The struggle between the flesh and the spirit found an end in Greek art
 - Greek artists were spiritual materialists
 - Greek statues were embodiments rather than symbols of qualities
- 174)** "The Greeks flung a challenge to nature in the fullness of their joyous strength." Which of the following best captures the challenge that is being referred to?
- To build a movement matching the background colours of the sky and the sea
 - To build a monument bigger than nature's creations
 - To build monuments that were more appealing to the mind and spirit than nature's creations
 - To build a small but architecturally perfect monument

PASSAGE 45

At first sight, it looks as though panchayati raj, the lower layer of federalism in our polity, is as firmly entrenched in our system as is the older and higher layer comprising the Union Government and the States. Like the democratic institutions at the higher level, those at the panchayat level, the Panchayati Raj Institutions (PRIs), are written into and protected by the Constitution. All the essential features which distinguish a unitary system from a federal one, are as much enshrined at the lower as the upper level of our federal system. But look closely and you will discover a fatal flaw. The letter of the Constitution as well as the spirit of the present polity have exposed the intra-State level of our federal system to a dilemma of which the inter-State and Union-State layers are free. The flaw has many causes. But all of them are rooted in an historical anomaly, that while the dynamics of federalism and democracy have given added strength to the rights given to the States in the Constitution, they have worked against the rights of panchayats.

At both level of our federal system, there is the same tussle between those who have certain rights and those who try to encroach upon them if they believe they can. Thus, the Union Government was able to encroach upon certain rights given to the States by the Constitution. It got away with that because the single dominate party system, which characterised Centre-State relations for close upon two decades, gave the party in power at the Union level many extra-constitutional political levers. Second, the Supreme Court had not yet begun to extend the limits of its power. But all that has changed in recent times. The spurt given to a multi-party democracy by the overthrow of the Emergency in 1977 became a long-term trend later on because of the ways in which a vigorously democratic multi-party system works in a political society which is as assertively pluralistic as Indian society is. It gives political clout to all the various segments which constitute that society. Secondly, because of the linguistic reorganistaion of States in the 1950s, many of the most assertive segments have found their most assertive expression as States. Thirdly, with single-party dominance becoming a thing of the past at the Union level, governments can be formed at that level only by multi-party coalitions in which State-level parties are major players. This has made it impossible for the Union Government to do much about anything unless it also carries a sufficient number of State-level parties with it. Indian federalism is now more real than it used to be, but an unfortunate side-effect is that India's panchayati raj system, inaugurated with such fanfare in the early 1980s, has become less real.

By the time the PRIs came on the scene, most of the political space in our federal system had been occupied by the Centre in the first 30 years of Independence and most of what was still left after that was occupied by the States in the next 20. PRIs might have hoped to wrest some space from their immediate neighbour, the States, just as the States had wrested some from the Centre. But having at last managed to checkmate the Centre's encroachments on their rights, the States were not about to allow the PRIs to do some encroaching of their own. By the 1980s and early 1990s, the only national party left, the Congress, had gone deeper into a siege mentality. Finding itself surrounded by State-level parties, it had built walls against them instead of winning them over. Next, the States retaliated by blocking Congress proposals for panchayati raj in Parliament, suspecting that the Centre would try to use panchayats to by-pass State Governments. The suspicion fed on the fact that the powers proposed by the Congress for panchayats were very similar to many of the more lucrative powers of State Governments. State-level leaders also feared, perhaps, that if panchayat-level leaders captured some of the larger PRIs, such as district-level panchayats, they would exert pressure on State-level leaders through intra-State multi-party federalism. It soon became obvious to Congress leaders that there was no way the panchayati raj amendments they wanted to write into the Constitution would pass muster unless State-level parties were given their pound of flesh. The amendments were allowed only after it was agreed that the powers of panchayats could be listed in the Constitution. Illustratively, they would be defined and endowed on PRIs by the State Legislature acting at its discretion. This left the door wide open for the States to exert the power of the new political fact that while the Union and State Governments could afford to ignore panchayats as long as the MIAs were happy, the Union Government had to be sensitive to the demands of State-level parties. This has given State-level actors strong beachheads on the shores of both inter-State and intra-State federalism. By using various administrative devices and non-elected parallel structures, State Governments have subordinated their PRIs to the State administration and given the upper hand to State Government officials against the elected heads of PRIs. Panchayats have become local agencies for implementing schemes drawn up in distant State capitals. And their own volition has been further circumscribed by a plethora of 'Centrally-sponsored schemes'. These are drawn up by even more distant Central authorities but at the same time tie up local staff and resources on pain of the schemes being switched off in the absence of

matching local contribution. The 'foreign aid' syndrome can be clearly seen at work behind this kind of 'grass roots development'.

175) The central theme of the passage can be best summarised as

- (a) our grassroots development at the panchayat level is now driven by the 'foreign aid syndrome'
- (b) panchayati raj is firmly entrenched at the lower level of our federal system of governance
- (c) a truly federal polity has not developed since PRIs have not been allowed the necessary political space
- (d) the Union Government and State-level parties are engaged in a struggle for the protection of their respective rights

176) The sentence in the last paragraph, "And their own volition has been further circumscribed", refers to

- (a) the weakening of the local institutions' ability to plan according to their needs
- (b) the increasing demands made on elected local leaders to match central grants with local contributions
- (c) the empowering of the panchayat system as implementers of schemes from State capitals
- (d) the process by which the prescribed Central schemes are reformulated by local elected leaders

177) What is the 'dilemma' at the intra-State level mentioned in the first paragraph of the passage?

- (a) Should the State Governments wrest more space from the Union, before considering the panchayati system?
- (b) Should rights similar to those that the States managed to get be extended to panchayats as well?
- (c) Should the single party system which has withered away be brought back at the level of the States?
- (d) Should the States get 'their pound of flesh' before allowing the Union Government to pass any more laws?

178) Which of the following most closely describes the 'fatal flaw' that the passage refers to?

- (a) The ways in which the democratic multi-party system works in an assertively pluralistic society like India's are flawed
- (b) The mechanisms that our federal system uses at the Union Government level to deal with States are imperfect
- (c) The instruments that have ensured federalism at one level, have been used to achieve the opposite at another
- (d) The Indian Constitution and the spirit of the Indian polity are fatally flawed

- 179) Which of the following best captures the current state of Indian federalism as described in the passage?
- (a) The Supreme Court has not begun to extend the limits of its power
 - (b) The multi-party system has replaced the single party system
 - (c) The Union, State and panchayati raj levels have become real
 - (d) There is real distribution of power between the Union and State level parties

PASSAGE 46

While I was in class at Columbia, struggling with the *esoterica du jour*, my father was on a bricklayer's scaffold not far up the street, working on a campus building. Once we met up on the subway going home—he was with his tools, I with my books. My father wasn't interested in Thucydides and I wasn't up on arches. My dad has built lots of places in New York City he can't get into: coliest condos, office towers. He made his living on the outside. Once the walls were up, a place took on a different feel for him, as though he wasn't welcome anymore. Related by blood, we're separated by class, my father and I. Being the white-collar child of a blue-collar parent means being the hinge on the door between two ways of life. With one foot in the working-class, the other in the middle class, people like me are Straddlers, at home in neither world, living a limbo life.

What drove me to leave what I knew? Born blue-collar. I still never felt completely at home among the tough guys and anti-intellectual crowd of my neighbourhood in deepest Brooklyn. I never did completely fit in among the preppies and suburban royalty of Columbia, either. It's like that for Straddlers. It was not so smooth jumping from Italian old-world style to US professional in a single generation. Others who were the first in their families to go to college, will tell you the same thing: the academy can render you unrecognisable to the very people who launched you into the world. The ideas and values absorbed in college challenge the mom-and-pop orthodoxy that passed for truth for 18 years. Limbo folk may eschew polyester blends for sea-isle cotton, prefer Brie to Kraft slices. They marry outside the neighbourhood and raise their kids differently. They might not be in church on Sunday.

When they pick careers (not jobs), it's often a kind of work their parents never heard of or can't understand. But for the white-collar kids of blue-collar parents, the office is not necessarily a sanctuary. In Corporate America, where the rules are based on notions foreign to

working-class people, a Straddler can get lost. Social class counts at the office, even though nobody likes to admit it. Ultimately, corporate norms are based on middle-class values, business types say. From an early age, middle-class people learn how to get along, using diplomacy, nuance and politics to grab what they need. It is as though they are following a set of rules laid out in a manual that blue-collar families never have the chance to read. People born into the middle-class to parents with college degrees have lived lives filled with what French sociologist Pierre. Bourdieu calls 'cultural capital'. Growing up in an educated environment, they learn about Picasso and Mozart, stock portfolios and creme brulee. In a home with cultural capital, there are networks: someone always has an aunt or golfing buddy with the inside track for an internship or some entry-level job. Dinner-table talk could involve what happened that day to mom and dad at the law firm, the doctor's office or the executive suite. Middle-class kids can grow up with a sense of entitlement that will carry them through their lives. This 'belongingness' is not just related to having material means, it also has to do with learning and possessing confidence in your place in the world. Such early access and direct exposure to culture in the home is the more organic, 'legitimate' means of appropriating cultural capital, Bourdieu tells us. Those of us possessing 'ill-gotten Culture' can learn it, but never as well. Something is always a little off about us, like an engine with imprecise timing. There's a greater match between middle-class lives and the institutions in which the middle-class works and operates—universities or corporations. Children of the middle and upper-classes have been speaking the language of the bosses and supervisors forever.

Blue-collar kids are taught by their parents and communities to work hard to achieve and that merit is rewarded. But no blue-collar parent knows whether such things are true in the middle-class world. Many professionals born to the working-class report feeling out of place and outmanoeuvred in the office. Soon enough, Straddlers learn that straight talk won't always cut. Resolving conflicts head-on and speaking your mind doesn't always work, no matter how educated the Straddler is.

In the working-class, people perform jobs in which they are closely supervised and are required to follow orders and instructions. That, in turn, affects how they socialise their children. Children of the working-class are brought up in a home in which conformity, obedience and intolerance for back talk are the norm—the same characteristics that make a good factory worker.

- 180)** When Straddlers enter white-collar jobs, they get lost because
- (a) they are thrown into an alien value system
 - (b) their families have not read the rules in corporate manuals
 - (c) they have no one to guide them through the corporate maze
 - (d) they miss the 'mom and opp orthodoxy'
- 181)** What does the author's statement, "My father wasn't interested in Thucydides and I wasn't up on arches", illustrate?
- (a) Organic cultural capital
 - (b) Professional arrogance and social distance
 - (c) Evolving social transformation
 - (d) Breakdown of family relationships
- 182)** Which of the following statements about Straddlers does the passage not support explicitly?
- (a) Their food preferences may not match those of their parents
 - (b) They may not keep up some central religious practices of their parents
 - (c) They are at home neither in the middle class nor in the working-class
 - (d) Their political ideologies may differ from those of their parents
- 183)** According to the passage, which of the following statements about 'cultural capital' is not true?
- (a) It socializes children early into the norms of middle class institutions
 - (b) It helps them learn the language of universities and corporations
 - (c) It creates a sense of enlightenment in middle-class children
 - (d) It develops bright kids into Straddlers
- 184)** According to the passage, the patterns of socialisation of working-class children make them most suited for jobs that require
- (a) diplomacy
 - (b) compliance with orders
 - (c) enterprise and initiative
 - (d) high risk taking

PASSAGE 47

The invention of the turbine by Frank Whittle in England and Hans von Ohain in Germany in 1939 signalled the beginning of jet transport. Although, the French engineer Lorin had visualised the concept of jet propulsion more than 25 years earlier, it took improved materials and the genius of Whittle and von Ohain to recognise the advantages that a gas turbine offered over a piston engine, including speeds in excess of 350 miles

per hour. The progress from the first flights of liquid propellant rocket and jet-propelled aircraft in 1939 to the first faster-than-sound (supersonic) manned airplane (the Bell X-1) in 1947 happened in less than a decade. This then led very rapidly to a series of supersonic fighters and bombers, the first of which became operational in the 1950s. World War II technology foundations and emerging Cold War imperatives then led us into space with the launch of Sputnik in 1957 and the placing of the first man on the moon only 12 years later—a mere 24 years after the end of World War II.

Now a hypersonic flight can take you anywhere in the planet in less than four hours. British Royal Air Force and Royal Navy and the air forces of several other countries are going to use a single-engine cousin to the F/A-22 called the F-35 joint Strike Fighter. These planes exhibit stealthy angles and coatings that make it difficult for radar to detect them, among aviation's most cutting-edge advances in design. The V-22, known as tilt-rotor, part helicopter, part airplane, takes off vertically; then tilts its engine forward for winged flight. It provides speed, three times the payload, five times the range of the helicopters it's meant to replace. The new fighter, F/A-22 Raptor, with more than a million parts, shows a perfect amalgamation of stealth, speed, avionics and agility.

It seems conventional forms, like the Predator and Global Hawk are passe, the stealthier Unmanned Aerial Vehicles (UAVs) are in. They are shaped like kites, bats and boomerang, all but invisible to the enemy radar and able to remain over hostile territory without any fear of getting grilled if shot down. Will the UAVs take away pilots' jobs permanently? Can a computer-operated machine take a smarter and faster decision in a war-like situation? The new free-flight concept will probably supplement the existing air traffic control system by computers on each plane to map the altitude, route, weather and other planes and a decade from now, there will be no use of radar any more.

How much bigger can the airplanes get? In the 50s they got speed, in the '80s they became stealthy. Now, they are getting smarter thanks to computer automation. The change is quite huge: from the four-seater to the A 380 airplane. It seems we are now trading speed for size as we build a new Super-jumbo jet, the 555 seater A 380, which will fly at almost the same speed of the Boeing 707 introduced half a century ago, but with an improved capacity; range, greater fuel economy. A few years down the line will come the truly larger model, to be known as 747X. In the beginning of 2005, the A380, the world's first fully double-decked super-jumbo passenger jet, weighing 1.2 million pounds, may carry a load of about 840 passengers.

Barring the early phase, civil aviation has always lagged behind the military technologies (of jet engines, lightweight composite materials etc.). There are two fundamental factors behind the decline in commercial aeronautics in comparison to military aeronautics. There is no collective vision of our future such as the one that drove us in the past. There is also a need for a more aggressive pool of airplane design talents to maintain an industry that continues to find a multibillion dollar-a-year market for its product.

Can the history of aviation technology tell us something about the future of aeronautics? Have we reached a final state in our evolution to a mature technology in aeronautics? Are the challenges of coming out with the 'better, cheaper, faster' designs somehow inferior to those that are suited for 'faster, higher, further'? Safety should improve greatly as a result of the forthcoming improvements in airframes, engines and avionics. Sixty years from now, aircraft will recover on their own if the pilot loses control. Satellites are the key not only to GPS (Global Positioning System) navigation but also to in-communications, uplinked weather and even inflight e-mail. Although, there is some debate about what type of engines will power future airplanes—lightweight turbines, turbocharged diesels or both—there is little debate about how these power plants will be controlled. Pilots of the future can look forward to more and better on-board safety equipment.

- 185)** According to the paragraph of the passage, which of the following statements is not false?
- (a) Frank Whittle and Hans von Ohain were the first to conceive of jet propulsion
 - (b) Supersonic fighter planes were first used in the Second World War
 - (c) No man had travelled faster than sound until the 1950s
 - (d) The exploitation of jet propulsion for supersonic aviation has been remarkably fast
- 186)** What is the fourth paragraph of the passage, starting, "How much bigger....." about?
- (a) Stealth, speed, avionics and agility of new aircraft
 - (b) The way aircraft size has been growing
 - (c) Use of computer automation in aircraft
 - (d) Super-jumbo jets that can take more than 500 passengers
- 187)** What is most noteworthy difference between V-22 and a standard airplane?
- (a) It can take off vertically
 - (b) It has winged flight
 - (c) It has excellent payload
 - (d) Its range is very high

188) Why might radars not be used a decade from now?

- (a) Stealth technology will advance so much that it is pointless to use radar to detect aircraft
- (b) UAVs can remain over hostile territory without any danger of being detected
- (c) Computers on board may enable aircraft to manage safe navigation on their own
- (d) It is not feasible to increase the range of radars

189) According to the author, commercial aeronautics, in contrast to military aeronautics, has declined because, among other things,

- (a) speed and technology barriers are more easily overcome in military aeronautics
- (b) the collective vision of the past continues to drive civil and commercial aeronautics
- (c) though the industry has a huge market, it has not attracted the right kind of aircraft designers
- (d) there is a shortage of materials, like light weight composites, used in commercial aeronautics

PASSAGE 48

Pure love of learning, of course, was a less compelling motive for those who became educated for careers other than teaching. Students of law in particular had a reputation for being materialistic careerists in an age when law was becoming known as "the lucrative science" and its successful practice the best means for rapid advancement in the government of both church and state. Medicine too had its profit-making attractions. Those who did not go on to law or medicine could, if they had been well trained in the arts, gain positions at royal courts or rise in the clergy. Eloquent testimony to the profit motive behind much of 12th century education was the lament of a student of Abelard around 1150 that "Christians educate their sons ... for gain, in order that the one brother, if he be a clerk, may help his father and mother and his other brothers, saying that a clerk will have no heir and whatever he has will be ours and the other brothers. With the opening of positions in law, government and the church, education became a means for advancement not only in income but also in status most who were educated were wealthy; but in the 12th century; more often than before. Many were not and were to rise through the ranks by means of their education. The most familiar examples are Thomas Becket, who rose from a humble background to become chancellor of England and then archbishop of Canterbury and John of Salisbury; who was born a "but because of his reputation for learning died as bishop of Chartres.

The instances of Becket and John of Salisbury bring us to the most difficult question concerning twelfth-century education: To what degree was it still a clerical preserve?

Despite the fact that throughout the twelfth century the clergy had a monopoly of instruction, one of the outstanding medievalists of our day; RW Southern, refers with good reason to the institutions staffed by the clergy as secular schools. How can we make sense out of the paradox that 12th century schools were clerical and yet 'secular'?

Let us look at the clerical side first. Not only were all 12th century teachers except professionals and craftsmen in church orders, but in Northern Europe students in schools had clerical status and looked like priests. Not that all really were priests, but by virtue of being students all were awarded the legal privileges accorded to the clergy. Furthermore, the large majority of 12th century students, outside of the possible exception of Italy; if not already priests became so after their studies were finished. For these reasons, the term 'cleric' was often used to denote a man who was literate and the term 'layman' one who was illiterate. The English word for cleric, clerk, continued for a long time to be a synonym for student or for a man who could write, while the French word *clerc* even today has the connotation of intellectual.

Despite all this, 12th century education was taking on many secular qualities in its environment goals and curriculum. Student life obviously became more secular when it moved out from the monasteries into bustling towns. Most students wandered from town to town in search not only of good masters, but also of worldly excitement and as the 12th century progressed they found the best of each in Paris. More important than environment was the fact that most students, even though they entered the clergy; had secular goals. Theology was recognised as the queen of the sciences, but very few very few went on to it. Instead they used their study of the liberal arts as a preparation for law, medicine, government service or advancement in the ecclesiastical hierarchy.

This being so, the curriculum of the liberal arts became more sophisticated and more divorced from religion. Teaching was still almost exclusively in Latin and the first book most often read was the Psalter, but further education was on long similar to that of a choir school. In particular, the discipline of rhetoric was transformed from a linguistic study into instruction in how to compose letters and documents; there was a new stress on logic and in all liberal arts and philosophy texts more advanced than those known in the early Middle Ages were introduced.

Along with the rise of logic came the translation of Greek and Arabic philosophical and scientific works. Most important was the translation of almost all the writings

of Aristotle, as well as his sophisticated Arabic commentators, which helped to bring about an intellectual revolution based on Greek rationalism. On a more prosaic level, contact with Arabs resulted in the introduction in the 12th century of the Arabic numeral system and the concept of zero. Though most westerners first resisted this and made crude jokes about the zero as an ambitious number "that counts for nothing and yet wants to be counted," the system steadily made its inroads first in Italy and then throughout Europe, thereby vastly simplifying the arts of computation and record keeping.

- 190)** According to the passage, what led to the secularisation of the curriculum of the liberal arts in the 12th century ?
- (a) It was divorced from religion and its influences
 - (b) Students used it mainly as a base for studying law and medicine
 - (c) Teaching could no longer be conducted exclusively in Latin
 - (d) Arabic was introduced into the curriculum
- 191)** According to the author, in the 12th century, individuals were motivated to get higher education because it
- (a) was a means for material advancement and higher status
 - (b) gave people with wealth an opportunity to learn
 - (c) offered a coveted place for those with a love of learning
 - (d) directly added to the income levels of people
- 192)** According to the passage, 12th century schools were clerical and yet secular because
- (a) many teachers were craftsmen and professionals who did not form part of the church
 - (b) while the students had the legal privileges accorded to the clergy and looked like priests, not all were really priests
 - (c) the term 'cleric' denoted a literate individual rather than a strict association with the church
 - (d) though the clergy had a monopoly in education, objectives and curriculum in the schools were becoming secular
- 193)** What does the sentence "Christians educate their sons ... will be ours and the other brothers" imply?
- (a) The Christian family was a close-knit unit in the 12th century
 - (b) Christians educated their sons not so much for the love of learning as for material gain
 - (c) Christians believed very strongly in educating their sons in the Church
 - (d) The relationship between Christian parents and their sons was exploitative in the 12th century

194) According to the passage, which of the following is the most noteworthy trend in education in twelfth century Europe?

- (a) Secularisation
- (b) Flowering of theology as the queen of the sciences
- (c) Wealthy people increasingly turning to education
- (d) Rise of the clergy's influence on the curriculum

Directions (Q. Nos. 195-219) Read the passage given below and answer the questions that follow based on the information given in the passage. (2002)

PASSAGE 49

The production of histories of India has become very frequent in recent years and may well call for some explanation. Why so many and why this one is particular? The reason is a two fold one: changes in the Indian scene requiring a reinterpretation of the facts and changes in attitudes of historians about the essential elements of Indian history. These two considerations are in addition to the normal fact of fresh information, whether in the form of archaeological discoveries throwing fresh light on an obscure period or culture or the revelations caused by the opening of archives or the release of private papers. The changes in the Indian scene are too obvious to need emphasis. Only two generations ago British rule seemed to most Indian as well as British observers likely to extend into an indefinite future; now there is a teenage generation which knows nothing of it. Changes in the attitudes of historians have occurred everywhere, changes in attitudes to the content of the subject as well as to particular countries, but in India there have been some special features. Prior to the British, Indian historiographers were mostly Muslims, who relied, as in the case of Sayyid Ghulam Hussain, on their own reflection of events and on information from friends and men of affairs. Only a few like Abul Fazl had access to official papers. These were personal narrative of events varying in value with the nature of the writer. The early British writers were officials. In the 18th century, they were concerned with some aspect Company policy or like Robert Orme in his *Military Transactions*, gave a straight narrative in what was essentially a continuation of the Muslim tradition. In the early 19th century, the writers were still, with two notable exceptions, officials, but they were now engaged in chronicling, in varying moods of zest, pride and awe, the rise of the British power in India to supremacy. The two exceptions were James Mill, with his critical attitude to the Company and John Marchman, the Baptist missionary. But they, like the officials, were anglo-centric in their attitude, so that the history of modern India in their hands came to be the

history of the rise of the British in India. The official school dominated the writing of Indian history until we get the first professional historian's approach, Ramsay Muir and PE Roberts in England and HH Dodwell in India. Then Indian historians trained in the English school joined in, of whom the most distinguished was Sir Jadunath Sarkar and the other notable writers : Surendranath Sen, Dr Radhakumud Mukerji and professor Nilakanta Shastri. They, it may be said, restored India to Indian history, but their bias was mainly political. Finally have come the nationalists who range from those who can find nothing good or true in the British to sophisticated historical philosophers like KM Panikkar.

Along with type of historians with their varying bias have gone changes in the attitude to the content of Indian history. Here Indian historians have been influenced both by their local situation and by changes of thought elsewhere. It is in this field that this work can claim some attention since it seeks to break new ground or perhaps to deepen a freshly turned furrow in the field of Indian history. The early official historians were content with the glamour and drama of political history Plassey to the Mutiny, from Dupleix to the Sikhs. But when the raj was settled down, glamour departed from politics and they turned to the less glorious but more solid ground of administration. Not how India was conquered but how it was governed was the theme of this school of historians. It found its archpriest in HH Dodwell, its priestess in Dame Lilian Penson and its chief shrine in the Volume VI of the *Cambridge History of India*. Meanwhile in Britain other currents were moving which led historical study into the economic and social fields. RC Dutt entered the first of these currents with his *Economic History of India* to be followed more recently by the whole group of Indian economic historians. WE Moreland extended these studies to the Mughal period. Social history is now being increasingly studied and there is also of course a school of nationalist historians who see modern Indian history in terms of the rise and the fulfillment of the national movement.

All these approaches have value, but all share in the quality of being compartmental. It is not enough to remove political history from its pedestal of being the only kind of history worth having if it is merely to put other types of history in its place. Too exclusive an attention to economic, social or administrative history can be as sterile and misleading as too much concentration on politics. A whole subject needs a whole treatment for understanding. A historian must dissect his subject into its elements and then fuse them together again into an integrated whole. The true history of a country must contain all the features just cited but must present them as parts of a single consistent theme .

- 195)** Which of the following may be the closest in meaning to the statement “restored India to Indian history?”
- Indian historians began writing Indian history.
 - Trained historians began writing Indian history.
 - Writing India-centric Indian history began.
 - Indian history began to be written in India.
- 196)** Which of the following is the closest implication of the statement “to break new ground or perhaps to deepen a freshly turned furrow”?
- Dig afresh or dig deeper
 - Start a new stream of thought or help establish a recently emerged perspective
 - Begin or conduct further work on existing archaeological sites to unearth new evidence
 - Begin writing a history free of any biases
- 197)** Historian moved from writing political history to writing administrative history because
- attitude of the historian changed
 - the ‘Raj’ was settled down.
 - politics did not retain its past glamour.
 - administrative history was based on solid ground.
- 198)** According to the outline which of the following is not among the attitude of Indian historian of Indian origin ?
- Writing story as personal narrative.
 - Writing history with political bias.
 - Writing non-political history due to take of glamour.
 - Writing history dissecting elements and intergrating them again.
- 199)** In the table given below match the historian to the approaches taken by them.
- | | |
|------------------------|------------------------|
| A. Administrative | B. Political |
| C. Narrative | D. Economic |
| E. Robert Orme | F. HH Dodwell |
| G. Radhakumud Mukherji | H. RC Dutt |
| (a) A-F, B-G, C-E, D-H | (b) A-G, B-F, C-E, D-H |
| (c) A-E, B-F, C-G, D-H | (d) A-F, B-H, C-E, D-G |

PASSAGE 50

There are a seemingly endless variety of laws, restriction, customs and traditions that effect the practice of abortion around the world. Globally; abortion is probably the single most controversial issue in the whole area of women’s rights and family matters. It is an issue that inflames women’s right groups, religious institutions and the self-proclaimed ‘guardians’ of public morality. The growing world did a belief is that the right to control one’s fertility is a basic human right. This has resulted in a world wide trend towards liberalization of abortion laws.

40 percent of the world’s population lives in countries where induced abortion is permitted on request. An additional 25 percent live in countries where it is allowed if the women’s life would be endangered if she went to full term with her pregnancy. The estimate is that between 26 and 31 million legal abortions were performed in 1987. However, there were also between 10 and 22 million illegal abortions performed in that year.

Feminists have viewed the patriarchal control of women’s bodies as one of the prime issues facing the contemporary women’s movement. They observe that the definition and control of women’s reproductive freedom have always been the province of men. Patriarchal religion, as manifest in Islamic fundamentalism, traditionist Hindu practice orthodox Judaism and Roman Catholicism has been an important historical contributory factor for this and continues to be an important presence in contemporary societies. In recent times, governments, usually controlled by men, have ‘given’ women the right to contraceptive use and abortion access when their countries were perceived to have an overpopulation problem. When these countries are perceived to be underpopulated, that right has been absent. Until the 19th century; a woman’s rights to an abortion followed English common law; it could only be legally challenged if there was a ‘quickening’, when the first movements of the foetus could be felt. In 1800, drugs to induce abortions were widely advertised in local newspapers. By 1900, abortion was banned in every state except to save the life of the mother. The change was strongly influenced by the medical profession, which focussed its campaign ostensibly on health and safety issues for pregnant women and the sanctity of life. Its position was also means of control of non-licensed medical practitioners such as midwives and women healers who practiced abortion.

The anti-abortion campaign was also influenced by political considerations. The large influx of eastern and southern European immigrants with their large families was seen as threat to the population balance of the future United States. Middle and Upper-class Protestants were advocates of abortion as a form of birth control. By supporting abortion prohibitions the hope was that these Americans would have more children and thus prevent the tide of immigrant babies from overwhelming the demographic characteristics of Protestant America.

The anti-abortion legislative position remained in effect in the United States through the first sixty-five years of the 20th century. In the early 1960s, even when it was widely known that the drug thalidomide taken during pregnancy to alleviate anxiety was shown to contribute to the formation of deformed ‘flipper-like’ hands or legs of children, abortion was illegal in the United States. A

second health tragedy was the severe outbreak of rubella during the same time period, which also resulted in major birth defects. These tragedies combined with a change of attitude towards a woman's right to privacy led a number of states to pass abortion-permitting legislation. On one side of the controversy are those who call themselves 'pro-life'. They view foetus as a human life rather than as an unformed complex of cells; therefore they hold to the belief that abortion is essentially murder of an unborn child. These groups cite both legal and religious reasons for their opposition to abortion. Pro-lifers point to the rise in legalised abortion figures and see this as morally intolerable. On the other side of the issue are those who call themselves 'pro-choice'. They believe that woman, not legislators or judges, should have the right to decide whether and under what circumstances they will bear children. Pro-choicers are of the opinion that laws will not prevent women from having abortions and cite the horror stories of the past when many women died at the hands of 'backroom' abortionists and in desperate attempts to self abort. They also observe that legalised abortion is especially important for rape victims and incest victims who became pregnant. They stress physical and mental health reasons why women should not have unwanted children.

To get a better understanding of the current abortion controversy; let us examine a very important work by Kristin Luker titled ABORTION AND THE POLITICS OF MOTHERHOOD. Luker argues that female pro-choice and pro-life activists hold different world views regarding gender, sex and the meaning of parenthood. Moral positions on abortions are seen to be tied intimately to views on -sexual behaviour, the care of children, family life, technology and the importance of the individual. Luker identifies 'pro-choice' women as educated, affluent and liberal. Their contrasting counterparts, 'pro-life' women, support traditional concepts of women as wives and mothers. It would be instructive to sketch out the differences in the world views of these two sets of women. Luker examines California with its liberalised abortion law, as a case history. Public documents and newspaper accounts over a twenty-year period were analysed and over 200 interviews were held with both pro-life and pro-choice activists.

Luker found that pro-life and pro-choice activists have intrinsically different views with respect to gender. Pro-life women have a notion of public and private life. The proper place for men is in the public sphere of work; for women, it is the private sphere of the home. Men benefit thorough the nurturance of women; women benefit through the protection of men. Children are seen to be the ultimate beneficiaries of this arrangement by having the mother as a full-time loving parent and by

having clear role models. Pro-choice advocates reject the view of separate spheres. They object to the notion of the home being the 'women's sphere'. Women's reproductive and family roles are seen as potential barriers to full equality. Motherhood is seen as a voluntary, not a mandatory or 'natural' role.

In summarizing her findings, Luker believes that women become activists in either of the two movements as the end result of lives that center around different conceptualisations of motherhood. Their beliefs and values are rooted to the concrete circumstances of their lives, their educations, incomes, occupations and the different marital and family choices that they have made. They represent two different world views of women's roles in contemporary society and as such the abortion issues represents the battleground for the justification of their respective views.

- 200) According to your understanding of the author's arguments which countries are more likely to allow abortion?
 - (a) India and China
 - (b) Australia and Mongolia
 - (c) Cannot be inferred from the passage
 - (d) Both (a) and (b)
- 201) Which amongst these was NOT a reason for banning of abortions by 1900 ?
 - (a) Medical professional stressing the health and safety of women
 - (b) Influx of eastern and southern European immigrants
 - (c) Control of unlicensed medical practitioners
 - (d) A tradition of matriarchal control
- 202) A pro-life woman would advocate abortion if
 - (a) the mother of an unborn child is suicidal
 - (b) bearing a child conflicts with a woman's career prospects
 - (c) the mother becomes pregnant accidentally.
 - (d) None of the above
- 203) Pro-choice women object to the notion of the home being the 'women's sphere' because they believe
 - (a) that the home is a 'joint sphere' shared between men and women
 - (b) that reproductions is a matter of choice for women
 - (c) that men and women are equal
 - (d) Both (b) and (c)
- 204) Two health tragedies affecting US Society in the 1960s led to
 - (a) a change in attitude to women's right to privacy
 - (b) retaining the anti-abortion laws with some exceptions
 - (c) scrapping to anti-abortion laws
 - (d) strengthening of the pro-life lobby

205) Historically, the pro-choice movement has got support from, among others

- (a) major patriarchal religions
- (b) countries with low population density
- (c) medical profession
- (d) None of the above

PASSAGE 51

If translated into English, most of the ways economists talk among themselves would sound plausible enough to poets, journalists, businessmen and other thoughtful though non-economical folk. Like serious talk any where among boat designers and baseball fans, say-the talk is hard to follow when one has not made a habit of listening to it for a while. The culture of the conversation makes the words arcane. But the people in the unfamiliar conversation are not favourite Martians. Underneath it (the economist's phrase) conversational habits are similar. Economics uses mathematical models and statistical tests and market arguments, all of which look alien to the literary eye. But looked at closely they are not so alien. They may be seen as figures of speech-metaphors, analogies and appeals to authority.

Figures of speech are not mere frills. They think for us. Someone who thinks of market as an 'invisible hand' and the organization of work as a 'production function' and its coefficients as being 'significant' as an economist does, is giving the language a lot of responsibility. It seems a good idea to look hard at his language. If the economic conversation were found to depend a lot on its verbal forms, this would not mean that economics would be not a science or just a matter of opinion or some sort of confidence game. Good poets, though not scientists, are serious thinkers about symbols; good historians, though not scientists, are serious thinkers about data. Good scientists also use language. What is more, (though it remains to be shown) they use the cunning of language, without particularly meaning to. The language used is a social object and using language is a social act. It requires cunning (or, if you prefer, consideration) attention to the other minds present when one speaks.

The paying of attention to one's audience is called 'rhetoric', a word that I later exercise hard. One uses rhetoric, of course, to warn of a fire in a theatre or to arouse the xenophobia of the electorate. This sort of yelling is the vulgar meaning of the word, like the president's 'heated rhetoric' in a press conference of the 'mere rhetoric' to which our enemies stoop. Since the Greek flame was lit, though, the word has been used also in a broader and more amiable sense, to mean the study of all the ways of accomplishing things with language : inciting a mob to lynch the accused, to be sure, but also persuading readers of a novel that its characters breathe

or bringing scholars to accept the better argument and reject the worse.

The question is whether the scholar-who usually fancies himself an announcer of 'result' or a starter of conclusions, free of rhetoric-speaks rhetorically. Does he try to persuade? It would seem so. Language, I just said, is not a solitary accomplishment. The scholar doesn't speak into the void or to himself. He speaks to a community of voices. He desires to be heeded, praised, published, imitated honoured, en-Nobeled. These are the desires. The devices of language are the means.

Rhetoric is the proportioning of means to desires in speech. Rhetoric is an economics of language, the study of how scarce means are allocated the insatiable desires of people to be heard. It seems on the face of it a reasonable hypothesis that economists are like other people in being talkers, who desire listeners. Why they go to the library or the laboratory as much as when they go to the office on the polls. The purpose here is to see if this is true and to see if it is useful : to study the rhetoric of economic scholarship.

The subject is scholarship. It is not the economy or the adequacy of economic theory as a description of the economy or even mainly the economist's role in the economy. The subject is the conversation economists have among themselves, for purposes of persuading each other that the interest elasticity of demand for investment is zero or that the money supply is controlled by the Federal Reserve.

Unfortunately, though the conclusion are of more than academic interest. The conversations of classicists or of astronomers rarely affect the lives of other people. Those of economists do so on a large scale. A well-known joke describes a May Day parade through Red Square with the usual mass of soldiers, guided missiles, rocket launchers. At last come rank upon rank of people in gray, business suits. A bystander asks, "Who are those? "Aha" comes the reply, "those are economists" you have no idea what damage they can do!" Their conversations do it.

206) According to the passage, which of the following is the best set of reasons for which one needs to 'look hard' at an economist's language?

- A. Economists accomplish a great deal through their language.
 - B. Economics is an opinion-based subject.
 - C. Economics has a great impact other's lives.
 - D. Economics is damaging.
- (a) Both A and B
 - (b) Both C and D
 - (c) Both A and C
 - (d) Both Band D

- 207) In the light of the definition of rhetoric given in the passage, which of the following will have the least element of rhetoric ?
- An election speech.
 - An advertisement jingle .
 - Dialogues in a play.
 - Commands given by army officers.
- 208) As used in the passage, which of the following is the closest meaning to the statement, “The culture of the conversation makes the words arcane”?
- Economists belong to a different culture.
 - Only mathematicians can understand economists .
 - Economists tend to use terms unfamiliar to the lay person, but depend on familiar linguistic forms.
 - Economists use similes and adjectives in their analysis.
- 209) As used in the passage, which of the following is the closest alternative to the word ‘arcane’?
- Mysterious
 - Secret
 - Covert
 - Perfidious
- 210) Based on your understanding of the passage, which of the following conclusions would you agree with
- the geocentric and the heliocentric views of the solar system are equally tenable.
 - the heliocentric view is superior because of better rhetoric.
 - both views use rhetoric to persuade.
 - scientists should not use rhetoric.

PASSAGE 52

The conceptions of life and the world which we call ‘philosophical’ are a product of two factors : one inherited, religious and ethical conceptions; the other, the sort of investigation which may be called ‘scientific’, using this word in this broadest sense. Individual philosophers have differed widely in regard to the proportions in which these two factors entered into their systems, but it is the presence of both in some degree that characterises philosophy. ‘Philosophy’ is a word which has been used in many ways, some wider, some narrower. I propose to use it in a very wide sense, which I will now try to explain.

Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All definite knowledge-so I should contend-belongs to science; all dogma as to what

surpass definite knowledge to theology. But between theology and science there is a ‘No man’s Land’ exposed to attack from both sides; this ‘No Man’s Land’ is philosophy. Almost all the questions of most interest to speculative minds are such as science cannot answer and the confident answers of theologians no longer seem so convincing as they did in former centuries. Is the world divided into mind and matter and if so, what is mind and what is matter? Is mind subject matter or is it possessed of independent powers? Has the universe any unity or purpose? Is it evolving towards some goal ? Are there really laws of nature or do we believe in them only because of our innate love of order ? Is man what he seems to the astronomer, a tiny lump of carbon and water impotently crawling on a small and unimportant planet? Or is he what he appears to Hamlet? Is he perhaps both at once? Is there a way of living that is noble and another that is base or are all ways of living merely futile? If there is a way of living that is noble, in what does it consist and how shall we achieve it ? Must the good be eternal in order to deserve to be valued or is it worth seeking even if the universe is inexorably moving towards death? Is there such a thing as wisdom or is what seems such merely the ultimate refinement of folly? To such questions no answer can be found in the laboratory.

Theologies have professed to give answers, all to definite; but their definiteness causes modern minds to view them with suspicion. The studying of these questions, if not the answering of them, is the business of philosophy.

Why, then, you may ask, waste time on such insoluble problems ? To this one may answer as a historian or as an individual facing the terror of cosmic loneliness.

The answer of the historian, in so far as I am capable of giving it, will appear in the course of this work. Ever since men became capable of free speculation, their actions in innumerable important respects, have depended upon their theories as to the world and human life, as to what is good and what is evil. This is as true in the present day as at any former time. To understand an age or a nation we must understand its philosophy and to understand its philosophy we must ourselves be in some degree philosophers. There is here a reciprocal causation: the circumstances of men’s lives do much to determine their philosophy, but, conversely, their philosophy does much to determine their circumstances. There is also, however, a more personal answer. Science tells us what we can know, but what we can know is little and if we forget how much we cannot know we may become insensitive to many things of very great importance. Theology, on the other hand, induces a dogmatic belief that we have knowledge, where in fact we

have ignorance and by doing so generated a kind of impermanent isolation towards the universe. Uncertainty, in the presence of vivid hopes and fears, is painful, but must be endured if we wish to live without the support of comforting fair tales. It is not good either to forget the questions that philosophy asks or to persuade ourselves that we have found indubitable answers to them. To teach how to live without certainty and yet without being paralysed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it.

- 211)** The purpose of philosophy is to
- reduce uncertainty and chaos
 - help us to cope with uncertainty and ambiguity
 - help us to find explanations for uncertainty
 - reduce the terror of cosmic loneliness
- 212)** Based on this passage what can be concluded about the relation between philosophy and science?
- The two are antagonistic
 - The two are complimentary
 - There is no relation between the two
 - Philosophy derives from science
- 213)** From reading the passage, what can be concluded about the profession of the author? He is most likely NOT to be a
- Historian
 - Philosopher
 - Scientist
 - Theologian
- 214)** According to the author, which of the following statements about the nature of the universe must be definitely true?
- The universe has unity.
 - The universe has a purpose.
 - The universe is evolving towards a goal.
 - None of the above

PASSAGE 53

Cells are the ultimate multi-taskers : They can switch on genes and carry out their order, talk to each other, divide in two and much more, all at the same time. But they couldn't do any of these tricks without a power source to generate movement. The inside of a cell bustles with more traffic than Delhi roads and like all vehicles, the cell's moving parts need engines. Physicists and biologists have looked 'under the hood' of the cell and laid out the nuts and bolts of molecular engines. The ability of such engines to convert chemical energy into motion is the envy of the nano technology researchers looking for ways to power molecule-sized devices. Medical researchers also want to understand how these engines work. Because these molecules are essential for cell

division, scientists hope to shut down the rampant growth of the cancer cells by deactivating certain motors. Improving motor-driven transport in nerve cells may also be helpful for treating diseases such as Alzheimer's, Parkinson's or ALS, also known as Lou Gehrig's disease. We wouldn't make it far in life without motor proteins. Our muscles wouldn't contract. We couldn't grow because the growth process requires cells to duplicate their machinery and pull the copies apart. And our genes would be silent without the services of messenger RNA, which carries genetic instructions over to the cell's protein-making factories. The movements that make these cellular activities possible occur along a complex network of threadlike fibers or polymers, along which bundles of molecules travel like trams. The engines that power the cell's freight are three families of proteins, called myosin, kinesin and dynein. For fuel, these proteins burn molecules, of ATP, which cells make when they breakdown the carbohydrates and fats from the foods we eat. The energy from burning ATP causes changes in the proteins' shape that allow them to have themselves along the polymer track. The results are impressive: In one second, these molecules can travel between 50 and 100 times their own diameter. If a car with 5-foot-wide engine were as efficient, it would travel 170 to 340 kmph.

Ronald Vale, a researcher at the Howard Hughes Medical Institute and the University of California at San Francisco and Ronald Milligan of the Scripps Research Institute have realised a long-awaited goal by re-constructing the process by which myosin and kinesin move, almost down to the atom. The dynein motor, on the other hand, is still poorly understood. Myosin molecules, best known for their role in muscle contraction, form chains that lie between filaments of another protein called actin. Each myosin molecule has a tiny head that pokes out from the chain like oars from a canoe. Just as rowers propel their boat by stroking their oars through the water, the myosin molecules stick their heads into the action and hoist themselves forward along the filament. While myosin moves along in short strokes, its cousin kinesin walks steadily along a different type of filament called a microtubule. Instead of using a projecting head as a lever, kinesin walks on two 'legs'. Based on these differences, researchers used to think that myosin and kinesin were virtually unrelated. But newly discovered similarities in the motors' ATP-processing machinery now suggest that they share a common ancestor-molecule. At this point, scientists can only speculate as to what type of primitive cell-like structure ; this ancestor occupied as it learned to burn ATP and use the energy to change shape. We'll never really know, because we can't dig up the remains of

ancient proteins, but that was probably a big evolutionary leap, says Vale.

On a slightly larger scale, loner cells like sperm or infectious bacteria are prime movers that resolutely push their way through to other cells. As L Mahadevan, an Paul Matsudaira of the Massachusetts Institute of Technology explain, the engines in this case are springs or ratchets that are clusters of molecules, rather than single protein like myosin and kinesin. Researchers don't yet fully understand these engines' fueling process or the details of how they move, but the result is a force to be reckoned with. For example, one such engine is a springlike stall connecting a single-celled organism called a vorticellid to the leaf fragment it calls home. When exposed to calcium, the spring contracts, yanking the vorticellid down at speeds approaching 3 inches (8 centimetres) per second.

Springs like this coiled bundles of filaments that expand or contract in response to chemical cues. A wave of positively charged calcium ions, for example, neutralizes the negative charges that keep the filaments extended. Some sperm use springlike engines made of acting filaments to shoot out a barb that penetrates the layers that surround an egg. And certain viruses use a similar apparatus to shoot their DNA into the host's cell. Ratchets are also useful for moving whole cells, including some other sperms and pathogens. These engines are filaments that simply grow at one end, attracting chemical building blocks from nearby. Because the other end is anchored in place, the growing end pushes against any barrier that gets in its way.

Both springs and ratchets are made up of small units that each move just slightly, but collectively produce a powerful movement. Ultimately, Mahadevan and Matsudaira hope to better understand just how these particles create an effect that seems to be so much more than the sum of its parts. Might such an understanding provide inspiration for ways to power artificial nano-sized devices in the future? "The short answer is absolutely," says Mahadevan. "Biology has had a lot more time to evolve enormous richness in design for different organisms. Hopefully, studying these structures will not only improve our understanding of the biological world, it will also enable us to copy them, take apart their components and re-create them for other purposes."

- 215)** According to the author, research on the power source of movement in cells can contribute to
- (a) Control over the movement of genes within human system.
 - (b) The understanding of nano technology.
 - (c) Arresting the growth of cancer in a human being.
 - (d) The development of cures for a variety of diseases.

- 216)** The author has used several analogies to illustrate his arguments in the article. Which of the following pairs of words are examples of the analogies used ?

- A. Cell activity and vehicular traffic
 - B. Polymers and tram tracks
 - C. Genes and canoes
 - D. Vorticellids and ratchets.
- (a) Both A and B (b) Both Band C
(c) Both A and D (d) Both A and C

- 217)** Read the five statements below: A, B, C, D and E. From the options given, select the one which includes a statement that is NOT representative of an argument presented in the passage.

- A. Sperms use spring like engines made of actin filament.
 - B. Myosin and kinesin are unrelated.
 - C. Nano technology researchers look for ways to power molecule-sized devices.
 - D. Motor proteins help muscle contraction.
 - E. The dynein motor is still poorly understood.
- (a) A, Band C (b) C, D and E
(c) A, D and E (d) A, C and D

- 218)** Read the four statements given below: A, B, C and D. From the options given, select the one which includes only statements(s) that are representative of arguments presented in the passage.

- A. Protein motors help growth processes .
 - B. Improved transport in nerve cells will help arrest tuberculosis and cancer.
 - C. Cells, together, generate more than the sum of the power generated by them separately.
 - D. Vorticellid and the leaf fragment are connected by a calcium engine.
- (a) A and B but not C (b) A and C but not D
(c) A and D but not B (d) C and D but not B

- 219)** Read the four statements given below: A, B, C and D. From the options given, select the one which includes statements(s) that are (is) representative of arguments presented in the passage.

- A. Myosin, kinesin and action are three types of proteins.
- B. Growth processes involve a routine in a cell that duplicates their machinery and pulls the copies apart.
- C. Myosin molecules can generate vibrations in muscles.

D. Ronald and Mahadevan are researchers at Massachusetts Institute of Technology.

- (a) A and B but not C and D
- (b) B and C but not A
- (c) B and D but not A and C
- (d) A, B and C but not D

Directions (Q. Nos. 220-249) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (2001)

PASSAGE 54

In the modern scientific story, light was created not once but twice. The first time was in the Big Bang when the universe began its existence as a glowing, expanding, fireball which cooled off into darkness after a few million years. The second time was hundreds of millions of years later when the cold material condensed into dense nuggets under the influence of gravity and ignited to become the first stars.

Sir Martin Rees, Britain's astronomer royal, named the long interval between these two enlightenments the cosmic "Dark Age". The name describes not only the poorly lit conditions, but also the ignorance of astronomers about that period. Nobody knows exactly when the first stars formed or how they organised themselves into galaxies or even whether stars were the first luminous objects. They may have been preceded by quasars, which are mysterious, bright spots found at the centres of some galaxies.

Now two independent group of astronomers, one led by Robert Becker of the University of California, Davis and the other by George Djorgovski of the Caltech, claim to have peered far enough into space with their telescopes (and therefore backwards enough in time) to observe the closing days of the Dark Age.

The main problem that plagued previous efforts to study the Dark Age was not the lack of suitable telescopes but rather the lack of suitable things at which to point them. Because these events took place over 18 billion years ago, if astronomers are to have any hope of unravelling them they study objects that are at least 13 billion light years away. The best prospects are quasars, because they are so bright and compact that they can be seen across vast stretches of space. The energy source that powers a quasar is unknown although it is suspected to be the intense gravity of a giant black hole. However at the distances required for the study of Dark Age, even quasars are extremely rare and faint.

Recently some members of Dr. Becker's team announced their discovery of the four most distant quasars known. All the new quasars are terribly faint, a challenge that

both teams overcame by peering at them through one of the twin Keck telescopes in Hawaii. These are the world's largest and can therefore collect the most light. The new work by Dr. Becker's team analysed the light from all four quasars. Three of them appeared to be similar to ordinary, less distant quasars. However, the fourth and most distant, unlike any other quasar ever seen, showed unmistakable signs of being shrouded in a fog of hydrogen gas. This gas is left over material from the Big Bang that did not condense into stars or quasars. It acts like fog because new born stars and quasars emit mainly ultraviolet light and hydrogen gas is opaque to ultraviolet. Seeing this fog had been the goal of would be Dark Age astronomers since 1965, when James Gunn and Bruce Peterson spelled out the technique for using quasars as backlighting becomes to observe the fog's ultraviolet shadow.

The fog prolonged the period of darkness until the heat from the first stars and quasars had the chance to ionise the hydrogen (breaking it into its constituent parts, protons and electrons). Ionised hydrogen is transparent to ultraviolet radiation, so at that moment the fog lifted and the universe became the well-lit place it is today. For this reason, the end of the Dark Age is called the "Epoch of Re-ionisation". Because the ultraviolet shadow is visible only in the most distant of the four quasars, Dr. Becker's team concluded that the fog had dissipated completely by the time the universe was about 900 million years old and one-seventh of its current size.

220) In the passage, the Dark Age refers to

- (a) the period when the universe became cold after the Big Bang.
- (b) a period about which astronomers know very little.
- (c) the medieval period when cultural activity seemed to have come to an end.
- (d) the time that the universe took to heat up after the Big Bang.

221) Astronomers find it difficult to study the Dark Age because

- (a) suitable telescopes are few.
- (b) the associated events took place aeons ago.
- (c) the energy source that powers a quasar is unknown.
- (d) their best chance is to study quasars, which are faint objects to begin with.

222) The four distant quasars discovered recently

- (a) could only be seen with the help of large telescopes.
- (b) appear to be similar to other ordinary quasars.
- (c) appear to be shrouded in a fog of hydrogen gas.
- (d) have been sought to be discovered by Dark Age astronomers since 1965.

223) The fog of hydrogen gas seen through the telescopes

- (a) is transparent to hydrogen radiation from stars and quasars in all states.
- (b) was lifted after heat from stars and quasars ionised it.
- (c) is material which eventually became stars and quasars.
- (d) is broken into constituent elements when stars and quasars are formed.

PASSAGE 55

Democracy rests on a tension between two different principles. There is on the one hand the principle of equality before the law or, more generally of equality and on the other what may be described as the leadership principle. The first gives priority to rules and the second to persons. No matter how skilfully we contrive our schemes, there is a point beyond which the one principle cannot be promoted without some sacrifice of the other.

Alexis de Tocqueville, the great nineteenth century writer on democracy maintained that the age of democracy whose birth he was witnessing, would also be the age of mediocrity: in saying this he was thinking primarily of a regime of equality governed by impersonal rules. Despite his strong attachment to democracy, he took great pains to point out what he believed to be its negative side: a dead level plane of achievement in practically every sphere of life. The age of democracy would in his view be an unheroic age; there would not be room in it for either heroes or hero-worshippers.

But modern democracies have not been able to do without heroes: this too was foreseen with much misgiving by Tocqueville. Tocqueville viewed this with misgiving because he believed rightly or wrongly that unlike in aristocratic societies there was no proper place in a democracy for heroes and hence, when they arose they would sooner or later turn into despots. Whether they require heroes or not, democracies certainly require leaders and in the contemporary age breed them in great profusion; the problem is to know what to do with them.

In a world preoccupied with scientific rationality, the advantages of a system based on an impersonal rule of law should be a recommendation with everybody. There is something orderly and predictable about such a system. When life is lived mainly in small, self-contained communities, men are able to take finer personal distinctions into account in dealing with their fellow men. They are unable to do this in a large and amorphous society and organised living would be impossible here without a system of impersonal rules. Above all such a system guarantees a kind of equality to the extent that everybody no matter in what station of

life is bound by the same explicit often written rules and nobody is above them.

But a system governed solely by impersonal rules can at best ensure order and stability; it cannot create any shining vision of a future in which mere formal equality will be replaced by real equality and fellowship. A world governed by impersonal rules cannot easily change itself or when it does, the change is so gradual as to make the basic and fundamental feature of society appear unchanged. For any kind of basic or fundamental change a push is needed from within a kind of individual initiative which will create new rules, new terms and conditions of life.

The issue of leadership thus acquires crucial significance in the context of change. (If the modern age is preoccupied with scientific rationality, it is no less preoccupied with change. To accept what exists on its own terms is traditional, not modern and it may be all very well to appreciate tradition in music, dance and drama, but for society as a whole the choice has already been made in favour of modernisation and development. Moreover, in some countries the gap between ideal and reality has become so great that the argument for development and change is now irresistible.

In these countries no argument for development has greater appeal or urgency than the one which shows development to be the condition for the mitigation, if not the elimination of inequality. There is something contradictory about the very presence of large inequalities in a society which professes to be democratic. It does not take people too long to realise that democracy by itself can guarantee only formal equality; beyond this, it can only whet people's appetite for real or substantive equality. From this arises their continued pre-occupation with plans and schemes that will help to bridge the gap between the ideal of equality and the reality which is so contrary to it.

When pre-existing rules give no clear directions of change, leadership comes into its own. Every democracy invests its leadership with a measure of charisma and expects from it a corresponding measure of energy and vitality. Now, the greater the urge for change in a society the stronger the appeal of a dynamic leadership in it. A dynamic leadership seeks to free itself from the constraints of existing rules, in a sense that is the test of its dynamism. In this process it may take a turn at which it ceases to regard itself as being bound by these rules, placing itself above them. There is always a tension between 'charisma' and 'discipline' in the case of a democratic leadership and when this leadership puts forward revolutionary claims, the tension tends to be resolved at the expense of discipline.

Characteristically, the legitimacy of such a leadership rest on its claim to be able to abolish or at least substantially reduce the existing inequalities in society. From the argument that formal equality or equality before the law is but a limited good, it is often one short step to the argument that it is a hindrance or an obstacle to the establishment of real or substantive equality. The conflict between a 'progressive' executive and a 'conservative' judiciary is but one aspect of this larger problem. This conflict naturally acquires added piquancy when the executive is elected and the judiciary appointed.

- 224)** Dynamic leaders are needed in democracies because
- (a) they have adopted the principles of 'formal' equality rather than 'substantive' equality
 - (b) 'formal' equality whets people's for 'substantive' equality
 - (c) systems that rely on the impersonal rules of 'formal' equality lose their ability to make large changes
 - (d) of the conflict between a 'progressive' executive and a 'conservative' judiciary
- 225)** What possible factor would a dynamic leader consider a 'hindrance' in achieving the development goals of a nation?
- (a) Principle of equality before the law
 - (b) Judicial activism
 - (c) A Conservative judiciary
 - (d) Need for discipline
- 226)** Which of the following four statements can be inferred from the above passage ?
- A. Scientific rationality is an essential feature of modernity
 - B. Scientific rationality results in the development of impersonal rules
 - C. Modernisation and development have been chosen over traditional music, dance and drama
 - D. Democracies aspire to achieve substantive equality
- (a) A and B, D but not C
 - (b) A and B but not C and D
 - (c) A and D, but not B and C
 - (d) A, B and C but not D
- 227)** Tocqueville believed that the age of democracy would be an unheroic age because
- (a) democratic principles do not encourage heroes
 - (b) there is no urgency for development in democratic countries
 - (c) heroes that emerged in democracies would become despots
 - (d) aristocratic society had a greater ability to produce heroes

228) A key argument the author is making is that

- (a) in the context of extreme inequality, the issue of leadership has limited significance
- (b) democracy is incapable of eradicating inequality
- (c) formal equality facilitates development and change
- (d) impersonal rules are good for avoiding instability but fall short of achieving real equality

229) Which of the following four statements can be inferred from the above passage?

- A. There is conflict between the pursuit of equality and individuality
 - B. The disadvantages of impersonal rules can be overcome in small communities.
 - C. Despite limitations, impersonal rules are essential in large systems
 - D. Inspired leadership rather than plans and schemes is more effective in bridging inequality
- (a) Band D but not A and C
 - (b) A and B but not C and D
 - (c) A and D but not B and C
 - (d) A and C but not B and D

PASSAGE 56

The narrative of Dersu Uzala is divided into two major sections set in 1902 and 1907 that deal with separate expeditions which Arseniev conducts into the Ussuri region. In addition, a third time frame forms a prologue to the film. Each of the temporal frames has a different focus and by shifting them Kurosawa is able to describe the encroachment of settlements upon the wilderness and the consequent erosion of Dersu's way of life. As the film opens, that erosion has already begun. The first image is a long shot of a huge forest, the tree piled upon one another by the effects of the telephoto lens so that the landscape becomes and abstraction and appears like a huge curtain of green. A title informs us that the year is 1910. This is as late into the century as Kurosawa will go. After this prologue, the events of the film will transpire even farther back in time and will be presented as Arseniev's recollections. The character of Dersu Uzala is the heart of the film, his life the example that Kurosawa wishes to affirm. Yet the formal organisation of the film works to contain, to close, to circumscribe that life by erecting a series of obstacles around it. The film itself is circular, opening and closing by Dersu's grave, thus sealing off the character from the modern world to which Kurosawa once so desperately wanted to speak. The multiple time frames also work to maintain a separation between Dersu and the contemporary world. We must go back farther even than 1910 to discover who he was. But this narrative structure has yet another implication. It

safeguards Dersu's example, inoculates it from contamination with history and protects it from contact with the industrialised, urban world. Time is organised by the narrative into a series of barriers, which enclose Dersu in a kind of vacuum chamber, protecting him from the social and historical dialectics that destroyed the other Kurosawa heroes. Within the film, Dersu does die, but the narrative structure attempts to immortalise him and his example, as Dersu passes from history into myth. We see all this at work in the enormously evocative prologue. The camera tilts down to reveal felled trees littering the landscape and an abundance of construction. Roads and houses outline the settlement that is being built. Kurosawa cuts to a medium shot of Arseniev standing in the midst of the clearing, looking uncomfortable and disoriented. A man passing in a wagon asks him what he is doing and the explorer says he is looking for a grave. The driver replies that no one had died here, the settlement is too recent. These words enunciate the temporal rupture that the film studies. It is the beginning of things (industrial society) and the end of things (the forest), the commencement of one world so young that no one has had time yet to die and the eclipse of another, in which Dersu has died. It is his grave for which the explorer searches. His passing symbolises the new order, the development that now surrounds Arseniev. The explorer says he buried his friend three years ago, next to hue cedar and fir trees, but now they are all gone. The man on the wagon replies they were probably chopped down when the settlement was built and he drives off. Arseniev walks to a barren, treeless spot next to a pile of bricks. As he moves, the camera tracks and pans to follow, revealing a line of freshly built houses and a woman hanging her laundry to dry. A distant train whistle is heard and the sounds of construction in the clearing vie with the cries of birds and the rustle of wind in the trees. Arseniev pauses, looks around for the grave that once was and murmurs desolately, "Dersu." The image now cuts farther into the past, to 1902 and the first section of the film commences, which describes Arseniev's meeting with Dersu and their friendship.

Kurosawa defines the world of the initially upon a void, a missing presence. The grave is gone, brushed aside by a world rushing into modernism and now the hunter exists only in Arseniev's memories. The hallucinatory dreams and visions of Dodeskaden are succeeded by nostalgic, melancholy ruminations. Yet by exploring these ruminations, the film celebrates the timelessness of Dersu's wisdom. The first section of the film has two purposes: to describe the magnificence and inhuman vastness of nature and to delineate the code of ethics by which Dersu lives and which permits him to survive in these conditions. When Dersu first appears, the other soliders treat him with condescension and laughter, but

Arseniev watches him closely and does not share their derisive response. Unlike them, he is capable of immediately grasping Dersu's extraordinary qualities. In camp, Kurosawa frames Arseniev by himself, sitting on the other side of the fire from his soldiers. While they sleep or joke among themselves, he writes in his diary and Kurosawa cuts in several point-of-view shots from his perspective of trees that appears animated and sinister as the fire light dances across their gnarled, leafless outlines. This reflective dimension, this sensitivity to the spirituality of nature, distinguishes him from the others and forms the basis of his receptivity of Dersu and their friendship. It makes him a fit pupil for the hunter.

230) How is Kurosawa able to show the erosion of Dersu's way of life?

- (a) By documenting the ebb and flow of modernisation
- (b) By going back farther and farther in time
- (c) By using three different time frames and shifting them
- (d) Through his death in a distant time

231) Arseniev's search for Dersu's grave

- (a) is part of the beginning of the film.
- (b) symbolises the end of the industrial society
- (c) is misguided since the settlement is too new
- (d) symbolises the rediscovery of modernity

232) The film celebrates Dersu's wisdom:

- (a) by exhibiting the moral vacuum of the pre-modern world
- (b) by turning him into a mythical figure
- (c) through hallucinatory dreams and visions
- (d) through Arseniev's nostalgic, melancholy ruminations

233) According to the author, the section of the film following the prologue

- (a) serves to highlight the difficulties that Dersu faces that eventually kills him
- (b) shows the difference in thinking between Arseniev and Dersu
- (c) shows the code by which Dersu lives that allows him to survive his surroundings
- (d) serves to criticize the lack of understanding of nature in the pre-modern era

234) In the film, Kurosawa hints at Arseniev's reflective and sensitive nature

- (a) by showing him as not being derisive to wards Dersu, unlike other soldiers
- (b) by showing him as being aloof from other soldiers
- (c) through shots of Arseniev writing his diary framed by trees
- (d) All of the above

235) According to the author, which of these statements about the film is (are) correct?

- (a) The film makes its arguments circuitously
- (b) The film highlights the insularity of Arseniev
- (c) The film begins with the absence of its main protagonist
- (d) None of the above

PASSAGE 57

Billie Holiday died a few weeks ago. I have been unable until now to write about her, but since she will survive many who receive longer obituaries, a short delay in one small appreciation will not harm her or us. When she died we-the musicians, critics, all who were ever transfixed by the most heart-rending voice of the past generation-grieved bitterly. There was no reason to few people pursued self-destruction more whole-heartedly than she and when the pursuit was at an end, at the age of forty-four, she had turned herself into a physical and artistic wreck. Some of us tried gallantly to pretend otherwise, taking comfort in the occasional moments when she still sounded like a ravaged echo of her greatness. Others had not even the heart to see and listen any more. We preferred to stay home and if old and lucky enough to own the incomparable records of her heyday from 1937 to 1946, many of which are not even available on British LP, to recreate those coarse-textured, sinuous, sensual and unbearable sad noises which gave her a sure corner of immortality. Her physical death called, if anything, for relief rather than sorrow. What sort of middle age would she have faced without the voice to earn money for her drinks and fixes, without the looks-and in her day she was hauntingly beautiful-to attract the men she needed, without business sense, without anything but the disinterested worship of ageing men who had heard and seen her in her glory?

And yet, irrational though it is, our grief expressed Billie Holiday's art, that of a woman for whom one must be sorry. The great blues singers to whom she may be justly compared, played their game from strength. Lionesses, though often wounded or at bay (did not Bessie Smith call herself 'a tiger, ready to jump'?) their tragic equivalents were Cleopatra and Phaedra; Holiday's was an embittered Ophelia. She was the Puccini heroine among blues singers or rather among jazz singers, for though she sang a cabaret version of the blues incomparably, her natural idiom was the pop song. Her unique achievements was to have twisted this into a genuine expression of the major passions by means of a total disregard of its sugary tunes, or indeed of any tune other than her own few delicately crying elongated notes, phrased like Bessie Smith or Louis Armstrong in sung in

a thin, gritty, haunting voice whose natural mood was an unresigned and voluptuous welcome for the pains of love. Nobody has sung, or will sing, Bess's songs from *Porgy* as she did. It was this combination of bitterness and physical submission, as of someone lying still while watching his legs being amputated which gives such a blood-curdling quality to her *Strange Fruit*, the anti-lynching poem which she turned into an unforgettable art song. Suffering was her profession; but she did not accept it. Little need be said about her horrifying life, which she described with emotional, though hardly with factual, truth in her autobiography *Lady Sings the Blues*. After an adolescence in which self-respect was measured by a girl's insistence on picking up the coins thrown to her by clients with her hands, she was plainly beyond help. She did not lack it, for she had the flair and scrupulous honesty of John Hammond to launch her, the best musicians of the 1930s to accompany her-notably Teddy Wilson, Frankie Newton and Lester Young-the boundless devotion of all serious connoisseurs and much public success. It was too late to arrest a career of systematic embittered self-immolation. To be born with both beauty and self-respect in the Negro ghetto of Baltimore in 1915 was too much of a handicap, even without rape at the age of ten and drug-addiction in her teens. But, while she destroyed herself, she sang, unmelodious, profound and heart-breaking. It is impossible not to weep for her, or not to hate the world which made her what she was.

236) Why will Billie Holiday survive many who receive longer obituaries?

- (a) Because of her blues creations
- (b) Because she was not as self-destructive as some other blues exponents.
- (c) Because of her smooth and mellow voice.
- (d) Because of the expression of anger in her songs.

237) According to the author, if Billie Holiday had not died in her middle age

- (a) she would have gone on to make a further mark
- (b) she would have become even richer than what she was when she died
- (c) she would have led a rather ravaged existence
- (d) she would have led a rather comfortable existence

238) Which of the following statements is not representative of the author's opinion?

- (a) Billie Holiday had her unique brand of melody
- (b) Billie Holiday's voice can be compared to other singers in certain ways
- (c) Billie Holiday's voice had a ring of profound sorrow.
- (d) Billie Holiday welcomed suffering in her profession and in her life

239) According to the passage, Billi Holiday was fortunate in all but one of the following ways

- (a) she was fortunate to have been picked up young by an honest producer
- (b) she was fortunate to have the likes of Louis Armstrong and Bessie Smith accompany her
- (c) she was fortunate to possess the looks
- (d) she enjoyed success among the public and connoisseurs

PASSAGE 58

Studies of the factors governing reading development in young children have achieved a remarkable degree of consensus over the past two decades. This consensus concerns the causal role of phonological skills in young children's reading progress. Children who have good phonological skills or good "phonological awareness", become good readers and good spellers. Children with poor phonological skills progress more poorly. In particular, those who have a specific phonological deficit are likely to be classified as dyslexic by the time that they are 9 or 10 years old.

Phonological skills in young children can be measured at a number of different levels. The term *phonological* awareness is a global one and refers to a deficit in recognising smaller units of sound within spoken words. Developmental work has shown that this deficit can be at the level of syllables, of onsets and rimes or of phonemes. For example, a 4-year old child might have difficulty recognising that a word like *valentine* has three syllables suggesting a lack of *syllabic* awareness. A 5-year old might have difficulty in recognising that the odd word out in set of words *fan, cat, hat, mat* is *fan*. This task requires an awareness of the sub-syllabic units of the onset and the rime. The onset corresponds to any initial consonants in a syllable and the rime corresponds to the vowel and to any following consonants. Rimes correspond to rhyme in single-syllable words and so the rime in *fan* differs from the rime in *cat, hat* and *mat*. In longer words, rime and rhyme may differ. The onsets in *val: en : tine* are /v/ and /t/ and the rimes correspond to the spelling patterns 'al', 'en' and 'ine'.

A 6-year-old might have difficulty in recognising that *plea* and *pray* begin with the same initial sound. This is a phonemic judgement. Although the initial phoneme /p/ is shared between the two words, in *plea* it is part of the onset 'pl' and in *pray* it is part of the onset 'pr'. Until children can segment the onset (or the rime), such phonemic judgements are difficult for them to make. In fact, a recent survey of different developmental studies has shown that the different levels of phonological

awareness appear to emerge sequentially. The awareness of syllables, onsets and rimes appears to emerge at around the ages of 3 and 4, long before most children go to school. The awareness of phonemes, on the other hand, usually emerges at around the age of 5 or 6, when children have been taught to read for about a year. An awareness of onsets and rimes thus appears to be a precursor for reading, whereas an awareness of phonemes at every serial position in a word only appears to develop as reading is taught. The onset-rime and phoemic levels of phonological structure, however, are not distinct. Many onsets in English are single phonemes and so are some times (*eg, sea, go, zoo*).

The early availability of onsets and rimes is supported by studies that have compared the development of phonological awareness of onsets, rimes and phonemes in the same subjects using the same phonological awareness tasks. For example, a study by Treiman and Zudowski used as same/different judgement task based on the beginning or the end sounds of words. In the beginning sound task, the words either began with the same onset, as in *plea* and *plank* or shared only the initial phoneme, as in *plea* and *pray*. In the end-sound task, the words either shared the entire rime, as in *spit* and *wit* or shared only the final phoneme, as in *rat* and *wit*. Treiman and Zudowski showed that 4 and 5 year old children found the onset-rime version of the same/different task significantly easier than the version based on phonemes. Only the 6-year-olds, who had been learning to read for about a year, were able to perform both versions of the tasks with an equal level of success.

240) From the following statements, pick out the true statement according to the passage.

- (a) A mono-syllabic word can have only one onset
- (b) A mono-syllabic word can have one rhyme but more than one rime
- (c) A mono-syllabic word can have only one phoneme
- (d) All of the above

241) Which one of the following is likely to emerge last in the cognitive development of a child?

- (a) Rhyme
- (b) Rime
- (c) Onset
- (d) Phoneme

242) A phonological deficit in which of the following is likely to be classified as dyslexia ?

- (a) Phonemic judgement
- (b) Onset judgement
- (c) Rime judgement
- (d) Anyone or more of the above.

- 243)** The Treiman and Zudowski experiment found evidence to support the following
- (a) at age 6, reading instruction helps children perform, both, the same-different judgement task
 - (b) the development of onset-rime awareness precedes the development of an awareness of phonemes
 - (c) at age 4-5 children find the onset-rime version of the same/different task significantly easier
 - (d) the development of onset-rime awareness is a necessary and sufficient condition for the development of an awareness of phonemes
- 244)** The single-syllable words Rhyme and Rime are constituted by the exact same set of
- | | |
|----------------|----------------|
| A. rime (s) | B. onset (s) |
| C. rhyme (s) | D. phoneme (s) |
| (a) A and B | (b) A and C |
| (c) A, B and C | (d) B, C and D |

PASSAGE 59

The union government's present position vis-a-vis the upcoming United Nations Conference on racial and related discrimination world-wide seems to be the following: discuss race please, not caste; caste is our very own and not at all as bad as you think. The gross hypocrisy of that position has been lucidly underscored by Kancha Ilaiah. Explicitly, the world community is to be cheated out of considering the matter on the technicality that caste is not a concept, tantamount to a racial category. Internally, however, allowing the issue to be put on agenda at the said conference would, we are patriotically admonished, damage the country's image. Somehow, India's virtual beliefs elbow out concrete actualities. Inverted representations, as we know, have often been deployed in human histories as balm for the forsaken-religion being the most persistent of such inversions. Yet, we would humbly submit that if globalising our markets are thought good for the 'national' pocket, globalising our social inequities might not be so bad for the mass of our people. After all, racism was as uniquely institutionalised in South Africa as caste discrimination has been within our society, why then can't we permit the world community to express itself on the latter with a fraction of the zeal with which, through the years, we pronounced on the former?

As to the technicality about whether or not caste is admissible into an agenda about race (that the conference is also about 'related discriminations' tends to be forgotten), a reputed sociologist has recently argued that where race is a 'biological' category, caste is a 'social' one. Having earlier fiercely opposed implementation of the Mandal Commission Report, the said sociologist is at least to be complemented now for admitting, however tangentially, that caste discrimination is a reality,

although, in his view, incompatible with racial discrimination. One would like quickly to offer the hypothesis that biology, in important ways that affect the lives of many millions, is in itself perhaps a social construction. But let us look at the matter in another way.

If it is agreed—as per the position today at which anthropological and allied scientific determinations rest—that the entire race of homo-sapiens derived from an originary black African female (called 'Eve') then one is hard put to understand how, on some subsequent ground, ontological distinctions are to be drawn either between races or castes. Let us also underline the distinction between the supposition that we are all God's children and the rather more substantiated argument about our descent from 'Eve', lest both positions are thought to be equally diversionary. It then stands to reason that all subsequent distinctions are, in modern parlance, 'constructed' ones and like all ideological constructions, attributable to changing equations between knowledge and power among human communities through contested histories here, there and elsewhere.

This line of thought receives, thankfully, extremely consequential buttress from the findings of the Human Genome project. Contrary to earlier (chiefly 19th century colonial) persuasions on the subject of race, as well as, one might add, the somewhat infamous Jensen offerings in the 20th Century from America, those findings deny genetic difference between 'races'. If anything, they suggest that environmental factors impinge on gene-function, as a dialectic seems to unfold between nature and culture. It would thus seem that 'biology' as the constitution of pigmentation enters the picture first only as a part of that dialectic. Taken together, the originary mother stipulation and the Genome findings ought indeed to furnish ground for human equality across the board, as well as yield policy initiatives towards equitable material dispensations aimed at building a global order where, in Hegel's formulation, only the rational constitutes the right. Such, sadly, is not the case as everyday fresh arbitrary ground for discrimination are constructed in the interests of sectional dominance.

245) When the author writes "globalising our social inequities", the reference is to

- (a) going beyond as internal deliberation on social inequity.
- (b) dealing with internal poverty through the economic benefits of globalisation.
- (c) going beyond an internal delimitation of social inequity
- (d) achieving disadvantaged people's empowerment, globally.

- 246) According to the author, 'inverted representations as balm for the forsaken'
- is good for the forsaken and often deployed in human histories
 - is good for the forsaken, but not often deployed historically of the oppressed
 - occurs often as a means of keeping people oppressed
 - occurs often to vert the *status quo*
- 247) Based on the passage, which broad areas unambiguously fall under the purview of the UN conference being discussed?
- Racial prejudice.
 - Racial pride.
 - Discrimination, racial or otherwise.
 - Caste-related discrimination.
 - Race-related discrimination.
- Both A and E
 - C and E
 - A, C and E
 - B, C and D
- 248) According to the author, the sociologist who argued that race is a 'biological' category and caste is a 'biological' category and caste is a 'social' one :
- generally shares the same orientation as the author's on many of the central issues discussed
 - tangentially admits to the existence of "caste" as a category
 - admits the incompatibility between the people of different race and caste
 - admits indirectly that both caste-based prejudice and racial discrimination exist
- 249) An important message in the passage, if one accepts a dialectic between nature and culture, is that
- the results of the Human Genome Project reinforces racial differences.
 - race is at least partially a social construct.
 - discrimination is at least partially a social construct.
 - caste is at least partially a social construct.

Directions (Q. Nos. 250-289) Read the passage given below and answer the questions that follow based on the information given in the passage. (2000)

PASSAGE 60

The teaching and transmission of North Indian classical music is and long has been achieved by largely oral means. The raga and its structure, the often breathtaking intricacies of tala or rhythm and the incarnation of rage and tala as bandish or composition, are passed thus, between guru and shishya by word of

mouth and direct demonstration, with no printed sheet of notated music, as it were acting as a go-between.

Saussure's conception of language as a communication between addresser and addressee is given, in this model, a further instance and a new, exotic complexity and glamour

These days, especially with the middle-class having entered the domain of classical music and playing not a small part in ensuring the continuation of this ancient tradition, the tape recorder serves as a handy technological slave and preserves, from oblivion, the vanishing, elusive moment of oral transmission. Hoary gurus, too, have seen the advantage of this device and increasingly use it as an aid to instruct their pupils; in place of the shawls and other traditional objects that used to pass from shishya to guru in the past, as a token of the regard of the former for the latter, it is not unusual, today, to see cassettes changing hands.

Part of my education in North Indian classical music was conducted via this rather ugly but beneficial rectangle of plastic, which I carried with me to England when I was an undergraduate. One cassette had stored in it various talas played upon the tabla, at various tempos, by my music teacher's brother-in-law, Hazarilalji, who was a teacher of Kathak dance, as well as a singer and a tabla player. This was a work of great patience and prescience, a one and half hours performance without any immediate point or purpose, but intended for some delayed future moment when I'd practise the talas solitarily.

This repeated playing out of the rhythmic cycles on the tabla was inflected by the noises—an irate auto driver blowing a horn, the sound of overbearing pigeons that were such a nuisance on the banister, even the cry of a kulfi seller in summer-entering from the balcony of the third floor flat we occupied in those days, in a lane in a Mumbai suburb, before we left the city for good. These sounds, in turn, would invade, hesitantly, the ebb and flow of silence inside the artificially heated room, in a borough of West London in which I used to live as an undergraduate. There, in the trapped dust, silence and heat, the theka of the tabla, qualified by the imminent but intermittent presence of the Mumbai suburb, would come to life again. A few years later, the tabla and in the background, the pigeons and the itinerant kulfi seller, would inhabit a small graduate room in Oxford.

The tape recorder though remains an extension of the oral transmission of music, rather than a replacement of it. And the oral transmission of North Indian classical music remains, almost uniquely, a testament to the fact that the human brain can absorb, remember and reproduce structures of great complexity and sophistication without the help of the hieroglyph or written mark or a system of notation. I remember my

surprise on discovering that Hazarilalji—who had mastered Kathak dance, tala and North Indian classical music and who used to narrate to me, occasionally, composition meant for dance that were grand and intricate in their verbal prosody, architecture and rhythmic complexity—was near illiterate and had barely learnt to write his name in large and clumsy letters.

Of course, attempts have been made, throughout the 20th century, to formally codify and even notate this music and institutions set up and degrees created, specifically to educate students in this 'scientific' and codified manner. Paradoxically, however, this style of teaching has produced no noteworthy student or performer, the most creative musicians still emerge from the *guru-shishya* relationship, their understanding of music developed by oral communication.

The fact that North Indian classical music emanates from and has evolved through oral culture, means that this music has a significantly different aesthetic and that this aesthetic has a different politics, from that of Western classical music. A piece of music in the Western tradition, at least in its most characteristic and popular conception originates in its composer and the connection between the two, between composer and the piece of music, is relatively unambiguous precisely because the composer writes down in notation, his composition, as a poet might write down and publish his poem. However far the printed sheet of notated music might travel thus from the composer, it still remains his property and the notion of property remains at the heart of the Western conception of 'genius', which derives from the Latin *gignere* or 'to beget'.

The genius in Western classical music—is, then, the originator, begetter and owner of his work—the printed, notated sheet testifying to his authority over his product and his power, not only for expression or imagination, but of origination. The conductor is a custodian and guardian of this property. Is it an accident that Mandelstam, in his note-books, compares the conductor's baton to a policeman's, saying all the music of the orchestra lies mute within it, waiting for its first movement to release it into the auditorium?

The *raga*—transmitted through oral means—is, in a sense, no one's property; it is not easy to pin down its source or to know exactly where its provenance or origin lies.

Unlike the Western classical tradition, where the composer begets his piece, notates it and stamps it with his ownership and remains in effect larger than or the father of his work in the North Indian classical tradition, the *raga* unconfined to a single incarnation, composer or

performer remains necessarily greater than the artists who invokes it.

This leads to a very different politics of interpretation and valuation to an aesthetic that privileges the evanescent moment of performance and invocation over the controlling authority of genius and the permanent record. It is a tradition thus that would appear to value the performer as medium, more highly than the composer who presumes to originate what effectively, cannot be originated in a single person—because the *raga* is the inheritance of a culture.

250) The author's contention that the notion of property lies at the heart of the Western conception of genius is best indicated by which one of the following?

- (a) The creative output of a genius is invariably written down and recorded
- (b) The link between the creator and his output is unambiguous
- (c) The word 'genius' is derived from a Latin word which means 'to beget'
- (d) The music composer notates his music and thus becomes the 'father' of a particular piece of music

251) Saussure's conception of language as a communication between addresser and addressee according to the author is exemplified by the

- (a) teaching of North Indian classical music by word of mouth and direct demonstration
- (b) use of the recorded cassette as a transmission medium between the music teacher and the trainee
- (c) written down notation sheets of musical compositions
- (d) conductor's baton and the orchestra

252) The author holds that the 'rather ugly but a beneficial rectangle of plastic, has proved to be a 'handy technological slave' in

- (a) storing the *talas* played upon the table at various tempos
- (b) ensuring the continuance of an ancient tradition
- (c) transporting North Indian classical music across geographical borders
- (d) capturing the transient moment of oral transmission

253) The oral transmission of North Indian classified music is an almost unique testament of the

- (a) efficacy of the *guru-shishya* tradition
- (b) learning impact of direct demonstration.
- (c) brain's ability to reproduce complex structures without the help of written marks
- (d) the ability of an illiterate person to narrate grand and intricate musical compositions

- 254)** According to the passage in the North Indian classical tradition the raga remains greater than the artist who invokes it. This implies an aesthetic which
- (a) emphasises performance and invocation over the authority of genius and permanent record
 - (b) makes the music no one's property
 - (c) values the composer more highly than the performer
 - (d) supports oral transmission of traditional music
- 255)** Which one of the following cannot be inferred?
- (a) It is easy to transfer a piece of Western classical music to a distant place
 - (b) The conductor in the Western tradition as a custodian can modify the music since it 'lies mute' in his baton
 - (c) The authority of the Western classical music composer over his music product is unambiguous
 - (d) The power of the Western classical music composer extends to the expression of his music
- 256)** According to the author the inadequacy of teaching North Indian classical music through a codified, notation based system is best illustrated by
- (a) a loss of the structural beauty of the ragas
 - (b) a fusion of two opposing approaches creating mundance music
 - (c) the conversion of free-flowing ragas into stilled set pieces
 - (d) its failure to produce any noteworthy student or performer
- 257)** Which of the following statements best conveys the overall idea of the passage?
- (a) North Indian and Western classical music are structurally different
 - (b) Western music is the intellectual property of the genius while the North Indian raga is the inheritance of the culture
 - (c) Creation as well as performance are important in the North Indian classical tradition
 - (d) North Indian classical music is orally transmitted while Western classical music depends on written down notations

PASSAGE 61

The story begins as the European pioneers crossed the Alleghenies and started to settle in the Midwest. The land they found was covered with forests. With incredible effort they felled the trees, pulled the stumps and planted their crops in the rich, loamy soil. When they finally reached the western edge of the place, we now call Indiana, the forest stopped and ahead lay thousand miles of the great grass prairie. The Europeans were puzzled by this new environment. Some even called it the 'Great

Desert'. It seemed untillable, The earth was often very wet and it was covered with centuries of tangled and matted and matted grasses. With their cast iron plows, the settlers found that the prairie sod could not be cut and the wet earth stuck to their plowshares. Even a term of the best oxen bogged down after a few years of tugging. The iron plow was a useless tool to farm the prairie soil. The pioneers were stymied for nearly two decades. Their western march was halted and they filled in the eastern regions of the Midwest.

In 1837, a blacksmith in the town of Grand Detour, Illinois, invented a new tool. His name was John Deere and tool was a plow made of steel. It was sharp enough to cut through matted grasses and smooth enough to cast off the mud. It was a simple tool, the 'sod buster' that opened the great prairies to agricultural development.

Sauk County, Wisconsin is the part of the prairie where I have a home. It is named after the Sauk Indians. In 1673, Father Marquette was the first European to lay his eyes upon their land. He found a village laid out in regular patterns on a plain beside the Wisconsin River. He called the place Prairie du Sac. The village was surrounded by fields that had provided maize, beans and squash for the Sauk people for generations reaching back into the unrecorded time.

When the European settlers arrived at the Sauk prairie in 1837, the government forced the native Sauk people, West of the Mississippi River. The settlers came with John Deere's new invention and used the tool to open the area to a new kind of agriculture. They ignored the traditional ways of the Sauk Indians and used their sod-busting tool for planting wheat. Initially, the soil was generous and the farmers thrived. However, each year the soil lost more of its nurturing power. It was only 30 years after the Europeans arrived with their new technology that the land was depleted. Wheat farming became uneconomic and tens of the thousands of farmers left Wisconsin seeking new land with sod to bust.

It took the Europeans and their new technology just one generation to make their homeland into a desert. The Sauk Indians who knew how to sustain themselves on the Sauk prairie land were banished to another kind of desert called a reservation. And they even forgot about the techniques and tools that had sustained them on the prairie for generations unrecorded. And that is how it was that three deserts were created-Wisconsin, the reservation and the memories of people. A century later, the land of the Sauks is now populated by the children of a second wave of European farmers who learned to replenish the soil through the regenerative powers of dairying, ground cover crops and animal manures. These third and fourth generation farmers and townspeople do

not realise, however, that a new settler is coming soon with an invention as powerful as John Deere's plow. The new technology is called 'bereavement counselling'. It is a tool forged at the great state university, an innovative technique to meet the needs of those experiencing the death of a loved one, a tool that can 'process' the grief of the people who now live on the Prairie of the Sauk. As one can imagine the final days of the village of the Sauk Indians before the arrival of the settlers with John Deere's plow, one can also imagine these final days before the arrival of the settlers with John Deere's plow, one can also imagine these final days before the arrival of the first bereavement counsellor at Prairie du Sac. In these final days, the farmers and the townspeople mourn at the death of a mother, brother, son or friend. The bereaved is joined by neighbours and kin. They meet grief together in lamentation, prayer and song. They call upon the words of the clergy and surround themselves in community.

It is in these ways that they grieve and then go on with life. Through their mourning they are assured of the bonds between them and renewed in the knowledge that this death is a part of the Prairie of the Sauk. Their grief is common property, an anguish from which the community draws strength and gives the bereaved the courage to move ahead.

It is into this prairie community that the bereavement counsellor arrives with the new grief technology. The counsellor calls the invention a service and assures the prairie folk of its effectiveness and superiority by invoking the name of the great university while displaying a diploma and certificate. At first, we can imagine that the local people will be puzzled by the bereavement counsellor's claim. However, the counsellor will tell a few of them that the new technique is merely to assist the bereaved's community at the time of death. To some other prairie folk who are isolated or forgotten, the counsellor will approach the Country Board and advocate the right to treatment for these unfortunate souls. This right will be guaranteed by the Board's decision to reimburse those too poor to pay for counselling services. There will be others, schooled to believe in the innovative new tools certified by universities and medical centres, who will seek out the bereavement counsellor by force of habit. And one of these people will tell a bereaved neighbour who is unschooled that unless his grief is processed by a counsellor, he will probably have major psychological problems in later life. Several people will begin to use the bereavement counsellor because, since the Country Board now taxes them to insure access to the technology,

they will feel that to fail to be counselled is to waste their money and to be denied a benefit or even a right. Finally, one day, the aged father of a Sauk woman will die. And the next door neighbour will not drop by because he doesn't want to interrupt the bereavement counsellor. The woman's kin will stay home because they will have learned that only the bereavement counsellor knows how to process grief the proper way. The local clergy will seek technical assistance from the bereavement counsellor to learn the correct form of service to deal with guilt and grief. And the grieving daughter will know that it is the bereavement counsellor who really cares for her because only the bereavement counsellor comes when death visits this family on the Prairie of the Sauk.

It will be only one generation between the bereavement counsellor arrives and the community of mourners disappears. The counsellor's new tool will cut through the social fabric throwing aside kinship care neighbourly obligations and community ways of coming together and going on. Like John Deere's plow the tools of bereavement counselling will create a desert where a community once flourished. And finally even the bereavement counsellor will see the impossibility of restoring hope in clients once they are genuinely alone with nothing but a service for consolation. In the inevitable failure of the service the bereavement counsellor will find the deserts even in herself.

258) Which one of the following best describes the approach of the author?

- (a) Comparing experiences with two innovations tried in order to illustrate the failure of both
- (b) Presenting community perspectives on two technologies which have had negative effects on people
- (c) Using the negative outcomes of one innovation to illustrate the likely outcomes of another innovation
- (d) Contrasting two contexts separated in time to illustrate how 'deserts' have arisen

259) According to the passage bereavement handling traditionally involves

- (a) the community bereavement counsellors working the bereaved to help/her overcome grief
- (b) the neighbours and kin joining the bereaved and meeting grief together in mourning and prayer
- (c) using techniques developed systematically in formal institutions of learning, a trained counsellor helping the bereaved cope with grief
- (d) the Sauk Indian Chief leading the community with rituals and rites to help lessen the grief of the bereaved

- 260)** Due to which of the following reasons, according to the author, will the bereavement counsellor find the deserts even in herself ?
- (a) Over a period of time working with Sauk Indians who have lost their kinship and relationships she becomes one of them
 - (b) She is working in an environment where the disappearance of community mourners makes her work place a social desert
 - (c) Her efforts at grief processing with the bereaved will fail as no amount of professional service can make up for the loss due to the disappearance of community mourners
 - (d) She has been working with people who have settled for a long time in the Great Desert
- 261)** According to the author, the bereavement counsellor is
- (a) a friend of the bereaved helping him or her handle grief
 - (b) an advocate of the right treatment for the community
 - (c) a kin of the bereaved helping him/her handle grief
 - (d) a formally trained person helping the bereaved handle grief
- 262)** The prairie was a great puzzlement for the European pioneers because
- (a) it was covered with thick, untillable layers of grass over a vast stretch
 - (b) it was a large desert immediately next to lush forests
 - (c) it was rich cultivable land left fallow for centuries
 - (d) it could be easily tilled with iron plows
- 263)** Which of the following does the 'desert' in the passage refer to?
- (a) Prairie soil depleted by cultivation wheat
 - (b) Reservations in which native Indians were resettled
 - (c) Absence of and emptiness in, community kinship and relationships
 - (d) All of the above
- 264)** According to the author, people will begin to utilise the service of the bereavement counsellor because:
- (a) new Country regulations will make them feel it is a right and if they don't use it, it would be a loss
 - (b) the bereaved in the community would find her a helpful friend
 - (c) the will fight for subsistence allowance from the Country Board for the poor among the bereaved
 - (d) grief processing needs tools certified by universities and medical centres

- 265)** Which of the following parallels between the plow and bereavement counselling is not claimed by the author?
- (a) Both are innovative technologies
 - (b) Both result in migration of the communities into which the innovations are introduced
 - (c) Both lead to 'deserts' in the space of only one generation
 - (d) Both are tools introduced by outsiders entering existing communities

PASSAGE 62

In a modern computer, electronic and magnetic storage technologies play complementary roles. Electronic memory chips are fast but volatile (their contents are lost when the computer is unplugged). Magnetic tapes and hard disks are slower, but have the advantage that they are non-volatile, so that they can be used to store software and documents even when the power is off.

In laboratories around the world however researchers are hoping to achieve the best of both worlds. They are trying to build magnetic memory chips that could be used in place of today's electronic ones. These magnetic memories would be non-volatile; but they would also be faster, would consume less power and would be able to stand up to hazardous environments more easily. Such chips would have obvious applications in storage cards for digital cameras and music players; they would enable handheld and laptop to boot up more quickly and to operate for longer, they would allow desktop computers to run faster, they would doubtless have military and space-farming advantages too. But although the theory behind them looks solid, there are tricky practical problems that need to be overcome.

Two different approaches based on different magnetic phenomena are being pursued. The first being investigated by Gary Prinz and his colleagues at the Naval Research Laboratory (NRL) in Washington D.C. exploits the fact that the electrical resistance of some materials changes in the presence of a magnetic field—a phenomenon known as magneto-resistance. For some multi-layered materials, this effect is particularly powerful and is accordingly called 'Giant' Magneto-Resistance (GMR). Since 1997, the exploitation of GMR has made cheap multi-gigabyte hard disks common place. The magnetic orientations of the magnetised spots on the surface of a spinning disk are detected by measuring the changes they induce in the resistance of a tiny sensor. This technique is so sensitive that it means the spots can be made smaller and packed closer together than was previously possible, thus increasing the capacity and reducing the size and cost of a disk drive.

Dr. Prinz and his colleagues are now exploiting the same phenomenon on the surface of memory chips, rather than spinning disks. In a conventional memory chip, each binary digit (bit) of data is represented using a capacitor reservoir of electrical charge that is either empty or full to represent a zero or a one. In the RL's magnetic design, by contrast, each bit is stored in a magnetic element in the form of a vertical pillar of magnetisable material. A matrix of wires passing above and below the elements allows each to be magnetised, either clockwise or anti-clockwise, to represent zero or one. Another set of wires allows current to pass through any particular element. By measuring an element's resistance you can determine its magnetic orientation and hence whether it is storing a zero or a one. Since the elements retain their magnetic orientation even when the power is off, the result is non-volatile memory. Unlike the elements of an electronic memory, a magnetic memory's elements are not easily disrupted by radiation and compared with electronic memories whose capacitors need constant topping up, magnetic memories are simpler and consume less power. The NRL researchers plan to commercialise their device through a company called Non-Volatile Electronics, which recently began work on the necessary processing and fabrication techniques. But it will be some years before the first chips roll off the production line.

Most attention in the field is focused on an alternative approach based on Magnetic Tunnel-Junctions (MTJs), which are being investigated by researchers at chip makers, such as IBM, Motorola, Siemens and Hewlett Packard. IBM's research team, led by Stuart Parkin, has already created a 500 element working prototype that operates at 20 times the speed of conventional memory chips and consumes one percent of the power. Each element consists of a sandwich of two layers of magnetisable material separated by a barrier of aluminium oxide just four or five atoms thick. The polarisation of the lower magnetisable layer is fixed in one direction, but that of the upper layer can be set (again, by passing a current through a matrix of control wires) either to the left or to the right, to store a zero or a one. The polarisations of the two layers are then in either the same or opposite directions.

Although the aluminium-oxide barrier is an electrical insulator, it is so thin that electrons are able to jump across it via a quantum-mechanical effect called tunnelling. It turns out that such tunnelling is easier when the two magnetic layers are polarised in the same direction than when they are polarised in opposite directions. So by measuring the current that flows through the sandwich, it is possible to determine the alignment of the topmost layer and hence whether it is storing a zero or a one.

To build a full-scale memory chip based on MTJs is, however, no easy matter. According to Paulo Freitas, an expert on chip manufacturing at the Technical University of Lisbon, magnetic memory elements will have to become far smaller and more reliable than current prototypes if they are to compete with electronic memory. At the same time, they will have to be sensitive enough to respond when the appropriate wires in the control matrix are switched on, but not so sensitive that they respond when a neighbouring element is changed. Despite these difficulties, the general consensus is that MTJs are the more promising ideas.

Dr. Parkin says his group evaluated the GMR approach and decided not to pursue it, despite the fact that IBM pioneered GMR in hard disks. Dr. Prinz, however, contends that his plan will eventually offer higher storage densities and lower production costs.

Not content with shaking up the multi-billion-dollar market for computer memory, some researchers have even more ambitious plans for magnetic computing. In a paper published last month in *Science*, Russell Cowburn and Mark Welland of Cambridge University outlined research that could form the basis of a magnetic microprocessor—a chip capable of manipulating (rather than merely storing) information magnetically.

In place of conducting wires, a magnetic processor would have rows of magnetic dots, each of which could be polarised in one of two directions. Individual bits of information would travel down the rows as magnetic pulses, changing the orientation of the dots as they went. Dr. Coburn and Dr. Welland have demonstrated how a logic gate (the basic element of a micro-processor) could work in such a scheme. In their experiment, they fed a signal in at one end of the chain of dots and used a second signal to control whether it propagated along the chain.

It is admittedly, a long way from a single logic gate to a full microprocessor, but this was true also when the transistor was first invented. Dr. Cowburn, who is now searching for backers to help commercialise the technology, says he believes it will be at least 10 years before the first magnetic microprocessor is constructed. But other researchers in the field agree that such a chip is the next logical step. Dr. Prinz says that once magnetic memory is sorted out 'the target is to go after the logic circuits.' Whether all-magnetic computers will ever be able to compete with other contenders that are jostling to knock electronics off its perch—such as optical, biological and quantum computing—remains to be seen. Dr. Cowburn suggests that the future lies with hybrid machines that use different technologies. But computing with magnetism evidently has an attraction all its own.

- 266)** In developing memory chips to replace the electronic ones, two alternative research paths are being pursued. These are approaches based on
- (a) volatile and non-volatile memories
 - (b) magneto-resistance and magnetic tunnel-junctions
 - (c) radiation disruption and radiation neutral effects
 - (d) orientation of magnetised spots on the surface of a spinning disk and alignment of magnetic dots on the surface of a conventional memory chip
- 267)** A binary digit or bit is represented in the magneto-resistance based magnetic chip using
- (a) a layer of aluminium oxide
 - (b) a capacitor
 - (c) a vertical pillar of magnetised material
 - (d) a matrix of wires
- 268)** In the Magnetic Tunnel-Junctions (MTJs) tunnelling is easier when
- (a) two magnetic layers are polarised in the same direction
 - (b) two magnetic layers are polarised in the opposite directions
 - (c) two aluminium-oxide barriers are polarised in the same direction
 - (d) two aluminium-oxide barriers are polarised in the opposite directions
- 269)** A major barrier on the way to build a full-scale memory chip based on MTJ is
- (a) the low sensitivity of the magnetic memory elements
 - (b) the thickness of aluminium oxide barriers
 - (c) the need to develop more reliable and far smaller magnetic memory chips
 - (d) All of the above
- 270)** In the MTJs approach, it is possible to identify whether the topmost layer of the magnetised memory element is storing a zero or one by
- (a) measuring an element's resistance and thus determining its magnetic orientation
 - (b) measuring the degree of disruption caused by radiation in the elements of the magnetic memory
 - (c) magnetising the elements either clockwise or anticlockwise
 - (d) measuring the current that flows through the sandwich
- 271)** A line of research which is trying to build a magnetic chip that can both store and manipulate information is being pursued by
- (a) Paul Freitas
 - (b) Stuart Parkin
 - (c) Gray Prinz
 - (d) None of the above
- 272)** Experimental research currently underway, using rows of magnetic dots, each of which could be polarised in one of the two directions, has led to the demonstration of
- (a) working of a microprocessor
 - (b) working of a logic gate
 - (c) working of a magneto-resistance based chip
 - (d) working of a Magneto Tunnelling-Junction (MTJ) based chip
- 273)** From the passage, which of the following cannot be inferred?
- (a) Electronic memory chips are faster and non-volatile
 - (b) Electronic and magnetic storage technologies play a complementary role
 - (c) MTJs are the more promising idea compared to the magneto-resistance approach
 - (d) Non-volatile Electronics is the company set up to commercialise the GMR chips

PASSAGE 63

One of the criteria by which we judge the vitality of a style of painting is its ability to renew itself—its responsiveness to the changing nature and quality of experience, the degree of conceptual and formal innovation that it exhibits. By this criterion, it would appear that the practice of abstractionism has failed to engage creatively with the radical change in human experience in recent decades. It has seemingly been unwilling to re-invent itself in relation to the systems of artistic expression and viewers expectations that have developed under the impact of the mass media. The judgement that abstractionism has slipped into 'inter gear' is gaining endorsement not only among discerning viewers and 'practitioners of other art forms but also among abstract painters themselves. Like their companions elsewhere in the world, abstractionists in India are asking themselves an overwhelming question today: Does abstractionism have a future? The major crisis that abstractionists face is that of revitalising their picture surface, few have improvised any solutions beyond the ones that were exhausted by the 1970s. Like all revolutions, whether in policies or in art, abstractionism must now confront its moment of truth: having begun life as a new and radical pictorial approach to experience, it has become an entrenched orthodoxy itself. Indeed, when viewed against a historical situation in which a variety of subversive, interactive and richly hybrid forms are available to the art practitioner, abstractionism assumes the remote and defiant air of an aristocracy that has outlived its age; trammelled by formulaic conventions yet buttressed by a rhetoric of sacred mystery, it seems condemned to being the last

citadel of the self-regarding 'fine art' tradition, the last hurrah of painting for painting's sake.

The situation is further complicated in India by the circumstances in which an indigenous abstractionism came into prominence here during the 1960s. From the beginning, it was propelled by the dialectic between two motives, one revolutionary and the other conservative— it was inaugurated as an act of emancipation from the dogmas of the nascent Indian nation state, when art was officially viewed as an indulgence at worst and at best as an instrument for the celebration of the republic's hopes and aspirations. Having rejected these dogmas, the pioneering abstractionists also went to reject the various figurative styles associated with the Shantiniketan circle and others. In such a situation, abstractionism was a revolutionary move. It led art towards the exploration of the subconscious mind, the spiritual quest and the possible expansion of consciousness. Indian painting entered into a phase of self-inquiry a meditative inner space where cosmic symbols and non-representational images ruled. Often, the transition from figurative idioms to abstractionist ones took place within the same artist.

At the same time Indian abstractionists have rarely committed themselves wholeheartedly to non-representational idiom. They have been pre-occupied with the fundamentally metaphysical project of aspiring to the mystical holy without altogether renouncing the symbolic. This has been sustained by a hereditary reluctance to give up the murti, the inviolable iconic form, which explains why abstractionism is marked by the conservative tendency to operate with images from the sacred repertoire of the past. Abstractionism thus entered India as a double-edged device in a complex cultural transaction. Ideologically it served as an internationalist legitimisation of the emerging revolutionary local trends. However, on entry, it was conscripted to serve local artistic pre-occupations— a survey of indigenous abstractionism will show that its most obvious points of affinity with European and American abstract art were with the more mystically oriented of the major sources of abstractionist philosophy and practice, for instance, the Kandinsky Klee School. There have been no takers for Malevich's Suprematism which militantly rejected both the artistic forms of the past and the world of appearances, privileging the new-minted geometric symbol as an autonomous sign of the desire for infinity.

Against this backdrop we can identify three major abstractionist idioms in Indian art. The first develops from a love of the earth and assumes the form of the self's dissolution in the cosmic panorama; the landscape is no longer a realistic transcription of the scene, but is transformed into a visionary occasion for contemplating

the cycles of decay and regeneration. The second idiom phrases its departures from symbolic and archetypal devices as invitations to heightened planes of awareness. Abstractionism begins with the establishment or dissolution of the motif which can be drawn from diverse sources including the hieroglyphic tablet, the Sufi mediation dance or the Tantric diagram. The third idiom is based on the lyric play of forms guided by gesture or allied with formal improvisations like the assemblage. Here, sometimes, the line dividing abstract image from patterned design or quasi-random expressive marking may blur. The flux of forms can also be regimented through the policies of pure colour arrangements, vector-diagrammatic spaces and gestural design.

In this genealogy, some pure lines of descent follow their logic to the inevitable point of extinction, others engage in cross-fertilisation and yet others undergo mutation to maintain their energy. However, this genealogical survey demonstrates the wave at its crests, those points where the metaphysical and the painterly have been fused in images of abiding potency; ideas sensuously ordained rather than fabricated programmatically to a concept. It is equally possible to enumerate the troughs where the two principles do not come together, thus arriving at a very different account. Uncharitable as it may sound, the history of Indian abstractionism records a series of attempts to avoid the risks of abstraction by resorting to an overt or near-generic symbolism which many Indian abstractionists embrace when they find themselves bereft of the imaginative energy to negotiate the union of metaphysics and painterliness.

Such symbolism falls into a dual trap: it succumbs to the pompous vacuity of pure metaphysics when the burden of intention is passed off as justification; or then it is desiccated by the arid formalism of pure painterliness with delight in the measure of chance or pattern guiding the execution of a painting. The ensuing conflict of purpose stalls the progress of abstractionism in an impasse. The remarkable Indian abstractionists are precisely those who have overcome this and addressed themselves to the basic elements of their art with a decisive sense of independence from prior models. In their recent work, we see the logic of Indian abstractionism pushed almost to the furthest it can be taken. Beyond such artists stands a lost generation of abstractionists whose work invokes a wistful, delicate beauty but stops there.

Abstractionism is not a universal language; it is an art that points up the loss of a shared language of signs in society. And yet, it affirms the possibility of its recovery through the effort of awareness. While its rhetoric has always emphasised a call for new forms of attention, abstractionist practice has tended to fall into a complacent pride in its own incomprehensibility; a complacency fatal

in an ethos where vibrant new idioms compete for the viewers' attention. Indian abstractionists ought to really return to basics to reformulate and replenish their understanding of the nature of the relationship between the painted image and the world around it. But will they abandon their favourite conceptual habits and formal conventions, if this becomes necessary ?

- 274)** Which one of the following is not stated by the author as a reason for abstractionism losing its vitality ?
- (a) Abstractionism has failed to re-orient itself in the context of changing human experience
 - (b) Abstractionism has not considered the developments in artistic expression that have taken place in recent times
 - (c) Abstractionism has not followed the path taken by all revolutions, whether in politics or art
 - (d) The impact of mass media on viewers' expectations has not been assessed and responded to, by abstractionism
- 275)** Which of the following, according to the author, is the role that abstractionism plays in a society?
- (a) It provides as an idiom that can be understood by most members in a society
 - (b) It highlights the absence of a share language of meaningful symbols which can be recreated through greater awareness
 - (c) It highlights the contradictory artistic trends of revolution and conservatism that any society needs to move forward
 - (d) It helps abstractionists invoke the wistful, delicate beauty that may exist in society
- 276)** According to the author, which one of the following characterises the crisis faced by abstractionism?
- (a) Abstractionists appear to be unable to transcend the solutions tried out earlier
 - (b) Abstractionism has allowed itself to be confined by set forms and practices
 - (c) Abstractionists have been unable to use to multiplicity of forms now becoming available to an artist
 - (d) All of the above
- 277)** According to the author, the introduction of abstractionism was revolutionary because it
- (a) celebrated the hopes and aspirants of a newly independent nation
 - (b) provided a new direction to Indian art, towards self-inquiry and non-representational images
 - (c) managed to obtain internationalist support for the abstractionist agenda
 - (d) was an emancipation from the dogmas of the nascent nation state

- 278)** Which one of the following is not part of the author's characterisation of the conservative trend in Indian abstractionism?
- (a) An exploration of subconscious mind
 - (b) A lack of full commitment to non-representational symbols
 - (c) An adherence to the symbolic while aspiring to the mystical
 - (d) Usage of the images of gods or similar symbols
- 279)** Given the author's delineation of the three abstractionist idioms in Indian art, the third idiom can be best distinguished from the other two idioms through its
- (a) depiction of nature's cyclical renewal
 - (b) use of non-representational images
 - (c) emphasis on arrangement of forms
 - (d) limited reliance on original models
- 280)** According to the author, the attraction of the Kandinsky-Klee School for Indian abstractionist can be explained by which one of the following?
- (a) The conservative tendency to aspire to the mystical without a complete renunciation of the symbolic
 - (b) The discomfort of Indian abstractionists with Malevich's Suprematism
 - (c) The easy identification of obvious points of affinity with European and American abstract art of which the Kandinsky-Klee School is an example
 - (d) The double-edged nature of abstractionism which enabled identification with mystically-oriented schools
- 281)** Which one of the following according to the author is the most important reason for the stalling of abstractionism's progress in an impasse?
- (a) Some artists have followed their abstractionist logic to the point of extinction
 - (b) Some artists have allowed chance or pattern to dominate the execution of their paintings
 - (c) Many artists have avoided the trap of a near-generic and an open symbolism
 - (d) Many artists have found it difficult to fuse the twin principles of the meta-physical and the painterly

PASSAGE 64

The current debate on Intellectual Property Rights (IPRs) raises a number of important issues concerning the strategy and policies for building a more dynamic national agricultural research system, the relative roles of public and private sectors and the role of agribusiness Multi-National Corporations (MNCs). This debate has been stimulated by the international agreement on Trade Related Intellectual Property Rights (TRIPs), negotiated as part of the Uruguay Round. TRIPs, for the first time,

seeks to bring innovations in agricultural technology under a new world wide IPR regime. The agribusiness MNCs (along with pharmaceutical companies) played a leading part in lobbying for such a regime during the Uruguay Round negotiations. The argument was that incentives are necessary to stimulate innovations and that this calls for a system of patents which gives innovators the sole right to use (or sell/lease the right to use) their innovations for a specific period and protects them against unauthorised copying or use. With strong support of their national governments, they were influential in shaping the agreement on TRIPs, which eventually emerged from the Uruguay Round.

The current debate on TRIPs in India—as indeed elsewhere—echoes wider concerns about ‘privatisation’ of research and allowing a free field for MNCs in the sphere of biotechnology and agriculture. The agriculture, the agribusiness corporations and those with unbounded faith in the power of science to overcome all likely problems, point to the vast potential that new technology holds for solving the problems of hunger, malnutrition and poverty in the world. The exploitation of this potential should be encouraged and this is best done by the private sector for which patents are essential. Some, who do not necessarily accept this optimism argue that fear of MNC domination are exaggerated and that farmers will accept their products only if they decisively outperform the available alternatives. Those who argue against agreeing to introduce an IPR regime in agriculture and encouraging private sector research are apprehensive that this will work to be disadvantage of farmers by making them more and more dependent on monopolistic MNCs. A different, though related apprehension is that extensive use of hybrids and genetically engineered new varieties might increase the vulnerability of agriculture to outbreaks of pests and diseases.

The larger, longer-term consequences of reduced biodiversity that may follow from the use of specially bred varieties are also another cause for concern. Moreover, corporations, driven by the profit motive, will necessarily tend to underplay, if not ignore, potential adverse consequences, especially those which are unknown and which may manifest themselves only over a relatively long period. On the other hand, high-pressure advertising and aggressive sales campaigns by private companies can seduce farmers into accepting varieties without being aware of potential adverse effects and the possibility of disastrous consequences for their livelihood if these varieties happen to fail. There is no provision under the laws, as they now exist, for compensating users against such eventualities.

Excessive pre-occupation with seeds and seed material has obscured other important issues involved in reviewing the research policy. We need to remind ourselves that improved varieties by themselves are not sufficient for sustained growth of yields. In our own experience, some of the early High Yielding Varieties (HYVs) of rice and wheat were found susceptible to widespread pest attacks and some had problems of grain quality. Further research was necessary to solve these problems. This largely successful research was almost entirely done in public research institutions. Of course, it could in principle have been done by private companies, but whether they choose to do so depends crucially on the extent of the loss in market for their original introductions on account of the above factors and whether the companies are financially strong enough to absorb the ‘losses’ invest in research to correct the deficiencies and recover the lost market. Public research, which is not driven by profit, is better placed to take corrective action. Research for improving common pool resource management, maintaining ecological health and ensuring sustainability is both critical and also demanding in terms of technological challenge and resource requirements. As such research is crucial to the impact of new varieties, chemicals and equipment in the farmer’s field, private companies should be interested in such research. But their primary interest is in the sale of seed material, chemicals, equipment and other inputs produced by them. Knowledge and techniques for resource management are not ‘marketable’ in the same way as those inputs. Their application to land, water and forests has a long gestation and their efficacy depends on resolving difficult problems such as designing institutions for proper and equitable management of common pool resources. Public or quasi-public research institutions informed by broader, long-term concerns can only do such work.

The public sector must therefore continue to play a major role in the national research system. It is both wrong and misleading to pose the problem in terms of public sector versus private sector or of privatisation of research. We need to address problems likely to arise on account of the public-private sector complementarity and ensure that the public research system performs efficiently. Complementarity between various elements of research raises several issues in implementing an IPR regime. Private companies do not produce new varieties and inputs entirely as a result of their own research. Almost all technological improvement is based on knowledge and experience accumulated from the past and the result of basic and applied research in public and quasi public institutions (universities, research organisations).

Moreover, as is increasingly recognised, accumulated stock of knowledge does not reside only in the scientific community and its academic publications, but is also widely diffused in traditions and folk knowledge of local communities all over.

The deciphering of the structure and functioning of DNA forms the basis of much of modern biotechnology. But this fundamental breakthrough is a 'public good' freely accessible in the public domain and usable free of any charge. Varieties/techniques developed using that knowledge can however be and are patented for private profit. Similarly, private corporations draw extensively and without any charge on germ plasm available in varieties of plants species (neem and turmeric are by now famous examples). Publicly funded gene banks as well as new varieties bred by public sector research stations can also be used freely by private enterprises for developing their own varieties and seek patent protection for them. Should private breeders be allowed free use of basic scientific discoveries? Should the repositories of traditional knowledge and germ plasm be collected which are maintained and improved by publicly funded institutions? Or should users be made to pay for such use? If they are to pay, what should be the basis of compensation? Should the compensation be for individuals or for communities/institutions to which they belong? Should individuals/institutions be given the right of patenting their innovations? These are some of the important issues that deserve more attention that they now get and need serious detailed study to evolve reasonably satisfactory, fair and workable solutions. Finally, the tendency to equate the public sector with the government is wrong. The public space is much wider than government departments and include co-operatives, universities, public trusts and a variety of Non-Governmental Organisations (NGOs). Giving greater autonomy to research organisations from government control and giving non-government public institutions the space and resources to play a larger, more effective role in research, is therefore an issue of direct relevance in restructuring the public research system.

282) Which one of the following statements describes an important issue or important issues not being raised in the context of the current debate on IPRs?

- (a) The role of MNCs in the sphere of biotechnology and agriculture
- (b) The strategy and policies for establishing an IPR regime for Indian agriculture
- (c) The relative roles public and private sectors
- (d) Wider concerns about 'privatisation' of research

283) The fundamental breakthrough in deciphering the structure and functioning of DNA has become a public good. This means that

- (a) breakthroughs in fundamental research on DNA are accessible by all without any monetary considerations
- (b) the fundamental research on DNA has the characteristic of having beneficial effects for the public at large
- (c) due to the large scale of fundamental research on DNA it falls in the domain of public sector research institutions
- (d) the public and other companies must have free access to such fundamental breakthroughs in research

284) In debating the respective role of the public and private sectors in the national research system, it is important to recognise

- (a) that private companies do not produce new varieties and inputs entirely on their own research
- (b) that almost all technologies improvements are based on knowledge and experience accumulated from the past
- (c) the complementary role of public and private-sector research
- (d) that knowledge repositories are primarily the scientific community and its academic publications

285) Which one of the following may provide incentives to address the problem of potential adverse consequences of biotechnology?

- (a) Include IPR issues in the TRIPs agreement
- (b) Nationalise MNCs engaged in private research in biotechnology
- (c) Encourage domestic firms to patent their innovations
- (d) Make provisions in the law for user compensation against failure of newly developed varieties

286) Which of the following statements is not a likely consequence of emerging technologies in agriculture?

- (a) Development of newer and newer varieties will lead to increase in biodiversity
- (b) MNCs may underplay the negative consequences of the newer technology on environment
- (c) Newer varieties of seeds may increase vulnerability of crops to pests and diseases
- (d) Reforms in patent laws and user compensation against crop failures would be needed to address new technology problems

- 287)** The TRIPs agreement emerged from the Uruguay Round to
- (a) address the problem of adverse consequences of genetically engineered new varieties of grain
 - (b) fulfil the WTO requirement to have an agreement on trade related property rights
 - (c) provide incentives to innovators by way of protecting their intellectual property
 - (d) give credibility to the innovations made by MNCs in the field of pharmaceuticals and agriculture
- 288)** Public or quasi-public research institutions are more likely than private companies to address the negative consequences of new technologies because of which of the following reasons ?
- (a) Public research is not driven by profit motive
 - (b) Private companies may not be able to absorb losses arising out of the negative effects of the new technologies
 - (c) Unlike new technology products, knowledge and techniques for resource management are not amenable to simple market transactions
 - (d) All of the above
- 289)** While developing a strategy and policies for building a more dynamic national agricultural research system which one of the following statements needs to be considered ?
- (a) Public and quasi-public institutions are not interested in making profits
 - (b) Public and quasi-public institutions have a broader and long-term outlook than private companies
 - (c) Private companies are incapable of building products based on traditional folk knowledge
 - (d) Traditional and folk knowledge cannot be protected by patents

Directions (Q. Nos. 290-300) Read the passage given below and answer the questions that follow based on the information given in the passage. (1999)

PASSAGE 65

Have you ever come across a painting, by Picasso, Mondrian, Miro or any other modern abstract painter of this century and found yourself engulfed in a brightly coloured canvas which your senses cannot interpret? Many people would tend to denounce abstractionism as senseless trash. These people are disoriented by Miro's bright fanciful creatures and two-dimensional canvases. They click their tongues and shake their heads at Mondrian's grid works, declaring that the poor guy played too many scrabble games. They silently shake their heads in sympathy for Picasso, whose gruesome, distorted figures must be a reflection of his mental health. Then, standing in front of a work by Charlie

Russel, the famous Western artist, they'll declare it a work of God. People feel more comfortable with something they can relate to and understand immediately without too much thought. This is the case with the work of Charlie Russell. Being able to recognise the elements in his paintings-trees, horses and cowboys-gives people a safety like to their world or 'reality'. There are some who would disagree when I say abstract art requires more creativity and artistic talent to produce a good piece than does representational art, but there are many weaknesses in their arguments.

People who look down on abstract art have several major arguments to support their beliefs. They feel that artists turn abstract because they are not capable of the technical drafting skills that appear in a Russell: therefore, such artists create an art form that anyone is capable of and that is less time consuming and then parade it as artistic progress. Secondly, they feel that the purpose of art is to create something of beauty in an orderly, logical composition. Russell's compositions are balanced and rational: everything sits calmly on the canvas, leaving the viewer satisfied that he has seen all there is to see. The modern abstractionists, on the other hand, seem to compose their pieces irrationally. For example, upon seeing Picasso's Guernica, a friend of mine asked me, "What's the point?" Finally, many people feel that art should portray the idea and real. The exactness of detail in Charlie's Russell's work is an example of this. He has been called a great historian because his pieces depict the life style, dress and events of the times. His subject matter is derived from his own experiences on the trail and reproduced to the smallest detail.

I agree in part with many of these arguments and at one time even endorsed them. But now, I believe differently. Firstly, I object to the argument that abstract artists are not capable of drafting.

Many abstract artists, such as Picasso, are excellent draftsmen. As his work matured, Picasso became more abstract in order to increase the expressive quality of his work. Guernica was meant as a protest against the bombings of that city by the Germans. To express the terror and suffering of the victims more vividly, he distorted the figures and presented them in a black and white journalistic manner. If he had used representational images and colour, much of the emotional content would have been lost and the piece would not have caused the demand for justice that it did. Secondly, I do not think that a piece must be logical and aesthetically pleasing to be art. The message it conveys to its viewers is more important. It should reflect the ideals and issues of its time and be true to itself, not just a flowery, glossy surface. For example, through his work,

Mondrian was trying to present a system of simplicity, logic and rational order. As a result, his pieces did end up looking like a scrabble board.

Miro created powerful surrealistic images from his dream and subconscious. These artists were trying to evoke a response from society through an expressionistic manner. Finally, abstract artists and representational artists maintain different ideas about reality. To the representational artist, reality is what he sees with his eyes. This is the reality he reproduced on canvas. To the abstract artist, reality is what he feels about what his eyes see. This is the reality he interprets on canvas. This can be illustrated by Mondrian's Trees series. You can actually see the progression from the early recognisable, though abstracted, trees, to his final solution, the grid system.

A cycle of abstract and representational art began with the first scratchings of prehistoric man. From the abstractions of ancient Egypt to representational, classical Rome, returning to abstractionism in early Christian art and so on up to the present day, the cycle has been going on. But this day and age may witness its death through the camera. With film there is no need to produce finally detail, historical records manually, the camera does this for us more efficiently. Maybe, representational art would cease to exist. With abstractionism as the victor of the first battle may be a different kind of cycle will be touched off. Possibly, some time in the distant future, thousand of years from now, art itself will physically non-existent. Some artists today believe that once they have planned and constructed a piece in their mind, there is no sense in finishing it with their hands; it has already been done and can never be duplicated.

- 290)** The author argues that many people look down abstract art because they feel that
- (a) modern abstract art does not portray what is ideal and real
 - (b) abstract artists are unskilled in matters of technical drafting
 - (c) abstractionist compose irrationally
 - (d) All of the above
- 291)** The author believes that people feel comfortable with representational art because
- (a) they are not engulfed in brightly coloured canvases
 - (b) they do not have to click their tongues and shake their heads in sympathy
 - (c) they understand the art without putting too much strain on their minds
 - (d) painting like Guernica do not have a point

292) In the author's opinion, Picasso's Guernica created a strong demand for justice since

- (a) it was a protest against the German bombing Guernica
- (b) Picasso managed to express the emotional content well with his abstract depiction
- (c) it depicts the terror and suffering of the victims in a distorted manner
- (d) it was a mature work of Picasso, painted when the artist's drafting skills were excellent

293) The author acknowledges that Mondrian's pieces may have ended up looking like a scrabble board because

- (a) many people declared the poor guy played too many scrabble games
- (b) Mondrian believed in the 'grid-works' approach to abstractionist painting
- (c) Mondrian was trying to convey the message of simplicity and rational order
- (d) Mondrian learned from his Tree series to evolve a grid system

294) The main difference between the abstract artist and the representational artist in matter of the 'ideal' and the 'real', according to the author is

- (a) how each chooses to deal with 'reality' on his or her canvas
- (b) the superiority of interpretation of reality over production of reality
- (c) the different values attached by each to being a historian
- (d) the varying levels of drafting skills and logical thinking abilities

PASSAGE 66

The World Trade Organisation (WTO) was formed in the early 1990s as a component of the Uruguay Round negotiation. However, it could have been negotiated as part of the Tokyo Round of the 1970s, since that negotiation was an attempt at a 'constitutional reform' of the General Agreement on Tariffs and Trade (GATT). Or it could have been put off to the future, as the US Government wanted. What factors led to the creation of the WTO in the early 1990s.

One factor was the pattern of multilateral bargaining that developed late in the Uruguay Round. Like all complex international agreements, the WTO was a product of a series of trade-offs between principal actors and groups. For the United States, which did not want a new organisation, the dispute settlement part of the WTO package achieved its longstanding goal of a more effective and more legal dispute settlements system. For

the Europeans, who by the 1990s had come to view GATT dispute settlement less in political terms and more as a regime of legal obligations, the WTO package was acceptable as a means to discipline the resort to unilateral measures by the United States. Countries like Canada and other middle and smaller trading partners were attracted by the expansion of a rules-based system and by the symbolic value of a trade organisation, both of which inherently support the weak against the strong. The developing countries were attracted due to the provisions banning unilateral measures. Finally and perhaps most important, many countries at the Uruguay Round came to put a higher priority on the export gains than on the import losses that the negotiation would produce and they came to associate the WTO and rules-based system with those gains. This reasoning-replicated in many countries was contained in US Ambassador Kantor's defence of the WTO and its amounted to a recognition that international trade and its benefits cannot be enjoyed unless trading nations accept the discipline of a negotiated rules-based environment.

A second factor in the creation of the WTO was pressure from lawyers and the legal process. The dispute settlement system of the WTO was seen as a victory of legalists over pragmatists but the matter went deeper than that the GATT and the WTO, are contract organisations based on rules and it is inevitable that an organisation created to further rules will in turn be influenced by the legal process. Robert Hudec has written of the 'momentum of legal development', but What is this precisely? Legal development can be defined as promotion of the technical legal values of consistency, clarity (or, certainty) and effectiveness: these are values that those responsible for administering any legal system will seek to maximise. As it played out in the WTO, consistency meant integrating under one roof the whole lot of separate agreements signed under GATT auspices; clarity meant removing ambiguities about the powers of contracting parties to make certain decisions or to undertake waivers and effectiveness meant eliminating exceptions arising out of grandfather-rights and resolving defects in dispute settlement procedures and institutional provisions. Concern for these values is inherent in any rules based system of co-operation, since without these values, rules would be meaningless in the first place. Rules, therefore, create their own incentive for fulfillment.

The momentum of legal development has occurred in other institutions besides the GATT, most notably in the European Union (EU). Over the past two decades the European Court of Justice (ECJ) has consistently rendered decisions that have expanded incrementally the

EU's internal market, in which the doctrine of 'mutual recognition' handed down in the case *Cassis de Dijon* in 1979 was a key turning point. The court is now widely recognised as a major player in European integration, even though arguably such a strong role was not originally envisaged in the treaty of Rome, which initiated the current European Union. One means the court used to expand integration was the 'teleological method of interpretation', whereby the actions of member states were evaluated against 'the accomplishment of the most elementary community goals set forth in the Preamble to the (Rome) Treaty'. The teleological method represents an effort of keep current policies consistent with stated goals and it is analogous to the effort in GATT to keep contracting party trade practices consistent with stated rules. In both cases legal concerns and procedures are an independent force for further co-operation.

In large part, the WTO was an exercise in consolidation. In the context of a trade negotiation that created a near-revolutionary expansion of international trade rules, the formation of the WTO was a deeply conservative act needed to ensure that the benefits of the new rules would not be lost. The WTO was all about institutional structure and dispute settlement: these are the concerns of conservatives and not revolutionaries, which is why lawyers and legalists took the lead on these issues. The WTO codified the GATT institutional practice that had developed by custom over three decades and it incorporated a new dispute settlement system that was necessary to keep both old and new rules from becoming a sham. Both the international structure and the dispute settlement system were necessary to preserve and enhance the integrity of the multilateral trade regime that had been incrementally from the 1940s to the 1990s.

295) What could be the closest reason, why the WTO was not formed in the 1970s?

- (a) The US Government did not like it
- (b) Important players did not find it in their best interest to do so
- (c) Lawyers did not work for the dispute settlement system
- (d) The Tokyo Round negotiation was an attempt at constitutional reform

296) The most likely reason for the acceptance of the WTO package by nations was that

- (a) it had the means to prevent the US from taking unilateral measures
- (b) they recognised the need for a rule-based environment to protect the benefits of increased trade
- (c) it settles disputes more legally and more effectively
- (d) its rule-based system leads to export gains

- 297)** According to the passage, WTO promoted the technical legal values partly through
- (a) integrating under one roof the agreements signed under GATT
 - (b) rules that create their own incentive for fulfilment
 - (c) grandfather-rights exceptions and defects in dispute settlement procedures
 - (d) ambiguities about the powers of contracting parties to make certain decisions
- 298)** In the method of interpretation of the European Court of Justice
- (a) current policies needed to be consistent with state goals
 - (b) contracting party trade practices needed to be consistent with stated rules
 - (c) enunciation of the most elementary community goals needed to be emphasised
 - (d) actions of member states needed to be evaluated against the stated community goals
- 299)** In the statement “..... it amounted to a recognition that international trade and its benefits cannot be enjoyed unless trading nations accept the discipline of a negotiated rules-based environment”, ‘it’ refers to
- (a) Ambassador Kantor’s defence of the WTO
 - (b) the higher priority on export gains placed by many countries at the Uruguay Round
 - (c) the export gains many countries came to associate with a rule-based system
 - (d) the provision of a rule-based system by the WTO
- 300)** The importance of Cassis de Dijon is that it
- (a) gave a new impetus to the momentum of legal development at the European Court of justice
 - (b) resulted in a decision that expanded incrementally the EU’s internal market
 - (c) strengthened the role of the court more than envisaged in the Treaty of Rome
 - (d) led to a doctrine that was a key turning point in European integration

Directions (Q. Nos. 301-366) Read the passage given below and answer the questions that follow based on the information given in the passage. (1998)

PASSAGE 67

From ancient times, men have believed that, under certain peculiar circumstances, life could arise spontaneously: from the ooze of rivers could come eels and from the entrails of dead bulls, bees; worms from mud and maggots from dead meat. This belief as held by Aristotle, Newton and Descartes, among many others and apparently the great William Harvey too. The weight of centuries gradually disintegrated men’s beliefs

in the spontaneous origin of maggots and mice, but the doctrine of spontaneous generation clung tenaciously to the question of bacterial origin.

In association with Buffon, the Irish Jesuit priest John Needham declared that he could bring about at will the creation of living microbes in heat-sterilised broths and presumably in propitiation theorised that God did not create living things directly but bade the Earth and water to bring them forth.

In his Dictionnaire Philosophique, Voltaire reflected that it was odd to read of Father Needham’s claim while atheists canversely should deny a Creator yet attribute to themselves the power of creating eels. But, wrote Thomas Huxley, ‘The great tragedy of science-the slaying of a beautiful hypothesis by an ugly fact-which is so constantly being enacted under the eyes of philosophers, was played almost immediately for the benefit of Buffon and Needham.

The Italian Abbe Spallanzani did any experiment. He showed that a broth sealed from the air while boiling never develops bacterial growths and hence never decomposes. To Needham’s objection that Spallanzani had ruined his broths and the air above them by excessive boiling the abbe replied by breaking the seals of his flasks. Air rushed in and bacterial growth began! But the essential conflict remained. Whatever Spallanzani and his followers did to remove seeds and contaminants was regarded by the spontaneous generationists as damaging to the ‘vital force’ from whence comes new life.

Thus doubt remained and into the controversy came the Titanic figure of Louis Pasteur. Believing that a solution to this problem was essential to the development of his theories concerning the role of bacteria in nature, Pasteur freely acknowledged the possibility that living bacteria very well might be arising a new form inanimate matter. To him the research problem was largely a technical one: to repeat the work of those who claimed to have observed bacterial entry. For the one that contended that life did not enter from the outside, the proof had to go to the question of possible contamination. Pasteur worked logically. He found during the experiments that after prolonged boiling, a broth would ferment only when air was admitted to it. Therefore, he contended either air contained a factor necessary for the spontaneous generation of life or viable germs were borne in by the air and seeded in the sterile nutrient broth. Pasteur designed ingenious flasks whose long S-shaped necks could be left open. Air was trapped in the sinuous glass tube. Broths boiled in these flask tubes remained sterile. When their necks were snapped to admit ordinary air, bacterial growth would then commence but not in every case. An occasional flask

would remain sterile presumably because the bacterial population of the air is unevenly distributed. The forces of spontaneous generation would not be so erratic. Continuous scepticism drove Pasteur almost to fanatical efforts to control the ingredients of his experiments to destroy the doubts of the most sceptical. He ranged from the mountain air of Montanvert which he showed to be almost sterile, to those deep, clear wells whose waters had been rendered germ free by slow filtration through sandy soil. The latter discovery led to the familiar porcelain filters of the bacteriology laboratory. With pores small enough to exclude bacteria, solutions allowed to percolate through them could be reliably sterilised.

The argument raged on and soon spilled beyond the boundaries of science to become a burning religious and philosophical question of the day. For many, Pasteur's conclusions caused conflict because they seemed simultaneously to support the Biblical account of creation while denying a variety of other philosophical systems. The public was soon caught up in the cross fire of a vigorous series of public lectures and demonstrations by leading exponents of both views, novelists, clergymen their adjuncts and friends. Perhaps the most famous of these evening in the theatre-competing perhaps with a great debate between Huxley and Bishop Wiberforce for elegance of rhetoric-was Pasteur's public lecture at the Sorbonne on April 7, 1864. Having shown his audience the swan necked flasks containing sterile broths, he concluded, "And, therefore, gentleman, I could point to that liquid and say to you, I have taken my drop of water from the immensity of creation and I have taken it full of the elements appropriated to the development of inferior beings. And I wait, I watch, I question it! begging it to recommence for me the beautiful spectacle of the first creation. But it is dumb, dumb since these experiments were begun several years ago; it is dumb because I have kept it from the only thing man does not know how to produce: from the germs that float in the air, from life, for life is a germ and a germ is Life. Never will the doctrine of spontaneous generation recover from the mortal blow of this impel experiment. "And it is not. Today these same flasks stand immutable : they are still free of microbial life.

It is an interesting fact that despite the ringing declaration of Pasteur, the issue did not die completely. And although far from healthy, it is not yet dead. In his fascinating biography of Pasteur, Rene Dubos has traced the later developments which saw new eruptions of the controversy, new technical progress and criticism and new energetic figures in the breach of the battle such as Bastion for and the immortal Tyndall against the doctrine of spontaneous generation. There was also new

'sorrow' for Pasteur as he read years later, in 1877, the last jottings of the great physiologist Claude Bernard and saw in them the 'mystical' suggestion that yeast may arise from grape juice. Even at this late date, Pasteur was stirred to new experiments again to prove to the dead Bernard and his followers the correctness of his position.

It seems to me that spontaneous generation is not only a possibility but a completely reasonable possibility which should never be relinquished from scientific thought. Before men knew of bacteria they accepted the doctrine of spontaneous generation as the 'only reasonable alternative' to a belief in supernatural creation. But today, as we look for satisfaction at the downfall of the spontaneous generation hypothesis, we must not forget that science has rationally concluded that life once did originate on earth by spontaneous generation. It was really Pasteur's evidence against spontaneous generation that for the first time brought the whole difficult question of the origin of life before the scientific world.

In the above controversy, what was unreasonable was the parade of men who claimed to have 'proved' or who resolutely 'believed in' spontaneous generation on the face of proof-not that spontaneous generation cannot occur-but that their work was shot through with experimental error. The acceptable evidence also makes it clear that spontaneous generation, if it does not occur, must obviously be a highly improbable event under present conditions. Logic tells us that science can only prove an event improbable : it can never prove it impossible and Gamow has appropriately remarked that nobody is really certain what would happen if a hermetically sealed can were opened after a couple of million years. Modern science agrees that it was highly improbable for life to have arisen in the Pre-Cambrian seas, but it concluded, nevertheless, that there it did occur. With this, I think, Pasteur would agree.

Aside from their theoretical implications, these researchers had the great practical result of putting bacteriology on a solid footing. It was now clear how precisely careful one had to be to avoid bacterial contamination in the laboratory. We now knew what 'sterile' meant and we knew that there could be no such thing as 'partial sterilisation'. The discovery of bacteria high in the upper atmosphere, in the mud of the deep sea bottom, in the waters of hot springs and in the Arctic glaciers established bacterial ubiquity as almost absolute. In recognition of this Lord Lister introduced aseptic technique into the practice of surgery.

It was the revolution in technique alone that made possible modern bacteriology and the subsequent research connecting bacteria to phenomena of human

concern, research, which today is more prodigious than ever. We are just beginning to understand the relationship of bacteria to certain human diseases, to soil chemistry, nutrition and the phenomenon of anti-biosis wherein a product of one organism (eg penicillin) is detrimental to another.

It is not an exaggeration then to say that the emergence of the cell theory represents biology's most significant and fruitful advance. The realisation that all plants and animals are composed of cells which are essentially alike, that cells are all formed by the same fundamental division process, that the total organism is a whole made up of the activities and inter-relations of its individual cells, opened up horizons we have not even begun to approach. The cell is a microcosm of life, for in its origin, nature and continuity resides the entire problem of biology.

- 301)** Needham's theory that 'God did not create living things directly' was posited as
- (a) an attempt to support his assertion by religious doctrine
 - (b) an attempt to placate his religious peers
 - (c) an attempt at propitiating a possibly offended God or the religious psyche of the time
 - (d) All of the above
- 302)** It can be inferred from the passage that
- (a) Huxley, Buffon and Needham were contemporaries
 - (b) Buffon, Needham, Voltaire and Huxley were contemporaries
 - (c) Voltaire wrote a treatise on Needham's claim
 - (d) None of the above
- 303)** According to the passage
- (a) Pasteur's precursors in the field worked on the basis of spontaneous generation
 - (b) Unlike his predecessors Pasteur worked on logical premises rather than arbitrary and spontaneous discoveries
 - (c) Pasteur stood to benefit largely from the work of his predecessors
 - (d) Pasteur developed the ideas set forth by Voltaire and Needham
- 304)** Pasteur began his work on the basis of the contention that
- (a) either air contained a factor necessary for the spontaneous generation of life or viable germs were borne in by the air and seeded in the sterile nutrient broth
 - (b) after prolonged boiling, a broth would ferment only when air was admitted to it
 - (c) Both (a) and (b)
 - (d) Neither (a) nor (b)
- 305)** The porcelain filters of the bacteriology laboratories owed their descent to
- (a) Pasteur's homeland
 - (b) The well water of Montan vert that had been rendered germ free by slow filtration through sandy soil
 - (c) Both (a) and (b)
 - (d) None of the above
- 306)** What, according to the passage was Pasteur's declaration to the world?
- (a) Nobody could deny the work done by him
 - (b) Science would forever be indebted to his experiments in bacteriology
 - (c) The doctrine of spontaneous generation would never recover from the mortal blow dealt to it by his experiments
 - (d) Those who refused to acknowledge his experiments would regret their scepticism
- 307)** What according to the writer, was the problem with the proponents of spontaneous generation?
- (a) Their work had no scientific basis
 - (b) Their work was ruined by experimental errors
 - (c) Both (a) and (b)
 - (d) Neither (a) nor (b)
- 308)** One of the results of the theoretical cross fire regarding bacteriology was that
- (a) partial sterilization as a possibility was ruled out
 - (b) aseptic technique was introduced in surgery
 - (c) the meaning of sterile was clear to all
 - (d) All of the above
- 309)** One of the reasons for the conflict caused by Pasteur's experiments was that
- (a) they denied the existence of God as the creator
 - (b) they seemed simultaneously to support the Biblical account of creation while denying a variety of other philosophical systems
 - (c) academicians and scientists refused to accept his theories
 - (d) there were too many debates on the topic and this left the people confused
- 310)** According to the author
- (a) it is an exaggeration to say that cell theory represents biology's most significant and fruitful advance
 - (b) Pasteur could not hold his own against the contenders
 - (c) cell theory rendered null and void all the other bacteriological theories of the time
 - (d) the emergence of the cell theory represents biology's most significant and fruitful advance

PASSAGE 68

The highest priced words are ghost-written by gagmen who furnish the raw material for comedy over the air and on the screen. They have a word-lore all their own, which they practise for five to fifteen hundred dollar a week or fifteen dollars a gag at piece rates. That's sizeable rate for confounding acrimony with matrimony or extracting atar of roses from the otter.

Quite apart from the dollar sign on it, gagmen's word-lore is worth a close look, if you are given to the popular American pastime of playing with words—or if you're part of the 40 percent who make their living in the word trade.

Gag writers' tricks with words point up the fact that we have two distinct levels of language : familiar ordinary words that everybody knows and more elaborate words that don't turn up so often, but many of which we need to know if we are to feel at home in listening and reading today.

To be sure gagmen play hob with the big words, making not sense but fun of them. They keep on confusing bigotry with bigamy, illiterate with illegitimate, monotony with monogamy, osculation with oscillation. They trade on the fact that for many of their listeners, these fancy terms linger in a twilight zone of meaning. It's their deliberate intent to make everybody feel cozy at hearing big words, jumbled up or smacked down. After all, such words loom up over-size in ordinary talk, so no wonder they get the bulldozer treatment from the gagmen.

Their wrecking technique incidentally reveals our language as full of tricky words, some with 19 different meanings, others which sound alike but differ in sense. To ring good punning changes, gag writers have to know their way around in the language. They don't get paid for ignorance, only for simulating it.

Their trade is a hard one and they regard it as serious business. They never laugh at each other's jokes; rarely at their own. Like comediennesses, they are usually melancholy men in private life.

Fertile invention and ingenious fancy are required to clean up 'blue' burlesque gags for radio use. These shady gags are the theoretically taboo on the air. However, a gag writer who can leave a faint trace of bluing when he lauders the joke is all the more admired—and more highly paid.

A gag that keeps the blue tinge is called a 'double intender', gag-land jargon for double entendre. The double meaning makes the joke funny at two levels. Children and other innocents hearing the crack for the first time take it literally, laughing at the surface humour; listeners who remember the original as they

head it in vaudeville or burlesque, laugh at the artfulness with which the blue tinge is disguised.

Another name for a double meaning of this sort is 'insinuendo'. This is a portmanteau word or 'combo', as the gagmen would label it, thus abbreviating combination. By telescoping insinuation and innuendo, they get insinuendo, on the principle of blend words brought into vogue by Lewis Carroll 'Shock logic' is another favourite with gag writers. Supposedly, a speciality of women comediennesses, it is illogical logic more easily illustrated than defined. A high school girl has to turn down a boy's proposal, she writes

Dear Jerry

I'm sorry, but I can't get engaged to you. My mother thinks I am too young to be engaged and besides, I'm already engaged to another boy.

Yours regretfully.

Guess who.

Gag writers' lingo is consistently funnier than their gags. It should interest the slang-fancier. And like much vivid jargon developed in specialised trades and sports, a few of the terms are making their way into general use. Gimmick, for instance, in the sense either of a trick devised or the point of a joke, is creeping into the vocabulary of columnists and feature writers.

Even apart from the trade lingo, gagmen's maneuvers are of real concern to anyone who follows words with a fully awakened interest. For the very fact that gag writers often use a long and unusual word as the hinge of a joke or as a peg for situation comedy, tells us something quite significant: they are well aware of the limitations of the average vocabulary and are quite willing to cash in on its shortcomings.

When Fred Allens' joke-smiths work out a fishing routine, they have Allen referring to the bait in his most arch and solemn tones : "I presume you mean the legless invertebrate." This is the old minstrel tick, using a long fancy term, instead of calling a worm a worm.

Chico Marx can stretch a pun over 500 feet of film, making it funnier all the time, as he did when he worried the work viaduct, which he rendered, "Why a duck ?"

And even the high-brow radio writers have taken advantage of gagmen's technique. You might never expect to hear on the air. Such words as lepidopterist and entomologist. Both occur in a very famous radio play by Norman Corvine, 'My client Curly', about an unusual caterpillar which would dance to the tune 'yes, sir, she's my bad' but remained inert to all other music. The dancing caterpillar was given a real New York buildup, which involved calling in the experts on butterflies and insects which travel under the learned names above.

Corvine made mild fun of the fancy professional titles, at the same time explaining them unobtrusively.

There are many similar occasions where anyone working with words can turn gagmen's trade secrets to count. Just what words do they think outside the familiar range? How do they pick the words that they 'kick around'? It is not hard to find out.

- 311)** According to the writer, a larger part of the American population
- (a) indulges in playing out the role of gag writers
 - (b) indulges in the word trade
 - (c) seeks employment in the gag trade for want of something better
 - (d) looks down on gag writers
- 312)** The hallmark of gag writers is that
- (a) they ruin good, simple language
 - (c) make better sense of words
 - (b) have fun with words
 - (d) play with words to suit the audience's requirements
- 313)** According to the passage, the second level of language is important if
- (a) one wants to be at home reading and listening today
 - (b) one wants to be a gag writer
 - (c) one wants to understand clean entertainment
 - (d) All of the above
- 314)** According to the writer, gag writers thrive on
- (a) the double-layered aspect of language
 - (b) audience craze for double entendres
 - (c) vulgar innuendoes
 - (d) common place jugglery with language
- 315)** In gag writers' trade
- (a) long words are abbreviated for effect
 - (b) parts of words are combined to produce hilarious portmanteau effect
 - (c) long words play a major role
 - (d) Both (b) and (c)
- 316)** When the writer says, "They don't get paid for ignorance, only for simulating it," he means to say
- (a) the audience likes to think the gag writers are an ignorant lot
 - (b) gag writers are terrific with insinuations
 - (c) simulating ignorance is the trick that makes gag writers tick
 - (d) None of the above
- 317)** Gag writers have influenced
- (a) television artists
 - (b) radio writers
 - (c) circus clowns
 - (d) All of these

PASSAGE 69

If Western civilization is in a state of permanent crisis, it is not far fetched to suggest that there may be something wrong with its education. No civilization, I am sure, has ever devoted more energy and resources to organised education and if we believe in nothing else, we certainly believe that education is or should be, the key to everything. In fact, the belief in education is so strong that we treat it as the residual legatee of all our problems. If the nuclear age brings new danger, if the advance of genetic engineering opens the doors of new abuses; if commercialism brings new temptations, the answer must be more and better education. The modern way of life is becoming more complex: This means that everybody must become more highly educated, "By 1984", it was said recently; "It will be desirable that the most ordinary of men is not embarrassed by the use of a logarithm table, the elementary concepts of the calculus and by the definitions and uses of such words as electron, coulomb and volt. He should further have become able not only to handle a pen and ruler but also a magnetic tape, valve and transistor.

The improvement of communications between individuals and groups depends on it." Most of all, it appears, the international situation calls for prodigious educational efforts. The classical statement on this point was delivered by Sir Charles (now Lord) Snow in his *Rede Lecture* some years ago: To say that we must educate ourselves or perish, is a little more melodramatic than the facts warrant. To say we have to educate ourselves or watch a steep decline in our lifetime, is about right. 'According to Lord Snow, the Russians are apparently doing much better than anyone else and will 'have a clear edge', unless and until the Americans and we educate ourselves both sensibly and imaginatively. Lord Snow, it will be recalled, talked about 'The Two Cultures and the Scientific Revolution' and expressed his concern that 'the intellectuals life of the whole of western society is increasingly being split into two polar groups At one pole we have the literary intellectuals ...at the other the scientists'. He deplores the 'gulf of mutual incomprehension' between these two groups and wants it bridged. It is quite clear how he thinks this 'bridging' operation is to be done; the aims of his educational policy would be, first, to get as many 'alpha-plus scientists as the country can throw up'; second, to train 'a much larger stratum of alpha professionals' to do the supporting research, high class design and development; third, to train 'thousands upon thousands' of other scientists and engineers and finally; to train 'politicians, administrators and entire community; who know enough science to have a sense of what the scientists are talking about'. If this fourth and last group can at least be educated enough to

'have sense' of what the real people, the scientists and engineers, are talking about, so Lord Snow seems to suggest, the gulf of mutual incomprehension between the 'Two Cultures' may be bridged. These ideas on education, which are by no means unrepresentative of our times, leave one with the uncomfortable feeling that ordinary people, including politicians, administrators and so forth, are really not much use, they have failed to make the grade: but, at least, they should be educated enough to have a sense of what is going on and to know what the scientists mean when they talk to quote Lord Snow's example about the Second Law of Thermodynamics. It is an uncomfortable feeling, because the scientists never tire of telling us that the fruits of their labours are 'neutral': whether they enrich humanity or destroy it depends on how they are used. And who is to decide how they are used? There is nothing in the training of scientists and engineers to enable them to take such decision or else, what becomes of the neutrality of science?

If so much reliance is today being placed in the power of education to enable ordinary people to cope with the problems thrown up by scientific and technological progress, then there must be something more to education than Lord Snow suggests. Science and engineering produce 'knowhow' is one more a culture than a piano is music. Can education help us to finish the sentence, to turn the potentiality into a reality to the benefit of man?

To do so the task of education would be first and foremost the transmission of ideas of value, of what to do with our lives. There is no doubt also the need to transmit knowhow but this must take second place, for it is obviously somewhat foolhardy to put great powers into the hands of people without making sure that they have a reasonable idea of what to do with them. At present, there can be little doubt that the whole of mankind is in mortal danger, not because we are short of scientific and technological knowhow, but because we tend to use it destructively; without wisdom. More education can help us only if it produces more wisdom.

The essence of education, I suggested, is the transmission of values, but values do not help us to pick our way through life unless they have become our own, a part, so to say, of our mental make-up. This means that they are more than mere formulae or dogmatic assertions: that we think and feel with them, that they are the very instruments through which we like and interpret and experience the world. When we think, we do not just think: we think with ideas. Our mind is not a blank, a tabula rasa. When we begin to think we can do so only because our mind is already filled with all sorts of ideas with which to think. All through our youth and

adolescence, before the conscious and critical mind begins to act as a sort of censor and guardian at the threshold, ideas seep into our mind, vast hosts and multitudes of them. These years are, one might say, our Dark Ages during which we are nothing but inheritors; it is only in later years that we can gradually learn to sort out our inheritance.

First of all, there is language. Each word is an idea. If the language which seeps into us during our Dark Ages is English, our mind is thereby furnished by a set of ideas which is significantly different from the set represented by Chinese, Russian, German or even American. Next to world, there are the rules of putting them together: grammar another bundle of ideas, the study of which has fascinated some modern philosophers to such an extent that they thought they could reduce the whole of philosophy to a study of grammar.

All philosophers and others have always paid a great deal of attention to ideas seen as the result of thought and observation; but in modern times all too little attention has been paid to the study of the ideas which form the very instruments by which thought and observation proceed. On the basis of experience and conscious thought, small ideas may easily be dislodged, but when it comes to bigger, more universal or more subtle ideas, it may not be so easy to change them. Indeed, it is often difficult to become aware of them, as they are the instruments and not the result of our thinking just as you can see what is outside you, but cannot easily see that with which you see, the eye itself. And even when one has become aware of them it is often impossible to judge them on the basis of ordinary experience.

We often notice the existence of more or less fixed ideas in other people's minds-ideas with which they think without being aware of doing so. We then call them prejudices, which is logically quite correct because they have merely seeped into the mind and are in no way the result of judgement. But the world prejudice is generally applied to ideas that are patently erroneous and recognisable as such by anyone except the prejudiced man. Most of the ideas with which we think are not of that kind at all. To some of them, like those incorporated in words and grammar, the notions of truth or error cannot even be applied, others are quite definitely not prejudices but the result of a judgement; others again are tacit assumptions or presuppositions which may be very difficult to recognise.

I say, therefore, that we think with or through ideas and that what we call thinking is generally the application of pre-existing ideas to a given situation or set of facts. When we think about, say the political situation we apply to that situation our political ideas, more or less

systematically and attempt to make that situation 'intelligible' to ourselves by means of these ideas. Similarly, everywhere else, we evaluate the situation in the light of our value-ideas.

The way in which we experience and interpret they would obviously depends very much indeed on kind of ideas that fill our minds. If there are mainly small, weak, superficial and incoherent, life will appear insipid, uninteresting, petty and chaotic. It is difficult to bear the resultant feeling of emptiness and the vacuum of our minds may only too easily be filled by some big, fantastic notion-political or otherwise-which suddenly seem to illumine everything and to give meaning and purpose to our existence. We feel that education will help solve each new problem or complexity that arises. It needs no emphasis that herein lies one of the great dangers of our times.

When people ask for education they normally mean something more than mere training, something more than mere knowledge of facts and something more than a mere diversion. May be they cannot themselves formulate precisely that they are looking for; but I think what they are really looking for is ideas that could make the world and their own lives, intelligible to them. When a thing is intelligible you have a sense of participation; when a thing is unintelligible you have a sense of estrangement. 'Well, I don't know', you hear people say, as an impotent protest against the unintelligibility of the world as they meet it. If the mind cannot bring to the world a set -or, shall we say, a tool box-of powerful ideas, the world must appear to it as a chaos, a mass of unrelated phenomena, of meaningless events. Such a man is like a person in a strange and without any signs of civilisation, without maps or signposts or indicators of any kind. Nothing has any meaning to him; nothing can hold his vital interest; he has no means of making anything intelligible to himself.

318) The writer's contention in the passage is that the crisis in Western civilization can be explained by

- (a) the presence of some flaws in its education
- (b) some inherent lack of co-ordination among its various elements
- (c) some basic misunderstanding in its society
- (d) the energy it has devoted to education

319) According to the writer, Lord Snow sees the intellectual life of Western society as split between

- (a) the educated and the uneducated
- (b) the government servants and the plebeians
- (c) scientists and literary intellectuals
- (d) administrators and intellectuals

320) 211. The writer seems to criticise the belief that

- (a) education gives rise to further complexities as the civilization progresses
- (b) all new problems and complexities can be tackled and solved by more and better education
- (c) people need to learn more in order to earn more
- (d) None of the above

321) What, according to the author, would be the definition of 'prejudice' ?

- (a) Ideas that help people to identify with new situations
- (b) Fixed ideas with which people think without being aware of doing so
- (c) Ideas that people cull from experience in order to judge a situation
- (d) Fixed ideas that see a person through the trials and tribulations of life

322) According to Lord Snow, which of the following groups need to be educated enough to atleast understand the works of scientists and engineers?

- (a) Politicians, administrators and the entire community
- (b) Politicians and literary intellectuals
- (c) Politicians and the laymen
- (d) All of the above

323) In the passage, the writer questions

- (a) the neutrality of science
- (b) scientists' stand on the neutrality of science
- (c) scientists' stand on the neutrality of their labours
- (d) Lord Snow's assertion regarding the potential of intellectuals in society

324) The author's assertion in the passage is that education's main responsibility is to

- (a) transmit ideas of value
- (b) transmit technical knowledge
- (c) Both (a) and (b)
- (d) transmit values regarding human and societal norms

325) The author believes that

- (a) the gulf between science and literature needs to be bridged
- (b) ideas should be maintained for a holistic view of society and its problems
- (c) words are not ideas
- (d) None of the above

326) Which of the following sentences is not true according to the author?

- (a) Values must be part of one's psyche
- (b) Values are merely dogmatic assertions
- (c) One identifies with values
- (d) Values are the means to interpret and experience the world

327) Thinking is

- (a) being
- (b) knowing
- (c) application of pre-existing ideas to a situation
- (d) application of fixed ideas to a situation

PASSAGE 70

The narrator of *Midnight's Children* describes it as a kind of collective fantasy. I suppose what he or I, through him was trying to say, was that there never had been a political entity called India until 1947. The thing that became independent had never previously existed except that there had been an area, a zone called India. So it struck me that what was coming into being, this idea of a nation-state, was an invention. It was an invention of the nationalist movement and a very successful invention.

One could argue that nation states are a kind of collective fantasies. Very similar things happened with the unification of Italy and also with the unification of Germany. The history of India is a history of independent nation states. It is a history of Oudh or Bengal or Maratha kingdoms. All those independent histories agreed to collectivise themselves into the idea of the nation of India. In the case of Pakistan, it was less successful. Pakistan was underimagined. It did not survive as a nation-state.

If you ask people in general, they would have absolutely no problem with the idea of India at all. I think, in a way the strength of nationalist idea is shown by its ability to survive the extraordinary stresses that it was placed under. I think the stresses of things communalism, the high degree of public corruption, of regional rivalries, of the tension between the centre and the state, the external pressures of bad relations with Pakistan—these are colossal pressures which any state could be forgiven for being damaged by. I think the thing to say about the success of the idea is that it remains an idea though people might not find it very easy to give a simple definition of it. But that it does exist and that it is something to which people feel they belong, I think is now the case. That it survives these stresses is an indication of its strength.

I'm not interested in an idealised, romantic vision of India, I know it is the great pitfall of the exile. So you know for me, always, the issue of writing about India has been not to write as an outsider. On the other hand, evidently something has changed in the last 10 years, which is that as result of various circumstances, I've not been able to return. All I can say is that I have felt it as the most profound loss and I still do. There have been many losses in the last decade but the loss of the easy return of India has been for me an absolute anguish, an

inescapable anguish. I feel as if I've lost a limb. I am very anxious to bring that period to an end.

I do not think that one of the most interesting phenomena for India as a country is the phenomenon of the India Diaspora. I often think Indian–Indian Indians—find that very hard to understand. In England, when people call themselves British Indian, they mean both halves of that. And yet, what it means to be a British Indian is very alien to an Indian India. The same is true in the Caribbean, in Africa, in Canada, in the United States and so on. The thing that has interested me is that there are now many, many ways of being something which you can legitimately call Indian. Being an Indian in India is just one of those ways.

The forces of disintegration are always there. I think in every society there is the tension between the forces that bring it together and the forces that pull it apart. I'm worried, above all, of the communal issue because half a century is no time at all in the eye of history and half a century ago something of colossally horrible proportion took place. The fact that it hasn't happened for 50 years on quite the same scale means nothing. It could still happen tomorrow. One of the things that I remember very vividly, being there 10 years ago at about the time of the killings that took place in Assam, is discussing this with good friends and fellow writers. And I remember somebody said to me, until we understand that we are capable of these things, we can't begin to move beyond them. Because it's a very easy response to atrocities, to say: oh those terrible people did that and we are not like that. I think the difficult response is to accept we are also capable of that, the thing that happened there could also, in certain circumstances, be something that we were able to perpetrate. The civilising influence is what prevents most of us from giving vent to those terrible urges. Those urges are part of humanity as well as the more civilised urges.

Of course, I fear in India the recurrence of communal or regionalist inter-community violence. I fear the long term damage to a democracy that can be done by mass corruption. I think corruption is in a way a subversion of democracy and the commonplace view in India is that corruption is every where. In a sense, you could say that is not a democratic society. If money, favour and privilege is what makes the place work, then that's not a democracy. Atleast, it runs the danger of being no longer able to call itself a democracy.

What was happening, I thought, was that people were trying to seize control of that rhetoric. That is to say, special interest groups you could say Hindus are a very large special interest group. If any group inside such a complex and many faceted country tries to define the nation exclusively in its own terms, then it begins to

create terrible stresses. I do think that the kind of attempt to define India in Hindu terms is worrying for that reason. It creates backlashes, it creates polarisation and it creates the risk of more upheaval. Partly, I am saying this as a kind of objective observer, but nobody is an objective observer.

I come from an Indian minority, I no doubt have a minority perspective. I can't ignore that and nor would I wish to. Partly also I am speaking temperamentally. That is to say, the kind of religious language in politics is something I find temperamentally unpleasant. I don't like people who do that, whether they be sectarians in Northern Ireland or India. I believe in, if possible, separating one's personal spiritual needs and aspirations from the way in which a country is run. I think in those countries where that separation has not taken place, one can see all kinds of distortions of social and ordinary life which are unpleasant. Iran is an obvious example. The country in which that kind of separation has completely fragmented it.

Where Naipaul is right, although I don't share his conclusions about it, but I think where he is right, is in saying that this is a great historical moment. One reason why the 50th anniversary is interesting is that it does seem to represent the end of the first age and the beginning of second age. And to that extent that is true now, if someone was born today, they would be born into a very different set of cultural assumptions and hopes than somebody born 50 years ago. We were entirely sold on the Nehru-Gandhi kind of plan. We grew up and that was the portrait of the nation we had hung on our wall and to the extent that you never entirely lose those formative ideas, that's still the picture of the country I've got on my wall. But it's clear that for somebody being born now, they are being born into a very different country.

I also think of taking the Naipaul point on what would happen if the BJP were to form a government. Well what I would like to think is that in order for the BJP or anybody of that persuasion to form a government, they would have to change. There is even some kind of suggestion that it may even be happening a little bit because they are intelligent people. They understand their weaknesses as well as their strengths. Clearly, for a Hinduist party to form the government of the country is not at all unlikely. So I think one does have to engage with that in the same way as many people in the country who, like myself, were not remotely in tune with the Thatcherite revolution but have to engage with it because it was in fact happening and kept winning election and the world was not going to go back. So of course, both people inside the Hindu political enterprise and people outside it will have to shift. I am optimistic

about India's ability to force those changes that are necessary because I do believe it is not fundamentally an intolerant country and will not fundamentally accept intolerant politics.

On the other hand, there has to be reckoning with the fact that these are ideas, which are gaining in popularity. I'll tell you where I would draw the line myself. I think there was a great historical mistake made in Europe about the Nazi Party. People attempted to see whether they could live with it and discovered very rapidly that was a mistake, that appeasement was a great historical mistake. So, it seems to me, the question is : What do we make of this political enterprise? Is it fundamentally democratic or fundamentally anti-democratic? If democratic, then we must all learn to make the best of it. If anti-democratic, then we must fight it very hard.

What happened in India happened before the book (*Satanic Verses*) had actually entered. It happened because of an article in *India Today*, which, I must say, I thought was an irresponsibly written article, because it was written by somebody, who, as a friend, asked me for an early copy of the book and then presented that book in the most inflammatory sort of way.

This was one of the things that disappointed me, that after a lifetime of having written from a certain sensibility and a certain point of view, I would have expected people in India to know about it since it was all entirely about India. It was written from a deep sense of connection and affection for India. I would have expected that I had some money in the bank. That is to say, if Salman Rushdie wrote any book, then we know who he is. He is not some idiot who just arrived from nowhere shouting abuse. This is somebody whose work, whose opinions, whose lectures and whose stories we know. I would have hoped that my work would have been judged in the context of what people already knew about me. Instead, it seemed as if everything I had been in my life up to that point suddenly vanished out of the window and this other Rushdie was inverted who was this complete bastard who had done this terrible thing. There did not seem to be any attempt to correct that or to combat that. I was surprised and disappointed it did not. It didn't happen here either. It didn't happen anywhere in the world. It was as if the force of history, the force of a historical event was so huge that it erases all that goes before it.

The negative response to the *Satanic Verses*, let us remember that there was also a positive response, was such that it erased my personality and put in its place some other guy who didn't recognise at all. Anybody who knows anything about these countries and I do know something about these countries, knows that every cheap

politician can put a demonstration in the street in five minutes. That doesn't represent in any sense the people's will. It represents a certain kind of political structure, political organization. It doesn't represent truth.

But I always believed and I still believe that India would come back. I never believe that the loss of India was forever. Because India is not Iran, It's not even Pakistan and I thought good sense will prevail in India because that's my life experience of Indian people and of the place.

328) The idea of India that inspired the writer's generation was the one dominated or formed by

- (a) the Nehru-Gandhi politics
- (b) the Nehru-Gandhi ideology
- (c) the Nehru-Gandhi idea regarding India's formative years
- (d) the Nehruvian idea of socialism

329) The writer does not share

- (a) Naipaul's stand that the 50th anniversary is a historical moment
- (b) Naipaul's stand that the 50th anniversary is not a historical moment
- (c) Naipaul's conclusion on the 50th anniversary being a historical moment
- (d) Naipaul's conclusion on the 50th anniversary not being a historical moment

330) The writer shows faith in India's basic

- (a) stability
- (b) resilience
- (c) fortitude
- (d) democracy

331) According to the writer

- (a) politicians incite the general public to demonstrate against writers
- (b) a politician's demonstration does not reflect the people's will
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

332) The writer's view of India is determined mainly by

- (a) his experience
- (b) his fondness for the country
- (c) his love for the resilience of the Indian people
- (d) his love of writing about India

333) According to the writer's friend

- (a) we should fight against communal pressure
- (b) the fact that the communal conflagrations haven't occurred in India for half a century, is something to be proud of
- (c) we can move beyond things, only after we know we are capable of those things
- (d) we have to identify with the people who were involved in inciting communal passions

334) What, according to the passage, prevents us from giving into violent, terrible urges?

- (a) Our education
- (b) Our upbringing
- (c) Our cultural influences
- (d) The civilising influence

335) According to the writer, what disqualifies India from being called a democracy?

- (a) Its communalism
- (b) Its corruption
- (c) Its anti-minority stance
- (d) All of these.

336) The writer contradicts his assertion of being an 'objective observer' on the basis that

- (a) no one can be an 'objective observer'
- (b) no one is an 'objective observer'
- (c) he is a subjective observer
- (d) everybody is subjective observer

337) In the first paragraph of the passage, the writer questions

- (a) the existence of political entity called India prior to independence
- (b) the contention that a political entity called India did not exist
- (c) the stand that India was an invention
- (d) the stand that India needs to think in terms of its being a nation state

338) According to the writer, the difference between India and Pakistan was that

- (a) India survived as a nation state, Pakistan did not
- (b) Indians were full of fantastic ideas in 1947
- (c) Pakistan was born out of another nation
- (d) the creation of Pakistan suffered from under-imaginativeness

339) According to the passage, the secret of India's survival lies in

- (a) its ability to fight back in the face of tremendous stress and strains
- (b) in the highly fertile imagination of the Indian people
- (c) in a sense of belonging that people feel for it
- (d) Both (a) and (b)

PASSAGE 71

The persistent patterns in the way nations fight reflect their cultural and historical traditions and deeply rooted attitudes that collectively make up their strange culture. These patterns provide insights that go beyond what can be learnt just by comparing armaments and divisions. In the Vietnam War, the strategic tradition of the United States called for forcing the enemy to fight a massed battle in an open area, where superior American weapons would prevail. The United States was trying to

re-fight Second World War in the jungles of South-East Asia, against an enemy with no intention of doing so. Some British historians describe the Asian way of war as one of indirect attacks, avoiding frontal attacks meant to overpower an opponent. This traces back to Asian history and geography : the great distances and harsh terrain have often made it difficult to execute the sort of open field clashes allowed by the flat terrain and relatively compact size of Europe. A very different strategic tradition arose in Asia.

The bow and arrow were metaphors for an Eastern way of war. By its nature, the arrow is an indirect weapon. Fired from a distance of hundreds of yards, it does not necessitate immediate physical contact with the enemy. Thus, it can be fired from hidden positions. When fired from behind a ridge, the barrage seems to come out of nowhere, taking the enemy by surprise. The tradition of this kind of fighting is captured in the classical strategic writing of the East. The 2,000 years worth of Chinese writings on war constitutes the most subtle writing on the subject in any language. Now until Clausewitz, did the West produce a strategic theorist to match the sophistication of Sun-tzu, whose *Art of War* was written 2,300 years earlier.

In Sun-tzu and other Chinese writings, the highest achievement of arms is to defeat an adversary without fighting. He wrote : “To win one hundred victories in one hundred battles is not the acme of skill. To subdue the enemy without fighting is the supreme excellence.” Actual combat is just one among many means towards the goal of subduing an adversary. War contains too many surprise to be a first resort. It can lead to ruinous losses, as had been seen time and again, it can have the unwanted effect of inspiring heroic efforts in an enemy, as the United States learned in Vietnam and as the Japanese found out after Pearl Harbour.

Aware of the uncertainties of a military campaign, Sun-tzu advocate war only after the most thorough preparations. Even then it should be quick and clean. Ideally, the army is just an instrument to deal the final blow to an enemy already weakened by isolation, poor morale and disunity. Ever since Sun-tzu, the Chinese have been seen as masters of subtlety who take measured actions to manipulate an adversary without his knowledge. The dividing line between war and peace can be obscure. Low level violence often is the backdrop to a larger strategic campaign. The unwitting victim, focused on the day-to-day events, never realises what’s happening to him until it’s too late. History holds many examples. The Viet Cong lured French and US infantry deep into the jungle, weakening their morale over several

years. The mobile army of the United States was designed to fight on the plains of Europe, where it could quickly move unhindered from one spot to the next. The jungle did more than make quick movement impossible, broken down into smaller units and scattered in isolated bases. US forces were deprived of the feeling of support and protection that ordinarily comes from being part of a big army.

The isolation US troops in Vietnam was not just a logistical detail, something that could be overcome by, for instance, bringing in reinforcements by helicopter. In a big army reinforcements are from being part of a larger formation. Just the knowledge of its lowers the soldier fear and increase his aggressiveness. In the jungle and on isolated bases, this feeling was removed. The thick vegetation slowed down the reinforcements and made it difficult to find stranded units. Soldiers felt they were on their own.

More important, by altering the way the war was fought, the Viet Cong stripped the United States of its belief in the inevitability of victory, as it had done to the French before them. Morale was high when these armies first went to Vietnam. Only after many years of debilitating and demoralising fighting did Hanoi launch its decisive attacks, at Dien Bien Phu in 1954 and against Saigon in 1975. It should be recalled that in the final push to victory the North Vietnamese abandoned their jungle guerrilla tactics completely, committing their entire army of twenty divisions to pushing the South Vietnamese into collapse. This final battle, with the enemy’s army all in one place, was the one that the United States had desperately wanted to fight in 1965. When it did come out into the open in 1975, Washington had already withdrawn its forces and there was no possibility of re-intervention.

The Japanese early in Second World War used a modern form of the indirect attack, one that relied on stealth and surprise for its effects. At Pearl Harbour, in the Philippines and in South-East Asia, stealth and surprise were attained by sailing under radio silence so that the navy’s movements could not be tracked, moving troops aboard ships into South-East Asia made it appear that the Japanese army was also ‘invisible’. Attacks against Hawaii and Singapore seemed, to the American and British defenders, to come from nowhere. In Indonesia and the Philippines, the Japanese attack was even faster than the German blitz against France in the West.

The greatest military surprises in American history have all been in Asia. Surely there is something going on here beyond the purely technical difficulties of detecting enemy movements. Pearl Harbour, the Chinese

intervention in Korea and the Tet offensive in Vietnam all came out of a tradition of surprise and stealth. US technical intelligence the location of enemy units and their movements was greatly improved after each surprise, but with no noticeable improvement in the American ability to foresee or prepare what would happen next. There is a cultural divide here, not just a technical one. Even when it was possible to track an army with intelligence satellites, as when Iraq invaded Kuwait or when Syria and Egypt attacked Israel, surprise was achieved. The United States was stunned by Iraq's attack on Kuwait even though it had satellite pictures of Iraqi troops massing at the border.

The exception that proves the point that cultural differences obscure the West's understanding of Asian behaviour was the Soviet Union's 1979 invasion of Afghanistan. This was fully anticipated and understood in advance. There was no surprise because the United States understood Moscow's world view and thinking it could anticipate Soviet action almost as well as the Soviets themselves, because the Soviet Union was really a Western country.

The difference between the Eastern and the Western way of war is striking. The West's great strategic writer, Clausewitz, linked war to politics, as did Sun-tzu. Both were opponents of militarism, of turning war over to the generals. But there, all similarity ends. Clausewitz wrote that the way to achieve a larger political purpose is through destruction of the enemy's army. After observing Napoleon conquer Europe by smashing enemy armies to bits, Clausewitz made his famous remark in *On War* (1932) that combat is the continuation of politics by violent means. Morale and unity are important, but they should be harnessed for the ultimate battle. If the Eastern way of war is embodied by the stealthy archer, the metaphorical Western counterpart is the swordsman charging forward, seeking a decisive showdown, eager to administer the blow that will obliterate the enemy once and for all with this view, war proceeds along a fixed course and occupies a finite extent of time, like a play in three acts with a beginning, a middle and an end. The end, the final scene, decides the issue for good.

When things don't work out quite this way, the Western military men feel tremendous frustration. Sun-tzu's great disciples, Mao Zedong and Ho Chi Minh, are respected in Asia for their clever use of indirection and deception to achieve an advantage over stronger adversaries. But in the West, their approach is seen as underhanded and devious. To the American strategic mind, the Viet Cong guerilla did not fight fairly. They should have come out into the open and fought like men, instead of hiding in the jungle and sneaking around like a cat in the night.

- 340)** According to the author, the main reason of the US losing the Vietnam war was
- (a) the Vietnamese understood the local terrain better
 - (b) the lack of support for the war from the American people
 - (c) the failure of the US to mobilise its military strength
 - (d) their inability to fight a war on terms other than those they understood well
- 341)** Which of the following statements does not describe the 'Asian' way of war?
- (a) Indirect attacks without frontal attacks
 - (b) The swordsman charging forward to obliterate the enemy once and for all
 - (c) Manipulation of an adversary without his knowledge
 - (d) Subduing an enemy without fighting
- 342)** Which of the following is not one of Sun-tzu's ideas?
- (a) Actual combat is the principal means of subduing an adversary
 - (b) War should be undertaken only after thorough preparation
 - (c) War is linked to politics
 - (d) War should not be left to the generals alone
- 343)** The difference in the concepts of war of Clausewitz and Sun-tzu is best characterised by
- (a) Clausewitz's support for militarism as against Sun-tzu's opposition to it
 - (b) their relative degrees of sophistication
 - (c) their attitude to guerilla warfare
 - (d) their differing conceptions of the structure, time and sequence of a war
- 344)** To the Americans, the approach of the Viet Cong seemed devious because
- (a) the Viet Cong did not fight like men out in the open
 - (b) the Viet Cong allied with America's enemies
 - (c) the Viet Cong took strategic advice from Mao Zedong
 - (d) the Viet Cong used bows and arrows rather than conventional weapons
- 345)** According to the author, the greatest military surprise in American history have been in Asia because
- (a) the Americans failed to implement their military strategies many miles away from their own country
 - (b) the Americans were unable to use their technologies like intelligence satellites effectively to detect enemy movements
 - (c) the Americans failed to understand the Asian culture of war that was based on stealth and surprise
 - (d) Clausewitz is inferior to Sun-tzu

PASSAGE 72

Since Second World War, the nation-state has been regarded with approval by every political system and every ideology. In the name of modernisation in the West, of socialism in the Eastern Block and of the development in the Third World, it was expected to guarantee the happiness of individuals as citizens and of people as societies. However, the state today appears to have broken down in many parts of the world. It has failed to guarantee either security or social justice and has been unable to prevent either international wars or civil wars. Distributed by the claims of communities within it, the nation-state tries to repress their demands and to proclaim itself as the only guarantor of security of all. In the name of national unity, territorial integrity, equality of all its citizens and non-partisan secularism, the state can use its powerful resources to reject the demands of the communities; it may even go so far as genocide to ensure that order prevails. As one observes the awakening of communities in different parts of the world, one cannot ignore the context in which identity issues arises. It is no longer a context of sealed frontiers and isolated regions but is one of the integrated global systems. In a reaction to this trend towards globalisation, individuals and communities everywhere are voicing their desire to exist, to use their power of creation and to play an active part in national and international life.

There are two ways in which the current upsurge in demands for the recognition of identities can be looked at. On the positive side, the efforts by certain population groups to assert their identity can be regarded as 'liberation movements', challenging oppression and injustice. What these groups are doing-proclaiming that they are different, rediscovering the roots of their culture or strengthening group solidarity may accordingly be seen as legitimate attempts to escape from their state of subjugation and enjoy a certain measure of dignity. On the downside, however, militant action for recognition tends to make such groups more deeply entrenched in their attitude and to make their cultural compartments even more watertight. The assertion of identity then starts turning into self-absorption and isolation and is liable to slide into intolerance of others and towards ideas of 'ethnic cleansing', xenophobia and violence.

Whereas continuous variations among people prevent drawing of clear dividing lines between the groups, those militating for recognition of their group's identity arbitrarily choose a limited number of criteria such as religion, language, skin colour and place of origin so that their members recognise themselves primarily in terms of the labels attached to the group whose existence is being asserted. This distinction between the group in

question and other groups is established by simplifying the feature selected. Simplification also works by transforming group into essences, abstractions endowed with the capacity to remain unchanged through time. In some cases, people actually act as though the group has remained unchanged and talk, for example, about the history of nations and communities as if these entities survived for centuries without changing, with the same ways of acting and thinking, the same desires, anxieties and aspirations.

Paradoxically, precisely because identity represents a simplifying fiction, creating uniform groups out of disparate people, that identity performs a cognitive function. It enables us to put names to ourselves and others form some idea of who we are and who others are and ascertain the place we occupy along with the others in the world and society. The current upsurge to assert the identity of groups can thus be partly explained by the cognitive function performed by identity. However, that said, people would not go along as they do, often in large numbers, with the propositions put to them, in spite of the sacrifices they entail, if there was not a very strong feeling of need for identity, a need to take stock of things and know who we are, 'where we come from' and where we are going'.

Identity is thus a necessity in a constantly changing world, but it can also be a potent source of violence and disruption. How can these two contradictory aspects of identity be reconciled? First, we must bear the arbitrary nature of identity categories in mind, not with a view to eliminating all forms of identification—which would be unrealistic since identity is a cognitive necessity—but simply to remind ourselves that each of us has several identities at the same time. Second, since tears of nostalgia are being shed over the past, we recognise that culture is constantly being recreated by cobbling together fresh and original elements and counter-cultures. There are in our own country a large number of syncretic cults wherein modern elements are blended with traditional values or people of different communities venerate saints or divinities of particular faiths. Such cults and movements are characterised by a continual inflow and outflow of members which prevent them from taking on a self-perpetuating existence of their own and hold our hope for the future, indeed, perhaps for the only possible future. Finally, the nation-state must respond to the identity urges of its constituent communities and to their legitimate quest for security and social justice. It must do so by inventing what the French philosopher and sociologist, Raymond Aron, called 'peace through law'. That would guarantee justice both to the state as a whole and its parts and respect the claims of both reason and emotions. The problem is one of reconciling nationalist demands with exercise of democracy.

- 346)** According to the author, happiness of individuals was expected to be guaranteed in the name of
- development in the Third World
 - socialism in the Third World
 - development in the West
 - modernisation in the Eastern Bloc
- 347)** Demands for recognition of identities can be viewed
- positively and negatively
 - as liberation movements an militant action
 - as efforts to rediscover cultural roots which can slide towards intolerance of others
 - All of the above
- 348)** Going by the author's exposition of the nature of identity, which of the following statements is untrue?
- Identity represents creating uniform groups out of disparate people
 - Identity is a necessity in the changing world
 - Identity is a cognitive necessity
 - None of the above
- 349)** According to the author, the nation-state
- has fulfilled its potential
 - is willing to do anything to preserve order
 - generates security for all its citizens
 - has been a major force in preventing civil and international wars
- 350)** Which of the following views of the nation-state cannot be attributed to the author?
- It has not guaranteed peace and security
 - It may go as far as genocide for self-preservation
 - It represents the demands of communities within it
 - It is unable to prevent international wars

PASSAGE 73

Each one has his reasons : for one art is a flight; for another, a means of conquering. But one can flee into a hermitage, into madness, into death. One can conquer by arms. Why does it have to be writing? Because, behind the various aims of authors, there is a deeper and more immediate choice which is common to all of us. We shall try to elucidate this choice and we shall see whether it is not in the name of this very choice of writing that the engagement of writers must be required.

Each of our perceptions is accompanied by consciousness that human reality is a 'revealer'. That is, it is through human reality, that 'there is' being or, to put it differently, that man is the means by which things are manifested. It is our presence in the world which multiplies relations. It is we who set up a relationship between this tree and that bit of sky.

Thanks to us, that star which has been dead for millenia, that quarter moon and that dark river are disclosed in the unity of a landscape. It is the speed of our auto and out airplane which organises the great masses of the Earth. With each of our acts, the world reveals to us a new face. But, if we know that we are directors of being, we also know that we are not its producers. If we turn away from this landscape, it will sink back into its dark permanence. At least, it will sink back: there is no one mad enough to think that it is going to be annihilated. It is we who shall be annihilated and the Earth will remain in its lethargy until another consciousness comes along to awaken it. Thus, to our inner certainty of being 'revealers' is added that of being inessential in relation to the thing revealed.

One of the chief motives of artistic creation is certainly the need of feeling that we are essential in relationship to the world. If I fix on canvas or in writing a certain aspect of the fields or the sea or a look on someone's face which I have disclosed, I am conscious of having produced them by condensing relationships, by introducing order where there was none, by imposing the unit of mind on the diversity of things. That is I think myself essential in relation to my creation. But this time it is the created object which escapes me, I cannot reveal the produce at the same time. The creation becomes inessential in relation to the creative activity. First of all, even if it appears to others as definitive, the created object always seems to us in a state of suspension, we can always change this line, that shade, that word. Thus, it never forces itself. A novice painter asked his teacher, 'When should I consider my painting finished?' And the teacher answered, "When you can look at it in amazement and say to yourself I'm the one who did that!"

Which amounts to saying 'never'. For it is virtually considering one's work with someone else's eyes and revealing what has been created. But it is self-evident that we are proportionally less conscious of the thing produced and more conscious of our productive activity. When it is a matter of poetry or carpentry, we work according to traditional norms, with tools whose usage is codified; it is Heidegger's famous 'they' who are working without our hands. In this case, the result can seem to us sufficiently strange to preserve its objectivity in our eyes. But if we ourselves produce the rules of production, the measures, the criteria and if our creative drive comes from the very depths of our heart, then we never find anything but ourselves in our work. It is we who have invented the laws by which we judge it, it is our history, our love, our gaiety that we recognise in it. Even if we should regard it without touching it any further, we never receive from it that gaiety or love we put them into

it. The results which we have obtained on canvas or paper never seem to us objective. We are too familiar with the processes of which they are the effects. These processes remain a subjective discovery: they are ourselves, our inspiration, our ruse and when we seek to perceive our work, we create it again, we repeat mentally the operations which produced it, each of its aspects appears as a result. Thus, in the perception, the object is given as the essential thing and the subject as the inessential. The latter seeks essentially in the creation and creation and obtains it, but then it is the object becomes the inessential.

The dialectic is nowhere more apparent than in the art of writing, for the literary object is a peculiar top which exists only in movement. To make it come into view a concrete act called reading is necessary and it last only as long as this act can last. Beyond that, there are only black marks on paper. Now, the writer cannot read what he writes, whereas the shoemaker can put on the shoes he has just made if they are to his size and the architect can live in the house he has built. In reading, one foresees: one waits. He foresees the end of the sentence, the following sentence, the next page. He waits for them to confirm or disappoint his foresights. The reading is composed of a host of hypotheses, followed by awakenings, of hopes and deceptions. Readers are always ahead of the sentence they are reading in a merely probable future which partly collapses and partly comes together in proportion as they progress, which withdraws from one page to the next and forms the moving horizon of the literary object. Without waiting, without a future, without ignorance, there is no objectivity.

351) The author holds that

- (a) there is an objective reality and a subjective reality
- (b) nature is the sum total of disparate elements
- (c) It is human action that reveals the various facets of nature
- (d) apparently disconnected elements in nature are unified in fundamental sense

352) It is author's contention that

- (a) artistic creations are results of human consciousness
- (b) the very act of artistic creation leads to the escape of the created object
- (c) man can produce and reveal at the same time
- (d) an act of creation forces itself on our consciousness leaving us full of amazement

353) The passage makes a distinction between perception and creation in terms of

- (a) objectivity and subjectivity
- (b) revelation and action
- (c) objective reality and perceived reality
- (d) essentiality and non-essentiality of objects and subjects

354) The art of writing manifests the dialectic of perception and creation because

- (a) seading reveals the writing till the act of reading lasts
- (b) writing to be meaningful needs the concrete act of reading
- (c) this art is anticipated and progresses on a series of hypotheses
- (d) this literary object has a moving horizon brought about by the very act of creation

355) A writer as an artist

- (a) reveals the essentiality of revelation
- (b) makes us feel essential vis-a-vis nature
- (c) creates reality
- (d) reveals nature in its permanence

PASSAGE 74

The end of mutual funds, when it came, was sudden but not unexpected. For over 10 years, mutual fund has been scripting its own growth demise, embarking on a reckless course of high risks, unhealthy pastimes and unchecked maladies. Ironically but fittingly too, the very hand that had supported and sustained it through the turbulent early period of its existence was the one that, finally wielded the euthanasian syringe. The individual investor it was who had made the mutual fund post-liberalisation India's most vibrant vehicle for individual investment. The individual investor it was who brought the curtain down on an act that had started with a virtuous performance, only to putrefy into a show of ineptitude, imprudence and irresponsibility.

The mutual fund, as we know it, may be dead. It died of many things. But, primarily, of a cancer that ate away at its innards. A cancer that destroyed the value of the investments, the mutual funds had made to service the ₹ 85,000 crore that India's investors had entrusted them with ever since they began life way back in 1964 as The Unit Trust Of India's (UTI), now disgraced Unit Scheme 64 (US 64). A cancer that grew from the refusal of the men and women to manage the mutual fund to exercise a mixture of caution and aggression, but to adopt, instead and undisciplined, unplanned, fire-from-the hip approach to investment. A cancer that ultimately, robbed the mutual funds of the resources, they would have to use to pay back their investors, leaving them on Death Row.

Indeed, the scandal that US 64 had been brewing for years, was only one, but not the first, of the warning-bells that pointed to the near emptiness of many a mutual fund's coffers. In quick succession have emerged reports of more and more fund schemes that have been laid, their corpses empty, their ability to meet their promises of assured returns to investors demolished. At least 37 percent of the 235 fund schemes

in operation in the country have promised investors assured returns of over 15 percent for 5 years and repurchase-prices well above their Net Asset Values (NAVs).

According to a study conducted by the Delhi based Value Research, at least 18 big schemes due for redemption over the next three years will be unable to service their investors or even return their money at the time of redemption. The shortfall ? ₹ 4,685.10 crore. Or 75-87 percent of the amount handed over by trusting investors to fund managers. Worries Ajai Kaul, 38, president, Alliance Capital Asset Management: "When an assured-returns scheme runs into problems, investors view it as one more let-dew by the mutual funds."

Had they but known of the actual practices seen in the offices and hallways of the mutual funds, which have translated into these results, investors would have shown their disgust long ago. Take the case of a mutual fund company that manages more than a dozen schemes. According to an unwritten, but formalised, principle, each scheme takes it in turn to sell some of its holdings to its sister-schemes, booking fat notional gains and position NAVs. While investors responded by pouring in even more of their savings, the profits were clearly only on paper. In the offices of another asset management company half way across Mumbai, the demand for cellular-phones peaked six months ago.

Its employees had suddenly, realised that making their personal deals using information gathered in the course of their professional work, was best done over cell phones so that the company's records wouldn't show the call being made. Obviously, the hot tips went to fatten their and not investors' pockets. Earlier, quite a few merchant bankers entered the mutual funds industry to use the corpus to subscribe to the issues they were lead managing. It took a crash in the primary market—not ethics or investigations—for this practice to stop.

Filled with fear and loathing—and righteous anger—the investor has, therefore, decided to adjure the mutual fund. According to Marketing And Development Research Associates (MDRA) opinion poll of 342 investors conducted last fortnight in the five metros, Bangalore, Kolkata, Chennai, Delhi and Mumbai, mutual funds as an investment instrument now ranks a low fourth on safety—after bank deposits, gold and real estate—and fifth on returns—ahead only of bank deposits and gold. And only 14.20 percent of the sample will even consider investing in a mutual fund in the future.

Still, it is the species that has died not its every member. The ones that have survived are the bright performers who beat the market benchmark—the 100-scrip. The Bombay Stock Exchange' (BSE) National Index by the

widest margins within their three genres : growth, income and balance. However, even their star turns have not been able to stave off the stench of death over the business. In fact, an autopsy of the late and, at the moment not particularly lamented—mutual funds reveal a sordid saga of callousness and calumny.

Sheer disaster stares the mutual funds in the face and a cataclysm could destroy the savings of lakhs of investors too. A Value Research estimate of probable shortfall that 18 assured-returns schemes will face at the time of their scheduled redemptions over the three years adds up to a sense-numbering ₹ 4,685 crore. An independent audit of the 60 assured-returns schemes managed by the public sector mutual funds conducted by Price Warehouse Coopers at the behest of the Securities and Exchange Board of India (SEBI) estimated a shortfall of between ₹ 2,500 crore and ₹ 3,000 crore. In 1999 alone judging from their present NAVs, the four schemes due for redemption—Canbank Asset Management Company's Cantriple, IndBank Asset Management Company's IndPrakash, SBI Funds Management's Magnum Triple Plus and BOI Mutual Funds's (BOIMF) Double Square Plus—are heading for a collective shortfall of ₹ 1,639.55 crore.

As on June 30, 1998, the country's 252 fund-schemes managed assets with a market value of ₹ 69,599 crore, with the UTI alone controlling the fate of ₹ 50,000 crore. That is ₹ 11,000 crore less than the money invested in these schemes as of June 30, 1997, which means that the mutual funds have wiped out ₹ 11,000 crore from the investors's hard earned money in the intervening 12 months. Of course, every fund is paying for the sins of the black sheep. For the villain of the piece was UTI and the 95 funds managed by the public sector banks and institutions, the value of whose corpuses fell from ₹ 66,748 crore to ₹ 57,350 crore in the past year. In fact, these funds contributed 85.40 percent of the overall value-loss, with the private sector funds boosting their corpuses from ₹ 4,000 crore to ₹ 4,120 crore to lower the extent of the erosion.

For investors, that has translated into an option of either exiting at a loss—or holding on in vain hope. On November 20, 1998, a depressing 77 percent of the 58 listed fund schemes were quoting at discounts of between 5 percent and 40 per cent to their NAVs. And what of the NAVs themselves? The units of a shoulder-slumping 15 percent of the Schemes were worth less than their par values. And US 64, of course continued of languish, with an estimated NAV of ₹ 9.68 Even if there are schemes that have performed individually well, that the mutual funds have collectively failed to deliver couldn't be more obvious. So, investors' murderous mood can hardly be debated.

Their genesis and growth reveals just what blinded the mutual funds to the possibility of failure. Forty percent of the banks and insurance companies-promoted funds in operation were launched between 1987 and 1993, when the stock markets were bull-dominated. In a period that saw only one bear phase, the BSE Sensitivity Index (the Sensex) climbed by 346 percent. Being successful with equity investments required on skills; only investible funds. Nor was fund-raising a problem, as investors desperately sought ways to grab a piece of equity boom. Between 1984 and 1989, the mutual funds collected ₹ 13,455 crore as subscriptions, but, in the next five years, they picked up ₹45,573 crore. In January, 1994, the UTI's Mastergain mopped up a stunning ₹ 4,700 crore while the most awaited Morgan Stanley Growth—a showcase for the fabled fund-management metier of the foreign mutual funds—took in Rs. 1,000 crore in just three days. Low entry-barriers—a so called sound track-record, a general reputation of fairness and integrity, an application fee of Rs. 25,000, a registration fee of Rs. 25 lakh and an annual fee of Rs. 2.500 lakh—made entering the business a snap. Explains Ajay Srinivasan, 34, CEO, Prudential ICICI Mutual Fund: "Mutual funds were misunderstood by investors Everyone thought they were a one way ticket to a jackpot."

Intoxicated, fund-managers poured in more and more of their corpuses into equity, ignoring the down sides, confident that the boom would last forever. In the process, they ignored the very concept of risk-management, blithely ignoring the safety net of fixed-income instruments, an accusing those who advised caution of being cowards. In 1995, for instance, ABN estimated 70 percent of the money being managed by the mutual funds had been funnelled into equity. Whether they knew it or not, they were breaking away from the trend set by the mutual funds in the US, where the industry began by investing primarily in the money market, with only 25 percent of their corpus set a side for stocks. Only in the past 15 years, after operating for more then seven decades, have those funds ventured into equity. Unfortunately; their success blinded the fund-managers to the fact that they were riding a wave-not navigating the treacherous seas. As Vivek Reddy- 36, CEO Kothari-Pioneer Mutual Fund, puts it : "It was the stock market conditions that helped the mutual funds deliver returns, not superior investment skills." Then, the stock markets collapsed and never quite recovered. Between July 1997 and October 1998, the Sensex free-fell from 4306 to 2812 finally nullifying the theory that if you wait long enough, share-prices are always bound to rise. And the

mutual fund, unused to a diet of falling equity indices, collapsed too.

The quantum of money mopped up by the mutual fund may suggest that the reports of its extinction have been greatly exaggerated. In 1997-98, Indians entrusted Rs. 18,701 crore to the mutual funds, with new schemes alone mopping up Rs. 12,279 crore. Questions R.G. Sharma, 58, CEO, UC Mutual Fund: "How do you explain that Dhanvarsha 12 and Dhanvarsha 13, floated in April and September 1998, managed to mop up Rs. 335 crore ?" Not quite a loss of faith, would you say ? Think again. In those 12 months, those very investors also took away Rs. 16,227 crore in the form of repurchases and redemptions, leaving only Rs. 2,474 crore more in the hands of fund-managers. What's more, since none of the withdrawals could have been made from the new schemes, the old schemes, obviously; gave it all up, effectively yielding Rs. 9,805 crore to angry investors who took away their money. It is the same story this year: in the first quarter of 1998-99, old schemes collected Rs. 2,340 crore, compared to the new schemes' Rs. 1,735 crore but they gave up Rs. 2,749 crore-ending up Rs. 409 crore poorer.

Sure, some people are still putting money into the mutual funds. The real reason : money is flowing in from two genres of investors—neither of whom is the quintessential urban. The first comprises people in the semi-urban and rural areas, for whom names like the UC and GIC still represent safety and assured schemes of income. Importantly; this category investor isn't clued into the financial markets and is not, accordingly; aware of the problems that confront the mutual funds. Confirms Nikhil Khatau, 38, Managing Director, Sun F & C Asset Management: "That market is fairly stable." However, as soon as the fundamental problems hit their dividend-paying ability, even the die hard mutual fund investor from India's villages and small towns—who, don't forget, has already been signed by the disappearance of thousands of non banking finance companies-will swear off their favourite investment vehicle.

The second genre of investor explains why the private sector funds have been successful in soaking up large sums 31:10 percent of the total taking in 1997-98 and 10.70 percent in the first quarter of 1998-99. They are the so called high net worth players—corporates and individuals—who is Khatau's terms, "are aggressive about managing their wealth and look closely at comparative performance."

While their fastidiousness has forced them to pick the private sector mutual funds, whose disclosures and performance has both been ahead to their public sector cousins, their interest does not represent every investor's disillusionment.

- 356)** The amount of money entrusted to the care of the mutual funds was
 (a) ₹. 75,000 crore (b) ₹. 80,000 crore
 (c) ₹. 85,000 crore (d) ₹. 82,000 crore
- 357)** The end of mutual funds was carried out at the hands of
 (a) the government
 (b) non-banking finance companies
 (c) the individual investors
 (d) banks
- 358)** According to the passage, the flaws of the mutual funds lay in their
 (a) post-liberalisation syndrome
 (b) imprudent and irresponsible attitude
 (c) stagnation
 (d) All of these
- 359)** According to the passage, one of the reasons for the failure of the mutual funds was
 (a) their in disciplined approach to investmen
 (b) their devil-may-care approach to the world of finance
 (c) their ability to deceive investors
 (d) their inability to read the pulse of their investors.
- 360)** According to the writer, one of the fallouts of the end of mutual funds is that
 (a) at least some of the big schemes due for redemption over the next three years will be unable to service their investors
 (b) only very few of the big schemes due for redemption over the next three years will be unable to service their investors
 (c) none of the big schemes due redemption over the next three years will be able to service their investors
 (d) None of the above
- 361)** It can be inferred from the passage that
 (a) money was siphoned away outside the country by the mutual funds
 (b) many of the mutual fund offices indulged in malpractice
 (c) money invested in the mutual fund schemes were never returned to the investors
 (d) a sustained attack by the media exposed the anomalies in the mutual fund industry.
- 362)** The current rank of the mutual fund industry in terms of safety and returns on deposits respectively is
 (a) third and fourth
 (b) tenth and twelfth
 (c) fourth and fifth
 (d) It is not ranked at all
- 363)** The increase in the number of cell phone subscriptions in the office of an asset management company was due to the fact that
 (a) calls made by employees for personal deals couldn't be lodged in the company's records
 (b) employees found it easier to deal with investors without involving the company
 (c) the company was scrupulous about maintaining correct records
 (d) the company was unscrupulous in granting personal deals to the employees
- 364)** According to the passage, mutual funds caused a loss of :
 (a) ₹ 10,000 crore of the investor's money
 (b) ₹ 11,000 crore of the investor's money
 (c) ₹ 5,000 crore of the investor's money
 (d) ₹ 8,000 crore of the investor's money
- 365)** On the basis of the passage, it may be said that, in terms of retrieving their money, the investors:
 (a) are caught between the devil and the deep sea
 (b) have a no-exit route
 (c) have to make do with little or no gain
 (d) will trust the few bright stars in the mutual fund industry
- 366)** According to the passage, one of the reasons for the euphoria in the mutual fund industry can be attributed to
 (a) The stock market boom in the late eighties and early nineties
 (b) failure of the primary market
 (c) Both (a) and (b)
 (d) Neither (a) nor (b)
- Directions (Q. Nos. 367-416)** Read the passage given below and answer the questions that follow based on the information given in the passage. (1997)
- PASSAGE 75**
- I think that it would be wrong to ask whether 50 years of India's Independence are an achievement or a failure. It would be better to see things as evolving. It's not an either-or question. My idea of the history of India is slightly contrary to the Indian idea. India is a country that in the north outside Rajasthan was ravaged and intellectually destroyed to a large extent by the invasions that began in about AD 1000 by forces and religions that India had no means of understanding.
- The invasions are in all the schoolbooks. But I don't think that people understand that every invasion, every war, every campaign, was accompanied by slaughter, a slaughter always of the most talented people in the

country. So these wars, apart from everything else led to a tremendous intellectual depletion of the country. I think that in the British period and in the 50 years after the British period, there has been a kind of regrouping or recovery, a very slow revival of energy and intellect. This isn't an idea that goes with the vision of the grandeur of old India and all that sort of rubbish. That idea is a great simplification and it occurs because it is intellectually, philosophically easier for Indians to manage.

What they cannot manage and what they have not yet come to terms with, is that ravaging of all the north of India by various conquerors. That was ruin not by the act of nature, but by the hand of man. It is so painful that few Indians have begun to deal with it. It is much easier to deal with British imperialism. That is a familiar topic, in India and Britain. What is much less familiar is the ravaging of India before the British.

What happened from AD 1000 onwards, really, is such a wound that it is almost impossible to face. Certain wounds are so bad that they can't be written about. You deal with that kind of pain by hiding from it. You retreat from reality. I do not think, for example, that the Incas of Peru or the native people of Mexico have ever got over their defeat by the Spaniards. In both places, the head was cut off. I think the pre-British ravaging of India was as bad as that.

In the place of knowledge of history, you have various fantasies about the village republic and the Old Glory. There is one big fantasy that Indians have always found solace on : about India having the capacity for absorbing its conquerors. This is not so. India was laid low by its conquerors. I feel the past 150 years have been years of every kind of growth. I see the British period and what has continued after that as one period. In that time, there has been a very slow intellectual recruitment. I think every Indian should make the pilgrimage to the site of the capital of the Vijayanagar empire, just to see what the invasion of India led to. They will see a totally destroyed town. Religious wars are like that. People who see that might understand what the centuries of slaughter and plunder meant. War isn't game. When you lost that kind of war, your town was destroyed, the people who built the towns were destroyed. You are left with a headless population. That's where modern India starts from. The Vijayanagar capital was destroyed in 1565. It is only now that the surrounding region has begun to revive.

A great chance has been given to India to start up again and I feel it has started up again. The questions about whether 50 years of India since Independence have been a failure or an achievement are not the questions to ask. In fact, I think India is developing quite marvellously, people thought even Mr. Nehru thought that

development and new institutions in a place like Bihar, for instance, would immediately lead to beauty. But it doesn't happen like that when a country as ravaged as India, with all its layers of cruelty, begins to extend justice to people lower down, it's a very messy business. It's not beautiful, it's extremely messy. And that's what you have now, all these small politicians with small reputations and small parties. But this is part of growth, this is part of development. You must remember that these people and the people they represent, have never had rights before. When the oppressed have the power to assert themselves, they will behave badly. It will need a couple of generations of security and knowledge of institutions and the knowledge that you can trust institutions-it will take at least a couple of generations before people in that situation begin to behave well.

People in India have known only tyranny. The very idea of liberty is a new idea. The rulers were tyrants. The tyrants were foreigners. And they were proud of being foreign. There's story that anybody could run and pull a bell and the emperor would appear at his window and give justice. This is a child's idea of history-the slave's idea of the ruler's mercy. When the people at the bottom discover that they hold justice in their own hands, the Earth moves a little. You have to expect these Earth movements in India. It will be like this for a hundred years. But it is the only way. It's painful and messy and primitive and petty, but it's better that it should begin. It has to begin. If we were to rule people according to what we think fit, that takes us back to the past when people had no voices.

With self-awareness all else follows. People begin to make new demands on their leaders, their fellows, on themselves. They ask for more in everything. They have a higher idea of human possibilities. They are to content with what they did before or what their fathers did before. They want to move. That is marvellous. That is as it should be.

I think that within every kind of disorder now in India there is a positive movement. But the future will be fairly chaotic. Politics will have to be at the level of the people now. People like Nehru were colonial—style politicians. They were to a large extent created and protected by the colonial order. They did not begin with the people. Politician now have to begin with the people. They cannot be too far above the level of the people. They are very much part of the people.

It is important that self-criticism does not stop. The mind has to work, the mind has to be active, there has to be an exercise of the mind. I think it's almost a definition of a living country that it looks at itself, analyses itself all times. Only countries that have ceased to live can say it's all wonderful.

- 367)** The central thrust of the passage is that
- (a) India is gearing up for a new awakening
 - (b) India is going back to its past status
 - (c) India is yet to understand itself
 - (d) India's glorious past is a figment of the imagination
- 368)** The writer's attitude is
- (a) excessively critical of India
 - (b) insightful
 - (c) cynical
 - (d) cold
- 369)** The writer has given the example of the Vijaynagar kingdom in order to drive home the point that
- (a) Indians should know their historical sites
 - (b) Indians should be aware of the existence of such a historical past
 - (c) It is time that India came to terms with the past
 - (d) All of the above
- 370)** The writer is against
- (a) the child's view of history
 - (b) taking a critical stand on their history
 - (c) indulging in the details of the past
 - (d) None of the above
- 371)** According to the writer, India's regeneration and revival took place
- (a) in the British period
 - (b) after the British period
 - (c) during and after the British period
 - (d) a long time after the British left
- 372)** According to the passage, self-awareness is followed by
- (a) self- righteousness
 - (b) a higher idea of human possibilities
 - (c) a desire for more in everything
 - (d) Both (b) and (c)
- 373)** According to the passage, India's current situation is
- (a) blank
 - (b) horrific
 - (c) primitive and messay
 - (d) all are wrong
- 374)** For a country to be alive and progressive, it is important that
- (a) self-criticism does not stop
 - (b) self-criticism does not exceed a certain limit
 - (c) it feels that all is right with itself
 - (d) None of the above
- 375)** The writer's prognosis for India's future is that
- (a) it will be stable
 - (b) it will be chaotic
 - (c) it will reflect the manipulations of the present
 - (d) it will give way to self-criticism

- 376)** One of the main features of the tyranny of foreign rulers was

- (a) the decimation of the country's artists
- (b) the decimation of the country's wealth
- (c) the decimation of the country's talented people
- (d) All of the above

PASSAGE 76

When talks come to how India has done for itself in 50 years of independence, the world has nothing but praise for our success in remaining a democracy. On other fronts, the applause is less loud. In absolute terms, India hasn't done too badly, of course, life expectancy has increased. So has literacy. Industry, which was barely a fledgling, has grown tremendously. And as far as agriculture is concerned, India has been transformed from a country perpetually on the edge of starvation into a success story held up for others to emulate.

But these are competitive times when change is rapid and to walk slowly when the rest of the world is running is almost as bad as standing still on walking backwards. Compared with large chunks of what was then the developing world South Korea, Singapore, Malaysia, Thailand, Indonesia, China and what was till lately a separate Hong Kong-India has fared abysmally.

It began with a far better infrastructure than most of these countries had. It suffered hardly or not at all during the Second World War. It had advantages like an English speaking elite, quality scientific manpower (including a Nobel laureate and others who could be ranked among the world's best) and excellent business acumen. Yet, today, when countries are ranked according to their global competitiveness, it is tiny Singapore that figures at the top. Hong Kong is an export powerhouse. So is Taiwan. If a symbol were needed of how far we have fallen back, note that while Korean Cielos are sold in India, no one is South Korea is rushing to buy an Indian car.

The reasons list themselves. Topmost is economic isolationism. The government discouraged imports and encouraged self-sufficiency. Whatever the aim was, the result was the creation of a totally inefficient industry that failed to keep pace with global trends and, therefore, became absolutely uncompetitive. Only when the trade gates were opened a little did this become apparent. The years since then have been spent in merely trying to catch up.

That the government actually sheltered its industrialists from foreign competition is a little strange. For in all other respects, it operated under the conviction that businessmen were little more than crooks who were to be prevented from entering the most important areas of the economy, who were to be hamstrung in as many ways as possible, who were to be tolerated in the same way as an in excisable wart. The high, expropriatory rates of

taxation, the licensing laws, the reservation of whole swathes of industry for the public sector and the granting of monopolies to the public sector firms were the principal manifestations of this attitude. The government forgot that before wealth could be distributed, it had to be created. The government forgot that it itself could not create, but only squander wealth.

Some of the manifestations of the old attitude have changed. Tax rates have fallen. Licensing has been all but abolished. And the gates of global trade have been opened wide. But most of these changes were forced by circumstances partly by the foreign exchange bankruptcy of 1991 and the recognition that the government could no longer muster the funds of support the public sector, leave alone expand it. Whether the attitude of the government itself or that of more than handful of ministers, has changed, is open to question.

In many other ways, however, the government has not changed one with. Business still has to negotiate a welter of negotiations. Transparency is still a longer way off. And there is no exit policy. In defending the existing policy, politicians betray an inability to see beyond their noses. A no-exit policy for labour is equivalent to a no-entry policy for new business. If one industry is not allowed to retrench labour, other industries will think a hundred times before employing new labour.

In other ways too, the government hurts industries. Public sector monopolies like the department of telecommunications and Videsh Sanchar Nigam Ltd. make it possible for Indian businesses to operate only at a cost several times that of their counterparts abroad. The infrastructure is in a shambles partly because it is unable to formulate a sufficiently remunerative policy for private business and partly because it does not have the stomach to change market rates for services.

After a burst of activity in the early nineties, the government is dragging its feet. At the rate it is going, it will be another 50 years before the government realises that a pro-business policy is the best pro-people policy. By then of course, the world would have moved even farther ahead.

377) The writer's attitude towards the government is

- (a) critical
- (b) ironical
- (c) sarcastic
- (d) derisive

378) The writer is surprised at the government's attitude towards its industrialists because:

- (a) the government did not need to protect its industrialists
- (b) the issue of competition was non-existent
- (c) the government looked upon its industrialists as crooks
- (d) the attitude was a conundrum

379) The government was compelled to open the economy due to

- (a) pressure from international markets
- (b) pressure from domestic market
- (c) foreign exchange bankruptcy and paucity of funds with the government
- (d) All of the above

380) The writer ends the passage on a note of

- (a) cautious optimism
- (b) pessimism
- (c) optimism
- (d) pragmatism.

381) According to the writer, India should have performed better than the other Asian nations because

- (a) it had adequate infrastructure
- (b) it had better infrastructure
- (c) it had better politicians who could take the required decisions
- (d) All of the above

382) India was in better condition than the other Asian nations because

- (a) it did not face the ravages of the Second World War.
- (b) it had an English speaking populace and good business sense.
- (c) it had enough wealth through its exports.
- (d) Both (a) and (b) above.

383) The major reason for India's poor performance is

- (a) economic isolationism
- (b) economic mismanagement
- (c) inefficient industry
- (d) All of the above

384) One of the features of the government's protectionist policy was

- (a) encouragement of imports
- (b) discouragement of exports
- (c) encouragement of exports
- (d) discouragement of imports

385) The example of the Korean Cielo has been presented to highlight

- (a) India's lack of stature in the international market
- (b) India's poor performance in the international market
- (c) India's lack of credit-ability in the international market
- (d) India's disrepute in the international market

386) According to the writer (1997)

- (a) India's politicians are myopic in their vision of the country's requirements
- (b) India's politicians are busy lining their pockets
- (c) India's politicians are not conversant with the needs of the present scenario.
- (d) All of the above

PASSAGE 77

When Deng Xiaoping died a few months ago, the Chinese leadership barely paused for a moment before getting on with the business of governing the country. Contrast that with the chaotic contortions on India's political stage during the past month and it is easy to conclude that democracy and democratic freedoms are serious obstacles to economic progress.

When the Chinese leadership wants a power plant to be set up, it just goes ahead. No fears of protracted litigation, of environmental protests or of lobbying by interested parties. It-or the economy—is not held to ransom by striking truckers or air traffic controllers. Certainly there is much that is alluring about an enlightened dictatorship.

But there the trouble begins. First, there is no guarantee that a dictatorship will be an enlightened one. Myanmar has been ruled by a dictator for decades and no one would claim that it is better off than even Bangladesh which has itself suffered long stretches of dictatorship. Nor can Mobuto Sese Seko, much in the news these days, be described as enlightened by any reckoning.

The people of Israel, almost the only democracy in a region where dictatorships (unenlightened ones) are the norm, are much better off than their neighbours.

Second, dictatorships can easily reverse policies. China was socialist as long as Mao Zedong was around. When Deng Xiaoping took over in what was essentially a palace coup, he took the country in the opposite direction. There is little to ensure that the process will not be repeated. In India such drastic reversals are unlikely.

Six years ago Indian politicians agreed that industries should be de-licensed, that imports should be freed or the investment decisions should be based on economic considerations. Now few think otherwise. Almost all politicians are convinced of the merits of liberalisation though they may occasionally lose sight of the big picture in pandering to their constituencies. India has moved slower than China on liberalisation, but whatever moves it has made are more permanent.

Democracies are also less likely to get embroiled in destructive wars. Had Saddam Hussain been under the obligation of facing free elections every five years, he would have thought ten times before entangling his people in a long confrontation with the West. Germany, Italy and Japan were all dictatorships when they launched the Second World War. The price was paid by the economies.

Democracies make many small mistakes. But dictatorships are more susceptible to making huge ones and risking everything on one decision-like going to war. Democracies are the political equivalent of free markets.

Companies know they can't fool the consumer too often; he will simply switch to the competition. The same goes for political parties. When they fail to live up to their promises in government, the political consumer opts for the competition.

Democratic freedoms too are important for the economy, especially now that information is supreme. Few doubt that the internet will play an important part in the global economy in the decades to come. But China, by preventing free access to it, is already probably destroying its capabilities in this area. As service industries grow in importance, China may well be at a disadvantage though that may not be apparent today when its manufacturing juggernaut is rolling ahead.

India has stifled its entrepreneurs through its licensing policies. That was an example of how the absence of economic freedom can harm a country. But right-wing dictatorships like South Korea erred in the opposite direction. They forced their businesses to invest in industries, which they (the dictators) felt had a golden future. Now many of those firms are trying to retreat from those investments. Statism is bad, no matter what the direction in which it applies pressure. At this moment, China and other dictatorships may be making foolish in investment decisions. But as industries are subsidized and contrary voices not heard, the errors will not be realised until the investments assume gargantuan proportions.

India's hesitant ways may seem inferior to China's confident moves but at least we know what the costs are. That is not the case with China. It was only years after the Great Leap Forward and only such experiments that the cost in human lives (millions of them) became evident to the world. What the cost of China's present experiments is we may not know for several years more. A 9 percent rate of growth repeated year after year may seem compelling. But a 7 percent rate of growth that will not falter is more desirable. India seems to be on such a growth curve, whatever the shenanigans of our politicians.

387) According to the passage

- (a) India needs a benevolent dictatorship
- (c) India should go the way of China
- (b) India has failed as a democracy
- (d) None of the above

388) The passage says that

- (a) benevolent dictators are not easy to find
- (b) not all dictators will be enlightened
- (c) dictators can make or break a country
- (d) an enlightened dictatorship is better than a corrupt democracy

- 389)** It can be implied from the passage that
- a lower rate of growth is preferred to a higher rate of growth
 - a higher rate of growth is preferred to a lower rate of growth
 - a low but stable rate of growth is preferred to a high rate of growth
 - a low but faltering rate of growth is a sign of stability amidst growth
- 390)** Vis-a vis democracies, dictatorships run the risk of
- losing all for a single mistake
 - making bigger mistakes.
 - making huge mistakes and risking everything
 - None of the above.
- 391)** The writer's conclusion in the passage is that
- under no circumstances should a country encourage a corrupt demagogue
 - under no circumstances should statism be a welcome move
 - a statist will not give due importance to the voice of the people
 - a statist will always look to his own welfare
- 392)** Democracy has been compared to the free market, as
- both have a high degree of competition
 - both offer a multitude of options to choose from
 - consumer satisfaction plays an important role in both
 - All of the above
- 393)** It can be inferred from the passage that :
- China stands to lose out in the global market because it has blocked the internet
 - India stands to gain in the global market because of its policy vis-a-vis the internet
 - Internet will play a crucial role in the global market in the years to come
 - All of the above
- 394)** According to the passage, a democratic set up works as a check on the
- actions and decisions of its leaders
 - functioning of its economy
 - Both (a) and (b)
 - None of the above
- 395)** India's moves on liberalisation are more permanent than China's because
- India's politicians are in agreement over the need for reforms
 - India is not at the mercy of dictators
 - Unlike China, India is unlikely to have drastic policy reversals
 - India is not in a hurry to reform

- 396)** According to the passage

- Israel is the only democracy in West Asia
- Israel is better off than Bangladesh or Myanmar
- Israel does not face policy reversals
- None of the above

PASSAGE 78

Of each of the great leaders, it is said by his followers, long after he is gone, he made us do it. If leadership is the art of persuading your people to follow your bidding, without their realising your involvement, the archetype of its practice is N.R. Narayana Murthy, the Chairman and Managing Director of the (₹ 143.81 crore) Infosys Technologies (Infosys).

For, the 52-years-old CEO of the globalised software corporation—which he founded with six friends and a combined capital of ₹ 10,000, in 1981 and which now occupies the front ranks of the country's most admired corporations, leads with the subtlest of weapons : personal example.

Infosys ranks only 578th among the country's listed companies and sixth in the software sector, in terms of its turnover. But it is setting new standards for India Inc. through its practices of inter alia awarding stock options to its employees, putting the value of its intellectual assets and its brands on its balance sheet and conforming to the disclosure standards of the Securities and Exchange Commission (SEC) of the US. Behind all this is the stubborn personal subscription of its CEO to the underlying causes of wealth-creation, people-power and transparency. "What were choices earlier and compulsions now," asserts Murthy.

In fact, the mirror images of Murthy, the Man, can be found all over Infosys, his company, His egalitarianism—which finds expression in such habits as using the same table and chair as anyone else in the organisation—is practiced firmly when it comes to charting a course for the company's future: everyone has a voice. "We have no hierarchy just for the sake of control".

Brimming with the conviction that customer satisfaction is the key to success, Murthy has built a fleet-footed human resource management system that treats employees as customers, using the resources of the organisation to meet their professional and personal needs. His instruments are not just top-of-the-market salaries, but also operational empowerment as well as every facility that an employee needs to focus on the job. Just what methods does Murthy use to ensure that his DNA is replicated in his company? Not for him are the classical leadership genre—transactional or transformational, situational or visionary. His chosen

style, instead, is to lead by example, ensuring that the CEO's actions set the template for all Infosys.

Murthy believes that the betterment of man can be brought about through the "creation of wealth, legally and ethically". The personal example that he has set enabled his company to mirror those beliefs, tying his own rewards and measuring his value to the company, to his ability to create wealth and erecting systems for the company's wealth to be shared by its people. Sums up Nandan Nilekani, 41, deputy managing director, Infosys : "This is the future model of the corporation. Run an excellent company and let the market increase its value to create wealth".

Although Murthy is one of the prime beneficiaries of the philosophy—his 10 percent stake in Infosys is worth ₹ 130 crore today—in his book, the leader leads not by grabbing the booty but by teaching others to take what they deserve. That's why, on the Infosys's balance sheet, the value of Murthy's intellectual capital is nowhere near the top, on the rationale, that the CEO, at 52, is worth far less to his company than, say, a bright young programmer of 26. To spread the company's wealth, Murthy has instituted stock options—the first to do so in the country—for employees, creating 300 millionaires already. By 2000, he wants the number to climb to 1000. To act as a beacon for his version of the learning organisation, Murthy not only spends an hour a day trawling the Internet to learn about new technological developments in his field, he also makes as many luncheon appointments as he can with technical people and academicians—dons from the Indian Institutes of Technology—for instance—systematically plumbing their depths for an understanding of new developments in infotech. Murthy's objective is not just to stay abreast of the state-of-the-art, but also to find a way to use that knowledge for the company.

Following Murthy's example, Infosys has set up a technology advancement unit, whose mandate is to track, evaluate and assimilate new techniques and methodologies. In fact, Murthy views learning not just as amassing data, but as a process that enables him to use the lessons from failure to achieve success. This self-corrective loop is what he demonstrates through his leadership during a crisis.

In 1995, for example, Infosys lost a ₹ 15 crore account—then 20 percent of its revenues—when the \$69 billion GE yanked its business from it. Instead of recriminations, Murthy activated Infosys's machinery to understand why the business was taken away and to leverage the learning for getting new clients instead. Feeling determined instead of guilty, his employees went

on to sign up high profile customers like the \$20 billion Xerox, the \$7 billion Levis Strauss and the \$14 billion Nynex.

"You must have a multi-dimensional view of paradigms," says the multi-tasking leader. The objective is obvious: ensure that Infosys's perspective on its business and the world comes from as many vantage points as possible so that corporate strategy can be synthesised not from a narrow vision, but from a wide angle lens. In fact Murthy still regrets that, in its initial years, Infosys didn't distill a multi-pronged understanding of the environment into its strategies, which forced it onto an incremental path that led revenues to snake up from ₹ 0.02 crore in the first 10 years.

It was after looking around itself instead of focusing on its initial business of banking software, that Infosys managed to accelerate. Today the company operates with stretch targets setting distant goals and working backwards to get to them. The crucial pillar on which Murthy bases his ethical leadership is openness. Transparency, he reckons, is the clearest signal that one has nothing to hide. The personal manifestations of that are inter alia the practice of always giving complete information whenever any employee, customer or investor asks for it : the loudly proclaimed insistence that every Infosys pay taxes and file returns: and a perpetually open office into which anyone can walk. But even as he tries to lead Infosys into cloning his own approach to enterprise, is Murthy choosing the best future for it ? If Infosys grows with the same lack of ambition, the same softness of style and the same absence of aggression, is it not cutting off avenues of growth that others may seize? As Infosys approaches the 21st century it is obvious that Murthy's leadership will have to set ever-improving role models of his ever-learning company. After all, men grow old : companies shouldn't.

397) One of the ways in which Infosys spreads the company's wealth among its employees

- (a) by awarding stock options
- (b) by giving extravagant bonus at the end of each year
- (c) Both (a) and (b)
- (d) None of the above

398) According to the passage

- (a) at Infosys, control is exerted through a system of hierarchy
- (b) control is not exerted through a system of hierarchy
- (c) hierarchy does not have pride of place in Infosys
- (d) popular opinion is the most respected voice in Infosys

399) 290. Murthy believes in

- (a) betterment of man through learning
- (b) betterment of man through ethical creation of wealth
- (c) betterment of man through experimentation
- (d) All of the above

400) The example of the ₹ 15 crore account highlights

- (a) Murthy's ability to see his company through a crisis
- (b) Murthy's ability to turn failure into success
- (c) Murthy's potential to handle a crisis
- (d) All of the above

401) According to Murthy, learning is

- (a) the essence of an employee
- (b) the art of amassing data
- (c) a process that helps him to learn from failure
- (d) All of the above

402) According to the passage

- (a) Infosys could not have succeeded without working backward
- (b) Infosys succeeded because it worked backwards
- (c) working backwards contributed to Infosys's success
- (d) working backwards is a hallmark of Infosys' functioning today

403) Openness at Infosys includes

- (a) the payment of taxes
- (b) giving complete information
- (c) sharing secrets
- (d) both (a) and (b) above

404) It is evident from the passage that

- (a) Infosys will have to devise new strategies to meet the challenges of the 21st century
- (b) Infosys will stagnate if it does not become aggressive
- (c) Infosys may have to become more aggressive in order to retain its market
- (d) None of the above

405) The cornerstone of Murthy's human resource management system is

- (a) the employee as God
- (b) optimum utilisation of human potential
- (c) customer satisfaction
- (d) satisfaction of personal needs

406) According to the passage

- (a) Infosys is a reflection of its CEO
- (b) Infosys brings the best out in Murthy
- (c) Infosys and Murthy are synonymous
- (d) Murthy, the man and Murthy, the CEO are incompatible

PASSAGE 79

Last fortnight, news of a significant development was tucked away in the inside pages of newspapers. The government finally tabled a bill in Parliament seeking to make primary education a fundamental right. Tabled a bill in Parliament seeking to make primary education a fundamental right. A fortnight earlier, a Delhi-based newspaper had carried a report about a three-month interruption in the Delhi Government 'Education for All' programme. The report made for distressing reading. It said that literacy centres across the city were closed down, volunteers beaten up and enrolment registers burnt. All because the state government had, earlier this year, made participation in the programme mandatory for teachers in government schools. The routine denials were issued and there probably was a wee bit of exaggeration in the report. But it still is a pointer to the enormity of the task at hand.

That economic development will be inherently unstable unless it is built on a solid base of education, specially primary education, has been said so often that it is in a danger of becoming a platitude. Nor does India's abysmal record in the field need much reiteration. Nearly 30 million children in the six to ten age group do not go to school- reason enough to make primary education not only compulsory but a fundamental right. But is that the solution? More importantly, will it work? Or will it remain a mere token, like the laws providing for compulsory primary education? It is now widely known that 14 states and four Union Territories have this law on their statute books. Believe it or not, the list actually includes Bihar, Madhya Pradesh (MP) and Rajasthan, where literacy and education levels are miles below the national average. A number of states have not even notified the compulsory education law.

This is not to be little the decision to make education a fundamental right. As a statement of political will, a commitment by the decision-makers, its importance cannot be undervalued. Once this commitment is clear, a lot of other things like resource allocation will naturally fall into place. But the task of Universalising Elementary Education (UEE) is complicated by various socio-economic and cultural factors which vary from region to region and within regions.

If India's record continues to appall, it is because these intricacies have not been adequately understood by the planners and administrators. The trouble has been that education policy has been designed by grizzled mandarins ensconced in Delhi and is totally out of touch with the ground reality. The key then is to decentralise education planning and implementation. What's also

needed is greater community involvement in the whole process. Only then can school timings be adjusted for convenience, school children given a curriculum they can relate to and teachers made accountable.

For proof, one has only to look at the success of the district primary education programme, which was launched in 1994. It has met with a fair degree of success in the 122 districts it covers. Here the village community is involved in all aspects of education -allocating finances to supervising teachers to fixing school timings and developing curriculum and text books—through district planning tenants. Teachers are also involved in the planning and implementation process and are given small grants to develop teaching and learning material, vastly improving motivational levels. The consequent improvement in the quality of education generates increased demand for education.

But for this demand to be generated, quality will first have to be improved. In MP, the village panchayats are responsible for not only constructing and maintaining primary schools but also managing scholarships, besides organising non-formal education. How well this works in practice remains to be seen (though the department claims the schemes are working very well) but the decision to empower panchayats with such powers is itself a significant development. Unfortunately, the Panchayati Raj Act has not been notified in many states. After all, delegating powers to the panchayats is not looked upon too kindly by vested interests. More specifically, by politicians, since decentralisation of education administration takes away from them the power of transfer, which they use to grant favours and build up a support base. But if the political leadership can push through the bill to make education a fundamental right, it should also be able to persuade the states to implement the laws on Panchayati Raj. For, UEE cannot be achieved without decentralisation. Of course, this will have to be accompanied by proper supervision and adequate training of those involved in the administration of education. But the devolution of powers of powers to the local bodies has to come first.

407) One of the problems plaguing the education system in India is

- (a) poverty
- (b) diverse cultural and socio-economic factors
- (c) male chauvinism
- (d) All of the above

408) In the context of the passage, the term 'grizzled mandarins' means

- (a) old hags
- (b) decrepit men.
- (c) ineffective old men
- (d) None of the above

409) One of the reasons contributing in India's poor performance on the education front is that

- (a) its leaders do not have the conviction required to improve the education system
- (b) male members of society do not want their female counterparts to be educated
- (c) administrators in charge of education are out of touch with the ground realities
- (d) the country does not have the law for implementation of education policies in its statute books

410) The only way in which the education system can be improved is by

- (a) decentralising education planning and implementation
- (b) introducing fresh blood in the planning body
- (c) injecting funds into the exchequer solely for the purpose
- (d) educating the people on the need for primary education

411) Very low education levels are visible in

- (a) Bihar, Rajasthan and Uttar Pradesh
- (b) Rajasthan, West Bengal and Madhya Pradesh.
- (c) Rajasthan, Bihar and Madhya Pradesh
- (d) West Bengal, Uttar Pradesh and Bihar

412) The district primary education programme

- (a) was launched in 1994 in 22 states
- (b) was launched in 1994 in 12 states
- (c) launched in 1994 has been successful in 122 districts
- (d) launched in 1994 has met with dubious success

413) The village panchayats in Madhya Pradesh are responsible for

- (a) implementing adult education policies for the villages
- (b) organising non-formal education
- (c) scholarships and construction and maintenance of primary schools
- (d) Both (b) and (c)

414) The successful implementation of education policies is obstructed by

- (a) vested interests
- (b) politicians
- (c) politicians especially
- (d) bureaucrats

415) Primary education

- (a) is a fundamental right
- (b) will be made a fundamental right
- (c) is only for the privileged sections of society
- (d) None of the above

416) One of the ways in which education policy can be successfully implemented as mentioned in the passage, is

- (a) greater community involvement
- (b) greater community development
- (c) greater community awareness
- (d) Both (a) and (b)

Directions (Q. Nos. 417-466) Read the passage given below and answer the questions that follow based on the information given in the passage. (1996)

PASSAGE 80

I want to stress this personal helplessness we are all stricken with in the face of a system that has passed beyond our knowledge and control, To bring it nearer home, I propose that we switch off from the big things like empires and their wars to more familiar little things. Take pins for example! I do not know why it is that I so seldom use a pin when my wife cannot get on without boxes of them at hand; but it is so and I will therefore take pins as being for some reason specially important women.

There was a time when pinmakers would by the material; shape it; make the head and the point; ornament it and take it to the market and sell it and the making required skill in several operations. They not only knew how the thing was done from beginning to end, but could do it all by themselves. But they could not afford to sell you a paper of pins for the farthing. Pins cost so much that a woman's dress allowance was calling pin money.

By the end of the 18th century Adam Smith boasted that it took 18 men to make a pin, each man doing a little bit of the job and passing the pin on the next and none of them being able to make a whole pin or to buy the materials or to sell it when it was made. The most you could say for them was that at least they had some idea of how it was made, though they could not make it.

Now as this meant that they were clearly less capable and knowledgeable men than the old pin-makers, you may ask why Adam Smith boasted of it as a triumph of civilisation when its effect had so clearly a degrading effect. The reason was that by setting each man to do just one little bit of the work and nothing but that, over and over again, he became very quick at it. The men, it is said, could turn out nearly 5000 pins a day each and thus pins became plentiful and cheap. The country was supposed to be richer because it had more pins, though it had turned capable men into mere machines doing their work without intelligence and being fed by the spare food of the capitalist just as an engine is fed with coal and oil. That was why the poet Goldsmith, who was a farsighted

economist as well as a poet, complained that 'wealth accumulates and men decay'.

Now-a-days Adam Smith's 18 men are as extinct as the diplodocus. The 18 flesh and blood men have been replaced by machines of steel which spout out pins by the hundred million. Even sticking them into pink papers is done by machinery. The result is that with the exception of a few people who design the machines, nobody knows how to make a pin or how a pin is made: that is to say, the modern worker in pin manufacture need not be one-tenth so intelligent, skillful and accomplished as the old pin maker and the only compensation we have for this deterioration is that pins are so cheap that a single pin has no expressible value at all.

Even with a big profit stuck on the cost-price you can buy dozens for a farthing and pins are so recklessly thrown away and wasted that verses have to be written to persuade children (without success that it is a sin to steal, if even it's a pin).

Many serious thinkers, like John Ruskin and William Morris, have been greatly troubled by this, just as Goldsmith was and have asked whether we really believe that it is an advance in wealth to lose our skill and degrade our workers for the sake of being able to waste pins by the ton. We shall see later on, when we come to consider the Distribution Leisure, that the cure for this is not to go back to the old free for higher work than pin-making or the like. But in the meantime the fact remains that the workers are now not able to make anything themselves even in little bits. They are ignorant and helpless and cannot lift their finger to begin their day's work until it has all been arranged for them by their employers who themselves do not understand the machines they buy and simply pay other people to set them going by carrying out the machine maker's directions.

The same is true for clothes. Earlier the whole work of making clothes, from the shearing of the sheep to the turning out of the finished and washed garment ready to put on, had to be done in the country by the men and women of the household, especially the women; so that to this day an unmarried woman is called a spinster. Now-a-days nothing is left of all these but the sheep shearing and even that, like the milking of cows, is being done by machinery as the sewing is. Give a woman a sheep today and ask her to produce a woollen dress for you and not only will she be quite unable to do it, but you are likely to find that she is not even aware of any connection between sheep and clothes. When she gets her clothes, which she does by buying them at the shop, she knows that there is a difference between wool and cotton and silk, between flannel and merino, perhaps even between stockinet and other wefts, but as to how they

are made or what they are made of or how they came to be in the shop ready for her to buy, she knows hardly anything. And the shop assistant from whom she buys is no wiser. The people engaged in the making of them know even less; for many of them are too poor to have much choice of materials when they buy their own clothes.

Thus, the capitalist system has produced an almost universal ignorance of how things are made and done whilst at the same time it has caused them to be made and done on a gigantic scale. We have to buy books and encyclopedias to find out what it is we are doing all day and as the books are written by people who are not doing it and who get their information from other books, what they tell us is twenty to fifty years out of date knowledge and almost impractical today. And of course most of us are too tired of our work when we come home to want to read about it; what we need is cinema to take our minds off it and feel our imagination.

It is a funny place, this word of capitalism, with its astonishing spread of education and enlightenment. There stand the thousands of property owners and the millions of wage workers, none of them able to make anything, none of them knowing what to do until somebody tells them, none of them having the least notion of how it is made that they find people paying them money and things in the shops to buy with it. And when they travel they are surprised to find that savages and Esquimaux villages who have to make everything for themselves are more intelligent and resourceful! The wonder would be of they were anything else. We should die of idiocy through disuse of our mental faculties if we did not fill our heads with romantic nonsense out of illustrated newspapers and novels and play and films. Such stuff keeps us alive, but it falsifies everything for us so absurdly that it leaves us more or less dangerous lunatics in the real world.

Excuse my going on like this; but as I am a writer of books and play myself, I know the folly and peril of it better than you do. And when I see that this moment of our utmost ignorance and helplessness, delusion and folly, has been stumbled on by the blind forces of capitalism as the moment for giving votes to everybody, so that the few wise women are hopelessly overruled by the thousands whose political minds, as far as they can be said to have any political minds at all, have been formed in the cinema, I realise that I had better stop writing plays for a while to discuss political and social realities in this book with who are intelligent enough to listen to me.

417) A suitable title to the passage would be

- (a) You can't hear a pin-drop now-a-days
- (b) Capitalism and labour Disintegration : Pinning the Blame
- (c) The Saga of the Non Safety Pins
- (d) Reaching the Pinnacle of Capitalistic Success

418) Why do you think that the author gives the example of Adam Smith?

- (a) Because he thinks that Adam Smith was a boaster without any facts to back his utterance
- (b) Because he wants to give us an example of something undesirable that Adam Smith was proud of
- (c) Because he is proud to be a believer in a tenet of production that even a great man like Adam Smith boasted about
- (d) Because he feels that Adam Smith was right when he said that it took 18 men to make a pin

419) Which of the following is true as far as pins are concerned?

- (a) The cost of pins is more now-a-days to produce
- (b) Earlier, workmen made pin with a lot of love and care
- (c) Pinball machines are the standard pin producing gadgets now-a-days
- (d) It took much longer to make a pin earlier

420) The reason that children have to be taught that stealing a pin is wrong is that

- (a) they have an amazing proclivity to steal them right from childhood
- (b) pins are so common and cheap that taking one would not even be considered stealing by them
- (c) stealing a pin would lead to stealing bigger and bigger things in the future
- (d) stealing an insignificant thing like a pin smacks of kleptomania

421) It may be inferred from the passage that the author

- (a) is a supporter of the craftsmanship over bulk mechanised production
- (b) is a supporter of assembly line production
- (c) is a defender of the faith in capitalistic production
- (d) None of the above

422) Which of the following is not against the modern capitalistic system of mass production?

- (a) John Ruskin
- (b) Goldsmith
- (c) Adam Smith
- (d) William Morris

423) Goldsmith's dictum, "wealth accumulates and men decay, "in the context of the passage, probably means

- (a) the more wealthy people get, the become more and more corrupt
- (b) the more rich people get, the forget the nuances of individual ability
- (c) people may have a lot of money, but they have to die and decay someday
- (d) the more a company gets wealthy, the less they take care of people

424) When the author says that a woman now is likely to know about any connection between sheep and clothes, he is probably being:

- (a) vindictive
- (b) chauvinistic
- (c) satirical
- (d) demeaning

425) Which of the following can be a suitable first line to introduce the hypothetical next paragraph at the end of the passage?

- (a) The distribution of leisure is not a term that can be explained in a few words
- (b) If people wear clothes they hardly seem to think about the method of production
- (c) Machines are the gods of our age and there seems to be no atheists
- (d) None of the above

PASSAGE 81

Now let us turn back to inquire whether sending our capital abroad and consenting to be taxed to pay emigration fares to get rid of the women and men who are left without employment in consequence, is all that capitalism can do when our employers, who act for our capitalists in industrial affairs and are more or less capitalists themselves in the earlier stages of capitalistic development, find that they can sell no more of their goods at a profit or indeed at all, in their own country.

Clearly they cannot send abroad the capital they have already invested, because it has all been eaten up by the workers leaving in its place factories and railways and mines and the like and these cannot be packed into a ship's hold and sent to Africa. It is only the freshly saved capital that can be sent out of the country. This, as we have seen, does go abroad in heaps of finished products. But the British land held by him on long lease, must, when once he has sold all the goods at home that his British customers can afford to buy, either shut up his works until the customers have worn out their stock of what they have bought, which would bankrupt him (for the landlord will not wait) or else sell his superfluous goods somewhere else; that is, he must send them abroad. Now it is not easy to send them to civilised

countries, because they practise protection, which means that they impose heavy taxes on foreign goods.

Uncivilized countries, without protection and inhabited by natives to whom gaudy calicoes and cheap showy brassware are dazzling and delightful novelties, are the best places to make for at first.

But trader requires a settled government to put down the habit of plundering strangers. This is not a habit of simple tribes, who are often friendly and honest. It is what civilized men do where there is no law to restrain them. Until quite recent times it was extremely dangerous to be wrecked on our coasts, as wrecking, which meant plundering wrecked ships and refraining from any officious efforts to save the lives of their crews was a well-established business in many places on our shores. The Chinese still remember some astonishing outbursts of looting perpetrated by English ladies of high position, at moments when law was suspended and priceless works of art were to be had for the grabbing. When trading with aborigines begins with the visit of a single ship, the cannons and cutlasses carried may be quite sufficient to overawe the natives if they are troublesome. The real difficulty begins when so many ships come that a little trading station of white men grows up and attracts the white never-do-wells and violent roughs who are always being squeezed out of civilization by the pressure of law and order. It is these riff-raff who turn the place into a sort of hell in which sooner or later missionaries are murdered and traders plundered. Their home governments are appealed to put a stop to this. A gunboat is sent out and inquiry made. The report after the inquiry is that there is nothing to be done but set up a civilized government, with a post office, police, troops and the navy in the offing. In short, the place is added to some civilized empire. And the civilized taxpayer pays the bill without getting a farthing of the profits. Of course the business does not stop there. The riff-raff who have created the emergency move out just beyond the boundary of the annexed territory and are as great a nuisance as ever to the traders when they have exhausted the purchasing power of the included natives and push on after fresh customers. Again they call on their home government to civilize a further area and so bit by bit the civilized empire grows at the expense of the home taxpayers, without any intention or approval on their part, until at last although all their real patriotism is centred on their own people and confined to their own country, their own rulers and their own religious faith; they find that the centre of their beloved realm has shifted to the other hemisphere. That is how we in the British Islands have found our centre moved from London to the Suez Canal and are now in the position that out of every hundred of our fellow-subjects, in whose defence we are expected to shed the last drop of our

blood, only 11 are whites or even Christians, In our bewilderment some of us declare that the Empire is a burden and a blunder, whilst others glory in it as triumph. You and I need not argue with them just now, our point for the moment being that, whether blunder or glory. The British Empire was quite unintentional. What should have been undertaken only as a most carefully considered political development has been a series of commercial adventures thrust on us by capitalists forced by their own system to cater to foreign customers before their own country's need were one-tenth satisfied.

426) It may be inferred that the passage was written

- (a) when Britain was still a colonial power.
- (b) when the author was in a bad mood.
- (c) when the author was working in the foreign service of Britain.
- (d) when the author's country was overrun by the British.

427) According to the author, the habit of plundering the strangers

- (a) is usually not found in simple tribes but civilized people
- (b) is usually found in the barbaric tribes of the uncivilized nations
- (c) is a habit limited only to English ladies of high position
- (d) is a usual habit with all white-skinned people

428) Which of the following does not come under the aegis of capital already invested?

- (a) Construction of factories
- (b) Development of a mine.
- (c) Trade of finished products
- (d) All of the above

429) Which of the following may be called the main complaint of the author?

- (a) The race of people he belongs to are looters and plunderers
- (b) The capitalists are taking over the entire world
- (c) It is a way of life for English ladies to loot and plunder
- (d) The English taxpayer has to pay for the upkeep of territories he did not want

430) Why do capitalistic traders prefer the uncivilized countries to the civilized ones?

- (a) Because they find it easier to rule them
- (b) Because civilized countries would make them pay protection duties
- (c) Because civilized countries would make their own goods
- (d) Because uncivilized countries like the cheap and gaudy goods of bad quality all capitalists produce

431) The word 'officious', in the context of the passage, means

- (a) Self important
- (b) official
- (c) Rude
- (d) Oarfish

432) According to the author, the main reason why capitalist go abroad to sell their goods is

- (a) that they want to civilize the underdeveloped countries of the world by giving them their goods
- (b) that they have to have new places to sell their surplus goods some where in new markets
- (c) that they actually want to rule new lands and selling goods is an excuse
- (d) None of the above

PASSAGE 82

That the doctrines connected with the name of Mr. Darwin are altering our principles has become a sort of common place thing to say. And moral principles are said to share in this general transformation. Now, to pass by other subjects, I do not see why Darwinism need change our ultimate moral ideas. It was not to modify our conception of the end, either for the community or the individual, unless we have been holding views, which long before Darwin were out of date. As to the principles of ethics I perceive, in short, no sign of revolution. Darwinism has indeed helped many to truer conception to the end, but I cannot admit that it has either originated or modified that conception.

And yet in ethics Darwinism after all perhaps be revolutionary, it may lead not to another view about the end, but to a different way of regarding the relatively importance of the means. For in the ordinary moral creed those means seem estimated on no rational principle. Our creed appears rather to be an irrational mixture of jarring elements. We have the moral code of Christianity, accepted in part; rejected practically by all save a few fanatics. But we do not realise how in its very principle the Christian ideals is false. And when we reject this code for another and in part a sounder morality, we are in the same condition of blindness and of practical confusion. It is here that Darwinism, with all the tendencies we may group under that name, seems destined to intervene. It will make itself felt, I believe more and more effectually. It may force us in some points a correction of our moral view and a return to non-Christian and perhaps a Hellenic ideal. I propose to illustrate here these general statements by some remarks on punishment.

Darwinism, I have said, has not even modified our ideas of the Chief Good. We may take that as—the welfare of

the community realised in its members. There is, of course, a question as to meaning to be given to welfare. We may identify that with mere pleasure or gain with mere system or may rather view both as inseparable aspects of perfection and individuality. And the extent and nature of the community would once more once more be a subject for some discussion. But we are forced to enter on these controversies here. We may leave welfare undefined and present purpose need not distinguish the community from the state. The welfare of this whole exists, of course, nowhere outside the individuals again have rights and duties only as members in the whole. This is the revived Hellenism—or we may call it in the organic view of thing—urged by German Idealism early in the present century.

- 433)** What is most probably the author's opinion of the existing moral principles of the people?
- He thinks they have to be revamped in the light of Darwinism
 - He thinks that they are okay as they are and do not need any major change
 - He thinks that it may be a good idea to have a modicum of the immortal Darwinism in us
 - Cannot be determined from the passage
- 434)** According to the author, the doctrines of Mr. Darwin
- have changed our physical and moral principles
 - have to be re-evaluated to correct the faults endemic in them
 - do not have to change our moral ideas
 - are actually new versions of old moral rules
- 435)** What, according to the passage, is the Chief Good?
- Being good and kind to all fellow human beings
 - The greatest good of the greatest number
 - The welfare of the community realised in its members
 - Cannot be determined from the passage
- 436)** It is implied in the passage that
- a Hellenic ideal is not proper substitute of the Christian ideal
 - what mankind needs is a Hellenic ideal rather than a Christian one
 - darwinism is more Christian than Hellenic
 - fanatics do not understand what Darwinism really is
- 437)** According to the author, the moral code of Christianity
- is not followed by most people
 - is in danger due to opposition of Darwinism
 - is followed by a vast majority of people
 - is totally ignored by all true Christians

PASSAGE 83

Governments looking for easy popularity have frequently been tempted into announcing give-aways of all sorts; free electricity, 'virtually free water, subsidised food, cloth at half price, and so on. The subsidy culture has gone to extremes. The richest farmers in the country get subsidised fertiliser. University education, typically accessed by the wealthier sections, is charged at a fraction of cost. Postal services are subsidised and so are railway services. Bus fares cannot be raised to economical levels because there will be violent protest, so bus travel is subsidised too. In the past, price control on a variety of items, from steel to cement, meant that industrial consumer of these items got them at less than actual cost, while the losses of the public sector companies that produced, them were borne by the taxpayer! A study done a few years ago, came to the conclusion that subsidies in the Indian economy total as much as 14.5 per cent of gross domestic product. At to day's level, that would work out to about ₹. 1,50,000 crore. And who pays the bill ? The theory-and the political fiction on the basis of which it is sold to unsuspecting voters-is that subsidies go to the poor and are paid for by the rich. The fact is that most subsidies go to the 'rich' (defined in the Indian context as those who are above the poverty line) and much of the tab goes indirectly to the poor. Because the hefty subsidy bill results in fiscal deficits, which in turn push up rates of inflation-which, as everyone knows, hits the poor the hardest of all. Indeed, that is why taxmen call inflation the most regressive form of taxation.

The entire subsidy system is built on the thesis that people cannot help themselves, Therefore governments must do so. That people cannot afford to pay for variety of goods and services and therefore the government must step in. This thesis has been applied not just in the poor countries but in the rich ones as well; hence the birth of the welfare state in the West and an almost Utopian social security system; free medical care, food aid, old age security, et. al. But with the passage of time, most of the wealthy nations have discovered that their economies cannot sustain this social safety net, which infact reduces the desire among people to pay their own way and takes away some of the incentive to work, in short, the bill was unaffordable and their societies were simply not willing to pay. To the regret of many, but because of the laws of economies and harsh, most Western societies have been busy pruning the welfare bill.

In India, the lessons of this experience over several decades and in many countries-do not seem to have been learnt. Or they are simply ignored in the pursuit of immediate votes. People who are promised cheap food or clothing do not in most cases look beyond the gift

horses-to the question of who picks up the tab. The uproar over higher petrol, diesel and cooking gas prices ignored this basic question; if the user of cooking gas does not want to pay for its cost, who should pay? Diesel in the country is subsidised and if the trucker or owner of diesel generator does not want to pay for its full cost, who does he or she think should pay the balance of the cost? It is a simple question, nevertheless it remains unasked.

The Deva Gowda Government has shown some courage in biting the bullet when it comes to the price of petroleum products. But it has been bitten by a much bigger subsidy bug. It wants to offer food at half its cost to everyone below the poverty line, supposedly estimated at some 380 million people. What will be the cost? And of course, who will pick up the tab? The Andhra Pradesh Government has been bankrupted by selling rice as ₹ 2 per kg. Should the Central Government be bankrupted too, before facing up to the question of what is affordable and what is not? Already, India is perennially short of power because the subsidy on electricity has bankrupted most electricity boards and made private investment wary unless it gets all manner of state guarantees. Delhi's subsidised bus fares have bankrupted the Delhi Transport Corporation, whose buses have slowly disappeared from the capital's streets. It is easy to be soft and sentimental, by looking at programmes that will be popular. After all, who does not like a free lunch? But the evidence is surely mounting that the lunch isn't free at all. Somebody is paying the bill. And if you want to know who, take a look at the country's poor economic performance over the years.

438) Which of the following should not be subsidised now, according to the passage?

- (a) University education (b) Postal services
- (c) Steel (d) All of these

439) The statement that subsidies are paid for by the rich and go to the poor is

- (a) fiction
- (b) fact
- (c) fact, according to the author
- (d) fiction, according to the author.

440) Why do you think that the author calls the Western social security system Utopian?

- (a) The countries' belief in the efficacy of the system was bound to turn out to be false
- (b) The system followed by these countries is the best available in the present context
- (c) Every thing under this system was supposed to be free but people were charging money for them
- (d) The theory of system followed by these countries was devised by Dr. Utopia

441) It can be inferred from the passage that the author

- (a) believes that people can help themselves and do not need the government
- (b) believes that the theory of helping with subsidy is destructive
- (c) believes in democracy and free speech
- (d) is not a successful politician

442) Which of the following is not a victim of extreme subsidies?

- (a) The poor
- (b) The Delhi Transport Corporation
- (c) The Andhra Pradesh Government
- (d) None of the above

443) What according to the author, is a saving grace of the Deva Gowda Government?

- (a) It has realised that it has to raise the price of petroleum products
- (b) It has avoided being bitten by a bigger subsidy bug
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

444) A suitable title to the passage would be

- (a) There's no Such Thing as a Free Lunch
- (b) The Economic Overview
- (c) Deve Gowda's Government and its Follies
- (d) It takes two to Tango.

445) Which of the following is not true in the context of the passage?

- (a) Where subsidies are concerned, the poor ultimately pay the tab
- (b) Inflation is caused by too much subsidies
- (c) Experts call subsidies the most regressive form of taxation
- (d) Fiscal deficits are caused due to heavy subsidy bills

PASSAGE 84

The membrane-bound nucleus is the most prominent feature of the eukaryotic cell. Schleiden and Schwann, when setting forth the cell doctrine in the 1830s, considered that it had a central role in growth and development. Their belief has been fully supported even though they had only vague notions as to what that role might be and how the role was to be expressed in some cellular action. The membraneless nuclear area of the prokaryotic cell, with its tangle of fine threads, is now known to play a similar role.

Some cells, like the sieve tubes of vascular plants and the red blood cells of mammals, do not possess nuclei during the greater part of their existence, although they had nuclei when in a less differentiated state. Such cells can

no longer divide and their life span is limited. Other cells are regularly multinucleate. Some, like the cells of striated muscles of the latex vessels of higher plants, become so through cell fusion. Some like the unicellular protozoan paramecium, are normally binucleate, one of the nuclei serving as a source of hereditary information for the next generation, the other governing the day-to-day metabolic activities of the cell. Still other organisms, such as some fungi, are multinucleate because cross walls, dividing the mycelium into specific cells, are absent or irregularly present. The uninucleate situation, however, is typical for the vast minority of cells and it would appear that this is the most efficient and most economical manner of partitioning living substance into manageable units. This point of view is given credence not only by the prevalence of uninucleate cells but because for each kind of cell there is a ratio maintained between the volume of the nucleus and that of the cytoplasm. If we think of the nucleus as the control centre of the cell, this would suggest that for a given kind of cell performing a given kind of work, one nucleus can take care of a specific volume of cytoplasm and keep it in functioning order. In terms of material and energy, this must mean providing the kind of information needed to keep flow of materials and energy moving at the correct rate and in the proper channels. With the multitude of enzymes in the cell, material and energy can of course be channelled in a multitude of ways; it is the function of some information molecules to make channels of use more preferred than other at any given time. How this regulatory control is exercised is not entirely clear.

The nucleus is generally a rounded body. In plant cells, however where the centre of the cell is often occupied by a large vacuole, the nucleus may be pushed against the cell wall, causing it to assume a lens shape. In some white blood cells, such as polymorphonucleated leukocytes and in cells of the spinning gland of some insects and spider, the nucleus is very much lobed. The reason for this is not clear, but it may relate to the fact that for given volume of nucleus, a lobate form provides much greater surface area for nuclear-cytoplasmic exchange, possibly affecting both the rate and the amount of metabolic reactions. The nucleus, whatever its shape, is segregated from the cytoplasm by a double membrane, the nuclear envelope, with the two membranes separated from each other by a perinuclear space of varying width. The envelope is absent only during the time of cell division and then just for a brief period. The outer membrane is often continuous with the membranes of the endoplasmic reticulum, a possible retention of an earlier relationship, since the envelope, at least in part, is formed at the end cell division by coalescing fragments of the endoplasmic reticulum. The cytoplasmic side of the nucleus is frequently coated with

ribosomes, another fact that stresses the similarity and relation of the nuclear envelope to the endoplasmic reticulum. The inner membrane seems to possess a crystalline layer where it abuts the nucleoplasm, but its function remains to be determined.

Everything that passes between the cytoplasm and the nucleus in the eukaryotic cell must transverse the nuclear envelope. This includes some fairly large molecules as well as bodies such as ribosomes, which measure about 25 mm in diameter. Some passageway is, therefore, obviously necessary since there is no indication of dissolution of the nuclear envelope in order to make such movement possible. The nuclear pores appear to be reasonable candidates for such passageways. In plant cells these are irregularly, rather sparsely distributed over the surface of the nucleus, but in the amphibian oocyte, e.g., the pores are numerous, regularly arranged and octagonal and are formed by the fusion of the outer and inner membrane.

446) Which of the following kinds of cells never have a nuclei?

- (a) Sieve tubes
- (b) Red blood cells of mammals
- (c) Prokaryotic cells
- (d) None of the above

447) According to the first paragraph, the contention of Schleiden and Schwann that the nucleus is the most important part of the cell has:

- (a) been proved to be true
- (b) has been true so far but false in the case of the prokaryotic cell
- (c) is only partially true
- (d) has been proved to be completely false

448) It may be inferred from the passage that the vast majority of cells are:

- (a) multinucleate
- (b) binucleate
- (c) uninucleate
- (d) anucleate

449) What is definitely a function of the nuclei of the normally binucleate cell ?

- (a) To arrange for the growth and nourishment of the cell
- (b) To hold hereditary information for the next generation
- (c) To make up the basic physical structure of the organism
- (d) To fight the various foreign diseases attacking to body

450) The function of the crystalline layer of the inner membrane of nucleus is :

- (a) generation of nourishment of the cell
- (b) holding together the disparate structures of the endoplasmic reticulum
- (c) helping in transversal of the nuclear envelope
- (d) cannot be determined from the passage

451) Why according to the passage, is the polymorphonucleated leukocyte probably lobed?

- (a) Because it is quite convoluted in its functions
- (b) Because it is the red blood cell which is the most important cell in the body
- (c) Because it provides greater area for metabolism reactions
- (d) Because it provides greater strength to the spider web due to greater area

452) Why, according to the passages, are fungi multinucleate?

- (a) Because they need more food to survive
- (b) Because they frequently lack walls dividing the mycelium
- (c) Because their mycelium is area wise much bigger than other cells
- (d) Cannot be determined from the passages

PASSAGE 85

The second plan to have to examine is that of giving to each person what she deserves. Many people, especially those who are comfortably off, think this is what happens at present; that the industrious and sober and thrifty are never in want and that poverty is due to idleness, improvidence, drinking, betting, dishonesty and bad character generally. They can point to the fact that a labourer whose character is bad finds it more difficult to get employment than one whose character is good; that a farmer or country gentleman who gambles and bets heavily and mortgages his land to live wastefully and extravagantly, is soon reduced to poverty and that a man of business who is lazy and does not attend to it becomes bankrupt. But this proves nothing that you cannot eat your cake and have it too; it does not prove that your share of the cake was a fair one. It shows that certain vices makes us rich. People who are hard, grasping, selfish, cruel and always ready to take advantage of their neighbours, become very rich if they are clever enough not to overreach themselves. On the other hand, people who are generous, public spirited, friendly and not always thinking of the main chance, stay poor when they are born unless they have extraordinary talents. Also as things are today, some are born poor and others are born with silver spoons in their mouths; that is to say, they are divided into rich and poor before they are old enough to have any character at all. The notion that our present system distributes wealth according to merit even roughly, may be dismissed at once as ridiculous. Everyone can see that it generally has the contrary effect; it makes a few idle people very rich and a great many hardworking people very poor.

On this, intelligent lady, your first thought may be that if wealth is not distributed according to merit, it ought to be and that we should at once set to work to alter our laws so that in future the good people shall be rich in proportion to their goodness and the bad people in proportion to their badness. There are several objections to this; but the very first one settles the question for good and all. It is, that the proposal is impossible and impractical. How are you going to measure anyone's merit in money? Choose any pair of human beings you like, male or female and see whether you can decide how much each of them should have on her or his merits. If you live in the country, take the village blacksmith and the village clergyman or the village washerwoman and the village schoolmistress, to begin with. At present, the clergyman often gets less pay than the blacksmith; it is only in some villages he gets more. But never mind what they get at present: you are trying whether you can set up a new order of things in which each will get what he deserves. You need not fix a sum of money for them : all you have to do is to settle the proportion between them. Is the blacksmith to have as much as the clergyman? Or twice much as the clergyman? or half as much as the clergyman? Or how much or less? It is no use saying that one ought to have more the other less; you must prepared to say exactly how much more or less in calculable proportion.

Well, think it out. The clergyman has a college education: but that is not any merit on his part: he owns it to his father, so you cannot allow him any thing for that. But through it he is able to read the New Testament in Greek, so that he can do something the blacksmith cannot do. On the other hand, the blacksmith can make a horse-shoe, which the person cannot. How many versers of the Greek Testament are worth one horse-shoe ? You have only to ask the silly question to see that nobody can answer it.

Since measuring their merits is no use, why not try to measure their faults? Suppose the blacksmith swears a good deal and gets drunk occasionally. Everybody in the village knows this; but the person has to keep his fault to himself. His wife knows them, but she will not tell you what they are if she knows that you intend to cut off some of his pay for them. You know that as he is only a mortal human being or twice as bad or twice and quarter as bad or only half as bad? In other words, if the blacksmith is to have a shilling, is the person to have six pence or five pence and one third or two shillings? Clearly these are fools' question; the moment they bring us down from moral generalities to business particulars it becomes plain to every sensible person that no relation can be established between human qualities, good or bad and sums of money, large or small. It may seem scandalous that a prize fighter for hitting another prize-fighter so hard at Wembley that he fell down and

could not rise within ten seconds, received the same sum that was paid to the Archbishop of Canterbury for acting as Primate of the Church of England for nine months; but none of those who cry out against the scandal can express any better in money the difference between the two. Not one of the persons who think that the prize-fighter got for his six or seven months' boxing would pay a judge's salary for two years and we all agree that nothing could be more ridiculous and that any system of distributing wealth which leads to such absurdities must be wrong. But to suppose that it could be changed by any possible calculation that an ounce of archbishop of three ounces of judge is worth a pound of prize-fighter would be sillier still. You can find out how many candles are worth a pound of butter in the market on any particular day; but when you try to estimate the worth of human souls the utmost you can say is that they are all of equal value before the throne of God. And that will not help you in the least to settle how much money they should have. You must simply give it up and admit that distributing money according to merit is beyond mortal measurement and judgement.

- 453)** Which of the following is not a vice attributed to the poor by the rich ?
 (a) Idleness (b) Drug addiction
 (c) Gambling (d) Alcoholism
- 454)** What, according to the author, do the generous and public spirited people need to become rich?
 (a) A criminal mind (b) To be born with silver spoons
 (c) Extraordinary talents (d) Strength of character
- 455)** In the passage, which kind of people are not mentioned as likely to get rich quickly?
 (a) Selfish people (b) Grasping people
 (c) Hard people (d) Ambitious people
- 456)** What, according to the author, is the main problem is distributing wealth according to the goodness or badness of human beings?
 (a) Because the bad people will as always, cheat the good of their fair share of the money
 (b) Because there are too many people in the world and it will take a long time to categorise them into good or bad
 (c) Because there are no standards by which to judge good or bad relation to money
 (d) None of the above
- 457)** Which of the following about the author's thinking may be inferred from the passage?
 (a) The poor should work hard to become rich
 (b) The present system of distribution of wealth is biased in favour of the rich

- (c) The honest men should resort to trickery if they want to become rich
 (d) The present system of government should give way to more progressive one

- 458)** This passage most probably is a part of
 (a) a newspaper article
 (b) an anthropological document
 (c) a letter to some one
 (d) an ecclesiastical liturgy

- 459)** The word 'improvidence' in the context of the passage, means:
 (a) extravagance (b) lasciviousness
 (c) corruption (d) indelicacy

- 460)** The author gives the example of the Archbishop of Canterbury and the prize-fighter to :
 (a) prove that there cannot be any division of wealth based on moral standards
 (b) prove that in this day and age might always scores over religion and love
 (c) prove the existence of a non-discriminating God
 (d) prove that a pound of butter is worth more than any amount of candles any day

PASSAGE 86

The conventional wisdom says that this is an issue-less election. There is no central personality of whom voters have to express approval of dislike; no central matter of concern that makes this a one-issue referendum like so many elections in the past; no central party around which everything else revolves-the Congress has been displaced from its customary pole position and no one else has been able to take its place. Indeed, given that all-seeing video cameras of the Election Commission and the detailed pictures, they are putting together on campaign expenditure, there isn't even much electioneering; no slogans on the walls, no loudspeakers blaring forth at all hours of the day and night, no cavalcades of cards heralding the arrival of a candidate at the local bazaar. Forget it being an issue-less election, is this an election at all ?

Perhaps the 'fun' of the election lies in its featuring someone whom you can love or hate. But Narasimha Rao has managed to reduce even a general election, involving nearly 600 million votes, to the boring non-event that is the trademark of his election rallies and indeed of everything else that he does. After all, Nehru-Gandhi clan has disappeared from the political map and the majority of voters will not even be able to name P.V. Narasimha Rao as India's Prime Minister. There could be as many as a dozen prime ministerial candidates ranging from Jyoti Basu to Ramkrishna Hegde and from Chandra Shekhar (believe it or not) to K.R. Narayanan.

The sole personality who stands out, therefore, is none of the players, but the umpire: T.N. Seshan.

As for the parties, they are like the blind men of Hindustan, trying in vain to gauge the contours of the animal they have to confront. But it doesn't look as if it will be the mandir-masjid, nor will it be Hindutva or economic nationalism. The Congress will like it to be stability; but what does that mean for the majority? Economic reform is a non-issue for most people with inflation down to barely 4 percent, prices are not top of the mind either. In a strange twist, after the Hawala scandal, corruption has been pushed off the map too.

But ponder for a moment, isn't this state of affairs astonishing, given the context? Consider that so many ministers have had to resign over the Hawala issue; that the Prime Minister himself is under investigation for his involvement in not one scandal but two; that the main prime ministerial candidate from the opposition has had to bow out because he too has been changed in the Hawala case and that the head of the 'third force' has his own little (or not so little) fodder scandal to face. Why then is corruption not an issue-not as a matter of competitive politics, but as an issue on which the contenders for power feel that they have to offer the prospect of genuine change? If all this does not make the parties (almost all of whom have broken the law, in not submitting their audited accounts every year to the income tax authorities) realise that the country both needs-and is ready for change in the Supreme Court; the assertiveness of the Election Commission, giving new life to a model code of conduct that has been ignored for a quarter century; the independence that has been thrust upon the Central Bureau of Investigation and the fresh zeal on the part of tax collector out to nab corporate no-gooders, think also that at no other point since the Emergency of 1975-77 have so many people in power been hounded by the system for their misdeeds.

Is this just a case of a few individuals outside the political system doing the job or is the country heading for a new era? The seventies saw the collapse of the national consensus that marked the Nehruvian era and ideology took over in the Indira Gandhi years. That too was buried by Rajeev Gandhi and his technocratic friends. And now, we have these issue less election. One possibility is that the country is heading for period of constitutionalism as the other arms of the state reclaim some of powers they lost or yielded, to the political establishment. Economic reform free one part of Indian society from the clutches of political class. Now this could spread to other parts of the system. Against such a dramatic backdrop, it should be obvious that people (voters) are looking for accountability, for ways in which

to make a corrupted system work again. And the astonishing thing is that no party has sought to ride this particular wave, instead all are on the defensive, desperately evading the real issue. No wonder this is an 'issue-less' election.

461) Why does the author probably say that the sole personality who stands out in the elections is T.N. Seshan ?

- (a) Because all the other candidates are very boring
- (b) Because all the other candidates do not have his charisma
- (c) Because the shadow of his structures are looming large over the elections
- (d) None of the above

462) A suitable title to the passage would be

- (a) Elections: An overview
- (b) The country's issueless Elections
- (c) T. N. Seshan-the Real Hero
- (d) Love or Hate them, but vote for Them

463) Which of the following are not under scrutiny for alleged corruption, according to the passage?

- (a) The opposition prime ministerial candidate
- (b) P.V. Narasimha Rao
- (c) The leader of the 'third force'
- (d) Ramakrishna Hegde

464) Why does the author say that almost all parties have broken the law?

- (a) Because they all indulge in corrupt electoral process
- (b) Because they all have income than recorded sources
- (c) Because they are all indicated on various charges
- (d) Because they have failed to submit accounts to tax authorities

465) According to the passage, which of the following has not been responsible for the winds of change blowing throughout the country ?

- (a) Greater awareness on the part of the general public
- (b) Enforcement of a model code of conduct by the Election Commission
- (c) Greater independence to the Central Bureau of Investigation
- (d) Fresh zeal on the part of tax collectors

466) According to the passage, which of the following is not mentioned as even having the potential to be an issue in the current elections?

- (a) The mandir-masjid issue
- (b) The empowerment of women
- (c) Economic nationalism
- (d) Hindutva

Directions (Q. Nos. 467-516) *Read the passage given below and answer the questions that follow based on the information given in the passage.* (1995)

PASSAGE 87

The Republican party has lost its mind. To Win elections, a party obviously needs votes and constituencies, However first, it needs an idea. In 1994-95, the Republican Party had after a long struggle advanced a coherent, compelling set of political ideas expressed in a specific legislative agenda. The political story of 1996 is that this same party, with in the space of six weeks, became totally, shockingly intellectually deranged.

Think back. The singular achievement of House Speaker Newt Gingrich's 1994 revolution was that it swept into power united behind one comprehensive ideological goal; dismantling the welfare state. Just about anything in the contract with America and the legislative agenda of the 104th Congress is a mere subheading; welfare reform, tax cuts entitlement reform, returning power to the states, the balanced budget (a supremely powerful means for keeping the growth of government in check).

The central Republican idea was that the individual, the family, the church, the schools-civil society-were being systematically usurped and strangled by the federal behemoth Republicans who were riding into Washington to slay it.

With this idea they met Clinton head-on in late 1995. And although they were tactically defeated-the government shut down proved a disaster for Republicans-they won philosophically. Clinton conceded all their principles. He finally embraced their seven year balanced budget. Then, in a State of the union speech that might have been delivered by a moderate Republican, he declared, the era of Big Government is over, the dominant theme of the Gingrich Revolution.

It seems so long ago. Because then, astonishingly, on the very morrow of their philosophical victory, just as the Republicans prepared to carry these ideas into battle in November, came aonnon fire from the rear. The first Republican renegade to cry 'Wrong !' and charge was Steve Forbes. With his free-lunch, tax-cutting flat tax, he declared the balanced budget, the centre piece of the Republican revolution, unnecessary. Then, no sooner had the Forbes mutiny been put down than Pat Buchanan declared a general insurrection. He too declared war on the party's central ideology in the name not supply side theory but of class welfare, the Democratic weapon of choice against Republicanism.

The enemy, according to the Buchanan, in not welfare state. It is that conservative icon, capitalism, with its ruthless captains of industry. Greedy financiers and

political elite (Republicans included, of course). All three groups collaborate to let foreigners-immigrants, traders, parasitic foreign-aid loafers-destroy the good life of the ordinary American worker.

Buchananism holds that what is killing the little guy in America is the Big Guy, not big Government. It blames not an overreaching government that tries to insulate citizens from life's buffeting to the point where it creates deeply destructive dependency, but an uncaring government that does not protect its victim-people enough from that buffeting. Buchanan would protect and wield a mighty government apparatus to do so, government that builds trade walls and immigrant-repelling fences, that imposes punitive taxes on imports, that policies that hiring and firing practices of business with the arrogance of the most zealous affirmative action enforcer.

This is Reaganism standing on its head. Republicans have focused too much on the mere technical dangers posed by this assault. Yes, it gives ammunition to the Democrats. Yes, it puts the eventual nominee through a bruising campaign and delivers him tarnished and drained into the ring against Bill Clinton.

But the real danger is philosophical, not tactical. It is axioms, not just policies, that are under fire. The Republican idea of smaller government is being proud to dust-by Republicans. In the middle of an election year, when they should be honing their themes against Democratic liberalism, Buchanan's rise is forcing a pointless rearguard battle against a philosophical corpse, the obsolete Palaeo conservatism-a mix of nativism, protectionism and isolationism of the 1930s.

As the candidates' debate in Arizona last week showed, the entire primary campaign will be fought on Buchanan's grounds, fending off his Smoot-Hawley-Franco populism. And then what? After the convention, what does the nominee do ? Try to resurrect the anti welfare state themes of the historically successful 1994 congressional campaign? Well, yes but with a terrible loss of energy and focus and support. Buchanan's constituency, by then convinced by their leader that the working man's issue have been pushed aside, may simply walk on election day or, even worse, defect to the democrats. After all,dDemocrats fight class war very well.

Political parties can survive bruising primary battles. They cannot survive ideological meltown. Dole and Buchanan say they are fighting for the heart and soul of the Republican party, heart and soul, however, will get you nowhere when you have lost your way and your mind.

467) Which broad ideology helped Newt Gingrich lead the Republican revolution of 1994?

- (a) Tax cuts
- (b) Entitlement reform
- (c) Welfare reform
- (d) Welfare state dismantling

468) Assuming the passage to be truthful, what does a party not need to win elections?

- (a) Votes
- (b) Money
- (c) Constituencies
- (d) Ideas

469) Which of the following is not a Republican?

- (a) Newt Gingrich
- (b) Pat Buchanan
- (c) Bob Dole
- (d) None of the above

470) The Republicans were tactically defeated by the Democrats because:

- (a) of the shutdown of the government
- (b) the balanced budget plan failed
- (c) Steve Forbes led a revolution
- (d) Bill Clinton pre-empted them

471) Which of the following would be a suitable title for the passage ?

- (a) The Democrats: Victory in Sight
- (b) Follies and Foibles of the Republican Party
- (c) Republicans: Are You Crazy?
- (d) Mutinies on the Republican Party

472) The word 'obsolete' in the context of the passage means:

- (a) antiquated
- (b) absolute
- (c) boring
- (d) miasmic

473) What according to the author, is the real danger for Republicans ?

- (a) The fact that small government is being ground to dust
- (b) The fact that Bill Clinton is gaining popularity
- (c) The fact that it is axioms and not just policies that are under fire
- (d) The fact that the eventual nominee would be too tired of fight an election against Clinton

474) Which of the following, according to Buchanan, is not an enemy?

- (a) Big government
- (b) Immigrants
- (c) Captains of industry
- (d) Foreign-aid requesters

PASSAGE 88

Icicles-two metres long and, at their tips, as bright and sharp as needles-hang from the caves; wild ice stalactites, dragon's teeth. I peer through them to see world transformed to abstract. Little snow tornadoes twirl across the blank. The car is out there somewhere, represented by subtle bump in the snow-field. The old jeep truck, a larger beast, its up to its door handles, like a sinking remnant: dinosaur yielding to ice age. The town's behemoth snow-plow passes on the road, dome light twirling and casts aside a frozen doe that now lies, neck broken, upon the road side snow-bank, soon to vanish under the snowfall still to come.

There is double-jointed consciousness at work in the dramatics of big weather. Down in the snowstorm, we are as mortal as the deer. I sink to my waist in a drift; I panic, my arms claw for an instant, like a drawing swimmer's in the powder. Men up and down the storm collapse with the coronaries, snow shovels in their hands, cheeks turned into a deathly colour, like frost-bitten plums.

Yet when we go upstairs to consult the Weather Channel, we settle down, as cosy gods do, to hover high above the Earth and watch the play with a divine perspective. Moist air labelled for low rides up the continent from the Gulf of Mexico and collides with the high that has slid down from the North Pole. And thus is whipped up the egg-white fluff on the studio map that, down in the frozen, messy world, buries mortals.

An odd new metaphysics of weather: It is not that weather has necessarily grown more apocalyptic. The famous 'Winter of the, Blue snow' of 1886-87 turned rivers of the American West into glaciers that when they thawed, carried along inundation of dead cattle. President Theodore Roosevelt was virtually ruined as a rancher by the weather that destroyed 65 percent of his herd. In 1811 Mississippi river flowed briefly because of the New Madrid earthquake.

What's new in America is the theatre of it. Television does not create weather; any more than it creates contemporary politics. However, the ritual ceremonies of televised weather have endowed a subject often previously banal with an amazing life as mass entertainment, nationwide interactive preoccupation and a kind of immense performance art.

What we have is weather as electronic American Shintoism, a casual but almost mystic daily religion, wherein nature is not inert but restless, stirring alive with kinetic fronts and meanings and turbulent expectations (forecasts, variable, prophecies). We have

installed an elaborate priesthood and technology of interpretation: acolytes and satellites preside over snow and circuses. At least major snowstorms have about them an innocence and moral neutrality that is more refreshing than the last national television spectacle, the O.J. Simpson trial. One attraction is the fact that these large gestures of nature are political. The weather in the mirabilis mode can, of course, be dragged onto the opened page to start a macro-argument about global warming or a microspat over a mayor's fecklessness in deploying snowplows. Otherwise, traumas of weather do not admit of political interpretation. The snow Shinto reintroduces an element of what is almost charmingly uncontrollable in life. And as shown last week, surprising, even as the priests predict it. This is welcome—a kind of ideological relief in a rather stupidly politicised society living under the delusion that everything in life (and death) is arguable, political and therefore manipulable—from diet to DNA. None of the old earthbound Marxist Who—Whom here in meteorology, but rather sky gods that bang around at higher altitudes and leave the Earth in its misery, to submit to the sloppy collateral damage.

The moral difference of weather, even when destructive, is somehow stimulating. Why? The sheer levelling force is pleasing. It overrides routine and organises people into a shared moment that will become a punctuating memory in their lives (Lord, remember the blizzard in 1996?).

Or perhaps one's reactions are no more complicated than a child's delight in dramatic disruption. Anyone loves to stand on the beach with a hurricane coming—a darkly lashing Byronism in surf and wind gets the blood up. The God's or child's. Part of the mind welcomes big weather—floods and blizzards. The coping, grown-up human part curses it and skins.

The paradox of big weather, it makes people feel important even while it, dramatises their insignificance. In some ways, extreme weather is a brief moral equivalent of war—as stimulating as war can sometimes be, through without most of the carnage.

The Sun rises upon diamond-scattered snow-fields and glistens upon the lucent dragon's teeth. In the distance three deer, roused from their shelter under pines, venture forth. They struggle and plunge undulously through the opulent white.

Upstairs, I switch on the Shinto Weather Channel and the priests at the map show me the next wave-white swirls and eddies over Indiana heading ominously East.

- 475)** How many vehicles does the author mention in the passage?
- (a) One (b) Two
(c) Three (d) Four
- 476)** The author compares the weather bulletin channel reportage to:
- (a) a war (b) the O.J. Simpson trial
(c) a ritual ceremony (d) a theatre
- 477)** Which of the following was not the result of the "Winter of the Blue Snow"?
- (a) It almost ruined Theodore Roosevelt
(b) It made the Mississippi flow northward
(c) It turned rivers into glaciers
(d) It killed a lot of cattle
- 478)** The moral indifference of the weather is stimulating in spite of being destructive because:
- (a) it shows no mercy
(b) it organises people into shared moment
(c) Both (a) and (b)
(d) Neither (a) nor (b)
- 479)** The author's reaction to the snowstorm may be said to be:
- (a) Fascinated (b) Scared
(c) Cynical (d) Deadpan
- 480)** According to the author, one of the greatest attractions of the weather is that:
- (a) it is politicized
(b) it is a political
(c) it is reckless
(d) it is beautiful
- 481)** What is most probably the physical position of the author of the passage?
- (a) In his house (b) In a snowstorm
(c) In his office (d) In a bunk
- 482)** Which of the following is not true of the weather?
- (a) It is a moral equivalent of war
(b) It is a pleasantly manipulable
(c) It is leveling force
(d) It dramatises man's insignificance
- 483)** The word 'undulously' in the context of the passage means :
- (a) unduly
(b) indomitably
(c) powerful
(d) curved

PASSAGE 89

Among those who call themselves socialists, two kinds of persons may be distinguished. There are, in the first place, those whose plan for a new order of society, in which private property and individual competition are to be superseded and other motives to action substituted, are on the scale of a village community of township and would be applied to an entire country by the multiplication of such self-acting units; of this character are the systems of Owen, of Fourier and the more thoughtful and philosophic socialists generally. The other class, which is more a product of the continent than of Great Britain and may be called the revolutionary socialists, has people who propose to themselves a much bolder stroke. Their scheme is the management of the whole productive resources of the country by one central authority, the general government. And with this view some of them avow as their purpose that the working classes or somebody on their behalf, should take possession of all the property of the country, and administer it for the general benefit.

Whatever may be the difficulties of the first of these two forms of socialism, the second must evidently involve the same difficulties and many more. The former, too, has the great advantage that it can be brought into operation progressively, and can prove its capabilities by trial. It can be tried first on a select population and extended to others as their education and cultivation permit. It need not and in the natural order of things would not, become an engine of subversion until it had shown itself capable of being also a means of reconstruction. It is not so with the other: the aim of that is to substitute the new rule for the old at a single stroke and to exchange the amount of good realised under the present system and its large possibilities for a plunge without any preparation into the most extreme form of the problem of carrying on the whole round of the operations of social life without the motive power which has always hitherto worked the social machinery. It must be acknowledged that those who would play this game on the strength of their own private opinion, unconfirmed as yet by any experimental verification—who would forcibly deprive all who have now a comfortable physical existence of their only present means of preserving it and would brave the frightful bloodshed and misery that would ensue if the attempt was resisted—must have a serene confidence in their own wisdom on the one hand the recklessness of other people's suffering on the other, which Robespierre and St. Just, hitherto the typical instances of those united attributes, scarcely came up to. Nevertheless this scheme has great elements of popularity which the more cautious and reasonable form of socialism has not; because what it professes to do, it promises to do quickly

and holds out hope to the enthusiastic of seeing the whole of their aspirations realised in their own time and at a blow.

484) Who among of the following is not a socialist?

- (a) Robespierre
- (b) Fourier
- (c) Owen
- (d) All are socialists

485) Which of the following, according to the author, is true?

- (a) The second form of socialism has more difficulties than the first
- (b) The second form of socialism has the same difficulties as the first
- (c) The second form of socialism has less difficulties than the first
- (d) The author has not compared the difficulties of the two

486) According to the author, the difference between the two kinds of socialists is that:

- (a) one consists of thinkers and the others are active people
- (b) the first have a definite philosophy and the second don't have any definite philosophy
- (c) the first believe in gradual change while the others believe in revolutionary change
- (d) the first are the products of Britain, while the other are products of Russia

487) Which of the following were characteristics of St. Just and Robespierre?

- (a) Unconcern for other's suffering
- (b) Full confidence in their own wisdom
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

488) Which of the following according to the author, may not be the result of not verifying the desirability of socialism experimentally first?

- (a) Bloodshed
- (b) Deprivation of current comfortable existence
- (c) Corruption in high places
- (d) Misery caused by resisting the change

489) According to the philosophy of revolutionary socialism:

- (a) the government takes over the villages first and then gradually the whole country
- (b) the government takes over all productive resources of the country at one stroke
- (c) the government declares a police state and rules by decree
- (d) there is no government as such; the people rule themselves by the socialist doctrine

490) The word 'avow' in the context of the passage means:

- (a) proclaim (b) vow (c) affirm (d) deny

491) It may be inferred from the passage that the author's sympathies are for

- (a) neither side
(b) the side of the socialist doctrine
(c) the second type of socialism
(d) the first type of socialism

PASSAGE 90

Whatever philosophy may be, it is in the world and must relate to it. It breaks through the shell of the world in order to move into the infinite. But it turns back in order to find in the finite its always unique historical foundation. It pushes into the furthest horizons beyond being-in-the-world in order to experience the present in the eternal. But even the profoundest meditation acquires its meaning by relating back to man's existence here and now. Philosophy glimpses the highest criteria, the starry heaven of the possible and seeks in the light of the seemingly impossible the way to man's dignity in the phenomenon of his empirical existence.

Philosophy addresses itself to individuals. It creates a free community of those who rely on each other in their will for truth into this community the philosophic man would like to enter. It is there in the world all the time, but cannot become a worldly institution without losing freedom of its truth. He cannot know whether he belongs to it. No authority decides on his acceptance. He wants to live in his thinking in such a way as to make his acceptance possible. But how does the world relate to philosophy? There are chairs of philosophy at the universities. Now-a-days they are an embarrassment. Philosophy is politely respected because of tradition, but despised in secret. The general opinion is : it has nothing of importance to say. Neither has it any practical value. It is named in public but does it really exist? Its existence is proved at least by the defence measures it provokes. We can see this in the form of comments like: Philosophy is too complicated. I don't understand it. It's beyond me. It's something for professionals. I have no gift for it. Therefore it doesn't concern me. But that is like saying I don't need to bother work or scholarship without thinking or questioning its meaning and, for the rest, have 'opinions' and be content with that. The defence becomes fanatical. A benighted vital instinct hates philosophy. It is dangerous. If I understood it I would have to change my life. I would find myself in another frame of

mind, see everything in a different light, have to judge a new. Better now think philosophically! Then come the

accusers, who want to replace the obsolete philosophy by something new and totally different. It is mistrusted as the utterly mendacious end product of a bankrupt theology. The meaninglessness of philosophical propositions is made fun of. Philosophy is denounced as the willing handmaiden of political and other powers. For many politicians, their wretched trade would be easier if philosophy did not exist at all. Masses and functionaries are easier to manipulate when they do not think but only have a regimented intelligence. People must be prevented from becoming serious. Therefore, it is better for philosophy to be boring. Let that chairs of philosophy rot. The more piffle is taught, the sooner people will be blinkered against the light of philosophy. Thus philosophy is surrounded by enemies, most of whom are not conscious of being such. Bourgeois complacency, conventionality the satisfactions of economic prosperity, the appreciation of science only for its technical achievements, the absolute will to power, the bonhomie of politicians, the fanaticism of ideologies, the literary self-assertiveness of talented writers-in all these things people parade their anti-philosophy. They do notice it because they do not realise what they are doing. They are unaware that their anti-philosophy in itself a philosophy, but a perverted one and that this anti-philosophy, if elucidated, would annihilate itself.

492) A suitable title for the passage would be

- (a) Man and Philosophy
(b) Philosophical Angst
(c) A Defence of Philosophy
(d) The Enemies of Philosophy.

493) Which of the following is true, keeping the passage in the mind?

- (a) Philosophy is evidently respected
(b) Philosophy is secretly despised
(c) Both (a) and (b)
(d) Neither (a) nor (b)

494) Which of the following is not a charge against philosophy?

- (a) That it is obsolete
(b) That it is mendacious
(c) That it is the handmaiden of political powers
(d) That it is immortal

495) Which of the following is not mentioned as a function of philosophy in the passage?

- (a) It shows the way to man's dignity in the face of his empirical existence
(b) It breaks through the shell of the world in order to move into the infinite
(c) It pushes into the furthest horizons beyond being in the world
(d) It makes the world a better place to live in.

- 496) Why, according to the passage, would the politicians be happy if philosophy did not exist?
- (a) Masses would be easier to manipulate as they would not think for themselves
 - (b) They would not have to make false allegiances to ideologies
 - (c) They would not have to face allegations of ignoring philosophy
 - (d) They would not have to be philosophical about losing an election.
- 497) The word 'chairs' in the context of the passage, means :
- (a) wooden-faced people
 - (b) departments
 - (c) separate chairs for philosophers
 - (d) reserved seats for students of philosophy
- 498) According to the author, the existence of philosophy is proved by :
- (a) the fact that there are still chairs of philosophy in universities
 - (b) the defence measures it provokes
 - (c) the polite respect it gets
 - (d) the fact that it answers the fundamental question of life

PASSAGE 91

Even if were a bit snooty about them, we should go down on our kness and thank heaven for movies like Jurassic Park and directors like Steven Spielberg who make them. They fill the cinemas, if only because the hype is virtually irresistible. And because they do so, hundreds of maniacs all over the world continue to finance films. But is this an example of world wide jackpot movie? Yes and no. Yes, because it delivers dinosaurs by the dozen, in as weird a fashion as have bee seen on the screen before. And no, because the accompanying story, courtesy Michael Crichton, has little of the real imagination that made Spielberg's ET and Close Encounters into the jackpot movies of their time. Technically, it works like a dream but, as a cinematic dream, it is unmemorable. This may be because of its cardboard human characters, dwarfed by the assemblage of their prehistoric ancestors and serviced by a screenplay that makes the abortive mating calls of this weirdly a sexual zoo seem eloquent in comparison. What kind of park is this? enquires Sam Neil. "Oh, it's right up your alley", says Richard Attenborough. More likely, though it has something to do with the development of the story which at no point engages us properly on the human level, except perhaps to hope that the kids and Neil, "Oh, it's right up your alley", says Richard Attenborough. More likely, though it

has something the velociraptors chasing them. We are looking at nothing but stunts and they get tiresome laid end to end. Crichton's book was scarcely much better but at least it had a convincing villain in John Hammond, Jurassic Park's billionaire developer, whereas Attenborough's approximation seems merely enthusiastically misguided. And Crichton's warning of what might happen if we muck about with nature becomes weaker in the film. What we actually have in Jurassic Park is a non-animated Disney Aepic with affiliations to Jaws which seems to amuse and frighten but seceeds in doing neither well enough to count. Its real interest lies in how Spielberg's obsession with childhood now manifests itself in his middle age. It looks like being on automatic pilot-gestural rather than totally convinced but determined to remain the subject of analytical study. The whole thing, of course, is perfectly adequate fun once the ludicrously simplistic explanation of DNA has been traversed in Hammond's costly futuristic, computerised den. Even I could understand it. Thereafter, the theme park's creaky inability to ideal with an ordinary old typhoon as its VIP travel around hoping the investment will work, leads to predictable disaster, proficiently worked out but never truly frightening. But then this is a film for children of all ages, except perhaps those under 12 and one shouldn't expect sophistication on other than the technological level. Jurassic Park is more of a roller-coaster ride than a piece of real cinema. It delivers, but only on a certain plane. Even the breaking of the barriers between our civilization and a monstrous past doesn't have the kick it could have had.

Possibly one is asking for a different film which in the end would not have appealed across the box-office spectrum as well as this obviously does. But still one leaves it vaguely disappointed. All that work and just a mouse that roars. It's wonderful story, but told with more efficiency than inspiration-possibly a sign of the times, along with the merchandising spree which follows it so readily.

- 499) Which of the following has not been mentioned as a Steven Spielberg movie in the passage?
- (a) Jaws
 - (b) ET
 - (c) Close Encounters
 - (d) Jurassic Park
- 500) In which way does the author find the film inferior to the original book?
- (a) The book is more interesting
 - (b) The book had a more convincing villain.
 - (c) The book is easier to understand
 - (d) The story had a good author but a bad director

- 501)** The passage is most probably:
 (a) a book review (b) a film critic's comments
 (c) a film review (d) a magazine article
- 502)** The book Jurassic Park is written by :
 (a) Crichton (b) Attenborough
 (c) Hammon (d) Neil
- 503)** Which of the following does the author say of the film ?
 (a) The film is technically inferior and does not have a good storyline
 (b) The film is technically inferior but has a good storyline
 (c) The film is technically slick but does not have a good storyline
 (d) The film is technically slick and has a good storyline
- 504)** The writer's opinion of the film Jurassic Park may be said to be :
 (a) very favourable (b) very depressing
 (c) excellent (d) not very favorable
- 505)** Why according to the author, should we thank heaven for movies like Jurassic Park, even though they may not be very good aesthetically ?
 (a) Because they fill the halls and thus people will finance more films
 (b) Because it is of the major hits of the year
 (c) Because the film has brilliant technical wizardry
 (d) Because of the hundreds of films being produced this is one of the few excellent ones
- 506)** According to the author, Jurassic Park:
 (a) is very amusing (b) is very frightening
 (c) Both (a) and (b) (d) Neither (a) and (b)
- 507)** The phrase 'muck about', in the context of the passage, means:
 (a) make dirty (b) interfere with
 (c) be frivolous about (d) to mask

PASSAGE 92

The opinion polls had been wrong. Although they were signaling a weakening in Labour's lead in the days before the general election—which pointed to a hung Parliament—many working class voters had been embarrassed to tell middle-class pollsters that they were intending to vote Labour. The final result on April 9, 1992, which gave Neil Kinnock a working majority of 30, was a turnaround of the country.

As John Major cleared his desk in Downing Street, pundit after pundit lined up to criticise his lacklustre campaign. The trouble was, they all agreed, that the Conservative Party no longer has a message or political

purpose. Its representation in the North of England was decimated; its future as a national party doubtful.

For Kinnock the victory was a sweet reward for nine years Herculean labour in making his party electable. Not only had he a working majority, but the divisions in conservative ranks—between anti-Europeans, free marketers and moderates—threatened to split the party. Having set himself the objective of heading a two or three term government, Kinnock made his cabinet appointments with the long haul in mind. There were few surprises. John Smith, with whom he coexisted uneasily; was made chancellor; Roy Hattersley became home secretary; Gerald Kaufmann went to the foreign office; inveterate Euro-sceptic Bryan Gould took over environment and Gordon Brown went to trade. It was, as many commentators, a much more heavy weight cabinet than any of the conservatives could have mustered.

But the new cabinet was to have its first trial of strength very soon. The problem was the foreign exchange markets. Although both Kinnock and Smith had, throughout, the election campaign, reaffirmed their commitment to hold the pound's parity at 2.95 DM inside the ERM, the foreign exchange markets simply did not believe them. Every previous labour government had devalued; what reason was there to suppose this one would be different?

The pressure built up immediately. On Friday, April 10, the Bank of England managed to hold the line only by spending £ 4 billion—around a sixth of its total reserves to support the exchange rate. But late that night, as the New York markets closed, the Governor of the Bank of England led the deputation to a meeting at 11, Downing Street with Smith and the permanent secretary to the Treasury; Sir Terence Burns. If, said the governor, the pound was to survive the coming week inside the ERM, then Smith would have to demonstrate his resolve by raising interest rates—by at least 2 percent. It would also help, added the officials, if the government were to commit Britain to full monetary union and to meet the Maastricht criteria for a single currency. This would mean that both the taxation from Smith's first budget would have to be used to reduce government borrowing and the manifesto promises to raise child benefit and pensions be postponed.

Smith listened to Eddie George—number two at the bank of England and the arbiter of British exchange rate policy explain that, at the current rate of reserve loss, Britain's reserves would have run out by the following weekend. The markets needed decisive action. And they needed to know, by the night of Sunday, April 12, at the very latest, what the government would do when the far-eastern markets opened after the weekend. Sir Terence advised that once the markets recognised the government was resolved to hold the exchange rate,

pressure would quickly subside and the interest rate increases could be reversed. The name of the game was earning credibility.

Although Smith had been warned to expect a Treasury/Bank of England move to assert the cannons of economic orthodoxy; he had hoped to have been more than a few hours in to his chancellorship before the pressures started to mount. As it stood, he felt like the victim of a coup and wondered to what extent the foreign exchange market selling had been prompted by the Bank of England's ham fisted intervention-almost designed to manufacture a run on the pound. In any case, he could do nothing without conferring with the Prime Minister.

In fact Kinnock had asked Smith to have the preliminary Bank of England meeting without him. Although he was not at one with his chancellor over economic policy and distrusted his judgement, he wanted to complete his cabinet appointments-and confer with his own advisers about how to react to what he knew the bank and treasury recommendations would be. He was determined to avoid being bounced into decisions before he had decided his line. The alternative was to apply to the EC for a realignment conference, in which many more currencies would be devalued. But that could hardly be done then; it would have to wait until the following weekend. And it was not clear if the pound would be devalued sufficiently; or if other countries would follow the British lead. Not only might Britain have to devalue alone, it might not secure a devaluation large enough to make a difference and be accompanied by higher interest rates.

508) The word 'pundit' in the context of the passage, means:

- (a) a religious leader
- (b) a psychologist
- (c) an expert
- (d) a paleontologist

509) What was the main problem facing the new cabinet?

- (a) The dissension in the ranks of the party
- (b) The devaluation of the currency
- (c) The foreign exchange market problem
- (d) The monetary union problem

510) Who, according to the passage, is the leader of the Labour Party ?

- (a) Neil Kinnock
- (b) John Smith
- (c) Gerald Kaufmann
- (d) Roy Hattersley

511) What, according to the treasury secretary, was the only way out of the exchange problem?

- (a) Devaluation of the currency
- (b) Rise in interest rates
- (c) Government spending
- (d) Raising taxes

512) It may be inferred from the passage that

- (a) the Bank of England would go along with whatever the government decided
- (b) the Prime Minister was a puppet in the hands of the Bank of England
- (c) the Bank of England was completely independent of the government
- (d) the Bank of England could put enormous pressure on the government to formulate policy

513) Why did Kinnock ask Smith to attend the Bank of England meeting without him?

- (a) Because he did not get along with Smith
- (b) Because he wanted to use that time to confer with others
- (c) Because he already meet them and did not want to meet them again
- (d) Because he was afraid of being censured by them

514) Why, according to the author, was the realignment conference not a viable option for the government?

- (a) Because other countries may not follow the British lead in devaluation
- (b) Because other higher interest rates to be given by Britain may deplete resources further
- (c) Both (a) and (b)
- (d) Neither (a) nor (b)

515) Which of the following do not belong to the Labour cabinet?

- (a) Mr. John Smith
- (b) Mr. Bryan Goul
- (c) Mr. Maastricht
- (d) Mr. G. Brown

516) What, according to the passage, was not a reason for the defeat of the Conservative Party?

- (a) A lacklustre campaign
- (b) Wrong policies
- (c) No special message
- (d) No political purpose

Directions (Q. Nos. 517-566) Read the passage given below and answer the question that follow based on the information given in the passage. (1994)

PASSAGE 93

The communities of ants are sometimes very large, numbering even upto 500, individuals: and it is a lesson to us that no one has every yet seen quarrel between any two ants belonging to the same community. On the other hand, it must be admitted that they are in hostility not only with most other insects, including ants of different species, but even with those of the same species if belonging to different communities. I have over and over again introduced ants from one of my nests into another nest of the same species and they were in variable attacked, seized by a leg or an antenna and dragged out.

It is evident, therefore, that the ants of each community all recognize one another, which is very remarkable. But more than this, I several times divided a nest into two halves and found that even after separation of a year and nine months they recognize one another and were perfectly friendly, while they at once attacked ants from a different nest, although of the same species.

It has been suggested that the ant of each nest have some sign or password by which they recognize one another. To test this I made some of them insensible, first I tried chloroform; but this was fatal to them and I do not consider the test satisfactory. I decided therefore to intoxicate them. This was less easy than I had expected. None of my ants would voluntarily degrade themselves by getting drunk. However, I got over the difficulty by putting them into whisky for a few moments. I took fifty specimens-25 per cent from one nest and 25 percent from another made them dead drunk, marked each with a spot of paint and put them on a table close to where other ants from one of the nests were feeding. The table was surrounded as usual with a moat of water to prevent them from straying. The ants, which were feeding, soon noticed those, which I had made drunk. They seemed quite astonished to find their comrades in such a disgraceful condition and as much at loss to know what to do with their drunkards as we were. After a while, however, they carried them all away; the strangers they took to the edge of the moat and dropped into the water, while they bore their friends home in the nest, where by degrees they slept off the effects of the spirits. Thus it is evident that they know their friends even when incapable of giving any sign or password.

517) An appropriate title for this passage might be :

- (a) Nature's Mysteries
- (b) Human Qualities in the Insect World
- (c) Drunken Ants
- (d) Communication in Ant Communities

518) Attitudes of ants towards strangers of the same species may be categorized as :

- (a) indifferent
- (b) curious
- (c) hostile
- (d) passive

519) The author's anecdotes of the inebriated ants would support all the following inductions except the statement that:

- (a) ants take unwillingly to intoxicants
- (b) ants aid comrades in distress
- (c) ants have invariable recognition of their community members.
- (d) ants recognize their comrades by a mysterious password

520) According to the passage, chloroform was less successful than alcohol for inhibiting communication because of:

- (a) its expense
- (b) its unpredictable side effects
- (c) its unavailability
- (d) its fatality

521) Although the author is a scientist, his style of writing also exhibits a quality of

- (a) sophistry
- (b) whimsicality
- (c) hypocrisy
- (d) tragedy

PASSAGE 94

Compared with other experimental sciences, astronomy has certain limitations. First, apart from meteorites, the moon and the nearer planets, the objects of study are inaccessible and cannot be manipulated, although nature sometimes provides special conditions, such as eclipses and other temporary effects. The astronomer must content himself with studying radiation emitted or reflected from celestial bodies.

Second, from the Earth's surface these are viewed through a thick atmosphere that completely absorbs most radiation except within certain 'windows', wavelength regions in which the radiation can pass through the atmosphere relatively freely in the optical, near-infrared and radio bands of the electromagnetic spectrum and even in these windows the atmosphere has considerable effects. For light, these atmospheric effects are as follows: (a) some absorption that dims the radiation somewhat, even in a clear sky; (b) refraction, which causes slight shift in the direction so that the object appears in a slightly different place; (c) scintillation (twinkling); i.e. fluctuations in brightness of effectively point-like sources such as stars, fluctuations that are, however, averaged out for objects with larger images, such as planets (the ionosphere, an ionized layer high in the atmosphere, and interplanetary medium have similar effects on radio sources); (d) image movement because of atmospheric turbulence ('bad seeing') spreads the image of a tiny point over an angle of nearly one arc second or more on the celestial sphere (one arc second equals $\frac{1}{3}$, 600 degrees) and (5) background light from the night sky. The obscuring effects of the atmosphere and its clouds are reduced by placing observing stations on mountains, preferably in desert regions (e.g. Southern California and Chile) and away from city lights. The effects are eliminated by observing from high-altitude aircraft, balloons, rockets, space probes and artificial satellites. From stations all or most of the atmosphere, gamma rays and X-rays that is, high-energy radiation at extremely short wavelengths and far-ultraviolet rays and far-infrared radiation, all completely absorbed by the atmosphere at ground level

observatories can be measured. At radio wavelengths between about one centimetre and 20 metres, the atmosphere (even when cloudy) has little effect and man-made radio signals are the chief interference. Third, the Earth is a spinning, shifting and wobbling platform. Spin on its axis causes alternation of day and night and an apparent rotation of the celestial sphere with stars moving from east to west. Ground-based telescopes use a mounting that makes it possible to neutralize the rotation of earth relative to the stars; with an equatorial mounting driven at a proper speed, the direction of the telescope tube can be kept constant for hours while the earth turns under the mounting. Large radio telescopes usually have vertical and horizontal axes (altazimuth mounting), with their pointing continuously controlled by a computer.

In addition to the daily spin, there are much more gradual effects, called precession and nutation. Gravitational action of the Sun and Moon on the Earth's equatorial bulge causes the earth's axis to process like a top or gyroscope, gradually tracing out a circle on the celestial sphere in about 26,000 years and also to nutate or wobble slightly in a period of 18.6 years. This Earth's rotation and orbital motion provide the basic standard directions of stars, so that uncertainties in the rate of these motions can lead to quite small but important uncertainties in measurements of stellar movements.

- 522)** One of the type of radiations that cannot pass through the atmospheric 'windows' without distortion:
- (a) near infrared spectrum
 - (b) far-ultraviolet spectrum
 - (c) optical band in the spectrum
 - (d) radio band in the spectrum
- 523)** One of the atmospheric effects of Earth-based experiments that is not mentioned in the passage is
- (a) twinkling
 - (b) refraction
 - (c) image movement
 - (d) clouds from volcano eruptions
- 524)** The purpose of telescope mounting is to neutralize:
- (a) atmospheric interference
 - (b) the effect of precession
 - (c) the effect of nutation
 - (d) the effect of diurnal spinning
- 525)** The precession period of Earth is
- (a) 24 hours
 - (b) 365.25 days
 - (c) 18.6 years
 - (d) 26,000 years

- 526)** Gravitational action of the Sun and the Moon on Earth causes

- I. diurnal spinning
- II. precession
- III. nutation.
- (a) I
- (b) I and II
- (c) II and III
- (d) I, II and III

- 527)** The orbital motion of the Earth:

- (a) is partly caused by the moon
- (b) can have uncertain rates
- (c) has a periodicity of 18.6 years
- (d) is neutralized by telescope mounting

- 528)** The man-made radio signals have wavelengths of

- (a) more than 20 metres
- (b) less than one centimetre
- (c) between one centimetre and 20 metres
- (d) gamma rays

PASSAGE 95

If American policy towards Europe in the postwar years had been a conspicuous success and towards Asia a disappointing balance between success and failure, it could be said that the most conspicuous thing about relations with Latin America was the absence of any policy. Franklin Roosevelt, to be sure, had launched a 'Good Neighbour' policy, but being a good neighbour was, it seemed, a negative rather than a positive affair, a matter of keeping hands off, of making the Monroe Doctrine, in form at least, multilateral. All through the postwar years, the states of Latin America—Mexico and Chile were partial exceptions—were in the throes of major economic and social crises. Population was growing faster than in any other part of the globe, without a comparable increase in wealth or productivity; the gap between the poor and the rich was widening and as the rich and powerful turned to the military for the preservation of order and privilege, the poor turned to revolution. Deeply involved in other quarters of the globe, the United States paid little attention to the fortunes or misfortunes of her neighbours to the South, and when she did intervene, it appeared to be on the side of order and the status quo rather than on the side of reform. So frightened was the United States of 'Communism' in Latin America that it preferred military dictatorship to reformers who might drift too far to the 'left', and sustained a Batista in Cuba, a Trujillo in the Dominican Republic, a Peron in Argentina, and a Jimenez in Venezuela.

In his last two years, President Eisenhower had tried to mend his Latin American fences. Though rejecting a Brazilian proposal of a Marshall Plan for Latin America, he did take the initiative in setting up an Inter-American Development Bank with a capital of one billion dollars,

almost half of it supplied by the United States. Other government investments in Latin America ran to some four million dollars, while private investments exceeded nine billion. Yet though to most Americans, all this seemed a form of economic aid, many Latin Americans regarded it as economic imperialism. In September 1960, came a co-operative plan that could not be regarded as other than enlightened : the Act of Bogota, which authorized a grant of half a billion dollars to subsidize not only economic but social and educational progress in Latin America. "We are not saints", said President Eisenhower when he visited Santiago de Chile, "We know we make mistakes, but our heart is in the right place."

But was it? President Kennedy was confronted by the same dilemma that had perplexed his predecessors. Clearly, it was essential to provide a large-scale aid to the countries South of Rio Grande, but should this aid go to bolster up established regimes and thus help maintain status quo or should it be used to speed up social reforms, even at the risk of revolt? As early as 1958, the then Senator Kennedy had asserted that "the objective of our aid programme in Latin America should not be to purchase allies, but to consolidate a free and democratic Western Hemisphere, alleviating those conditions which might foster opportunities for communistic infiltration and uniting our peoples on the basis of constantly increasing living standards."

This conviction that raising the standards of living was the best method of checking communism now inspired President Kennedy's bold proposal for the creation of the Alliance for Progress—a 10 year plan designed to do for Latin America what Marshall Plan had done for Western Europe. It was to be "a peaceful revolution on a hemispheric scale, a vast co-operative effort, unparalleled in magnitude and nobility of purpose, to satisfy the basic needs of the American people for homes, work, land, health and schools. "To achieve this, the United States pleaded an initial grant of one billion dollars, with the promise of additional billions for the future.

529) Following Second World War which problem was the United States most concerned with regarding Latin America?

- (a) Economic stability (b) Political ideology
- (c) Religious persecution (d) Military dictatorship

530) A key reason why Latin American rejected the Inter-American Development Banks was that

- (a) it primarily provided money for social reform subsidies
- (b) the moneys provided only for specific performance projects
- (c) it constituted an extension of the Marshall Plan into Latin America
- (d) it was being used as a means to control the economic destiny of Latin America

531) Which of the following is most closely associated with the concept of a Marshall Plan for Latin America?

- (a) The Good Neighbour Policy
- (b) The Alliance for Progress
- (c) The Act of Bogota
- (d) The Monroe Doctrine

532) According to the passage, the fundamental change in US foreign policy directed towards Latin America:

- (a) resulted in deterioration of US Latin American relations
- (b) was responsible for Person remaining as a dictator in Peru
- (c) recognized that economic aid alone would prevent social revolutions
- (d) provided for increased military and economic aid prevent the spread of communism in Latin America

533) Which of the following statements is not true?

- (a) Mexico and Chile did not experience the general social crises that are common to the majority of Latin American countries
- (b) President Eisenhower continued in practice the theory that economic aid was the best defence against communist incursion into Latin America
- (c) The Good Neighbour Policy favoured a multilateral interpretation of the Monroe Doctrine
- (d) The traditional US approach in Latin America was to protect the status quo

534) Which of the inferences can be drawn if everything said in the passage were assumed to be true ?

- (a) Rebellions are fueled by social reforms and avoided by supporting established authorities or continuing the present state of affairs
- (b) The American policy towards Asia can be called an overall success, though small in magnitude
- (c) Kennedy, in 1958, wanted America to aid South American countries to acquire more support in their fight against communism
- (d) Eisenhower rejected the Marshall Plan whereas Kennedy implemented a similar one

PASSAGE 96

In order to better understand conservatism in China, it is essential that one has a grasp of what the term 'Chinese conservatism' means. Chinese conservatism is markedly different from the conservatism of the modern West. The political term conservative came about during the French Revolution and inspired men who were determined to preserve Christian and aristocratic elements in European society. Chinese conservatism began around

the time of the Taiping Rebellion and had as its primary objectives the preservation of both Confucian society and non-feudal strains of pre-Opium War Chinese society. While Western conservatism believes in sacredness of private property and distrust of cosmopolitanism, the Chinese conservatism is the defence of a rational cosmopolitan order. Thus, the only common area of agreement between European and Chinese conservatism is the intent to conserve.

During the Tung-Chin Restoration, the great aim was the revival of Confucian values and institutions. But these aims had to be modified so that they might endure. Restoration statesmen has no desire to create a new society-they wanted to restore a society that they believed had been based on truth. The statesmen of the Restoration stretched the traditional ideology to its limits in an effort to make the Confucian system under new conditions. They were true conservatives in a great tradition, living in an age when revolutionary change was unavoidable. The aim of the Restoration was to restore to their original vitality the best of the ancient institutions. During the Restoration, the two immediate problems were the suppression of rebellion and the stabilization of foreign relations. In addition, the people were striving for a restoration of the system of government by superior civil officials.

The men in the hierarchy of the Restoration rose to prominence through proven ability in both civil and military affairs. They emphasized human and social training-that is indoctrination, morality and the art of leadership through the cultivation of character. The great majority of the officials rose through the examination system.

During the chaos of this period, the examination system had lost much of its effectiveness. This is important and must be noted because the examination system was the traditional avenue for selecting officials. The senior official of Restoration realized that their policies would be ineffective unless the quality of the junior official was improved, so it was their duty to weed out the officials who had attained office in irregular ways and to promote the examination system as the only way to high position. But these men of the Restoration had enough foresight to determine that it was impossible to select officials automatically on the basis of objectives tests alone. As a result, the system of recommendation was ushered in, whereby; a high official sponsored the career of a promising young man. This acted as an important supplement to the examination system.

535) The traditional method for selecting officials was

- (a) by the civil government
- (b) the examination system
- (c) through a subjective testing system
- (d) sponsorship by a high government official

536) A primary objective in the development of Restoration thought was :

- (a) to modify traditional Chinese society to reflect new conditions
- (b) to create a new society based on truth
- (c) the knowledge that Chinese conservatism is superior to Western conservatism
- (d) the desire to familiarized China with military technology

537) The major similarity between Chinese and Western conservatism is :

- (a) that Chinese conservatism attempted to preserve traditions
- (b) that Chinese conservatism developed during the Taiping Revolution
- (c) the cosmopolitan nature of Western conservatism
- (d) that Chinese conservatism is primarily oriented

538) The most significant Chinese philosopher mentioned in the passage is :

- (a) Tung-chin
- (b) I. Ching
- (c) Buddha
- (d) None of them

539) During the Restoration, ancient institutions

- (a) were no longer accepted as a viable alternative to Western technology
- (b) were studied only as classical examples of a former glorious past
- (c) were to be the cornerstones of a changing but traditional society
- (d) were considered as a primary reason for the decline of traditional China

540) The Western conservatives intended to preserve all of the following except:

- (a) Christianity
- (b) private property
- (c) cosmopolitanism
- (d) aristocratic elements

541) Choose the most appropriate title for the passage

- (a) The Chinese Examination System
- (c) How the Officials Rose
- (b) Chinese Conservatism
- (d) Impact of the Taiping Rebellion

PASSAGE 97

Every state has a Constitution, since every state functions on the basis of certain rules and principles. It has often been asserted that the United States has a written constitution, but that the Constitution of Great Britain is unwritten. This is true only in the sense that, in the United States, there is a formal document called the Constitution, whereas there is no such document in Great Britain. In fact, however, many parts of the British Constitution exist in written form, whereas important

aspects of the American Constitution are wholly unwritten. The British Constitution includes the Bill of Rights (1689), the Act of Settlement (1700-01), the Parliament Act of 1911, the successive Representation of the People Acts (which extended the suffrage), the statutes dealing with the structure of the courts, the various local government Acts and many others. These are not ordinary statutes, even though they are adopted in 'the ordinary legislative way and they are not codified within the structure of single orderly document. On the other hand, such institutions in the United States as the presidential cabinet and the system of political parties, though not even mentioned in the written Constitution, are most certainly of constitutional significance. The presence or absence of a formal written document makes a difference, of course, but only one of degree. A single-document Constitution has such advantages as greater precision, simplicity and consistency. In a newly developing State as Israel, on the other hand, the balance of advantage has been found to lie with an uncoded Constitution evolving through the growth of custom and the medium of statutes. Experience suggests that some codified constitutions are much too detailed. An overlong Constitution invites disputes and litigation is rarely read or understood by the ordinary citizen and injects too much rigidity in case in which flexibility is often preferable. Since a very long Constitution says too many things on too many subjects, it must be amended often and this makes it still longer. The United States Constitution of 7,000 words is a model of brevity, whereas many of that country's state constitutions are much too long-the longest being that of the state of Louisiana, whose Constitution now has about 2,55,000 words. The very new, modern Constitutions of the recently admitted states of Alaska and Hawaii and the Commonwealth of Puerto Rico have, significantly, very concise constitutions ranging from 9,000 to 15,000 words. The 1949 Constitution of India, with 395 Articles, is the wordiest of all national constitutions. In contrast, some of the world's new constitutions, such as those of Japan and Indonesia, are very short indeed.

Some Constitutions are buttressed by powerful institutions such as an independent judiciary, whereas other, though committed to lofty principles, are not supported by governmental institutions endowed with the authority to defend these principles in concert situation. Accordingly, many juristic writers distinguish between 'normative' and 'nominal' Constitutions. A normative Constitution is the one that not only has the status to supreme law but is also fully activated and effective; it habitually obeyed in the actual life of the State. A nominal Constitution may express high aspirations, but it does not, in fact, reflect the political realities of the state. Article 125 of the 1936 Constitution

of the Soviet Union and the Article 87 of the 1954 Constitution of the People's Republic of China both purport to guarantee freedom of speech, but in those Countries even mild expressions of dissent are likely to be swiftly and sternly repressed. Where the written constitution is only nominal, behind the verbal facade will be found the real Constitution containing the basic principles according to which power is exercised in actual fact. Thus in the Soviet Union, the rules of the Communist Party describing its organs and functioning are more truly the Constitution of that country than are the grand phrases of the 1936 Stalin Constitution. Every state, in short has a Constitution, but in some real Constitution operates behind the facade of a nominal Constitution.

542) The lengthiest Constitution in the world is that of:

- (a) Great-Britain
- (b) India
- (c) Puerto Rico
- (d) Soviet Union

543) The instance of a country without a written constitution mentioned in the passage is:

- (a) People's Republic China
- (b) Japan
- (c) Israel
- (d) Indonesia

544) The unwritten parts of the US Constitution deal with

- (a) courts
- (b) presidential cabinet
- (c) relationship between the Centre and the State
- (d) fundamental right

545) In the United States:

- (a) the newly admitted states have lengthy Constitutions
- (b) the newly admitted states have concise Constitutions
- (c) the political parties have no constitutional significance
- (d) the constitution can be termed 'nominal'

546) In countries with 'normative Constitutions'

- (a) there will be very little freedom of speech
- (b) there are effective instruments to enforce their provisions
- (c) political realities are different from what are enshrined in them
- (d) there are frequent amendments to them

547) By 'nominal' Constitution, the author means

- (a) a written Constitution
- (b) one that Contains lofty ideals
- (c) a lengthy constitution
- (d) a Constitution that is not being enforced

- 548)** One of the drawbacks of a long Constitution is that
- (a) its publication is expensive
 - (b) it is difficult to understand
 - (c) it may require to be amended frequently
 - (d) it is difficult to enforce
- 549)** According to the author, the difference between a written and an unwritten Constitution
- (a) has no significance
 - (b) is just one of degree
 - (c) has been exaggerated by politicians
 - (d) cannot be defined

Passage 98

An urgent problem is now threatening libraries throughout the world. Their collections which are crucial for diverse purposes as economic development, educational research and recreational pursuits are in danger of disintegrating.

The problem is mainly due to one cause-the type of paper on which books have been printed for the past one and a half centuries. Until the 1850s, paper was produced from linen or cotton rags and proved to be relatively long-lasting. In the mid-19th century, however, the popular demand for paper and the commercial need for an economic method of production led to the use of mechanically ground wood pulp. Paper manufactured for wood pulp is highly acidic and therefore inherently unstable. It contains lignin-a major factor in causing paper to discolour and disintegrate. The useful lifespan of most 20th century book papers has been estimated to be no more than a few decades.

Libraries comprise an important part of the market for printed books and they are increasingly aware of the fragility of this material. The extent of the deterioration of library collections is alarming. Surveys conducted at various major institutions reveal that 26 percent to 40 percent of the books they hold are seriously embrittled and thus unavailable for normal use. Programmes are now being developed with two main aims in mind-on the one hand, to improve the physical condition of library collections, especially by the process called 'mass de-acidification' (which is designed to eliminate acid from the paper of published books and insert a buffer compound that will provide protection against future acid attack from the environment) and on the other, to transfer the contents of existing books to another medium (such as microfilm or optical disk).

Libraries will only be able to carry out these special tasks with the assistance of other experts such as book conservators and high-technology specialists. But here is another group with whom I have traditionally enjoyed strong affinities and whose co-operation will be crucial if

the problem of decaying collections is to be arrested-namely; the printing and publishing industries. The existing problem-that of book collections already assembled in libraries-is of vast proportions, but it is intensified by the continuing use of acid-based paper in book publishing. The key issue is how to preserve the books of the future not simply those of the past.

If the future dimensions of the conservation problem are to be curbed, there will need to be widespread adoption of paper which is of archival quality.

This change does not relate to a narrowly perceived need because the long-term preservation of library collections is important-both for the overall social benefits they bring as well as for the special advantages they bestow on the printing and publishing industries.

In the first place, libraries are of critical importance to the well-being of citizens since they provide the knowledge base of society. They contain the record of humanity-the accumulation of ideas and insights and discoveries on which social effort and progress are possible. The destruction of libraries would represent an immense cultural loss, a form of amnesia which would affect every member of society.

In the second place, printers and publishers have an economic interest in turning to paper of archival quality. So long as the libraries are acquiring books with a short lifespan they will be forced to devote an increasing share of their budgets to conservation. These budgets are severely strained by the combined impact of inflation and currency devaluation and there is scarcely any prospect of enlarged government funding. As a result, libraries will be compelled to balance the preservation of their collections against the expansion of those collations. In short, the choice will be between conservation and acquisition-and the funds for conservation are likely to come from acquisition budgets. This unpalatable choice will damage both libraries and the printing and publishing industries and can only be minimized in its effects by a bold decision to convert to use of permanent paper.

550) The tone of the passage is one of:

- (a) informed concern
- (b) destructive criticism
- (c) derisive ridicule
- (d) helpless alarm

551) The phrase 'archival quality' implies a/an :

- (a) smooth paper
- (b) thick paper
- (c) long-lasting paper
- (d) alkaline paper

552) Wood-pulp as raw material for paper was developed because of

- (a) the need to produce large quantities of paper
- (b) the shortage of linen
- (c) the need to develop non-acidic paper
- (d) scientific research

- 553)** If paper has to last long
- (a) it should be made of cotton rags
 - (b) it should be non-acidic
 - (c) it should be alkaline
 - (d) preservatives must be used
- 554)** One of the reasons not mentioned in the passage in favour of producing long-lasting paper is
- (a) it will help preserve the knowledge-base of society
 - (b) it will enable more books to be brought by libraries
 - (c) it will lead to more governmental allocation to libraries
 - (d) it will help the publishing industry
- 555)** Purchase of new books by libraries are bound to be curtailed because of all the following reasons except
- (a) drastic reduction in governmental funding
 - (b) the need for spending more money for conservation of old books
 - (c) the need to microfilm books
 - (d) inflationary trends
- 556)** Continued use of wood-pulp paper in book will affect:
- I. libraries
 - II. general public
 - III. the publishing industry
 - IV. the governments
- (a) I and III
 - (b) II and III
 - (c) I, II, III and IV
 - (d) I, II and III
- 557)** The substance which causes paper to discolour is :
- (a) acid
 - (b) linen
 - (c) lignin
 - (d) preservatives

PASSAGE 99

The Japanese want their emperor to reign for long, very long, but their Prime Ministers to have very short tenures. During the 61 years Hirohito has been on the Chrysanthemum throne, 38 Prime Ministers have come and gone (or atleast 32, if returns to power are left out of account). Eisaku Sato's eight uninterrupted years as Prime Minister in the sixties and early seventies provoked fears about the possible ill-effects of one-man leadership on Japanese democracy and led the dominant Liberal Democratic Party (LDP) to lay down the norm of a two-year for a party chief and head of government. Mr. Yasuhiro Nakasone, now bowing out, has served for an unusual five years. His success as Prime Minister was evidenced by the ruling party re-electing him leader more than once. But his plan to push through the Diet a Bill to levy a 5 percent indirect tax as part of financial

reforms failed, inspite of the LDP majority in both the chambers. It was time then for him to go.

The quick turnover of prime minister has contributed to the functioning of the LDP through factions. In the party that has ruled Japan for 32 years continuously, factionalism is not something unseemly. The leader is chosen by hard bargaining—some foreigners call it horse-trading—among the faction leaders, followed, if necessary, by a part election.

For the decision in favour of Noboru Takeshita as the next President of the LDP and Prime Minister of Japan, voting was not necessary. His hopes were stronger than those of the other two candidates—Finance Minister Kiichi Miyazawa and former Foreign Minister, Shintaro Abe—if only because he had proved himself more skillful in the game of factional politics. A one-time protege of Mr. Kakuei Tanaka, he thrust himself forward when the leader was disgraced on a charge of accepting bribes for sale of Lockheed aircraft to Japan and debilitated by physical ailments. Mr. Takeshita took away most of Mr. Tanaka's following and now leads the biggest faction in the LDP. Mr. Nakasone persuaded Mr. Miyazawa and Mr. Abe to accept Mr. Takeshita's leadership. An election would most probably have led to the same result. Mr. Takeshita seemed to have forged a firm alliance with at least two other factions and put in his bag the votes necessary for a win.

How Mr. Takeshita will fare after taking over the reins of government in 1987 is not so certain. He will be Japan's first Prime Minister with a humble rural origin. A dichotomy in his nature shows through his record of teaching English in a Junior High School and not trying to speak that language in public later. When he was the minister of finance, he gave the impression of an extremely cautious man with a reverence for consensus put challengingly titled a book on his ideas 'Going My Way'. Mr. Takeshita says that continuing Mr. Nakasone's programmes would be the basis of his policy. This is not saying enough. Japan faces two main issues, tax reforms and relations with United States. Mr. Nakasone's plan to impose an indirect tax ran into effective opposition and the friction with the US over trade continues. Mr. Takeshita cannot be facing an easy future as Japan's next leader and there is nothing to show yet that he will be drawing on secret reserves of dynamism.

- 558)** The political who had been Prime Minister of longest period since the Second World War was
- (a) Hirohito
 - (b) Kakuei Tanaka
 - (c) Nakasone
 - (d) Eisaku Sato
- 559)** When did Hirohito ascend the throne?
- (a) 1946
 - (b) 1926
 - (c) In the early fifties
 - (d) 1939

560) Mr. Tanaka ceased to be Prime Minister because

- (a) he could not get a favourable legislative bill passed by Parliament
- (b) he had completed the prescribed two years term
- (c) he was involved in a bribe scandal
- (d) of horse-trading among his party members

561) The politician who had just recently ceased to be Prime Minister is :

- (a) Eisaku Sato
- (b) Yasuhiro Nakasone
- (c) Shintaro Abe
- (d) Kiichi Miyazawa

562) Mr. Takeshita's success in the prime ministerial quest is due to :

- (a) his financial wizardry
- (b) his loyalty to his predecessor's policies
- (c) his skill in manipulating factional politics
- (d) his good knowledge of English

563) The author's assessment of the potential of Mr. Takeshita to be a successful Prime Minister can be summarized as one of

- (a) cautious optimism
- (b) enthusiastic adulation
- (c) objective skepticism
- (d) undisguised decision

564) Factionalism in the Liberal Democratic Party is mainly due to

- (a) the clash between urban and rural interests
- (b) the long reign of the Emperor
- (c) fears about one-man leadership
- (d) frequent changes in Prime Ministers

565) Most of the erstwhile Prime Ministers of Japan :

- (a) were English educated
- (b) were from rural areas
- (c) had urban backgrounds
- (d) have been former finance ministers

566) The number of erstwhile Prime Minister mentioned by name in the passage is

- (a) two
- (b) three
- (c) four
- (d) five

Directions (Q. Nos. 567-616) Read the passage given below and answer the questions that follow based on the information given in the passage. (1993)

PASSAGE 100

Mile Durkheim, the first person to be formally recognised as a sociologist and the most scientific of the pioneers, conducted a study that stands as a research model for

sociologists today. His investigation of suicide was, in fact, the first sociological study to use statistics. In *Suicide* (1964 originally published in 1897) Durkheim documented his contention that some aspects of human behaviour even something as allegedly individualistic as suicide can be explained without reference to individuals.

Like all of Durkheim's work, suicide must be viewed the context of his concern for social integration. Durkheim wanted to see if suicide rates within a social entity (for example, a group organisation or society) are related to the degree to which individuals are socially involved (integrated and regulated.) Durkheim described three types of suicide: egoistic, altruistic and anomie. Egoistic suicide is promoted when individuals do not have sufficient social ties. Since single (never married) adults, for example, are not heavily involved with family life, they are more likely to commit suicide than the married adults. Altruistic suicide, on the other hand, is more likely to occur when social integration is too strong. The ritual suicide of Hindu widows on their husbands' funeral pyres is one example. Military personnel, trained to lay down their lives for their country, provide another illustration.

Durkheim's third type of suicide-anomic suicide-increases when the social regulation of individuals is disrupted. For example, suicide rates increase during economic depression. People who suddenly find themselves without a job or without hope of finding one are more prone to kill themselves. Suicides may also increase during periods of prosperity. People may loosen their social ties by taking new jobs, moving to new communities or finding new mates.

Using data from the government population reports of several countries (much of it from the French Government Statistical Office), Durkheim found strong support for his line of reasoning. Suicide rates were higher among single than married people, among military personnel than civilians, among divorced than married people and among people involved in nation wide economic crises.

It is important to realise that Durkheim's primary interest was not in the empirical (observable) indicators he used, such as suicide rates among military personnel, married people and so forth. Rather, Durkheim used the following indicators to support several of his contentions. (a) Social behaviour can be explained by social rather than psychological factors. (b) Suicide is affected by the degree of integration and regulation within social entities and (c) Since society can be studied scientifically, sociology is worthy of recognition in the academic world. Durkheim was successful on all three counts.

- 567)** In his study of suicide Durkheim's main purpose was (1993)
- (a) to document that suicide can be explained without reference to the individual
 - (b) to provide an explanation of the variation in the rate of suicide across societies
 - (c) to categorise various types of suicide
 - (d) to document that social behaviour can be explained by social rather than psychological factors
- 568)** According to Durkheim, suicide rates within a social entity can be explained in terms of: (1993)
- (a) absence of social ties
 - (b) disruption of social regulation
 - (c) nature of social integration
 - (d) All of the above
- 569)** Since single adults are not heavily involved with family life, they are more likely to commit suicide which Durkheim categorised as :
- (a) anomic suicide
 - (b) altruistic suicide
 - (c) egoistic suicide
 - (d) Both (b) and (c)
- 570)** Higher suicide rate during rapid progress in a society is a manifestation of :
- (a) altruistic suicide
 - (b) anomic suicide
 - (c) egoistic suicide
 - (d) None of these
- 571)** Ritual suicide of Hindu widows on their husbands' funeral pyres was:
- (a) a manifestation of strong social integration
 - (b) an example of brutality against women
 - (c) an example of anomic suicide
 - (d) None of the above
- 572)** Increase in the suicide rate during economic depression is an example of :
- (a) altruistic suicide
 - (b) anomic suicide
 - (c) egoistic suicide
 - (d) Both (a) and (c)
- 573)** According to Durkheim, altruistic suicide is more likely among :
- (a) military personnel than among civilians
 - (b) single people than among married people
 - (c) divorcees than among married people
 - (d) people involve in nation-wide economic crisis
- 574)** To support his contentions, Durkheim relied on the following indicators :
- (a) Social behaviour is explicable predominantly through social factors
 - (b) Suicide is contingent upon the degree of regulation and interaction
 - (c) Recognising sociology is to acknowledge
 - (d) All of the above

- 575)** Basing himself on his own indicators, Durkheim was
- (a) right on some counts not others
 - (b) vindicated on all counts
 - (c) wrong but did not realise that he was right
 - (d) substantially correct but formally wrong

PASSAGE 101

How quickly things change in the technology business ! A decade ago, IBM was the awesome and undisputed king of the computer trade, universally feared and respected. A decade ago, two little companies called Intel and Microsoft were mere blips on the radar screen of the industry, upstart start-ups that had signed on to make the chips and software for IBM's new line of personal computers. Though their products soon became industry standards, the two companies remained protected children of the market leader.

What has happened since is a startling reversal of fortune. IBM is being ravaged by the worst crisis in the company's 79-year history. It is undergoing its fifth restructuring in the past seven years as well as seemingly endless rounds of job cuts and firings that have eliminated 100,000 jobs since 1985. Last week IBM announced to its shell shocked investors that it lost \$4.97 billion last year-the biggest loss in American corporate history.

And just when IBM is losing ground in one market after another, Intel and Microsoft have emerged as the computer industry's most fearsome pair of competitors. The numbers on Wall Street tell a stunning story. Ten years ago, the market value of the stock of Intel and Microsoft combined amounted to about a tenth of IBM's. Last week, with IBM's stock at an all-year low, Microsoft's value surpassed its old mentor's for the first time ever (\$26.76 billion to \$26.48 billion) and Intel (\$24.3 billion) is not far behind. While IBM is posting losses, Intel's profits jumped 30% and Microsoft's rose 44%.

Both Intel, the world's largest supplier of computer chips and Microsoft, the world's largest supplier of computer software, have assumed the role long played by Big Blue as the industry's pacesetter. What is taking place is a generational shift unprecedented in the information age-one recalls a transition in the US auto industry 70 years ago, when Alfred Sloan's upstart General Motors surpassed Ford Motor as America's no. 1 car maker. The transition also reflects the decline of computer manufacturers like IBM. Wang and Unisys and the rise of companies like Microsoft, Intel and AT & T that create the chips and software to make the computers work. "just like Dr. Frankenstein, IBM is in danger of being trampled by the creations it unleashed."

Although Intel and Microsoft still have close relationship with Big Blue, there is little love lost between IBM and

its potent progeny. IBM had an ugly falling-out with former partner Microsoft over the future of personal-computer software. Microsoft developed the now famous disk operating system for IBM-PC-called DOS and later created the operation software for the next generation of IBM personal computers, the Personal System/2. When PS/2 and its operating system OS/2, failed to catch on, a feud erupted over how the two companies would upgrade the system. Although they publicly patched things up, the partnership was tattered. IBM developed its own version of OS/2, which has so far failed to capture the industry's imagination. Microsoft's competing version dubbed New Technology or NT, several programmes at once. Windows NT, however, will offer more new features, such as the ability to link many computers together in a network and to safeguard them against unauthorised use.

IBM and Intel have also parting company. After relying almost exclusively on the Santa Clara, California company for the silicon chips that serve as computer brains, IBM has moved to reduce its dependence on Intel by turning to competing vendors. In Europe, IBM last year began selling a low-cost line of PC's called Ambra, which runs on chips made by Intel rival Advanced Micro Devices. IBM also demonstrated a sample PC using a chip made by another Intel enemy, Cyrix. And last October IBM said it would begin selling the company's own chips to outsiders in direct competition with Intel. IBM clearly feels threatened. And the wounded giant still poses the biggest threat to any further dominance by Intel and Microsoft. Last year it teamed up with both companies most bitter rivals—Apple Computers and Motorola—to develop advanced software and microprocessors for a new generation of Desktop computers. In selecting Apple and Motorola, IBM bypassed 'its long-time partners. Just as Microsoft's standards operating system runs only on computers built around Intel's computer chips, Apple's software runs only on Motorola's chips. Although IBM has pledged that the new system will eventually run out a variety of machines, it will initially run only computer programs written for Apple's Machintosh or IBM's OS/2. Its competitive juice now flowing, IBM last week announced that it and Apple Computer will deliver the operating system in 1994-a year ahead of schedule.

- 576)** As a result of greater competition in the US computer industry
- (a) some computer companies are expanding while others are contracting
 - (b) employment in the industry is going down
 - (c) the industry is becoming more monopolised
 - (d) the share value of IBM is going up relative to that of Intel and Microsoft

- 577)** Why is something that happened 70 years ago in the US auto industry being mentioned here?
- (a) General Motors broke away from Ford Motor
 - (b) A new company went ahead of an established market leader
 - (c) Like Dr. Frankenstein, Ford Motor created a monster in General Motors
 - (d) Microsoft, Intel and A T & T where originally created by IBM
- 578)** Who is mentioned as the principal supplier of silicon chips to IBM?
- (a) AT & T (b) Microsoft (c) Cyrix (d) Intel
- 579)** The personal computer called Ambra is marketed by:
- (a) Cyrix (b) IBM (c) Intel (d) Microsoft
- 580)** What was the original reason for the feud between IBM and Microsoft ?
- (a) The two companies developed competing softwares
 - (b) Microsoft and Intel teamed up against IBM
 - (c) IBM began to purchase microchips from Intel instead of Microsoft
 - (d) IBM made losses while Microsoft made profits
- 581)** Which of the following statements is not implied by the passage?
- (a) The makers of microchips and software are becoming leaders in the computer industry
 - (b) Wang and Unisys are primarily manufacturers of computers
 - (c) IBM laying off workers is the biggest job cut in American corporate history
 - (d) Intel is based in California
- 582)** Which of the following statements is true?
- (a) IBM plans to introduce a new system that will run on a variety of machines
 - (b) IBM's new generation desktop computers will run only on Motorola's chips.
 - (c) IBM is working out a joint strategy with Apple of force Motorola to supply chips at a lower price
 - (d) IBM is going to sell its own chips to Apple and Motorola
- 583)** Many computers would be linked together through a network in a system developed by :
- (a) IBM (b) Apple
 - (c) Microsoft (d) None of these
- 584)** One possible conclusion from the passage is that
- (a) share prices are not a good indicator of a company's performance
 - (b) firing workers restores a company's health
 - (c) all companies ultimately regret being a Dr. Frankenstein to some other company
 - (d) consumers gain as a result of competition among producers

PASSAGE 102

Environmental protection and management is deservedly attracting a lot of attention these days. This is a desirable development in the face of the alarming rate of natural resource degradation, which greatly hampers their optimal utilisation. When waste waters emanating from municipal sewage, industrial effluent, agriculture and land runoffs find their way either to ground water reservoirs to other surface water sources, the quality of water deteriorates rendering it unfit for use. The natural balance is distributed when concentrated discharges of waste water is not controlled. This is because the cleansing forces of nature cannot do their job in proportion to the production of filthy matter.

According to the National Environment Engineering and Research Institute (NEERI), a staggering 70 percent of water available in the country is polluted. According to the Planning Commission: "From the Dallake in the North to the Chaliyar rivers in the South, from Damodar and Hooghly in the East to the Thane creek in the West, the picture of water pollution is uniformly gloomy. Even our large perennial rivers, like the Ganga, are today heavily polluted."

According to one study, all the 14 major rivers of India are highly polluted. Beside the Ganga, these rivers include the Yamuna, Narmada, Godavari, Krishna and Cauvery. These rivers carry 85 percent of the surface runoff and their drainage basins cover 73 percent of the country. The pollution of the much-revered Ganga is due in particular to municipal sewage that accounts for 3/4th of its pollution load. Despite India having legislation on water pollution (The Water (prevention and control of Pollution) Act, 1974) and various water pollution, control boards rivers today have become synonymous with drains and sewers.

Untreated community wastes discharged into water courses from human settlements account for four times as much waste water as industrial effluent. Out of India's 3,119 towns and cities, only 217 have partial (209) or full (8) sewerage treatment facilities and cover less than a third of the urban population. Statistics reveal that 1,700 of 2,700 water using industries in India, are pollution the water around their factories. Only 160 industries have waste water treatment plants. One estimate suggests that the volume of waste water of industrial origin will be comparable to that of domestic sewage in India by 2000 AD. Discharges from agricultural fields which carry fertilising ingredients of nitrogen, phosphorous and pesticides are expected to be three times as much as domestic sewage. By that date, thermal pollution generated by discharges from thermal power plants will be the largest in volume.

Toxic effluents deplete the levels of oxygen in the rivers, endanger all aquatic life and render water absolutely unfit for human consumption, apart from affecting industrial production. Sometimes these effects have been disastrous. A recent study reveals that the water of the Ganga, Yamuna, Kali and Hindon rivers have considerable concentrations of heavy metals due to inflow of industrial wastes, which pose a serious health hazard to the millions living on their banks. Similarly, the Cauvery and Kapila rivers in Kamataka have been found to contain metal pollution which threatens the health of people in riverine towns. The Periyar, the largest river of Kerala, receives extremely toxic effluents that result in high incidence of skin problems and fish kills. The Godavari of Andhra Pradesh and the Damodar and Hooghly in West Bengal receive untreated industrial toxic wastes. A high level of pollution has been found in the Yamuna, while the Chambal of Rajasthan is considered the most polluted river in Rajasthan. Even in industrially backward Orissa, the Rushikula river is extremely polluted. The fate of the Krishna in Andhra Pradesh, the Tungabhadra in Karnataka, the Chaliyar in Kerala, the Gomti in U.P., the Narmada in M.P. and the Sone and the Subarnarekha rivers in Bihar ins no different.

According to the W.H.O. eighthly percent of diseases prevalent in India are water-borne; many of them assume epidemic proportions. The prevalence of these diseases heightens under conditions of drought. It is also estimated that India loses as many as 73 million man-days every year due to water prone diseases, costing ₹ 600 crore by way of treatment expenditure and production losses. Management of water resources with respect to their quality also assumes greater importance especially when the country can no more afford to waste water.

The recent Clean-the-Ganga Project with an action plan estimated to cost the exchequer ₹ 250 crore (which has been accorded top priority) is a trendsetter in achieving this goal. The action plan evoked such great interest that offers of assistance have been received from France, UK, US and the Netherlands as also the World Bank. This is indeed laudable. Poland too has now joined this list. The very fact that these countries have volunteered themselves to contribute their mite is a healthy reflection of global concern over growing environmental degradation and the readiness of the international community to participate in what is a truly formidable task. It may be recalled that the task of cleansing the Ganga alone the Rishikesh-Hardwar stretch under the first phase of the Ganga Action Plan has been completed and the results are reported to be encouraging.

The crisis of drinking water is deepening because water resources are drying up and the lowering of ground water through overpumping; this is compounded by the pollution of water sources. All these factors increase the magnitude of the problem. An assessment of the progress achieved by the end of March 1985, on completion of the first phase of the International Drinking Water Supply and Sanitation Decade (1981-91) reveals that drinking water has been available to 73 percent of the urban population and 56% of the rural population only. This means that nearly half the country's rural population has to get drinking water facilities. This needs to be urgently geared up especially when considered against the Government's professed objective of providing safe drinking water and sanitation to all by the end of the International Drinking Water Supply and Sanitation Decade i.e. March 1991. The foremost action in this would be to clean up our water resources.

As per surveys conducted by the NEERI, per capita drinking water losses in different cities in the country range between 11,000 to 31,000 litres annually. This indicates a waste level of 20 to 35 percent of the total flow of water in the distribution system primarily due to leaks in main and household service pipes. Preventive maintenance programme would substantially reduce losses and wastages and would certainly go a long way in solving the problem.

According to the Union Minister of Works and Housing, out of 2 . 31 lakh problem villages have been provided with at least one source of drinking water of March, 1986. The balance (38,748) villages are expected to be covered during the seventh plan. A time bound national policy on drinking water is being formulated by the government wherein the task is proposed to be completed by the end of the seventh plan. An outlay of ₹ 6,522-47 crore has been allotted for the water supply and sanitation sector in the seventh plan period against an outlay of ₹ 3,922.02 crore in the sixth plan. Of this, outlay for rural water supply sector is ₹ 3,454 . 47 crore. It is expected that this outlay would help to cover about 86 . 4 percent of the urban and 82 . 2 percent of the rural population with safe drinking water facilities by March 1991. Hygienic sanitation facilities would be provided to 44 . 7 percent and 1 . 8 percent of the urban and rural population respectively within the same period .

585) The degradation of a natural resource will necessarily lead to :

- (a) poor economic utilisation of resources
- (b) contamination of water from municipal sewage
- (c) water unfit for human consumption
- (d) None of the above

586) According to NEERI :

- (a) the extent of water pollution in the Dal Lake is grim
- (b) 70 percent of the total water available in the country is polluted
- (c) only 217 out of 3119 towns and cities have sewage treatment facilities
- (d) all the 14 major rivers of India are highly polluted

587) Municipal sewage pollutants account for:

- (a) the lowest percentage of water pollution
- (b) 75 percent of the Ganga's water pollution load
- (c) twice the volume of the waste water of industrial origin
- (d) three times as much as the discharge from agricultural fields

588) Which of the following statements is correct?

- (a) The river Periyar is in the South India
- (b) The river Periyar is the largest river of Kerala
- (c) The river Gomti is extremely polluted
- (d) All of these are correct

589) The cost of the Clean-the-Ganga Pollution Project Action Plan is likely to be sourced from

- (a) The Indian Exchequer
- (b) France, UK, US and the Netherlands
- (c) The World Bank, Poland, UK
- (d) the US, UK, Netherlands, Poland, France, the World Bank and India

590) Which of the following statements made by the W.H.O. is correct ?

- (a) Water-borne diseases account for 80 percent of all diseases prevalent in India
- (b) Water-borne diseases in India create a loss of ₹ 600 crore every year
- (c) Both (a) and (b) are correct
- (d) None of the above

591) Considerable amounts of metal pollutants are found in the river(s) :

- (a) Chambal of Rajasthan
- (b) Rushikula in Orissa
- (c) Damodar, Hooghly, Krishna and Gomti
- (d) Ganga, Yamuna, Kali, Hindon, Cauvery and Kapila

592) The crisis of drinking water is caused chiefly by:

- (a) the greenhouse effect
- (b) water pollution caused by industrial development
- (c) drying up of water sources and over pumping
- (d) increasing urbanisation

593) The best remedy for shortage lies in :

- (a) putting up more pumps in rural areas
- (b) cleaning up polluted water
- (c) reducing the waste level of 25-30 percent of the total flow of water
- (d) constructing large sized dams

594) Out of the total outlay for water supply sanitation in the seventh plan, rural water supply sector would receive:

- (a) about 53 percent
- (b) over 80 percent
- (c) between 65 to 80 percent
- (d) equal to 44.7 percent

PASSAGE 103

To teach is to create a space in which obedience to truth is practised. Space may sound a vague, poetic metaphor until we realise that it describes experiences of everyday life. We know what it means to be in a green and open field; we know what it means to be on a crowded rush hour bus. These experiences of physical space have parallels in our relations with others. In our jobs we know what it is to be pressed and crowded, our working space diminished by the urgency of deadlines and competitiveness of colleagues. But then there are times when deadlines disappear and colleagues co-operate, when everyone has a space to move, invent and produce, with energy and enthusiasm. With family and friends, we know how it feels to have unreasonable demands placed upon us, to be boxed in by the expectations of those nearest to us. But these there are times when we feel accepted for who we are (or forgiven for who we are not), times when a spouse or a child or a friend gives us the space both to be and to become.

Similar experiences of crowding and space are found in education. To sit in a class where the teacher stuffs our minds with information organises it with finality, insists on having the answers while being utterly uninterested in our views and focus us into a grim competition for grades-to sit in such a class is to experience a lack of space for learning. But to study with a teacher who not only speaks but also listens, who not only answers but asks questions and welcomes our insights, who provides information and theories that do not close doors but open new ones, who encourages students to help each other learn-to study with such a teacher is to know the power of a learning space.

A learning space has three essential dimensions; openness, boundaries and an air of hospitality. To create open learning space is to remove the impediments to learning that we find around and within us we often create them ourselves to evade the challenge of truth and transformation. One source of such impediments is our fear of appearing ignorant to others or to ourselves. The openness of a space is created by the firmness of its boundaries. A learning space cannot extend indefinitely, if it did, it would not be a structure for learning but an

invitation for confusion and chaos. When space boundaries are violated, the quality of space suffers. The teacher who wants to create an open learning space must define and defend its boundaries with care. Because the pursuit of truth can be painful and discomforting, the learning space must be hospitable. Hospitable means receiving each other, our struggles, our new-born ideas with openness and care. It means creating an ethos in which the community of truth can form and the pain of its transformation be borne. A learning space needs to be hospitable not to make learning painless, but to make painful things possible, things without which no learning can occur-things like exposing ignorance, testing tentative hypotheses, challenging false or partial information and mutual criticism of thought.

The task of creating learning space with qualities of openness, boundaries and hospitality can be approached at several levels. The most basic level is the physical arrangement of the classroom. Consider the traditional classroom setting with row upon row of chairs facing the lectern where learning space is confined to the narrow alley of attention between student and teacher. In this space, "there is no community of truth, hospitality or room for students to relate to the thoughts of each other."

Contrast it with the chairs placed in a circular arrangement creating an open space within which learners can interconnect. At another level, the teacher can create conceptual space-space with words in two ways. One is through assigned reading; the other is through lecturing. Assigned reading, not in the form of speed reading several hundred pages but contemplative reading, which opens, not fills our learning space. A teacher can also create a learning space by means of lectures. By providing critical information and a framework of interpretation, a lecturer can lay down boundaries within which learning occurs.

We also create learning space through the kind of speech we utter and the silence from which true speech emanates. Speech is a precious gift and a vital tool, but too often our speaking is an evasion of truth, a way of buttressing our self-serving reconstructions of reality. Silence must therefore be an integral part of learning space. In silence, more than in arguments, our mind made world falls away and we are open to the truth that seeks us. Words often divide us, but silence can unite. Finally teachers must also create emotional space in the classroom, space that allows feelings to arise and be dealt with because submerged feelings can undermine learning. In an emotionally honest learning space, one created by a teacher who does not fear dealing with feelings, the community of truth can flourish between us and we can flourish in it.

595) Which of the following statements best describes the author's conception of learning space?

- (a) Where the teacher is friendly
- (b) Where there is no grim competition for grades
- (c) Where the students are encouraged to learn about space
- (d) Where the teacher provides information and theories which open new doors and encourages students to help each other learn

596) The statement "the openness of a space is created by the firmness of its boundaries, appears contradictory." Which of the following statements provides the best justification for the proposition ?

- (a) We cannot have a space without boundaries
- (b) Bounded space is highly structured
- (c) When space boundaries are violated, the quality of space suffers
- (d) A teacher can effectively defend a learning space without boundaries

597) According to the author, learning is a painful process because :

- (a) it exposes our ignorance
- (b) our views and hypotheses are challenged
- (c) it involves criticising the views of others
- (d) All of these reasons

598) The task of creating learning space with qualities of openness, boundaries and hospitality is multidimensional. It involves operating at :

- (a) psychological and conceptual levels
- (b) physical perceptual and behavioural levels
- (c) physical, conceptual and emotional levels
- (d) conceptual, verbal and sensitive levels

599) According to the author, silence must be an integral part of learning space because:

- (a) silence helps to unite us with others to create a community of truth
- (b) silent contemplation prepares us to construct our mind-made world
- (c) speaking is too often an exercise in the evasion of truth
- (d) speaking is too often a way of buttressing our self-serving reconstruction of reality

600) According to the author, an effective teacher does not allow:

- (a) feeling to arise within the learning space
- (b) silence to become an integral part of the learning space
- (c) learning space to be filled by speed-reading of several hundred passage of assigned reading
- (d) violation of learning space boundaries

601) Understanding the nation of space in our relations with others is :

- (a) to acknowledge the beauty of a poetic metaphor
- (b) exclusively rooted in our experiences of physical space
- (c) to accept a spiritual dimension in our dealings with our peers
- (d) to extend the parallel of physical space to our experiences in daily life

602) Another way of describing the author's notion of learning space can be summarised in the following manner:

- (a) it is vital that learning be accompanied by unlearning
- (b) learning encompasses such elements as courage, dignity and endeavour
- (c) an effective teacher recognises the value of empathy
- (d) encourage good learners, discourage indifferent ones

603) Conceptual space with words can be created by :

- (a) assigned reading and lecturing
- (b) speed reading and written comprehension
- (c) gentle persuasion and deliberate action
- (d) creative extrapolation and illustrations

604) An emotionally honest learning space can only be created by :

- (a) a teacher committed to join the community of truth
- (b) a teacher who is not afraid of confronting feelings
- (c) a teacher who takes care not to undermine the learning process
- (d) a teacher who worships critical silence

PASSAGE 104

Management education gained new academic stature with US Universities and greater respect from outside during the 1960's and 1970's. Some observers attribute the competitive superiority of US corporations to the quality of business education. In 1978, a management professor Herbert A. Simon of Carnegie Mellon University, won the Nobel Prize in economics for his work in decision theory. And the popularity of business education continued to grow, since 1960, the number of master's degrees awarded annually has grown from under 5000 to over 50,000 in the mid 1980's and the MBA has become known as 'the passport to the good life'.

By the 1980's, however, US business schools faced critics who charged that learning had little relevance to real business problems. Some went so far as to blame business schools for the decline in US competitiveness.

Amidst the criticisms, four distinct arguments may be discerned. The first is that business schools must be either unnecessary or deleterious because Japan does so well without them. Underlying this argument is the idea that

management ability cannot be taught, one is either born with it or must acquire it over years of practical experience. A second argument is that business schools are overly academic and theoretical. They teach quantitative models that have little application to real world problems. Third, they give inadequate attention to shop floor issues, to production processes and to management resources. Finally, it is argued that they encourage undesirable attitudes in students, such as placing value on the short-term and 'bottom line' targets, while neglecting longer-term development criteria. In summary, some business executives complain that MBRs are incapable of handling day to day operational decisions, unable to communicate and to motivate people and unwilling to accept responsibility for following through on implementation plans. We shall analyse these criticisms after having reviewed experiences in other countries.

In contrast to the expansion and development of business education in the United States and more recently in Europe, Japanese business schools graduate no more than two hundred MBRs each year. The Keio Business School (KBS) was the only graduate school of management in the entire country until the mid 1970's and it still boasts the only two year masters programme. The absence of business schools in Japan would appear in contradiction with the high priority placed upon learning by its Confucian culture. Confucian colleges taught administrative skills as early as 1630 and Japan wholeheartedly accepted Western learning following the Meiji restoration of 1868 when hundreds of students were dispatched to universities in US, Germany, England and France to learn the secrets of Western technology and modernisation. Moreover, the Japanese educational system is highly developed and intensely competitive and can be credited for raising the literary and mathematical abilities of the Japanese to the highest level in the world.

Until recently, Japanese corporations have not been interested in using either local or foreign business schools for the development of their future executives. Their in-company training programs have sought the socialisation of new-comers, the younger the better. The training is highly specific and those who receive it have neither the capacity nor the incentive to quit. The 'prevailing belief' says Imai, 'is that management should be born out of experience and many years of effort and not learnt from educational institutions. A 1960 survey of Japanese senior executives confirmed that a majority (54%) believed that 'managerial capabilities can be attained only on the job and not in universities'.

However, this view seems to be changing that same to be changing: the same survey revealed that even as early as 1960, 37% of senior executives felt that the universities

should teach integrated professional management. In the 1980's, a combination of increased competitive pressures and greater multi-nationalisation of Japanese business are making it difficult for many companies to rely solely upon internally trained managers. This has led to a rapid growth of local business programmes and a greater use of American MBA programmes. In 1982-83, the Japanese comprised the largest single group of foreign students at Wharton, where they not only learnt the latest techniques of financial analysis, but also developed world-wide contacts through their classmates and became Americanised, something highly useful in future negotiations. The Japanese then do not 'do without' business schools, as it sometimes contended. But the process of selecting and orienting new graduates, even MBXs, into corporations is radically different than in the US. Rather than being placed in highly paying staff positions, new Japanese recruits are assigned responsibility for operational and even menial tasks. Success is based upon Japan's system of highly competitive recruitment and intensive in company management development, which in turn are grounded in its tradition of universal and rigorous academic education, life-long employment and strong group identification.

The harmony among these traditional elements has made Japanese industry highly productive and given corporate leadership a long-term view. It is true that this has been achieved without much attention to university business education, but extraordinary attention has been devoted to the development of managerial skills, both within the company and through participation in programmes sponsored by the Productivity Centre and other similar organisations.

605) The 1960's and 1970's can best be described as a period :

- (a) when quality business education contribute to the superiority of US corporations
- (b) when the number of MBXs rose from under 5,000 to over to 50,000
- (c) when management education gained new academic stature and greater respect
- (d) when the MBA became more disreputable

606) According to the passage:

- (a) learning which was useful in the 1960's and 1970's became irrelevant in the 1980's
- (b) management education faced criticisms in the 1980's
- (c) business schools are insensitive to the needs of industry
- (d) by the 1980's business school contributed to the decline in US competitiveness

- 607)** The growth in popularity of business schools among students was most probably due to :
- Herbert A. Simon, a management professor, winning the Nobel Prize in economics
 - the gain in academic stature
 - the large number of MBA degrees awarded
 - a perception that it was a passport to good life
- 608)** A criticism that management education did not face was that:
- it imparted poor quantitative skills to MBAs
 - it was unnecessary and deleterious
 - it was irrevocably irrelevant
 - it inculcated undesirable attitude in students
- 609)** US business schools faced criticism in the 1980's because :
- of the decline in Japanese competitiveness
 - many critics felt that the learning had little relevance to business problems
 - people realised that management ability cannot be taught
 - MBAs were unwilling to accept responsibility for implementation on the shop floor
- 610)** The absence of business schools in Japan:
- is due to the prevalent belief that management ability can only be acquired over years of practical experience
 - was due to the high priority placed on learning as opposed to doing in Confucian culture
 - is hard to explain for the proponents of business education
 - contributed a great deal to their success in international trade and business
- 611)** The Japanese were initially able to do without business schools as a result of :
- their highly developed and intensively competitive education system
 - dispatching hundreds of students to learn the secrets of Western technology and modernisation
 - their highly specific in company training programmes
 - prevailing beliefs regarding educational institutions
- 612)** The Japanese modified their views on management education because of :
- greater exposure to US MBA programme
 - the need to develop world-wide contracts and become Americanised
 - the outstanding success of business schools in the US during the 1960's and 1970's
 - a combination of increased competitive pressures and greater multi-nationalisation of Japanese business
- 613)** Training programmes in Japanese corporations have :
- been based upon Confucian culture
 - sought the socialisation of newcomers
 - been targeted at people who have neither the capacity nor the incentive to quit
 - been teaching people to do menial tasks
- 614)** The author argues that :
- Japanese do not do without business schools as is generally perceived
 - Japanese corporations do not hire MBAs because of traditions of universal and rigorous academic education, life-long employment and strong group identification
 - placing MBAs in operational and menial tasks is a major factor in Japanese business success
 - US corporations should emulate the Japanese and change the way new recruits are inducted
- 615)** The main difference between US and Japanese corporations is :
- that one employs MBAs, the other does not
 - that US corporations do not employ Japanese people
 - that US corporations pay more to fresh recruits
 - in the process of selecting and orienting new recruits
- 616)** The author argues that the Japanese system
- is better than the American system
 - is highly productive and give corporate leadership a long-term view as result of its strong traditions
 - is slowly becoming Americanised
 - succeeds without business schools, whereas the US system fails because of it
- Directions (Q. Nos. 617-636)** Read the passage given below and answer the questions that follow based on the information given in the passage.

PASSAGE 105

When I was little, children were bought two kinds of ice cream, sold from those white wagons with canopies made of silvery metal: either the two-cent cone or the four-cent ice cream pie. The two-cent cone was very small, in fact it could fit comfortably into a child's hand and it was made by taking the ice cream from its container with a special scoop and piling it on the cone. Granny 'always suggested I eat only a part of the cone, then throwaway the pointed end, because it had been touched by the vendor's hand (though that was the best part, nice and crunchy and it was regularly eaten in secret, after a pretence of discarding it).

The four-cent pie was made by a special little machine, also silvery, which pressed two disks of sweet biscuit against a cylindrical section of ice cream. First you had

to thrust your tongue into the gap between the biscuits until it touched the central nucleus of ice cream; then, gradually, you are the whole thing, the biscuit surfaces softening as they became soaked in creamy nectar. Granny had no advice to give here : in theory the pies had been touched only by the machine; in practice, the vendor had held them in his hand while giving them to us, but it was impossible to isolate the contaminated area.

I was fascinated, however, by some of my peers, whose parents bought them not a four-cent pie but two-cent cones. These privileged children advanced proudly with one cone in their right hand and one in their left and expertly moving their head from side to side, they licked first one, then the other. This liturgy seemed to me so sumptuously enviable, that many times I asked to be allowed to celebrate it. In vain. My elders were inflexible; a four-cent ice, yes; but two two-cent ones, absolutely no.

As anyone can see, neither mathematics nor economy nor dietetics justified this refusal. Nor did hygiene, assuming that in due course the tips of both cones were discarded. The pathetic and obviously mendacious justification was that a boy concerned with turning his eyes from one cone to the other was more inclined to stumble over stones, steps or cracks in the pavement. I dimly sensed that there was another secret justification, cruelly pedagogical, but I was unable to grasp it.

Today, citizen and victim of a consumer society a civilization of excess and waste (which the society of the thirties was not). I realize that those dear and now departed elders were right. Two two-cent cones instead of one at four-cents did not signify squandering, economically speaking, but symbolically they surely did. It was for this precise reason, that I yearned for them: because two ice creams suggested excess. And this was precisely why they were denied to me : because they looked indecent, an insult to poverty, a display of fictitious privilege, a boast of wealth. Only spoiled children ate two cones at once, those children who in fairy tales were rightly punished, as Pinocchio was when he rejected the skin and the stalk. And parents who encouraged this weakness, appropriate to little parvenus, were bringing up their children in the foolish theatre of “I d like to but I can’t.” They were preparing them to turn up at tourist-class check-in with a fake Gucci bag bought from a street peddler on the beach at Rimini.

Now-a-days the moralist risks seeming at odds with morality, in a world where the consumer civilization now wants even adults to be spoiled and promises them always something more, from the wristwatch in the box of detergent to the bonus bangle sheathed, with the magazine it accompanies, in a plastic envelope. Like the

parents of those ambidextrous gluttons I so envied, the consumer civilization pretends to give more, but actually gives, for four cents, what is worth four cents. You will throwaway the old transistor radio to purchase the new one, that boasts an alarm clock as well, but some inexplicable defect in the mechanism will guarantee that the radio lasts only a year. The new cheap car will have leather seats, double side mirrors adjustable from inside and a paneled dashboard, but it will not last nearly so long as the glorious old Fiat 500, which, even when it broke down, could be started again with a kick.

The morality of the old days made Spartans of us all, while to day’s morality wants all of us to be Sybarites.

617) Which of the following cannot be inferred from the passage?

- (a) Today’s society is more extravagant than the society of the 1930s.
- (b) The act of eating two ice cream cones is akin to a ceremonial process
- (c) Elders rightly suggested that a body turning eyes from one cone to the other was more likely to fall
- (d) Despite seeming to promise more, the consumer civilization gives away exactly what the thing is worth
- (e) The consumer civilization attempts to spoil children and adults alike

618) In the passage, the phrase “little parvenus” refers to

- (a) naughty midgets
- (b) old hags
- (c) arrogant people
- (d) young upstarts
- (e) foolish kids

619) The author pined for two two-cent cones instead of one four-cent pie because

- (a) it made dietetic sense
- (b) it suggested intemperance
- (c) it was more fun
- (d) it had a visual appeal
- (e) he was a glutton

620) What does the author mean by “now-a-days the moralist risks seeming at odds with morality” ?

- (a) The moralists of yesterday have become immoral today
- (b) The concept of morality has changed over the years
- (c) Consumerism is amoral
- (d) The risks associated with immorality have gone up
- (e) The purist’s view of morality is fast becoming popular

621) According to the author, the justification for refusal to let him eat two cones was plausibly

- (a) didactic
- (b) dietetic
- (c) dialectic
- (d) diatonic
- (e) diastolic

PASSAGE 106

Language is not a cultural artifact that we learn the way we learn to tell time or how the federal government works. Instead, it is a distinct piece of the biological makeup of our brains. Language is a complex, specialized skill, which develops in the child spontaneously, without conscious effort or formal instruction, is deployed without awareness of its underlying logic, is qualitatively the same in every individual and is distinct from more general abilities to process information or behave intelligently. For these reasons some cognitive scientists have described language as a psychological faculty, a mental organ, a neural system and a computational module. But I prefer the admittedly quaint term ‘instinct’. It conveys the idea that people know how to talk in more or less the sense that spiders know how to spin webs. Web-spinning was not invented by some unsung spider genius and does not depend on having had the right education or on having an aptitude for architecture or the construction trades. Rather, spiders spin spider webs because they have spider brains, which give them the urge to spin and the competence to succeed. Although there are differences between webs and words, I will encourage you to see language in this way, for it helps to make sense of the phenomena we will explore.

Thinking of language as an instinct inverts the popular wisdom, especially as it has been passed down in the canon of the humanities and social sciences. Language is no more a cultural invention than is upright posture. It is not a manifestation of a general capacity to use symbols: a three-year-old, we shall see, is a grammatical genius, but is quite incompetent at the visual arts, religious iconography, traffic signs and the other staples of the semiotics curriculum. Though language is a magnificent ability unique to *Homo sapiens* among living species, it does not call for sequestering the study of humans from the domain of biology, for a magnificent ability unique to a particular living species is far from unique in the animal kingdom. Some kinds of bats home in on flying insects using Doppler sonar. Some kinds of migratory birds navigate thousands of miles by calibrating the positions of the constellations against the time of day and year. In nature’s talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale.

Once you begin to look at language not as the ineffable essence of human uniqueness but as a biological adaptation to communicate information, it is not longer

as tempting to see language as an insidious sharper of thought and we shall see, it is not. Moreover, seeing language as one of nature’s engineering marvels—an organ with “that perfection of structure and co-adaptation which justly excites our admiration,” in Darwin’s words—gives us a new respect for your ordinary Joe and the much maligned English language (or any language). The complexity of language, from the scientist’s point of view, is part of our biological birthright; it is not something that parents teach their children or something that must be elaborated in school—as Oscar Wilde said,

“Education is an admirable thing, but it is well to remember from time to time that nothing that is worth knowing can be taught.” A preschooler’s tacit knowledge of grammar is more sophisticated than the thickest style manual or the most state-of-the-art computer language system and the same applies to all healthy human beings, even the notorious syntax-fracturing professional athlete and the, you know, like, inarticulate teenage skateboarder. Finally, since language is the product of a well-engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer columnists make it out to be.

- 622)** According to the passage, which of the following does not stem from popular wisdom on language?
- (a) Language is a cultural artifact
 - (b) Language is a cultural invention
 - (c) Language is learnt as we grow
 - (d) Language is unique to *homo sapiens*
 - (e) Language is a psychological faculty
- 623)** Which of the following can be used to replace the “spiders know how to spin webs” analogy as used by the author?
- (a) A kitten learning to jump over a wall
 - (b) Bees collecting nectar
 - (c) A donkey carrying a load
 - (d) A horse running a Derby
 - (e) A pet dog protecting its owner’s property
- 624)** According to the passage, which of the following is unique to human beings?
- (a) Ability to use symbols while communicating with one another
 - (b) Ability to communicate with each other through voice modulation
 - (c) Ability to communicate information to other members of the species
 - (d) Ability to use sound as means of communication
 - (e) All of the above

- 625)** According to the passage, complexity of language cannot be taught by parents or at school to children because:
- (a) children instinctively know language
 - (b) children learn the language on their own
 - (c) language is not amenable to teaching
 - (d) children know language better than their teachers or parents
 - (e) children are born with the knowledge of semiotics
- 626)** Which of the following best summarizes the passage?
- (a) Language is unique to Homo sapiens
 - (b) Language is neither learnt nor taught
 - (c) Language is not a cultural invention or artifact as it is made out
 - (d) Language is instinctive ability of human beings
 - (e) Language is use of symbols unique to human beings

PASSAGE 107

To summarize the Classic Maya collapse, we can tentatively identify five strands. I acknowledge, however, that Maya archaeologists still disagree vigorously among themselves in part, because the different strands evidently varied in importance among different parts of the Maya realm; because detailed archaeological studies are available for only some Maya sites and because it remains puzzling why most of the Maya heartland remained nearly empty of population and failed to recover after the collapse and after re growth of forests.

With those caveats, it appears to me that one strand consisted of population growth outstripping available resources : a dilemma similar to the one foreseen by Thomas Malthus in 1798 and being played out today in Rwanda, Haiti and elsewhere. As the archaeologist David Webster succinctly puts it, "Too many farmers grew too many crops on too much of landscape." Compounding that mismatch between population and resources was the second strand : the effects of deforestation and hillside erosion, which caused a decrease in the amount of useable farmland at a time when more rather than less farmland was needed and possibly exacerbated by an anthropogenic drought resulting from deforestation, by soil nutrient depletion and other soil problems and by the struggle to prevent bracken ferns from overrunning the fields .

The third strand consisted of increased fighting, as more and more people fought over fewer resources. Maya warfare, already endemic, peaked just before the collapse. That is not surprising when one reflects that at

least five million people, perhaps many more, were crammed into an area smaller than the US state of Colorado (104,000 square miles). That warfare would have decreased further the amount of land available for agriculture, by creating no man's lands between principalities where it was now

unsafe to farm. Bringing matters to a head was the strand of climate change. The drought at the time of the Classic collapse was not the first drought that the Maya had lived through, but it was the most severe. At the time of previous droughts, there were still uninhabited parts of the Maya landscape and people at a site affected by drought could save themselves by moving to another site.

However, by the time of the classic collapse the landscape was now full, there was no useful unoccupied land in the vicinity on which to begin a new and the whole population could not be accommodated in the few areas that continued to have reliable water supplies.

As our fifth strand, we have to wonder why the kings and nobles failed to recognize and solve these seemingly obvious problems undermining their society. Their attention was evidently focused on their short-term concerns of enriching themselves, waging wars, erecting monuments, competing with each other and extracting enough food from the peasants to support all those activities. Like most leaders throughout human history, the Maya kings and nobles did not heed long-term problems, in so far as they perceived them.

Finally, while we still have some other past societies to consider before we switch our attention to the modern world, we must already be struck by some parallels between the Maya and the past societies. As on Mangareva, the Maya environmental and population problems led to increasing warfare and civil strife. Similarly, on Easter Island and at Chaco Canyon, the Maya peak population numbers were followed swiftly by political and social collapse. Paralling the eventual extension of agriculture from Easter Island's coastal lowlands to its uplands and from the Mimbres flood plain to the hills, Copan's inhabitants also expanded from the flood plain to the more fragile hill slopes, leaving them with a larger population to feed when the agricultural boom in the hills went bust. Like Easter Island chiefs erecting ever larger statues, eventually crowned by pukao and like Anasazi elite treating hills- themselves to necklaces of 2,000 turquoise beads, Maya kings sought to outdo each other with more and more impressive temples, covered with thicker and thicker plaster

reminiscent in turn of the extravagant conspicuous consumption by modern American CEOs. The passivity of Easter chiefs and Maya kings in the face of the real big threats to their societies completes our list of disquieting parallels.

- 627)** According to the passage, which of the following best represents the factor that has been cited by the author in the context of Rwanda and Haiti ?
- (a) Various ethnic groups competing for land and other resources
 - (b) Various ethnic groups competing for limited land resources
 - (c) Various ethnic groups fighting with each other
 - (d) Various ethnic groups competing for political power
 - (e) Various ethnic groups fighting for their identity
- 628)** By an anthropogenic drought, the author means
- (a) a drought caused by lack of rains
 - (b) a drought caused due to deforestation
 - (c) a drought caused by failure to prevent bracken ferns from overrunning the fields
 - (d) a drought caused by actions of human beings
 - (e) a drought caused by climate changes
- 629)** According to the passage, the drought at the time of Maya collapse had a different impact compared to the droughts earlier because
- (a) the Maya kings continued to be extravagant when common people were suffering
 - (b) it happened at the time of collapse of leadership among Mayas
 - (c) it happened when the Maya population had occupied all available land suited for agriculture
 - (d) it was followed by internecine warfare among Mayas
 - (e) irreversible environmental degradation led to this drought
- 630)** According to the author, why is it difficult to explain the reasons for Maya collapse?
- (a) Copan inhabitants destroyed all records of that period
 - (b) The constant deforestation and hillside erosion have wiped out all traces of the Maya kingdom
 - (c) Archaeological sites of Mayas do not provide any consistent evidence
 - (d) It has not been possible to ascertain which of the factors best explains as to why the Maya civilization collapsed
 - (e) At least five million people were crammed into a small area

- 631)** Which factor has not been cited as one of the factors causing the collapse of Maya society ?

- (a) Environmental degradation due to excess population
- (b) Social collapse due to excess population
- (c) Increased warfare among Maya people
- (d) Climate change
- (e) Obsession of Maya population with their own short-term concerns

PASSAGE 108

A remarkable aspect of art of the present century is the range of concepts and ideologies which it embodies. It is almost tempting to see a pattern emerging within the art field or alternatively imposed upon it a posteriori-similar to that which exists under the umbrella of science where the general term covers a whole range of separate, though interconnecting, activities. Any parallelism is however in this instance at least misleading. A scientific discipline develops systematically once its bare tenets have been established, named and categorized as conventions. Many of the concepts of modern art, by contrast, have resulted from the almost accidental meetings of groups of talented individuals at certain times and certain places. The ideas generated by these chance meetings had two fold consequences. Firstly, a corpus of work would be produced which, in great part, remains as a concrete record of the events. Secondly, the ideas would themselves be disseminated through many different channels of communication-seeds that often bore fruit in contexts far removed from their generation. Not all movements were exclusively concerned with innovation. Surrealism, for instance, claimed to embody a kind of insight which can be present in the art of any period. This claim has been generally accepted so that a sixteenth century painting by Springer or a mysterious photograph by At get can legitimately be discussed in surrealist terms. Briefly, then, the concepts of modern art are of many different (often fundamentally different) kinds and resulted from the exposures of painters, sculptors and thinkers to the more complex phenomena of the twentieth century, including our ever increasing knowledge of the thought and products of earlier centuries. Different groups of artists would collaborate in trying to make sense of a rapidly changing world of visual and spiritual experience, We should hardly be surprised if no one group succeeded completely, but achievements, though relative, have been considerable.

Landmarks have been established-concrete statements of position which give a pattern to a situation which could easily have degenerated into total chaos. Beyond this, new language tools have been created for those who follow semantic systems which can provide a springboard for further explorations.

The codifying of art is often criticized. Certainly one can understand that artists are wary of being pigeon-held since they are apt to think of themselves as individuals sometimes with good reason. The notion of self-expression, however, no longer carries quite the weight it once did; objectivity has its defenders. There is good reason to accept the ideas codified by artists and critics, over the past sixty years or so, as having attained the status of independent existence an independence which is not without its own value. The time factor is important here. As an art movement slips into temporal perspective, it ceases to be a living organism becoming, rather, a fossil. This is not to say that it becomes useless or uninteresting. Just as a scientist can reconstruct the life of a prehistoric environment from the messages codified into the structure of a fossil, so can an artist decipher whole webs of intellectual and creative possibility from the recorded structure of a 'dead' art movement. The artist can match the creative patterns crystallized into this structure against the potentials and possibilities of his own time. As T.S. Eliot observed, no one starts anything from scratch; however consciously you may try to live in the present, you are still involved with a nexus of behaviour patterns bequeathed from the past. The original and creative person is not someone who ignores these patterns, but someone who is able to translate and develop them so that they conform more exactly to his and our present needs.

- 632)** Many of the concepts of modern art have been the product of
- (a) ideas generated from planned deliberations between artists, painters and thinkers
 - (b) the dissemination of ideas through the state and its organization
 - (c) accidental interactions among people blessed with creative muse
 - (d) patronage by the rich and powerful that supported art
 - (e) systematic investigation, codification and conventions

- 633)** In the passage, the word 'fossil' can be interpreted as

- (a) an art movement that has ceased to remain interesting or useful
- (b) an analogy from the physical world to indicate a historic art movement
- (c) an analogy from the physical world to indicate the barrenness of artistic creations in the past
- (d) an embedded codification of pre-historic life
- (e) an analogy from the physical world to indicate the passing of an era associated with an art movement

- 634)** In the passage, which of the following similarities between science and art may lead to erroneous conclusions?

- (a) Both, in general, include a gamut of distinct but interconnecting activities
- (b) Both have movements not necessarily concerned with innovation
- (c) Both depend on collaborations between talented individuals
- (d) Both involve abstract thought and dissemination of ideas
- (e) Both reflect complex priorities of the modern world

- 635)** The range of concepts and ideologies embodied in the art of the twentieth century is explained by

- (a) the existence of movements such as surrealism
- (b) landmarks which give a pattern to the art history of the twentieth century
- (c) new language tools which can be used for further explorations into new areas
- (d) the fast changing world of perceptual and transcendental understanding
- (e) the quick exchange of ideas and concepts enabled by efficient technology

- 636)** The passage uses an observation by T.S. Eliot to imply that

- (a) creative processes are not 'original' because they always borrow from the past
- (b) we always carry forward the legacy of the past
- (c) past behaviours and thought processes recreate themselves in the present and get labelled as 'original' or 'creative'.
- (d) 'originality' can only thrive in a 'greenhouse' insulated from the past biases
- (e) 'innovations' and 'original thinking' interpret and develop on past thoughts to suit contemporary needs

HINTS & SOLUTIONS

PASSAGE 1

- 1) (d) The reason for success of Indian national banks in this quarter is that the public is ready to invest in these banks.
- 2) (b) Statement B which states that Indian banks are showing growth in this quarter despite the recession is true.
- 3) (c) Increased hiring in Indian financial sector in times of economic slowdown will be a big boon in days to come.

PASSAGE 2

- 4) (b) As per the passage, the environmental disaster in the future will happen as a result of increased usage of fossil fuels. So, only statement C is correct.
- 5) (d) The phrase 'brewing a disastrous stew' is explained by the statement which is in option (d).
- 6) (d) Option (d) is relevant here as global warming can lead to drought, coastal flooding and extinction of species.

PASSAGE 3

- 7) (d) The statements A and B explain the reason for the increasing cost of food.
- 8) (d) All the three statements viz. A, B and C are correct here.
- 9) (b) The passage lays emphasis on the worldwide acute shortage of food commodities.
- 10) (c) Statement B is false in the context of passage.
- 11) (d) Dipping of US dollar value and volatility in commodity markets shows a cause-effect relationship.
- 12) (a) Here option (a) is true in the context of the passage.

PASSAGE 4

- 13) (b) The king could not punish the goldsmith as he did not have concrete evidence to prove the fraud.
- 14) (a) Option (a) is relevant here as Archimedes was famous and most learned man and mathematician.
- 15) (c) The king suspected that the goldsmith had mixed gold with a cheaper metal.
- 16) (d) Option (d) is relevant here as Archimedes could measure the purity of Gold.

17) (d) Option (d) is relevant here as it was a challenge for Archimedes.

18) (d) 'Rused out' is most similar in meaning to tore our.

PASSAGE 5

- 19) (d) The scenic beauty of the underwater world made the author revisit the underwater reef.
- 20) (d) None of the options are relevant here.
- 21) (c) The author dived into the Red Sea at the coast near Jeddah.
- 22) (c) The Red Sea is similar to the Caribbean Sea and the South Sea as it has clear and transparent water like them.
- 23) (a) Option (a) is relevant here as fringing reefs are calcareous deposit formation.
- 24) (c) Fishing in the Red Sea was easy because the fish are clearly visible near the surface itself.

PASSAGE 6

- 25) (d) The author has dwelt more on the problem of shortage of jobs which provide inadequate income even for those who are not directly affected by labour market problems.
- 26) (b) Unemployment now has less severe effects as increasing affluence, more than one wage earner in the family and improved social welfare protection have somehow mitigated the consequences of unemployment.
- 27) (c) The author's proposal is to develop new studies to measure the amount of suffering, which is caused due to unemployment and inadequately paid employment.
- 28) (b) Statistics can underestimate the hardships resulting from joblessness. The unemployment count excludes the millions of fully employed workers whose wages are so low that their families remain in poverty.
- 29) (b) The author is of the view that dependent children in single-earner families do not feel the mitigating effect of social programmes involving income transfers.
- 30) (d) The low wage workers and the unemployed have some members who are employed. This fact causes the unemployment and earning figures to overpredict the amount of economic hardship.

PASSAGE 7

- 31) (d) The government is apathetic and has not managed to handle disasters effectively.
- 32) (a) The fact that man-made disasters occur more frequently than natural disasters is not true in the context of this passage.
- 33) (d) None of the given option is correct here the author just mentions that all medical facilities, doctors and paramedical staff are not available due to lethargic organisational structures.
- 34) (b) The author considers that to work together to manage disasters competently, keeping in mind the public interest, will be a worthwhile challenge for both corporates and the government.
- 35) (b) Our government does not store the knowledge or lesson learnt from a particular disaster. No preemptive actions are thought about after any disaster has occurred.
- 36) (c) Looking at the lethargic and unprofession attitude of the government agencies, PPP can be provide services in a professional and competent manner.

PASSAGE 8

- 37) (a) The author's primary purpose of writing this passage is to criticise the inflexible attitudes of Americans towards economic mythology.
- 38) (d) The author wants to assert that reform in the United States has not been fundamental.
- 39) (b) We can infer from the passage that the author most probably thinks that giving the disenfranchised 'a piece of action', is an example of American's resistance to profound social change.
- 40) (b) Woodrow Wilson's ideas about the economic market perpetuated the traditional legends prevalent in America.
- 41) (c) The passage contains information that would answer the question that has economic policy in the United States tended to reward independence action.
- 42) (d) The myth of the American free enterprise system is full of serious short coming or flows.

PASSAGE 9

- 43) (d) The passage suggests that writers on management have misunderstood how managers use intuition in making business decisions.
- 44) (c) As presented in the passage a manager suddenly connects seemingly unrelated facts and experiences to create a pattern relevant to the problem at hand.

- 45) (c) The Manager X who uses intuition to reach decisions takes action in order to arrive at the solution to a problem but manager Y does not involve himself in any action.

PASSAGE 10

- 46) (c) The primary purpose of the passage is to call or plan about positive economic control policies for the future years.
- 47) (d) surprisingly during the recession year of 1949, 1954 and 1958, the rate of unemployment increased as a downfall of economic activity.
- 48) (d) The government should try to manage the economy carefully keeping in mind the rate of productivity and fall of unemployment.

PASSAGE 11

- 49) (d) As it is known that situation models show the events and processes that occur during the working of a system, but the last option has been opposing the idea. Hence, this is not associated with the model.
- 50) (c) Technological texts are processed easily and remembered easily too because these contain visual as well as verbal means of description.
- 51) (b) After reading the passage, it is well understood that scientific text when resembles with story, then it has lot more sense to the processing.
- 52) (d) All of the above given options contribute to the processing of a scientific text.

PASSAGE 12

- 53) (c) With the plenty of resources and efficient economic policy, Uganda can feed whole Africa.
- 54) (b) If Uganda loses the case against the Tullow Oil, then it would result into the loss of its membership from the World Bank and would soon find in the web of financial crisis.
- 55) (d) All of the above given options contribute to downfall of the inflation.
- 56) (b) Uganda intends to get some funds for its industry, so it is going to hold a meeting in the first days of October.

PASSAGE 13

- 57) (b) There is nothing lies in the fact that one is choosing earlier or posterior dates for an interview as it has nothing to do anything with attitude of the candidate.

- 58) (a) Digital age and digital economy both speaks of e-commerce and their much popularity which generates optimal revenue.
- 59) (d) B-schools need all of the above mentioned reasons in order to adapt a new policy.
- 60) (d) Here, 'data age' refers to the modern age where facts are manipulated for deriving conclusions.

PASSAGE 14

- 61) (b) Sponsors are important because they incur all the cost of a sporting league.
- 62) (a) The core concern of this article is to discuss the revenue generation spots from sports.
- 63) (c) Unpopularity and less attendance in any sporting event is due to the lack of basic amenities for the spectators in the sporting venue.
- 64) (d) All the aforesaid makes the prospects of sports in India very high.

PASSAGE 15

- 65) (d) The passage clearly states that talks on climate change are now also a debate on geo-politics and the shift in the economic balance from the developed economics to the emerging ones. Immediately after this, the passage states the talks about climate change by global leaders should therefore by "taken with a pinch of salt". Same idea is also expressed in option(d).
- 66) (c) The last two sentences of the passage have mentioned in terms of India's need for development. Therefore, the passage advocates that India should make efforts to reduce emission but should also focus on internal development on a priority basis. This idea is expressed in option (c).
- 67) (d) The passage mentions that global leaders talk about climate change but may ulterior motives while discussing it. This is just mentioned in the passage to show how climate change talks have also taken on an economic context as well. Hence, option (a) is not a valid theme and can be eliminated. The passage does not discuss the impact of climate change. Therefore, option (b) can also be eliminated. The passage mentions some of the problems faced by India to highlight how India should manage both its climate change obligations as well as its developmental issues. Therefore, option (d) is a valid theme while option (c) can be eliminated.

PASSAGE 16

- 68) (d) One aspect discussed in the passage is that the employees should be open to change management and must believe in the change. The passage does not say that the people need to have the same mindset. Therefore, Statement A is incorrect. The passage mentions that the companies have dropped employees under Voluntary Retirement Schemes and recruited new people with a positive attitude, if the original employees have not shown a mindset to change. Role models have been mentioned in a different context of the passage. Therefore, Statement B is also incorrect. Thus, neither Statement D is correct.
- 69) (a) The passage talks of the four conditions that are essential for changing mindsets. One of the conditions is that the employees must believe in the overall purpose behind the change. This would mean that they agree with and accept the goals of the organisation. Therefore, Statement B is correct. This also reinforces that fact that without the support of the employees, the organisation cannot change itself. Thus, Statement A is also correct. The passage says that 'role models' are required to accept the change at every level and not just at the top management level. So, Statements C and D are incorrect.
- 70) (a) The passage refers to the 'cultural lock-in' which refers to the inability to change the corporate policy despite market threats. This is mainly because of the inherent "mental models" in the company i.e. "core concepts of the corporation, the beliefs and assumptions, the cause and effect relationships, the guidelines for interpreting language and signals, the stories repeated within the corporate walls." This information makes Statement A and B correct. There is no information to support Statements C and D and so they are both incorrect. The passage also mentions that some organisations used the voluntary retirement scheme to remove people who refuse to change their mindset. So, people may resist change as they feel that they may lose their job due to the change. Therefore, Statement E is incorrect.

PASSAGE 17

- 71) (c) The overall theme of the passage is that the British Government and town dwellers working for the Government have directly and indirectly combined to cause deprivation to people whose livelihood depended on cottage industries.

The passage clearly mentions that profits generated by the British Government are at the cost of the cottage industries which are a substantial source of income for the Indian masses. The passage neither says that profits are due to the mass production of goods nor does it mention that the masses have any sort of share in the profit. Hence, option (a) and (d) can be eliminated. Option (b) incorrectly introduces the ideas of industries taking away some share of the profit. Hence, option (b) can also be eliminated.

- 72) (c) The passage specifies that the skeletons in many villages act as evidences of the effects of the deterioration of cottage industries in India. Hence, Statement A can be considered proof for the given argument.

Comfort of town dwellers has been cited to show their ignorance about the miseries of other fellow Indians. However, it cannot be considered an evidence to prove the deterioration of cottage industries in India. Hence, Statement B is not valid.

The human processes of the British have impacted Indian cottage industries and are the cause of the decline of Indian industry. They are not a proof of the decline. Hence, Statement C is not valid.

- 73) (a) The word miserable has been used to denote the exploitation of the masses that has gone behind achieving this comfort. Thus, option (a) seems plausible.

'Miserable' is not related to the establishment of industries on foreign lands or under foreign control.

Hence, option (b) and (c) can be eliminated.

This 'miserable' comfort is not related to India's political strength or weakness. Hence, option (d) can also be eliminated.

PASSAGE 18

- 74) (c) The author states that "in reality past, present and future are all frozen in the four dimensions of space time", this implies that time does not move we may automatically infer. So, (a) and (b) are wrong. The statement "Above all we must rid ourselves of the belief that the future is in some way less determined than the past" in no way implies that (d) is true.

The statement "static four-dimensional space-time structure" implies that (c) is true.

- 75) (d) The statement that "we must picture the history of the universe not as a three-dimensional stage on which things change but as a static four-dimensional space time structure" indicates that time is not moving. Hence, the concept of "now" or "the present moment" is non-existent. Thus, from this, we may infer that (a) and (b) are true. The statement that "Above all we must rid ourselves of the belief that the future is in some way less determined than the past" implies that the author believes the opposite to be true. So, option (c) is true.

PASSAGE 19

- 76) (c) The passage suggests that the idea of the purpose of education has been changing from time to time. Refer to the third sentence of para one.
- 77) (a) Refer to the second and the third sentences of para four, which talks about the 'terrible narrowness' of our vision.
- 78) (d) According to Amos Oz 'imagining the other can be an antidote' to all evils and this can make us better individuals.
- 79) (a) Refer to the second sentence of the last para of the passage, 'our dominant conception ...' according to which A is true. Refer to the sentence 'Education in this picture ...' of paragraph 4. 'Enrichment' here refers to the 'wealth' that is gained. Hence, E is also true. The students gain the knowledge of skills to earn wealth. Hence, A and E are our idea of worthwhile education. The author tries to say that holistic education should include B and D also.
- 80) (d) Refer to the fifth sentence of para four. 'Citizens in a democracy need ...' Thinking out of the box refers to, 'thinking of alternative possibilities' in the sentence. The aspect not referred to in the ability to negotiate.

PASSAGE 20

- 81) (c) The line in the third paragraph, 'And she is perfect example of how fact and fantasy can coexist in today's Japan' explicates option (c) as the answer. Last line of second paragraph, 'The books sell but they do not have any answers and the cult steps in and generates followers on mere sensationalism' negates the validity of option (b). Hence, (c) is the answer.

- 82) (b) This line has been mentioned in last paragraph, where the author sarcastically comments on Inoue's use of Nostradamus' name in marketing her creation. Hence, option (b) is the answer.
- 83) (a) The line in the first paragraph, "But a lot of un-nutty Japanese take it seriously and its influence has persisted for nearly three decades" validates option (a). Rest of the options is not supported by the passage. Hence, option (a) is the answer.
- 84) (d) Statement 1 would be incorrect as per this line in first paragraph, 'But a lot of un-nutty Japanese take it seriously and its influence has persisted for nearly three decades'. Statement 2 is correct as per this line in the same paragraph, 'Aum which allegedly masterminded the deadly sarin gas attacks in the to attract followers already bitten by the Nostradamus bug'. Statement 4 is true to an extent as per the line in second paragraph, 'The books sell but they do not have any answers and the cult steps in and generates followers on mere sensationalism'. As 2 and 4 are not given as one of the options, therefore, option (d) is the answer.

PASSAGE 21

- 85) (d) Last line of first paragraph, '... something sound and trustworthy about a man of bulk. Now this may, of course, be merely an optical illusion' explicates option (d) as the answer.
- 86) (c) The line in third paragraph, 'Let us disregard the disembodied ones, the out-of-vision narrators, those known in the trade as "voice-overs"' explicates option (c) as the answer.
- 87) (a) The line in paragraph 4, 'It is not a market place, nor a Speaker's Corner. And as in those two public arenas ...' explicate option (a) as the answer.

PASSAGE 22

- 88) (d) Refer to lines in paragraph 2, 'a public area with little active security measures and a more secure area in the airport waiting and boarding areas.'
- 89) (c) I and III are incorrect as per the passage.

PASSAGE 23

- 90) (c) Refer to the first few lines of the passage "Bruce Robbins's excellent article points up the paradox of cosmopolitanism-that it seems 'perpetually torn between an empirical dimension and a normative dimension'. For Robbins, the paradox of cosmopolitanism is rooted in the limited empirical sense of political community." Thus, it is evident the empirical dimension as mentioned in the passage is synonymous with the empirical realities which contradict the normative dimension/cosmopolitan aspirations. Since, Options (a) and (b) are parts of the 'normative dimension' hence, they can be eliminated. Option (d) is a paradox due to the dimensions. Option (c) is the correct answer as of shared fate leads to inequalities in practice which is an empirical reality.
- 91) (c) Option (a) is incorrect as it is only a fear that the expresses at the end of paragraph 3 and not an from the passage. For option (b) refer to the last is incorrect as the last paragraph states cosmopolitan theorists are challenging these seek to replace them. Option (d) is the reverse of what the author feels. Refer to the lines in paragraph 3 -. This article suggests that the cosmopolitan paradox -the gap between universal aspiration and hierarchical practice - is not merely one of cosmopolitan 'consciousness' lagging behind an immanent cosmopolitan 'reality'. Rather, the paradox is rooted in the essence of the cosmopolitan thesis itself. The limitations of abstract normative 'cosmopolitan conceptions of 'rights' and 'responsibilities'. It is clear that there is a gap between the cosmopolitan consciousness and reality. Option (c) can be inferred as the author says that the paradox is rooted in the thesis and its conception itself.
- 92) (a) Option (a) correctly describes the author's primary concern in the passage as the article explores the cosmopolitan paradox, and goes on with solutions and reasons for the same. Hence, option (a) is the best choice. The passage does not directly mention the advocates of nationalism. So, option (b) is not the author's primary concern. Option (c) is also incorrect, as the author's opinion on whether the paradox will continue cannot be determined from the passage. Option (d) is what Robbins feels in the initial lines of paragraph 2. The author does not make this his primary concern.
- 93) (c) 'Amortise' means to disagree. Hence, option (c), it correct.

PASSAGE 24

- 94) (d) The author talks about the necessity of diversity of viewpoints being essential for democracy. Therefore, a lack of it could be a threat to democracy. So, (a) can be inferred. Choice (b) is clearly mentioned in the passage. Choice (c) cannot be inferred from the passage. Hence, choice (d) is the correct answer.
- 95) (c) In the last line of the third paragraph, the author voices the contents of choice (b) as the serious threat to media oligopoly. While the author refers to the possibility of only six conglomerates, he uses the number six figuratively and not factually.
- 96) (c) In the third paragraph, the author answers that media mergers may not result in price increase. Hence, Statement A is mentioned. In the same paragraph, he clearly puts forth the case that the oligopoly will not be able to provide a democratic media. And in the sixth paragraph, the author mentions statement C and D. Hence, choice (c) is correct.
- 97) (c) The last paragraph of the passage provides a clear suggestion that choice (c) is correct.

PASSAGE 25

- 98) (b) The author's agenda is to discuss a possible solution for deforestation. Choice (a) is incorrect because the author's focus is not to discuss a lack of solutions; the author is clearly excited about the prospect of radar monitoring. Choice (c) is tempting but incorrect because nowhere in the passage does it mention that there has been a recent increase in the rate of deforestation. Choice (d) cites a recommendation—the lessening of emissions by companies—that is not discussed in the passage.
- 99) (b) In the fourth paragraph of the passage, the author states “Unlike photographic satellite images, radar images can be measured at night and during days of heavy cloud cover and bad weather.” This implies that photographic satellite images cannot be used efficiently at night. Choice (a) is incorrect because the passage implies that the photographic satellite images are actually obscured by clouds and rain, rather than impervious to it. Choice (c) is incorrect because the cost of the satellites is never discussed in the passage. Choice (d) is discussed in the final paragraph, but is true about radar imaging in the 90s, rather than about photographic imaging.
- 100) (d) Support for this answer choice can be found in the final sentence of the passage. The author is clearly excited about radar monitoring, which eliminates choices (a), (b), and (c) (ambivalent means to have two conflicting opinions about something).
- 101) (b) This answer choice is supported by the line “However, the limited data of the Mapping Project was due only to the small amount of data that could be sent from the satellite.” This implies that if more data had been able to be sent, the project may have been successful. Choice (a) is incorrect because nothing in the passage indicates that only satellite radar monitoring was used during the project. Choice (c) is incorrect because nothing in the passage indicates that the project was developed in response to the Kyoto treaty. Likewise, choice (d) is incorrect because nothing in the passage says that only conventional monitoring was used or that only Brazil and New Guinea were monitored.

PASSAGE 26

- 102) (d) As per para 1 of the passage, option ‘d’ is best supported, refer to the lines ‘... turn-of-the-century women neither wholly accepted nor rejected what she calls the dominant ... , . Option ‘a’ cannot be inferred , as when we refer to para 1, nowhere does it mention the ideology as been degrading. Option ‘b’ is rather contradicted in last para, last line as things are not too clear about that era as per the passage. Option ‘c’ is also not supported by the passage if we refer to para 1 lines ‘... turn-of-the-century women neither wholly accepted nor rejected what she calls the dominant’ Hence option ‘d’ is the answer.
- 103) (c) The passage in the initial part of para 1 explains the dominant and other ideologies and then talks about a contradictory point of view towards the end of 2 and para. In the last part of the passage, the author clearly states the initial theory and admits that Einstein's essays were not very definitive in specific areas. Hence, option ‘c’ is clearly the answer. Option ‘a’ can be eliminated as the passage has nothing to do with chronology. Also option ‘b’ is not worded correctly as the author is not defining a ‘term’. Option ‘d’ is wrong in calling the theory as a ‘proposal’.
- 104) (b) Since the structure of the passage seems analytical and based on some past happenings, option ‘b’ is the best answer. Option ‘a’ is factually incorrect as nowhere in the passage is it alluded as ‘oral’. Option ‘c’ is incorrect as it doesn't match with the theme of the passage which is not about who defines a dominant ideology.
- Option ‘d’ could be a close option but since the author admits that there was nothing definitive that could be said about the issue hence an individual's ideas would match the passage better rather than something which has been theoretically established. Hence option ‘b’ is the answer.

PASSAGE 27

- 105)** (b) Option 'a' is factually incorrect, refer to para 1,2,3 and hence is not supported by the passage. Option 'c' is incorrect as the para 2 clearly mentions the establishment of 'Zonations' during research. So it has nothing to do with time as mentioned by option 'c'. Option 'd' is out of scope as the passage does not deal with reclassification as such. The 2nd para of the passage clearly suggests that option 'b' is correct.
- 106)** (d) Refer to the third para, lines 'It appears that in areas where weak currents and weak tidal energies allow the accumulation ... of the passage. It clearly indicates that Davis's theory will apply to areas with weak currents, weak tidal energy.
Hence Options 'b' and 'c' can be ruled out. Obviously, it will apply to option 'a' as this is where he observed the phenomenon. The 3rd para of the passage clearly states that places that challenge Davis' theory are stable coastlines as per lines' But on stable coastlines, the distribution of mangrove species results in other patterns of zonation; "land building" does not occur Hence option 'd' is the answer.

PASSAGE 28

- 107)** (a) Refer to the second para, first few lines of the passage. It clearly spells out that Option 'a' is correct. Options 'b', 'c' and 'd' are not mentioned in the current context in the passage.
- 108)** (b) Option 'a' is incorrect as there is no series of ideas, rather it is a single idea presented throughout the passage. Option 'c' is incorrect as para 2 does not give any factual evidences. Option 'd' is also faulty as para one does not raise any questions as such it only explains a viewpoint. Hence the most favourable option is 'b'.
- 109)** (d) Refer to the second para, first few lines of the passage. They clearly spell out that huge level of investments keep the component sales' margins low. Thus option 'a' and 'b' which talk of modest investments are incorrect. Option 'c' is clearly negated by the second para. Hence correct option is 'd'.

PASSAGE 29

- 110)** (a) Option (a) is the most logical explanation because complex societies that developed in isolated islands can be different from large continents and hence studying the former can be of interest to historians.
- 111)** (b) 'Historians outcomes depend each case.' Refer to the para 1st where it says "Prediction in history become averaged out." This is further supported by the example.
- 112)** (b) Opening line of the third paragraph suggests that students of human history can draw on many more natural experiments.

PASSAGE 30

- 113)** (a) Relationship between rules, paradigms and normal science. The idea is mentioned in the 1st line itself and is carried throughout the passage.
- 114)** (c) Options (a) and (b) talk about a biochemical structure rather than conformity. It is loyalty to something and not loyalty among people talked about in the passage. Option (d) talks about adherence to an accepted norm which goes out of the scope of the argument. Option (e) talks about evolving trends which is not mentioned in the paragraph. Hence option (c) is the best choice.
- 115)** (e) From the theme and tone of the passage it can be intended that paradigms are predominant as compared to rules. It is difficult to define rules. Paradigm in part determine normal science and also need not depend on the formation of rules and assumptions. Hence the correct choice is 'paradigms are a general representation of rules and beliefs of a scientific transition'.

PASSAGE 31

- 116)** (b) The last three lines of the 1st para where the author talks about the gap between the two artistic interpretations within the depth of the creative power and doesn't mention width.
- 117)** (a) Define the place of the poet in his culture. The lines starting with 'But suddenly I understood define the position of the poet in his culture'.
- 118)** (c) 'Poets and artists of the Renaissance' This is very specific to the passage and it is directly given in the 5th line of the second para. In this para, the period of Renaissance is being described and within this period the 'adventures of experience' refers to the 'poets and artists' of the Renaissance. Rest of the options are 'defining statements' rather than referring to a specific context.

PASSAGE 32

- 119)** (e) This is the main idea of the passage that is carried throughout. 'Role of biology' is negated and 'reciprocal roles' are affirmed in paragraph 1 and 2.
- 120)** (b) All other options would have been false if biological linkages would have structured human society.
- 121)** (b) The passage doesn't talk about preventing manifestation. This rules out statement (a). The last para where the author mentions the examples of a waiter and clergyman refers to the alignment of self with the rules being performed. Statement 'c' goes beyond the scope of the passage.

PASSAGE 33

- 122) (c) Referring to tenth line of third passage Mr. Goran Lindblad admits that communism did commit brutalities but it also had positive consequences like rapid industrialisation and hence option (c) is the correct option.
- 123) (d) Different elements of communist ideology such as equality or social justice still seduce many. It means communism still survives, in bits and pieces, in the minds and hearts of the people.
- 124) (d) Where colonialism is described in the passage, the purpose is to counter the anti-communists. The author feels that it is wrong on behalf of the west to condemn communism as they have let colonialism off, scot free which held a far bloodier record (para 4). Thus, he seeks to neutralise the anti-communist arguments by showing that it is not prudent to condemn a lesser evil when one fails to acknowledge the far greater evil for what colonialism is.
- 125) (c) The second paragraph shows how Nazism lead to a lot of bloodshed. Para 4 gives the same about colonialism. But the key is to go to the root cause of this effect. This scenario exists as colonialism has stemmed from the ideology of Nazism as shown in the last few lines of para 4.
- 126) (c) Options (a), (b), (d) and (e) can be inferred from the passage. Option (c) is not something which cannot be definitely inferred from the passage.

PASSAGE 34

- 127) (e) Para 2 “it is understood as a purely hypothetical situation...” This is the crux of the passage, that principles of justice should not be based on one’s position in life.
- 128) (a) Refer to Para 1 “Rather, the idea is that the principles..... initial position of equality”. Read with para 2, (a) is the obvious choice.
- 129) (c) Only someone who does not have any interest in devising the rules for his own benefit can do full justice in choosing them, because, only then, would he forward ideas that are unbiased. Businessmen who have no possibility of returning to mainland can devise rules of justice without getting influenced.
- 130) (d) Refer to para 1, “These principles are to regulate all further agreements... Since, laws evolve gradually, it is imperative to base their foundation on sound basis principles.”

- 131) (d) When all children are provided free education, it indicates that the decision to do so has not been taken with any other considerations in mind, save the children’s benefits. Thus, the children’s family background and social status do not matter, in accordance with the passage’s theme.

PASSAGE 35

- 132) (c) Options (a), (d) are ruled out because they describe dogmatic beliefs and critical attitude as opponents which is not supported by the passage. Options (b) and (c) are close but (c) is better because the process explained in the option clearly underlined that the outcome of the process is definitely known. The same is supported by the passage in 3rd last para, last line about dogmatic beliefs and critical attitude.
- 133) (a) Options (c), (d) and (e) are ruled out because they are not supported by the passage (negative, neutral, inferior) options (a) and (b) are close but (a) is better as it is mentioned in the last passage, last few lines.
- 134) (c) Refer to 2nd paragraph of the passage, last few lines. Options (a), (b) and (e) can be easily ruled out as they are absurd. Here, we are specifically talking about dogmatic and critical attitude, so option (d) talking about ‘early stage of evolution’ is not as good as option (c).
- 135) (d) Para 2, initial lines states that dogmatic attitude is strong because it sticks to the first impressions while critical attitude is weak because it is ready to doubt its tenets. Therefore, option (d) is better than option (e). Also option (d) is a more specific answer to the question.
- 136) (c) Refer to third paragraph of the passage, dogmatic attitude is psuedo-scientific because its aim to only verify its laws and schemata even if it has to neglect the refutations, whereas critical attitude is flexible enough to change, refute or falsify its tenets and therefore, has a questioning attitude.

PASSAGE 36

- 137) (b) In paragraph 4, refer to line 11, “Chess may be psychologically... rationally.” According to the author, only when someone acts rationally will that act be considered psychologically interesting and out of the given choices only option (b) qualifies, where in adopting a defensive strategy against an aggressive opponent will be irrational. Option (c) is incorrect as the choice that the mountaineer would depend on external conditions and there would not be any internal conflicts as such, and the decision that he would need to make would have to be rational.

- 138) (c) In paragraph 4 lines 3 onward “The effort genuine”. According to this, in case of detective, if the criminal remains passive, there is no conflict, whereas the scientist has to unravel the secrets of nature (which is passive) by deduction.
- 139) (c) In para 2 “Each is torn...” and then further is para 3 “internal”. These lines in paras 2 and 3 talk about external conflict being psychologically empty and no psychological problems involved there in. This makes internal conflicts psychologically interesting.
- 140) (b) In first paragraph refer to line 4— “Thus, the ‘interest’ of the players are generally in conflict.” Choice (c) may also be correct but choice (b) is more appropriate as it is stated directly in the passage whereas choice (c) is an inference. Choice (a) is a consequence of applying game theory to a situation, not one of its prerequisite. Therefore, option (d) is also ruled out. Moreover, the preference mentioned in choice (a) is not of the options but of outcomes.

PASSAGE 37

- 141) (a) This is the correct option as option (b) is too narrow. Choice (c) is a universal truth which may not be the case. There could be a problem between (a) and (d) but (d) is ruled out because this option is one of the reasons supporting the author’s argument but is not his key argument as such. Moreover, the author does not say that the crisis is imminent.
- 142) (d) In the 2nd paragraph, the author is being sarcastic about the fact that the new production and refining capacity will effortlessly bring demand and supply back to balance (line 2 onwards “The accepted ... just like that”) and he quotes Tommy Cooper to emphasise his sarcasm. It must be remembered that we have to consider the author’s point of view not Tommy Coopers. Therefore, option (d) is correct option.
- 143) (b) Answer choice (d) says that the danger being talked about is ‘imminent; which is not necessarily the case as per the author in the passage, whereas the fact that everyone is complacent about it, is being talked about throughout the passage, which makes option (b) correct.
- 144) (c) Option (a) and (d) are incorrect because these choices are too narrow. Choice (c) is mentioned directly in the passage in the last 3 paragraphs.
- 146) (d) Answer choice (d) is contrary to what is being said. Answer choice (c) is irrelevant. There can be a confusion between (a) and (b) but it must be noted that it is not the meaning of the text which is based on binary opposites but the interpretation. This leaves us only with answer choice (a).
- 147) (d) Options (a) and (c) are contrary to what Derrida says in the passage which makes them incorrect. There can be a confusion between (b) and (d). Option (b) could have been an inference if the statement had been “language limits our interpretations of reality. But the word ‘construction’ is incorrect. Therefore, only option (d) is correct according to passage.”
- 148) (c) According to the passage, Derrida is against logocentrism and choice (a), (b) and (d) are pro logocentrism which leaves option (c) which is different from, logocentrism.

PASSAGE 39

PASSAGE 38

- 145) (a) In paragraph 2, refer to line 5 “Rather, they exist... position.” Option (a) directly follows from this line.

- 149) (c) The statement is made in the context of the artists’ freedom to choose a subject and the absence of subject in abstract art. Refer paragraph 2, lines 1 and 2.
- 150) (a) Paragraph 7, line 1 states that when a culture is in a state of disintegration or transition, in other words insecure, the freedom of the artist increases. This clearly indicates that choice (b) is correct.
- 151) (a) Choice (b), (c) and (d) are true according to the passage. Choice (b) is supported by paragraph 6, lines 1–3. choice (c) is supported by paragraph 7, lines 3 and 4. Choice (d) is supported by paragraph 5, lines 3–7. The passage says that the artist and his art is preceded by the culture of the society. Further, it goes on to say that if intellectuals are able to appreciate Renaissance art and Aztec art, it is because they are aware of the culture and history that inspired those works of art. This clearly implies that choice (d) is true. choice (a) however is incorrect Paragraph 3, lines 2 and 3 state that ‘a subject does not start... with something that the author happens to remember.’
- 152) (a) Paragraph 7 shows that when a culture is insecure the artist has freedom.
- 153) (d) The passage lists answer choices (a), (b) and (c) as necessary attributes for a painter to succeed. Choice (a) is supported by paragraph 5, line 1; Choice (b) is supported by paragraph 5, line 3; Choice (c) is supported by paragraph 5, line 2; However, choice (d) is not supported by the passage.

PASSAGE 40

- 154) (d) Paragraph 4, line 5 and the last line confirm choice (b).
- 155) (d) Paragraph 3, last line supports choice (d).
- 156) (b) Refer paragraph 4 which shows that have taken place in the automobile are insignificant. Paragraph 6 says the same for planes. Further, the last paragraph talks about 'calcified organisations' and 'industry-wide emulation'. Hence it confirms that industry is not very innovative.
- 157) (a) The last line of the passage indicates choice (a).

PASSAGE 41

- 158) (c) The statement implies that Craig and Peyton West felt that the amateur observers were incorrect in believing that the maneless lions were adults. Now they know that the amateurs were infect right.
- 159) (c) Paragraph 3, line 11 supports choice (c).
- 160) (c) The last paragraph states the hypothesis. It is that the Tsavo lions are similar to the cave lions of Pleistocene. If the Pleistocene lions are shown to be less violent than earlier thought, then the aggressiveness of the Tsavo lion cannot be reconciled with the lack of it in cave lions of Pleistocene. This calls into question the hypothesis that the two are similar. Hence choice (c) weakens that hypothesis. Choice (a) will neither strengthen nor weaken the hypothesis. Choice (b) will strengthen the hypothesis. Choice (d) will also strengthen the hypothesis as it states that the morphological variations are insignificant.
- 161) (c) Choice (a), (b) and (d) refer to facts that have contributed to the popular image of the Tsavo lion as being very aggressive. Choice (c) however, has not contributed to that image.

PASSAGE 42

- 162) (c) Last paragraph, line 6 and line 8 support choice (c).
- 163) (b) Refer paragraph 3, lines 2 and 3, and paragraph 4, line 1.
- 164) (d) Paragraph 1, line 4 supports choice (d)
- 165) (b) Paragraph 1, and paragraph 4, line 1 indicates that choice (b) is correct.

PASSAGE 43

- 166) (a) Paragraph 1, lines 5 and 6 say that Britain was unable 'to cope with the by-products of its own rapid accumulation of capital.'

- 167) (b) Refer paragraph 4, line (4). The sentence states that the native middle class could not afford to challenge the internal system.
- 168) (d) The underlying sentiment in paragraph 3 shows that New Mercantilism like New Imperialism (paragraph 1) has uneven and divisive effects. Refer paragraph 3, line 2.
- 169) (d) Refer paragraph 3, lines 5 and 6. The national middle class came to power In other words they became the centre.

PASSAGE 44

- 170) (b) The answer is stated in the last paragraph. All other combinations given are factually incorrect (as per the passage).
- 171) (d) The answer is stated in the first paragraph. Greeks were not into mysticism, thinkers as they were.
- 172) (d) The answer is stated in th penultimate paragraph. The sheer immensity of the Egyptian architecture proves it.
- 173) (a) The answer is stated explicitly in the first paragraph. You just can't get it wrong.
- 174) (c) The answer is stated in the last paragraph. Refer to the line "They would build what was more beautiful than hill and sea and sky and greater than all these."

PASSAGE 45

- 175) (c) Option (a) is not strong enough to be the central theme. Option (b) is completely wrong, as per the first paragraph. Option (d) is wrong because the focus of the passage is on PRIs.
- 176) (a) The idea is clear. The PRIs have been weakened over time. 'Volition' = Desire. 'Volition got circumscribed' means that their capability to plan and work as per their needs has reduced.
- 177) (b) The 'flaw' discussed in the first para makes it clear. While inter-state and centre-state are free of the problem of "Who gets what and how much power", the intra-state is not free of this dilemma.
- 178) (c) The answer is stated in the first paragraph. It is quite explicit.
- 179) (d) The answer is clearly evident from the facts mentioned in the passage like "rise of the several regional parties and smaller pressure groups representing the larger will to the masses they represent".

PASSAGE 46

- 180) (a) The answer is stated in the third paragraph.
- 181) (b) The statement means that his father was not interested in his intellectual studies, and he was not interested in the construction work of his father. So, a social was created.
- 182) (d) The other options find a mention in the second paragraph. Option (d) is not stated explicitly.
- 183) (d) This fact is not mentioned anywhere in the passage.
- 184) (b) The answer is stated in the last paragraph. This is quite an easy one to spot.

PASSAGE 47

- 185) (d) Only the 4th option is correct. The first three are wrong.
- 186) (b) Straight and simple !
- 187) (a) The answer is stated in the second paragraph.
- 188) (c) The answer is stated in the third paragraph.
- 189) (c) The answer is stated in the penultimate paragraph.

PASSAGE 48

- 190) (b) The answer is stated in the fourth paragraph.
- 191) (a) The answer is stated in the first paragraph.
- 192) (d) The answer is stated in the fourth paragraph.
- 193) (b) Option (b) is correct answer.
- 194) (a) The answer is stated in the second paragraph.

PASSAGE 49

- 195) (b) It is clear from para 2 and 3 as Indian Historians trained in English schools began writing history.
- 196) (d) It is clear as now there was a change in attitude of historians. They now paid attention of less glorious politics but more solid grounds of administration.
- 197) (b) It is evident from para 3 as 'RAJ' settled down glamour departed from politics.
- 198) (d) It can be understood from the passage because historians think that they should pay attention on political history but to know about true history they should also concentrate on economic, social, administrative history.

- 199) (a) (A) Administrative _____ H. H. Dodwell.
(B) Political _____ Radha Kumud Mukherji
(C) Narrative _____ Robert Orme
(D) Economic _____ R. C. Dutt

PASSAGE 50

- 200) (c) Answer is (c) since it is nowhere mentioned in the passage.
- 201) (d) It can be understood from paragraph 2. By 1900, abortions, were banned in every state to save the life of the mother.
- 202) (c) It is clear from the passage if mother become pregnant accidentally then abortion is the only remedial measure.
- 203) (d) Paragraph 7 clearly states because according to pro-choice women reproductive and family roles are barriers to equality. Accordingly motherhood is voluntary, not a mandatory or 'natural' role.
- 204) (a) Paragraph 4 clearly states that the tragedies showed that a drug taken during pregnancy led to deformed 'flipper-like' hands of children. Secondly, severe outbreak of rubella resulted in birth defects.
- 205) (c) Paragraph 5 describes that according to them legislators and judges, should not have right to decide on abortion. This should be done on medical advices.

PASSAGE 51

- 206) (c) It is clear from the last paragraph that economist language affect the lives of other people at a large scale. Moreover the talk is hard to follow.
- 207) (d) Clearly, commands given by army officers will have the least element of rhetoric.
- 208) (c) Paragraph first clearly states that the language used by economists is specious and apparently reasonable. Although the terms used by them are hard to follow and unfamiliar to the lay persons.
- 209) (b) 'Secret' is the closest alternative to arcome.
- 210) (c) It is inferred from the paragraph that both views use rhetoric to persuade.

PASSAGE 52

- 211) (b) It is clear from the last paragraph in the last four lines that philosophy teaches us how to live in uncertainty without being paralysed by hesitation.

- 212) (b) Paragraph 3 clearly states that philosophy appeals to human reasons whether they are of tradition or that of revelation like science.
- 213) (d) It is evident from the passage that author's profession cannot be of a theologian because according to him the definiteness of theologies presented by theologian cause modern minds to view them with suspicion. Theologists create a kind of isolation towards the universe.
- 214) (d) Options (a), (b) and (c) are nowhere mentioned in the passage.

PASSAGE 53

- 215) (d) It is clear from the fourth and the last paragraph that research has provided inspirations for ways to power artificial nano-sized devices in future. Secondly, such researches will also help in understanding biological world and recreating the researched material for future use.
- 216) (a) Paragraph 1 clearly states that cells perform different tasks simultaneously with the help of molecular engines which work as power source to generate the movement.
- 217) (a) Statement (B) of option (a) is not representative of argument presented in passage as : New discoveries suggest that Myosin and Kinesin are related and share common ancestor molecules.
- 218) (b) It is evident from paragraph 3 that protein motor it helps in contraction of muscles and creation of energy by burning molecules of ATP and cells together generate more power.
- 219) (a) Paragraph 3 stipulates that the three families of protein are myosin, kinesin and dynein. Cells duplicate their machinery and pull copies apart, Secondly, cells contribute to the growth through duplicating machinery and pulling copies apart.

PASSAGE 54

- 220) (b) A period signifying the ignorance of astronomers about this.
- 221) (b) The passage reveals the reason of not studying the dark age as lack of suitable things at which to point them. Moreover the events happened 13 billion years ago.
- 222) (a) It is clear from the passage that all new quasars are terribly faint, a challenge that both teams overcame by peering at them through one of the twin Keck telescope in Hawaii. They are largest and collect most light.
- 223) (b) According to the passage the fog prolonged the period of darkness until the heat formed. First stars and quasars had the chance to ionise the hydrogen.

PASSAGE 55

- 224) (c) It can be understood from the passage "as greater the urge for a change in society the stronger is the appeal for a dynamic leadership". A dynamic leadership seeks to free itself from constraints of existing rules.
- 225) (c) The passage reveals that equality before law or formal equality is a hindrance to the establishment of real or substantive equality. There is a conflict between progressive executive and conservative Judiciary which shows executive elected and judiciary appointed.
- 226) (a) (A) If modern age is preoccupied with scientific rationality then it is also no less preoccupied with change.
(B) A world preoccupied with scientific rationality have advantages of system based on impersonal rule of laws should be a recommendation with everybody.
(D) Democracy guarantees formal equality beyond this it can only what peoples appetite for substantive equality.
- 227) (a) It can be understood from the passage because Tocqueville believed that unlike aristocratic societies there was no proper place in democracy for heroes and hence if they arose they would sooner or later turn to despots.
- 228) (d) The passage reveals that system governed by impersonal rules can ensure stability. It can't create any shining version of a future in formal equality.
- 229) (c) A can be inferred from the passage democracy is based on two principles (a) equality before law (b) leadership principle. One principle can't be promoted without the sacrifice of other.
D can be inferred as continued pre-occupation with plans and schemes will help to bridge the gap between ideals of equality and reality.

PASSAGE 56

- 230) (c) It is clear from the passage as by shifting temporal frames Kurosawa is able to describe the encroachment of settlement upon wilderness and consequent erosion of Dersu's life.
- 231) (a) Passage 2 clearly shows that when Arseniev looks around for the grave and murmurs desolately "Dersu" then image cuts further into past to 1902 and first section of the film starts describing Arseniev's meeting Dersu.
- 232) (d) The Hallucinatory dreams and visions of Dodeskaden are succeeded by Nostalgic, melancholy rumination. By exploring these ruminations the film celebrates the timelessness of Dersu's wisdom.

- 233) (c) It is clear from the passage that the first section describes the magnificence and inhuman vastness of Nature and to delineate the code of ethics by which Dersu lives and which permits him to survive in these conditions.
- 234) (d) Kurosawa shows that Arseniev sits on other side of fire from his soldiers while soldiers sleep or Joke among themselves he writes in his diary. The Reflective dimension, sensitivity, spirituality of Nature distinguished him from other and form the basis of his receptivity to Dersu.
- 235) (c) It is clear from the passage that film begins with the absence of its main protagonist.

PASSAGE 57

- 236) (a) This is clear because of her 'Blues Creation' in which she had described her horrifying life full of emotional and factual truths.
- 237) (c) This is clear from the passage itself as the passage reveals that situations would have worsened as she was destroying herself slowly and slowly.
- 238) (d) It is mentioned in passage 2 that suffering was welcomed by her in profession although she didn't accept it. She suffered many pains in her life but didn't pay attention towards those sufferings.
- 239) (b) The passage describes that John Hammond launched her, the best musicians accompanied her which led to the success among the public.

PASSAGE 58

- 240) (a) It is clear from the passage as a monosyllabic word has only one syllable. So it can have only one onset. A phoneme, according to the passage, can be 'INITIAL' and 'FINAL'.
- 241) (d) It is understood as phoneme at every serial position in a word only appears to develop as reading is taught. It usually emerges at an age of 5 or 6.
- 242) (d) It can be understood from the passage as onset, Rime, Phonemic Judgement are difficult for children to make. The onset, rime emerges at age of 3 or 4 while phonemic judgement emerges at an age of 5 or 6.
- 243) (b) Trieman and Zudowski showed that 4 or 5 yrs. Old children found the onset, Rime version of same/different tasks easier than version based on phonemes. The 6 yrs. old children perform both versions of tasks with equal level of success.
- 244) (b) Paragraph 2 clearly states this as rimes correspond to rhyme in single syllable words. Also in longer words rime and rhyme may differ.

PASSAGE 59

- 245) (a) It is clear that reference is to an open discussion of the caste issue on a global platform. Also if globalisation of market is good then globalisation of social inequalities is also not bad.
- 246) (c) It can be easily understood from the passage because an inverted representation hardly further the cause of the forsaken. It is kept under the wrap of virtual belief.
- 247) (a) This can be understood as only A and E can reveal this.
- 248) (d) It is justified from paragraph 2 because sociologists admit that caste discrimination is a reality although incompatible with Racial Discrimination and hence 'BIOLOGY' which affects the life of millions is itself a social construction.
- 249) (b) It is clear from the passage because all distinctions are constructed ones and "those finding deny genetic differences between Races" environmental factors impinge on gene function.

PASSAGE 60

- 250) (c) The passage clearly states that printed sheets of notated music might travel from the composer, it still remains his property; the notion of property remains at heart of western conception of genius which derives from latin *gignere* or 'to beget'.
- 251) (a) The passage reveals that teaching of north Indian classical music is achieved by oral means. Saussures conception of language as a communication between addresser and addressee is new, exotic complexity and glamorous.
- 252) (d) The passage stipulates the fact that middle class play a significant role in continuing ancient tradition. Moreover, taperecorder serves as 'Handy technological slave' and preserves from oblivion, vanishing, elusive moment of oral transmission. The author's part of education was conducted via ugly but beneficial rectangle of plastic.
- 253) The passage states that oral transmission of North Indian classical music remains a testament to the fact that the human brains can absorb, remember and reproduce structures of great complexity and sophistication without the help of hieroglyph or written mark of a system of notation.
- 254) (a) The passage itself explains that conductor itself is a custodian and guardian of his property. The Raga is no one's property. It is not easy to pin down its source or to know exactly where it's provenance or origin lies.

- 255) (d) (a) The passage says that printed sheet of music might travel from composer but remains his property.
(c) Can be taken from passage as connection between composer and piece of music is unambiguous because composer writes down his composition as poets write their poems.
(d) The printed sheet testifies his authority over his product not for expression or imagination but for origination.
- 256) (d) The passage 6 illustrates that style of teaching followed in north Indian classical music has produced no noteworthy student, the creative musicians still emerge from guru-shishya relationships, their understanding of music developed through oral communication.
- 257) (b) The passage states that this idea is reflected very strongly in the passage. In fact the last four paragraphs are devoted completely in this theme.

PASSAGE 61

- 258) (c) It is clear from the passage.
- 259) (b) The paragraph gives the traditional method of bereavement handling in which farmers and town people mourn at the death of mother, brother, son and the bereaved is joined by neighbours and kin. They meet grief together in lamentation, prayer and song. They also surround themselves in community.
- 260) (c) The author says that tools of bereavement counselling will create a desert where community once flourished, the bereavement counsellor will see the impossibility of restoring hope in clients once they are alone with nothing but a service for consolation. In failure of service bereavement, counsellor will find desert in herself.
- 261) (d) According to the passage bereavement counsellor is a person who meets the need of those experiencing the death of loved ones and one who can process the grief of the people.
- 262) (a) According to the passage when they reached Indian Europeans were puzzled by the environment. Some also called it 'GREAT DESERT'. It seemed untillable. The earth was wet and it was covered with centuries of tangled and matted grass.
- 263) (d) The passage clearly says that it took Europeans just one generation to make their homeland into a desert. The souk Indians banished themselves to another desert called reservation. The counselor's new tool will cut through the social fabric throwing aside kinship, care, neighbourly obligations and community ways of coming together and going on. The tools will create desert where community once flourished.
- 264) (a) Bereavement counsellor knows how to process grief the proper way. He can make people learn the correct form of service to deal with guilt and grief. Moreover grieving daughter knows that it is bereavement counsellor who comes when death visits this family on the prairie of sauk.
- 265) (b) According to the passage 'Migration of communities' is not mentioned anywhere in the passage whereas other three parallels are mentioned at different points in the passage.

PASSAGE 62

- 266) (b) The passage stipulates that electrical resistance of some materials changes in the presence of magnetic field-a phenomenon known as [GMR]. Attention is also paid on alternative based on [MTJs].
- 267) (c) The passage states that in the NRLs magnetic design each bit is stored in a magnetic element in front of vertical pillar of magnetisable material.
- 268) (a) In MTJ tunneling is easier when the two magnetic layers are polarised in the same direction than when they are polarised in opposite direction.
- 269) (c) Passage 6 clearly says that building a full-scale memory chip based on MTJs is no easy matter. According to the experts magnetic memory elements will have to become far smaller and more reliable than current prototypes if they are to compete with electronic memory.
- 270) (d) Passage 6 says that when tunnels are polarised in same direction then the current that flows through the sandwich is measured to determine the alignment of the topmost layer and hence to know whether it is storing a zero or a one.
- 271) (d) The passage stipulates that Russel Cowburn and Mark Welland of Cambridge University are researching to build a magnetic chip.
- 272) (b) The passage clearly states that magnetic processors would have row of magnetic dots, each of which would be polarised in one of two directions. Individual bits of information would travel down the rows. Hence, logic gate could work in such a scheme.
- 273) (a) The passage says electronic memory chips are faster but volatile.

PASSAGE 63

- 274) (c) It is clear from paragraph 1 that abstractionism has failed to engage creativity with the radical change in human experience in recent decades. It has been unwilling to re-invent itself in relation to system of artistic expression and viewer expectation.

- 275) (b) The passage reveals that abstractionism is not a universal language, it is an art pointing the loss of shared language of signs in society. And hence, can be recovered through the efforts of awareness.
- 276) (d) It can be understood from the passage that major features are a revitalising picture's surface fens have improvised solution beyond ones that were exhausted by 1970. It has confined itself to set forms and practices. It louforms it's moment of truth it has become entrenched orthodoxy itself.
- 277) (b) It can be understood from paragraph 3 as Indian painting entered into a phase of self inquiry, a meditative inner space where cosmic symbols and non-representational images ruled.
- 278) (a) Paragraph 3 clearly states that abstractionism led art towards the exploration of subconscious mind, the spiritual quest and the possible expansion of consciousness.
- 279) (c) It can be understood from the passage that third idiom is based on lyric play of forms guided by gesture or allied with formal improvisations.
- 280) (a) Indian abstractionists have been preoccupied with the fundamentally metaphysical project of aspiring to mystical holy without altogether renouncing the symbolic.
- 281) (d) The conflict between the twin principles of metaphysical and painterly stalls the progress of abstractionism in an impasse.

PASSAGE 64

- 282) (b) This can be understood from the passage as the role of public and private sectors and role of agri-business MNCs. The current debate on TRIPS provide wider concern about privatisation of Research and allowing a free field for MNCs in the spheres of biotechnology and agriculture.
- 283) (a) The passage reveals the meaning that the fundamental breakthrough is a public accessibility in the public domain.
- 284) (c) The passage stipulates that problems also arise on account of public and private sectors complementary role.
- 285) (d) The passage clearly says that because of high-pressure advertising by private companies farmers accept varieties without being aware of adverse effects of such varieties. In case, the varieties fail there must be provision in laws to compensate the users.

- 286) (a) The passage clearly says that reduced Biodiversity is a cause for concern.
- 287) (c) The passage says that incentives are necessary to stimulate innovations and hence the system of patents was necessary to protect the innovators, against unauthorised use. With the national government supports they were influential in shaping agreement on TRIPS which emerged from Uruguay Rounds.
- 288) (d) The passage reveals that patents give the innovators the sole right to use their innovations for a specified period and protect them against unauthorised use.
- 289) (b) The passage explains that public, quasi-public research institutions informed by broader, long term concerns can only do such work. The public sector must play a major role in National Research System.

PASSAGE 65

- 290) (d) The passage reveals that people are not capable of technical drafting skills and hence such artists create an art form that anyone is capable of and less time consuming. Secondly, they feel that art deals with beauty. Moreover, modern abstractionists compose their pieces irrationally.
- 291) (c) The passage explains that people feel more comfortable with something that they can relate to and understand immediately without too much thought.
- 292) (b) This can be understood from the paragraph that if Guernica was a representational painting it would not have been able to express emotions that well.
- 293) (c) Passage 3 explains that Mondrian was trying to present a system of simplicity, logic and rational order. As a result his pieces didn't end up looking like a scrabble board.
- 294) (a) The passage says that both classes of painters have their ways of depicting 'reality'. To an representational artist reality is what he sees with his eyes. To an abstract artist reality is what he feels about what his eyes see.

PASSAGE 66

- 295) (b) The passage clearly reveals that significant players were attracted by expansion of a rules based system and by symbolic value of trade organisation both of which support the weak against strong.

- 296) (b) The passage says that WTO package was acceptable as a means to discipline the resort to unilateral measures by US.
- 297) (a) It is clear from the paragraph that technological method represent an effort to keep current policies consistent with stated goals, and it is analogous to the effort in GATT to keep contracting party trade. Practices consistent with stated rules.
- 298) (d) The passage clearly says that court used to expand integration as the technological method of interpretation, whereby the action of member states were evaluated against the accomplishment of most elementary community goals set forth in the preamble to the [ROME]treaty.
- 299) (c) It is understood that countries at Uruguay round pay priority on export gains than on import loses and they came to associate the WTO and a rules-based system with those gains.
- 300) (d) The passage says that court is now widely recognised as major player in European integration even though such a strong role was not originally envisaged in treaty of Rome which initiated current European union.

PASSAGE 67

- 301) (c) The passage explains that Needham's theory was on the basis that he could bring about at will the cereation of living microbes in heat sterilised broths. Hence, he bade the Earth and water to bring them forth.
- 302) (b) The passage clearly states that Needham, Voltaire, Thomas Huxley were contemporaries as all four were the philosophers of the same era and their matter of writing was based on God's creation.
- 303) (b) The passage explains Pasteur worked logically. He found at experiment a broth ferment when air admitted in it after boiling. And hence mentioned air contained a factor necessary for spontaneous generation of life or viable germs were borne in by air and seeded in sterile nutrient Broth.
- 304) (a) The passage reveals that Pasteur during his experiment found that after boiling broth would formed only when air was admitted into it and then it produced the result that air contained necessary factors for generation of life or viable germs.
- 305) (b) The passage tells that to destroy the doubts of most sceptical. He ranged from mountain air of montanvert which he showed to be almost sterile to those deep, clear wells whose waters had been rendered germ free by slow filtration through sandy soil.

- 306) (c) The passage reveals that man doesn't know how to produce from germs that float in air, from life for life is a germ and germ is life. Hence the doctrine of spontaneous generation will never recover from mortal blow of experiment.
- 307) (b) The passage states that the parade of men was unreasonable who claimed to have 'proved' or who resolutely believed in spontaneous generation on the face of proof-not that spontaneous generation can't occur-but their work was shot through with experimental errors .
- 308) (a) The passage explains that one had to be careful to avoid bacterial contamination in laboratory. And hence, there could be no such thing as partial sterilization. This explains us that researchers have the great practical result of putting bacteriology on a solid footing.
- 309) (b) The passage tells that Pasteur conclusion caused conflict because they seemed simultaneously to support Biblical account of creation while denying a variety of other philosophical system. The public was caught up in cross fire of a vigorous series of public lectures and demonstration by leading exponent of both views, novelist and their friends.
- 310) (d) The passage reveals that it is not an exaggeration to say that emergence of cell theory represents that Biology is most significant and fruitful advance.

PASSAGE 68

- 311) (b) The passage stipulates 40% of American population is engaged in world trade.
- 312) (b) The passage implies that wrecking technique reveals our language as full of tricky words. With 19 different meanings, other which sounds alike but differ in sense. To ring good punning changes, gag writers have to know their way around in the language.
- 313) (a) According to the passage we have two distinct level of languages : Familiar and ordinary words to which everybody knows; elaborate words that we need to know if we are to feel at home in listening and reading today.
- 314) (a) The passage makes us understand that gag writers often use a long and unusual word as a hinge of joke.
- 315) (d) The passage makes us understand that gag writers often use a long and unusual word as a hinge of joke or as a peg for situation comedy tells something significant; they are well aware of limitations of average vocabulary and are willing to cash in on its shortcomings.

- 316) (c) The passage reveals that wrecking reveals our language as full of tricky words which sound alike but differ in sense. Gag writers have to know their way around in the language. Hence they don't get paid for ignorance only for simulating it.
- 317) (b) The gag writers have influenced radio writers as words like lepidopterist and extomologist occur in famous radio plays.

PASSAGE 69

- 318) (a) It is evident from the passage that crisis in western civilization exist because there has been something wrong with it's education. The author believes that no civilization has ever devoted more energy and resources to organise education.
- 319) (c) The author describes that lord snow split the intellectual life of western society between scientists and literary intellectuals because the aim of his education policy is (a) to get as many alpha-plus scientists as the country can throw up. (b) to train 'a much larger stratum of alpha professionals'.
- 320) (b) The passage stipulates that author doesn't believe that education can help in solving complexity or problem that arises. The author describes it to be 'a great danger of our times'.
- 321) (b) According to author, existence of more or less fixed ideas in other peoples mind-ideas with which they think without being aware of doing so are called 'prejudice'. Moreover, such ideas seep into mind and are in no way the result of judgement.
- 322) (a) The passage tells that if politicians, administrators, entire community can atleast be educated enough to 'have sense' of what the real people, scientists and engineers are taking about then the gulf of mutual incomprehension between 'TWO CULTURES' will be bridged.
- 323) (c) According to author it is a uncomfortable feeling that scientists never tire of telling us the fruit of their labourers are 'Neutral' whether they enrich humanity or destroy it depends on how they are used.
- 324) (a) The passage implies that essence of education is transmission of values. It means values are more than mere formulae or dogmatic assertion that we think and feel with them that they are very instruments through which we like, interpret and experience the world.
- 325) (d) He doesn't believe in any of the given options.
- 326) (b) Passage (6) describes that essence of education is transmission of values. But author says that values are more than mere formulae or dogmatic assertion; they are very instrument through whcih we like, interpret and experience the world.
- 327) (c) The author describes that thinking is generally the application of pre-existing ideas to a given situation or set of facts. Moreover, everywhere else we evaluate the situation in the light of our value ideas.

PASSAGE 70

- 328) (b) The passage reveals that Nehru-Gandhi ideologies led to the formation of the idea of India that inspired writer's generation.
- 329) (c) The passage clearly states that writer does not share the view because he says it is a great historical moment. It is interesting as it represents the end of first age and the beginning of second age.
- 330) (b) The author itself believes that India would come back. He believes loss of India was not forever. He says that good sense still prevails in India because it is his life experience about the Indian people and this place.
- 331) (c) The passage reveals that every cheap politician can put a demonstration in the street in 8 minutes. It doesn't represent the people's will. It represents a kind of political structure, political organization. It doesn't represent truth.
- 332) (a) The passage highlights that author is of the view that the good sense will prevail in India because that was the life experience of author about Indian people and place.
- 333) (c) The passage clearly states that writer's friend once said we are capable of these things. We can't begin to move beyond them.
- 334) (d) It is understood from the passage that civilising influences prevent most of us from giving vent to those terrible urges. Those urges are a part of humanity as well as more civilized urges.
- 335) (b) The passage tells that the writer fears the long-term to democracy that the corruption can bring about, as it is a subversion of democracy and says that it will harm India too as corruption is everywhere in India.
- 336) (b) The passage reveals the fact that 'no one is a objective observer'.

- 337) (a) The passage tells that according to author there had never had been a political entity called India until 1947. The thing that became independent had never existed previously except that there had been a zone, an area called India.
- 338) (d) The passage reveals the fact that Independent histories agreed to collectivise themselves into the idea of the nation of India. But in the case of Pakistan it was less successful. Pakistan was under imagined. It didn't survive as a National state.
- 339) (d) The passage stipulates that the strength of nationalist idea is shown by its ability to survive the extraordinary stresses that it was placed under. Moreover, it always remained an Idea though people might not find it very easy to give a simple definition of it, It shows that it exists and is something to which people think they belong. It survives these stresses is an indication of its strength

PASSAGE 71

- 340) (d) The passage clarifies that American army was designed to fight on the plains of Europe and thus lost the war because it was not used to fight in Jungles while Vietnam was on their own land which they understood very well.
- 341) (b) The passage reveals all the ways of war except the option 2.
- 342) (a) The passage clearly states that ever since Sun-tzu, the Chinese have been seen as masters of subtlety, who take measure action to manipulate an adversary without his knowledge.
- 343) (b) The second last paragraph illustrates that Clausewitz view the way to achieve a larger political purpose is through destruction of enemy's army whereas Sun-tzu believes that war proceeds along a fixed course and occupy a finite extent of time like a lay in three acts with beginning a middle and an end.
- 344) (a) The passage clarifies that to the Americans strategic mind, the Viet Cong guerilla did not fight fairly. They should have come out in open and fought like men, instead of hiding in the jungle and sneaking around like a cat in the night.
- 345) (c) The passage states that Chinese intervention in Korea and jet offensive in Vietnam came out of tradition of surprise and stealth. The exception that proves the point was the Soviet Unions invasion of Afghanistan in 1979.

PASSAGE 72

- 346) (a) The passage clearly reveals that in the name of modernisation in west and of development in the third world it was expected to guarantee the happiness of individuals as citizens and of people as societies.
- 347) (d) The passage states that on positive side efforts by certain population groups to assert their identity can be regarded as 'Liberation Movement'. Challenging oppression and injustice whereas on negative side militant action for recognition makes such groups more entrenched in their attitudes and make their cultural compartments more watertight.
- 348) (d) None of them are wrong as all of them can be inferred from the passage.
- 349) (b) The passage reveals that in name of national unity equality of all its citizen and non-partisan secularism, the state can use its powerful resources to reject the demand of the communities; it may go to ensure that order prevails.
- 350) (c) Options (a), (b) and (d) can be inferred from passage as the state has failed to guarantee security or social justice and has been unable to prevent international wars, Moreover, state can use its powerful sources to reject the demand of communities; it may even go so far as genocide to ensure order prevails.

PASSAGE 73

- 351) (c) This can be understood from the entire passage.
- 352) (b) The passage states that author thinks himself essential in relation to creation.
- 353) (d) The passage clarifies that there is difference between perception and creation as in perception object is essential and subject is inessential whereas in creation subject is essential and object is inessential.
- 354) (a) The passage reveals the truth that reading is necessary and it lasts as long as this act can last. Beyond that there are only black marks on paper, but the writer can't read what he had written.
- 355) (b) The passage itself reveals that a writer as an artist makes us feel essential vis-a-vis nature.

PASSAGE 74

- 356) (c) The passage states that ₹. 85,000 crore has been entrusted to the case of mutual fund.
- 357) (c) The passage states that mutual fund's end was carried out in the hands of the individual investors.

- 358) (b) The passage explains that individual investors brought the curtain down on an act that had started with a virtuous performance only to putrefy into a show of ineptitude, imprudence and irresponsibility.
- 359) (a) The passage tells that mutual fund also died because a cancer grew from the refusal of men and women to manage the mutual to exercise a mixture of caution and aggression but to adopt instead an undisciplined, unplanned fire from the nip approach to investment.
- 360) (a) The passage states that atleast eighteen of the big schemes due fore redemption over the next three years will be unable to serve their investors.
- 361) (b) It is clear from the passage that many of the mutual funds offices indulged in malpractice.
- 362) (c) It is evident from the passage that according to MDRA opinion poll of 342 investors conducted last fortnight in five metros show mutual fund as an investment instrument ranks lowly fourth on SAFETY-after bank deposits, gold and real estate-and fifth on returns-ahead only of bank deposits and gold.
- 363) (a) The passage explains employees realised their personal, deals using information gathered during professional work was best done all over cell phone so that company's record wouldn't show the call being made.
- 364) (b) The passage states that mutual fund suffered a loss of 11,000 crore less than the money invested in the schemes, which meant that mutual fund wiped out ₹. 11000 crores from investors hard earned money in intervening 12 months.
- 365) (c) The passage explains that investors have the option of either exiting at a loss or holding on in vain hope.
- 366) (c) The passage tells that the stock market boom in the late eighties and early nineties led to the initial euphoria in the mutual fund's company.

PASSAGE 75

- 367) (c) The passage describes that people don't understand that every invasion, every war, was accompanied by slaughter of talented people in country. People don't even know whether 50 years of India's Independence were achievement or failure.
- 368) (b) The passage shows that author tries to show what exactly was India's history and what are it's prospects for the future.
- 369) (c) The passage states that Vijayanagar was destroyed in 1565 and it is now that surrounding regions have begun to revive.
- 370) (a) The passage explains the story that any body could run and pull the bell and the emperor would appear at his window and give justice is the child's idea of history which the author compares with slave ideas of ruler's mercy and doesn't follow the idea.
- 371) (c) The passage explains that in the British period and in 50 years after the British period there has been a kind of recovery,a slow revival of energy and intellect.
- 372) (d) The passage explains that when self-awareness follows when people begin to make new demands from their leaders, their fellows or on themselves. They ask for more in everything. They have higher ideas of human possibilities. They want to move.
- 373) (c) According to author India's current situation is primitive and messy.
- 374) (a) The passage explains that for the country to progressive and alive the mind has to work and mind has to be active, there has to be an exercise of the mind. The author defines it as the definition of a living country.
- 375) (b) The passage explains that for every kind of disorder there is a positive movement in India. But the future will be chaotic. Politics will have to be at the level of people now.
- 376) (c) The passage stipulates that idea of liberty is tyranny. The rulers were tyrants and tyrants were foreigners. Moreover, every invasion was accompanied by slaughter of country's most talented people.

PASSAGE 76

- 377) (a) The passage itself describes that writer's attitude towards the government is critical.
- 378) (c) The passage defines that government viewed that businessmen were little more than crooks who were to be prevented from entering important areas of economy. The rates of tax, licensing of laws, reservation of whole swathes of Industry for public sector, granting monopoly to public sector governed this attitude.
- 379) (c) The passage explains that changes that took place were forced by situations and partly by foreign exchange bankruptcy of 1991 and the recognition that government would no longer muster the funds to support the public sector.
- 380) (b) The author says that in another 50 years the World would have moved even further ahead.
- 381) (b) The passage explains that infrastructure in India is far better than most of developing countries have.

- 382) (d) The passage tells India didn't suffer during II World War. It was because it had advantages like an English speaking elite, quality scientific manpower (including a Nobel laureate and other's who could be ranked among the world's best) and excellent business acumen.
- 383) (a) The passage reveals that topmost reason for India's poor performance was economic isolationism. The government discouraged imports and encouraged self-sufficiency. The result was creation of inefficient industry that to keep pace with global trends and proved to be uncompetitive.
- 384) (d) It can be understood from passage that government discouraged imports and encouraged self-sufficiency.
- 385) (b) The passage states that symbols to show how far India have fallen back can be inferred as Korean Cielos are sold in India, while no one in South Korea is rushing to buy an Indian car.
- 386) (a) The passage tells that Indian politicians are unable to see beyond their noses. Hence a no-exit policy for labour is equivalent to no-entry policy for business.

PASSAGE 77

- 387) (d) The passage actually talks about the advantages of democracy. Hence, the above 3 mentioned statements are not true.
- 388) (b) The passage states that there is no guarantee that dictatorship will be enlightened one. Myanmar has been ruled out as a dictator for decades and no one could claim that it is better off than Bangladesh which has itself suffered long stretches of dictatorship.
- 389) (c) It can be understood from the passage that high rate of growth year after year may seem compelling but a lower rate of growth that will not fatter is more desirable.
- 390) (c) The passage explains that democracies make many small mistakes. But dictatorships are more susceptible to making huge ones and risking everything on one's decision-like going to war.
- 391) (b) The passage tells that statism is bad, no matter what the direction in which it applies pressure. Moreover the passage tells that author doesn't support statism under any circumstances.
- 392) (d) All the given statements are implied in the sixth para.

- 393) (c) The passage states that democratic freedoms are too important for the economy, especially now that information is supreme. Hence, it can be stated that internet will play an important role in global economy in decades to come.
- 394) (d) No one of the above options has been mentioned in the passage.
- 395) (b) The passage tells that India has moved slower than China on liberalisation but whatever moves it had made are more permanent.
- 396) (d) None of the above options is true.

PASSAGE 78

- 397) (a) The passages states that it is setting new standards for India Inc. through its practice of inter alai awarding stock option to its employees, putting the value of it's intellectual assets and its brands on its BIS and conforming to the disclosure standards of SEC of US.
- 398) (b) The passage tells "We have no hierarchy Just' for the sake of control".
- 399) (b) The passage tells Murthy believes that the betterment of man can be brought about through "creation of wealth, legally and ethically". His example made his company to mirror those beliefs, trying his own rewards and measuring his value to the company, to his ability to create wealth, erecting systems for company's wealth to be shared by people.
- 400) (d) The example highlights all given facts about Murthy.
- 401) (c) The passage tells that Murthy views learning not just as amassing data, but as a process that enables him to use lessons from failure to achieve success. This self-corrective loop is what he demonstrates through his leadership during crisis.
- 402) (d) The passage explains that infosys instead of focusing on its initial Business of Banking Software operates with stretch targets setting distant goals and working backwards to get them.
- 403) (d) The passage stipulates that the personal manifestation of openness are inter-alai the practice of always giving complete information whenever any employee, customer, or investor asks for it. Moreover, every infosci on pays taxes and files returns.
- 404) (a) The passage explains that as Infosys approaches the 21st century it is obvious that Murthy's leadership will have to set ever-improving role model for his ever-learning company because men grow old; companies don't.

- 405) (d) The passage explains that Murthy has built a fleet footed human resource management system that treats employees as customers using the resources of organisation to meet their professional and personal needs.
- 406) (a) According to passage infosys is a reflection of its CEO.

PASSAGE 79

- 407) (b) The passage explains that the task of universalising elementary education is complicated by various socio-economic and cultural factors which vary from region to region and within region.
- 408) (d) The passage clarifies that none of the above given options is correct.
- 409) (c) It is evident from the passage that intricacies have not been understood by planners and administrators. The trouble is that education policy has been designed by grizzled Mandrins ensconced in Delhi and is out of touch with ground realities.
- 410) (a) The passage explains that the key to improve education system is to decentralise education planning and implementation. Moreover, greater community involvement is also necessary. Only then school timing be adjusted for convenience, school children be given a curriculum they can relate to and teachers be made accountable.
- 411) (c) The passage tells that Bihar, MP and Rajasthan are the states where education and literacy level are miles below the national average. A number of states have not even notified the compulsory education law.
- 412) (c) The passage reveals that District Primary Education Programme launched in 1994 has met with a fair degree of success in 122 districts. Here village communities are involved in all aspects of education-allocating finances to supervise teachers to fix school timings and developing curriculum and text books through districts planning tenants.
- 413) (d) The passage states that in MP, village panchayats are responsible for not only constructing and maintaining primary schools but also managing scholarships, besides organising non-formal education.
- 414) (c) The passage says that delegating powers to the panchayat is not looked upon too kindly by politicians.

- 415) (d) None of the options mentioned explains the concept of primary education.
- 416) (a) The passage explains the key to improve system is to decentralise education planning and implementation. Moreover greater community involvement is also needed in the process.

PASSAGE 80

- 417) (b) The passage explains that how capitalism has led to disintegration of labour.
- 418) (b) The passage describes that author feels that Adam Smith boasted about something that was undesirable.
- 419) (d) The passage describes that there was a time when pinmakers would buy the material; shape it; make the head and the point; ornament it; and take it to the market; sell it. They knew each and every process from beginning to end but they couldn't afford to sell anybody a piper of pins for the farthing.
- 420) (b) It can be understood that pins are so cheap that if a child steals it, it would not be considered as stealing.
- 421) (a) The author is clearly against machines taking the place of men.
- 422) (c) The passage explains that Adam Smith was the supporter of mass production.
- 423) (b) The passage explains that as people become richer they lose out on individual abilities.
- 424) (c) He is attaching the fact by making fun of it.
- 425) (d) None of the given statements continue with what the author has said in the last paragraph.

PASSAGE 81

- 426) (a) The passage refers to the British Government as the 'Empire' and talks about the way it takes over the foreign territories.
- 427) (a) The passage stipulates that habit of plundering strangers is not the habit of simple tribes who are friendly and honest instead, it is the habit of civilized men where there is no law to restrain their activities.
- 428) (c) The passage explains that capital invested can't be sent abroad as it has been eaten up by the workers. Moreover, it is the freshly saved capital that can be sent out of the country and it goes abroad in the heaps of finished products.

- 429) (d) It can be understood from the passage that civilized empire grows at the expenses of home tax payers, without any intention or approval on their part until real patriotism is centred on their own people and confined on their own country, rulers and their religious faith.
- 430) (b) The passage says that civilized countries practise protection which means they impose heavy taxes on foreign goods.
- 431) (a) The passage states officious means self-important according to the passage.
- 432) (c) The passage explains that though the capitalist seem to come with intention of trade, but soon the gun boats follows to make inquiry and the result after inquiry is that the government is set up in the new land.

PASSAGE 82

- 433) (b) The passage says that moral principles are said to share general transformation. As to the principles of ethics there is no sign of revolution.
- 434) (c) The passage says that Darwin may need not change our ultimate moral ideas.
- 435) (c) The passage reveals that Chief Good refers to the welfare of community realised in its members.
- 436) (b) The passage states that Darwinism may force in some points a correction of our moral views and a return to Non-Christian and perhaps a Hellenic Ideal. Moreover, passage says that Christian ideals are false.
- 437) (a) The passage reveals that the moral code of Christianity, accepted in part; rejected by all saves a few fanatics. But passage states that Christian ideals are false.

PASSAGE 83

- 438) (d) The passage states that university education accessed by the wealthier section is charged at a fraction of cost. Postal services are subsidised and so are Railway Services. Moreover, items from steel to cement are also subsidised. Hence the passage is against all the subsidies.
- 439) (d) The passage reveals the fact that subsidies go to 'rich' and much of tab goes indirectly to poor. It is because the hefty subsidy bill result in fiscal deficit which leads to inflation, which everyone knows hits the hardest to poor.

- 440) (a) The passage explains that many poor can't afford to pay for variety of goods and services. This thesis has not only been applied in poor countries but also in rich countries hence the birth of welfare state in West and an almost utopian social security scheme; free medical care, food aid, old age security.
- 441) (b) The passage says that subsidies do more harm than good according to the author.
- 442) (d) The passage reveals that none of the above statements are correct. All are victims of subsidies.
- 443) (a) It is evident from the passage that the Deva Gowda Government has shown some courage in biting the bullet to the prices of petroleum products.
- 444) (a) The passage says that subsidies are not actually beneficial. Moreover, it says that everybody like free lunch but actually lunch is never free somebody always pays for the lunch. To know the name of payer one must look at country's poor economic performance.
- 445) (c) The passage says subsidy bill results in fiscal deficit which in turn pushes up the rate of inflation which hits the poor the hardest of all i.e. taxmen say that subsidies are most regressive form of taxation.

PASSAGE 84

- 446) (d) The passage says all the above three cells have nuclei in a less differentiated state.
- 447) (a) The contention has been proved to be true.
- 448) (c) The passage states that the point provided is true as for each kind of cells there is a ratio maintained between the volume of the nucleus and that to the cytoplasm.
- 449) (b) The passage explains that unicellular protozoan paramecium are normally binucleate, one of the nuclei serving as a source of hereditary information for the next generation, the other governing the day-to-day metabolic activities of the cell.
- 450) (d) The passage reveals that inner membrane seems to possess a crystalline layer where it abuts the nucleoplasm, but its function remains to be determined.
- 451) (c) The passage clearly says that a polymorphonucleated leukocyte is lobed because for a given volume of nucleus a lobate form provides much greater surfaces area for nuclear cytoplasmic exchange, possibly affecting both the rate and amount of metabolic reaction.

- 452) (b) The passage states that fungi are multinucleate because the cross walls dividing the mycelium into specific cells, are absent or irregularly present.

PASSAGE 85

- 453) (b) The passage does not speak anything about drug addiction which been attributed to the poor by rich.
- 454) (c) The passage explains that people who are generous, public spirited, friendly and don't always think of the main chance, they stay poor when they are born unless they have extraordinary talents.
- 455) (c) The passage says that people who are hard, grasping, selfish, cruel and are always ready to take advantage of their neighbours become very rich.
- 456) (c) The author says that there is no way to judge the goodness or badness of a person.
- 457) (b) It is understood as the author rejects that the wealth is distributed according to merit and feels that it is biased in favour of rich.
- 458) (c) While writing, the author refers to someone as 'intelligent lady' on the subject of wealth distribution which states that this passage is a part of author's letter to someone.
- 459) (a) 'Improvidence' in context of passage means 'extravagance' which means spending too much of money.
- 460) (a) The passage reveals that distributing money according to merit is beyond mortal measurement and judgement.

PASSAGE 86

- 461) (c) The passage states that there may be atleast dozen prime ministerial candidates but the sole personality who stands out therefore is none of the player but umpire. The passage also mentions the assertiveness being shown by election commission regarding code of conduct during election.
- 462) (b) The passage says that no party has sought to do ride 'this' particular wave instead all are on the defensive, desperately evading real issue. No wonder this is an 'issueless' election.
- 463) (d) Ramakrishna Hegde's involvement in any alleged corruption case has not been mentioned in the passage.
- 464) (d) The passage states that almost all of the parties have broken the laws as any party hadn't submitted their audited accounts every year to income tax authorities.

- 465) (a) It is evident that greater awareness among the general public has not been credited with the changes coming in the system.
- 466) (b) The passage mentions that empowerment of women has not been mentioned as having potential to be an issue in the current elections.

PASSAGE 87

- 467) (d) The dismantling of the welfare state helped Gingrich lead to Republican revolution of 1994.
- 468) (b) Money has not been mentioned in the passage. The passage says to win elections, a party obviously need money.
- 469) (d) All of the above are republican.
- 470) (a) The passage explains that republicans were tactically defeated by the democrates.
- 471) (b) The passage basically deals with the mistakes committed by the Republicans and their odd ways of thinking.
- 472) (a) Obsolete means old/antiquated in reference of the passage.
- 473) (c) The passage states that real danger for republican 3 is philosophical and not tactical. It is axiom not just policies, which is under fire.
- 474) (a) The passage reveals that Buchananism holds that what is killing the little guy in America is big guy, not the big government.

PASSAGE 88

- 475) (c) The author mentioned three vehicles a car, a jeep, a snowplough in the passage.
- 476) (c) The weather bulletin has been compared to a ritual ceremony.
- 477) (b) It is evident from the passage that in 1811 Mississippi river flowed Northward briefly because of new Madrid earthquake .
- 478) (b) Instead of being destructive weather is stimulating. It overrides routine and organises people into a shared moment that will become a punctuating memory in their lives.
- 479) (a) The use of language to describe the snow storm reflects the author's fascination with it.
- 480) (b) The passage highlights the fact that these large gestures of nature are political. Hence, the greatest attraction of weather for author is that it is political.
- 481) (a) The author says we go upstairs to consult the weather channels confirms that he is in his house.

482) (b) Weather is not manipulable.

483) (d) 'Undulously' means curved.

PASSAGE 89

484) (d) The passage reveals that Robespierre, Fourier, Owen all are socialist.

485) (a) The passage says that among the two forms of socialism the second must involve more difficulties and many more.

486) (c) The passage states that difference exists in their attitude towards change. The first one believes in gradual change while the other believes in revolutionary change.

487) (c) Both have mentioned as the characteristics of the two persons.

488) (c) The author has not mentioned corruption in high places anywhere in the passage.

489) (b) The passage tells that in the class of revolutionary socialists there are people who propose to themselves a much bolder stroke. Their scheme includes management of all productive resources of country by general government.

490) (a) The passage states some people in class of revolutionary socialists avow as their purpose that the working classes or some body on their behalf, should take possession of all property of the country, and administer it for general benefit.

491) (a) The author does not sympathise with the either of the two sides.

PASSAGE 90

492) (c) The passage explains that philosophy is named in public. Moreover, its existence is proved at least by the defence measures it provokes. Hence, most suitable title for the passage would be 'A defence of Philosophy'.

493) (c) The passage says that philosophy is politely respected because of tradition but despised in secret.

494) (d) The passage doesn't speak that philosophy is immoral.

495) (d) Philosophy makes world a better place to live has not been mentioned anywhere in the passage.

496) (a) If philosophy did not exist, masses would not think for themselves and would thus be easier to manipulate for the politicians.

497) (b) CHAIRS in context of passage refers to departments.

498) (b) The passage says that existence of philosophy is proved by the defence measures it provokes.

PASSAGE 91

499) (a) The passage doesn't speak anything about 'JAWS'.

500) (b) The passage explains that Crichton's book was scarcely much better but at least it had a convincing villain.

501) (c) The passage starts stating 'thanks to God' for films like Jurassic Park and Directors like Steven Spielberg who made it. Hence passage is talking about film review them.

502) (a) Mr. Michael Crichton had made/written the book Jurassic Park.

503) (c) The author praises the film for its technical effects and sophistication at the technological level but is disappointed with its story line.

504) (d) The writer says that 'one leaves it vaguely disappointed'.

505) (a) He is thankful for such films because they fill the cinemas and this lead people to finance films.

506) (d) Options (a) and (b) are not true for Jurassic park.

507) (b) 'Muck about with nature' means 'Interfere with nature' in context of the passage.

PASSAGE 92

508) (c) 'Pundit', in reference to the passage refers to 'an expert'.

509) (a) The passage describes the main problem to be foreign exchange market.

510) (a) Neil Kinnock is the leader of the party.

511) (b) The only way out of exchange problem was if the pound was to survive the coming week inside the ERM, then Smith would have to demonstrate his resolve by raising the interest rate by atleast-2 percent.

512) (d) The passage states that bank of England could exert exormous pressure on government in its policy formation.

513) (b) He wanted to complete his cabinet appointments and to consult his own advisors.

- 514) (a) The passage explains that alternative was to apply to the EC for a Realignment Conference in which many more currencies would be devalued. Moreover, it was not clear if the pound would be devalued sufficiently or if other countries would follow the British lead.
- 515) (c) Mr. Maastricht has not been mentioned as apart of labour cabinet.
- 516) (b) Wrong policies have not been mentioned as the reasons for defeat of conservative parties in the passage.

PASSAGE 93

- 517) (d) The passage basically deals with various Ant Communities which are about 500 in number. It deals with various ant species and their recognition to each other.
- 518) (c) The attitude of ant may be termed as 'Hostile' as they take the strangers to the edge of the moat and drop them into water.
- 519) (d) If they do so they would have been unable to communicate with drunken ants.
- 520) (d) The passage reveals that ants of each nest have a password or sign by which they recognize one another. To test this, the author tried chloroform but it proved to be fatal.
- 521) (a) The author uses clever argument in support of his statements. That's why his writing has a quality of sophistry.

PASSAGE 94

- 522) (b) The passage states that all the other three can pass through the atmospheric 'Windows' without distortion.
- 523) (d) Clouds from volcano eruption have not been mentioned anywhere in the passage.
- 524) (d) The passage states ground-based telescope uses a mounting that makes it possible to neutralize the rotation of Earth relative to stars; with an equatorial mounting driven at a proper speed, the direction of telescope tube can be kept constant for hours while the Earth turns under the mounting.
- 525) (d) The passage tells that gravitational action of Sun and Moon on Earth's equatorial bulge causes the Earth axis to process like a top or gyroscope gradually tracing out a circle on the celestial sphere in about 26,000 years.

- 526) (c) The passage states in addition to the daily spin, gravitational action of Sun and Moon causes much, more gradual effects called precession and nutation.
- 527) (b) It can be inferred that Earth's rotation and orbital motion provide the basic standard direction of stars so that uncertainties in the rate of these motions can lead to quite small but important uncertainties in the measurements of stellar movements.
- 528) (c) It is evident from the passage that Man-made Radio signals have wavelength of more than 20 metres.

PASSAGE 95

- 529) (b) US was more concerned with 'order' than with reforms of any kind.
- 530) (d) The passage describes that other government investment in Latin America ran to four million dollar, while private investment exceeded nine billion. Yet to most Americans all this seemed a form of economic aid, many Latin Americans regarded it as economic imperialism.
- 531) (b) The act of Bogota was most closely related to the Marshall plan or Latin America.
- 532) (c) The passage highlights us preferred dictatorship to the spread of communalism in Latin America.
- 533) (b) The passage states President Eisenhower had tried to mend his Latin American Fences, though rejecting Brazilian proposal of Marshall plan for Latin America. He took the initiative in setting up an inter-American Development Bank. Thus, he was not acting to continue to keep communism from intruding the country.
- 534) (a) The passage states that speeding up Social Reforms implied a risk of revolt which could be avoided by maintaining status quo.

PASSAGE 96

- 535) (b) The passage says that the great majority of officials rose through the examination system.
- 536) (a) The passage explains during Tung-Chin Restoration, the great aim was revival of Confucian values and institutions. But these aims had to be modified so that they may might endure. Restoration statesman had no desire to create a new society they wanted to restore a society that they believed was based on truth.

- 537) (a) The passage says while Western Conservatism believes in sacredness of private property and distrust of cosmopolitanism, the Chinese Conservationism is the defence of rational cosmopolitan order. The only common area of agreement between the two is the intent to conserve.
- 538) (d) Name of these philosophers has been mentioned in the passage.
- 539) (c) The passage says that the aim of restoration was to restore to their original vitality the best of the ancient institutions.
- 540) (c) The passage states Western Conservatives distrusted cosmopolitanism.
- 541) (b) The passage basically talks about Chinese Conservatism. It's meaning, It's relation with Western conservatism.

PASSAGE 97

- 542) (b) The passage says that the 1949 Constitution of India, with 395 Article is the wordiest of all National Constitutions.
- 543) (a) The passage describes that in Israel the balance of advantage has been found to lie with an uncoded Constitution evolving through the growth of custom and medium of statutes.
- 544) (b) The passage explains that institutions in US as Presidential Cabinet and system of political parties though not even mentioned in the written Constitution, are most certainly of constitutional significance.
- 545) (b) The passage tells newly admitted states have very concise and short constitution.
- 546) (b) The passage stipulates in case of Normative Constitution there is the status of supreme laws and is also fully activated and effective.
- 547) (d) The passage explains that Nominal Constitution may express high aspirations but it does not in fact reflect the political realities of the State.
- 548) (c) The passage says that very long constitution says too many things on too many subjects. It must be amended often.
- 549) (b) The passage states that presence or absence of formal written document makes a difference, of course but only one of degree.

PASSAGE 98

- 550) (a) The passage and its tone reveals that the author is well informed and well concerned about the topic of the passage.
- 551) (c) The paper of 'archival quality' refers to a long lasting paper.
- 552) (a) The passage explains that popular demand for paper and commercial need for an economic method of production led to the use of mechanically ground wood pulp.
- 553) (b) The passage stipulates that paper manufactured from wood pulp is highly acidic and therefore inherently unstable.
- 554) (c) This is not a reason mentioned in the passage for producing long lasting paper.
- 555) (a) Purchase of new books by libraries are bound to be curtailed because of drastic reduction in government funding has not been mentioned anywhere in the passage.
- 556) (d) The passage states continued use of wood-pulp will affect libraries by destructing them and hence by providing a cultural loss to the general public. Moreover, it effects printers and publishers by straining the budget by combined impact of Inflation and currency devaluation and hence, there is scarcely any prospect of enlarged government funding.
- 557) (c) It is evident from the passage that paper contains lignin-a major factor in causing paper to discolour and disintegrate.

PASSAGE 99

- 558) (d) It is evident from the passage that Eisaku Sato's eight uninterrupted years as Prime Minister in sixties and early seventies laid ill effect of one man leadership on Japanese Democracy.
- 559) (b) The passage tells that in 1926 Hirohito ascended the throne.
- 560) (a) The passage points out the fact that Mr. Tanaka, the leader, was disgraced on a charge of accepting bribe for the sale of Lockheed aircraft to Japan and Debilitated by physical ailments.
- 561) (b) The passage explains Yasuhiro Nakasone to be the Prime Minister. Moreover, Mr. Nakasone's programme would be the basis of Mr. Takeshita's policies.

- 562) (c) The passage says that Mr. Takeshita has proved himself to be skillful in game of factional politics.
- 563) (c) The author states how Mr. Takeshita will fare after taking over the reins of the government is not certain and has reasoned about this in an objective manner.
- 564) (d) The passage states that quick turnover of Prime Minister has contributed to the functioning of LDP through factions.
- 565) (c) The passage says that most of Erstwhile Prime Ministers are of Urban background. As Mr. Takeshita has been mentioned as Japan's first Prime Minister with a humble rural origin.
- 566) (b) The number of Erstwhile Prime Ministers are three.

PASSAGE 100

- 567) (a) The passage says that the main purpose of Durkheim in his study of suicide was that some aspects of the human behaviour can be explained without reference to individuals.
- 568) (d) All the above mentioned options can explain suicide rates in terms of/within a social entity.
- 569) (e) It is evident from the passage that egoistic suicide is promoted when individual doesn't have sufficient social ties. Since, single adults are not heavily involved with family life they are more likely to commit suicide than married adults.
- 570) (b) The passage tells that anomie suicide is committed when social regulation of the Individual is disrupted. Suicide rate increases during depression.
- 571) (a) The passage tells that Altruistic suicide are more likely to occur when social integration is too strong. The ritual suicide of Hindu widows on their husband's funeral pyres is an example.
- 572) (b) It is evident from the passage that increase in suicide rates during economic depression is anomic suicide.
- 573) (a) The passage says that using data from government population reports of several countries Durkheim stated that altruistic suicide was higher among single than married people, among military than among civilians, among divorced than married people, and among people involved in nationwide economic crises.
- 574) (d) All of the above.
- 575) (b) Durkheim was vindicated on all counts.

PASSAGE 101

- 576) (a) The passage reveals that greater competition led IBM to lose ground from one market to another whereas it led MICROSOFT and INTEL to emerge as computer industry's most fearsome pair of competitors.
- 577) (b) Refer paragraph 4.
- 578) (d) 'Intel' has been mentioned as principal supplier of silicon chips to IBM.
- 579) (b) It is evident from passage that in Europe last year IBM began selling a low cost line of PC's called AMBRA.
- 580) (a) The two companies developed competing softwares.
- 581) (c) Statement (c) is not implied.
- 582) (a) The passage explains that IBM planned development of advanced software and Microprocessors for new generation of Desktop Computers. Although IBM has pledged that new system will eventually run out a variety of machines, it will initially run only computer programme written for apple macintosh or IBM's OS/2.
- 583) (c) The passage describes MICROSOFT to be correct option.
- 584) (c) All companies ultimately regret being a Dr. Frankenstein to some other country.

PASSAGE 102

- 585) (a) The passage speaks that Environmental Protection and Management needs a lot of attention. There is a desirable development in the face of alarming rate of Natural Resource Degradation which hampers their optimum utilisation.
- 586) (b) It is evident from the passage that according to (NEERI) National Environment Engineering and Research Institute a staggering 70% of the water available in the country is polluted.
- 587) (b) It is clear from the passage that municipal sewage pollutants account for 3/4th of Ganga's water pollution load.
- 588) (d) It is clear that all of the above mentioned options are true and correct.

- 589) (d) The passage explains the 'Recent Clean The Ganga Project' with an action plan estimated to cost the exchequer ₹. 250 crore. The action plan evokes such great interest that offers of assistance have been received from France, US, UK, Netherland as also the World Bank.
- 590) (c) According to the passage W.H.O. points 80% of diseases prevalent in India are water-borne. Moreover, it is also estimated that India losses as many as 73 million man-days every year due to water prone diseases, costing ₹. 600 crore by way of treatment expenditure and production losses.
- 591) (d) The passage says that a recent study evolves that water of Ganga, Yamuna, Kali and Hindon cauvery and kapila Rivers had considerable concentration of heavy metals due to inflow of Industrial wastes which pose a serious, health hazard to the millions living on their Bank.
- 592) (c) The passage says that the crisis of drinking water is increasing because water resources are drying up and the lowering of ground water through over pumping; this is compounded by the pollution of water sources.
- 593) (b) The passage talks about the incomplete governments objective of providing safe drinking water and sanitation to all by March 1991. But the best remedy against this shortage is of cleaning up our water resources.
- 594) (a) From the passage it is clear that about 53 per cent of total outlay for water supply would be recovered by rural water supply sector.

PASSAGE 103

- 595) (d) Author's conception of learning space is where a teachers don't only speak but also listen, who not only answer but ask questions and welcome our insight, who provide information and theories that don't close doors, but open news ones, who encourage students to help each other to learn to study.
- 596) (c) The passage says learning space has three dimensions: openness, boundaries and air of hospitality. Moreover, it explains openness of a space is created by firmness of its boundaries. i. e., a learning space can't extend indefinitely. In case it did. It would not be a structure for learning but an invitation for confusion and chaos.
- 597) (d) All of these three reasons are correct.
- 598) (i) The task of creating learning space with qualities of openness, boundaries and hospitality can be approached at several levels. First, is physical arrangement of classroom. At second level teacher creates conceptual space-space with words in two ways. Third may be emotional level.

- 599) (a) According to passage silence helps to unite us with others to create a community of truth.
- 600) (c) The passage starts stating chairs placed in a circular arrangement create an open space within which learners can interconnect. At other level teacher may create conceptual space-space with words in two ways. First ASSIGNED READING not in the form of speed reading several hundred pages but contemplative reading which opens not fills our learning space.
- 601) (d) The passage reveals to teach is to create a space in which obedience to truth is practised. Space may sound a vague, poetic metaphor until we realise that it describes experience of everyday's life. The experience of physical space have parallels in our relations with other.
- 602) (c) The author says that teacher can create conceptual space-space with words in two ways. (i) Assigned reading (2) Lecturing. Assigned reading not in form of speed reading several hundred pages but contemplative reading which opens not fills our learning space. And through lectures by providing critical information and framework of interpretation, a lecturer lays down boundaries within which learning occurs.
- 603) (a) The passage stipulates two ways of creating conceptual space are assigned reading and through lectures.
- 604) (b) The passage explains that teachers must also create emotional space in the class room, space that allows feelings to arise. In an emotionally honest learning space one created by a teacher who doesn't fear dealing with feelings, the community of truth can flourish between us and we can flourish in it.

PASSAGE 104

- 605) (c) The passage stipulates that management education gained new academic stature with us universities and greater respect from outside during 1960's and 1970's.
- 606) (b) The passage provides by the 1980's however, us business school faced criticism who charged that learning had little relevance to real business problems.
- 607) (b) It was due to the gain in academic stature.
- 608) (c) The passage states that management education did not face the criticism that it was irrevocably relevant.
- 609) (b) The passage describes that by 1980's US business school faced criticism who charged that learning had little relevance to real business problems.

- 610)** (a) The passage says that A 1960 survey of Japanese Senior Executives confirmed that a majority (54%) believed that 'Managerial Capabilities can be attained only on the job and not in the universities'.
- 611)** (a) It can be inferred from the passage that Japanese educational system is highly developed and intensely competitive and can be credited for raising the literary and Mathematical abilities of Japanese to the highest level in the world.
- 612)** (d) The passage describes that in the 1980's a combination of increased competitive pressures and greater multinationalisation of Japanese business are making it difficult for many companies to rely solely upon internally trained managers.
- 613)** (b) The passage states that Japanese corporation have not been interested in using either Local or foreign business school for development of their future executives. In company training programmes have sought the socialisation of Newcomers, the youngers the better.
- 614)** (a) The passage reveals that in 1982-83 Japanese comprised the largest single group of foreign students at Wharton, where they do not only learn the latest technique of financial analysis but also developed world-wide contacts. Hence, it is said that Japanese do not 'do without' business schools as it is sometimes contended.
- 615)** (d) The difference lies in the process of selecting and orienting new recruits.
- 616)** (b) The passage reveals the fact that the harmony among the traditional elements has made the Japanese Industry highly productive and has given corporate leadership a long term view.

PASSAGE 105

- 617)** (c) Option (a) can be inferred from the first sentence of paragraph 5. The author's description of the way in which some of his friends enjoyed two two-cent ice creams at the same time, helps us infer (b). According to the author, the act of enjoying the ice creams was almost like a celebration. Refer to paragraph 6 "the... consumer civilisation pretends to give more ...what is worth four cents" - option (d) is mentioned. Option (e) is clearly stated in the first sentence of paragraph 6. Option (c) cannot be inferred because the author mentions in the fourth paragraph that the justification provided by elders was 'mendacious' or false. Hence, (c).
- 618)** (d) The word 'parvenu' means 'upstart', i.e., a person who has risen suddenly from a humble position to a position of wealth or consequence, but who has not yet gained the manner associated with this new position. In the passage 'little parvenus' refers to people who splurge inappropriately. Hence, (d).
- 619)** (b) Option (a) contradicts what is said in the passage, and (c) cannot be inferred at all. While (c) and (d) may be partially correct, the most comprehensive reason is (b), i.e. 'intemperance', which means lack of moderation or excessive indulgence. Refer to paragraphs 3 ('sumptuously enviable') and 5 ('two ice creams suggested excess'). Hence, (b).
- 620)** (b) Refer to the last two paragraphs. The penultimate paragraph begins with the quoted sentence, and the example given in the last paragraph clearly indicates that the concept of morality has changed over the years. Options (a) and (c) are exaggerations, and (d) and (c) are outside the purview of the passage. Hence, (b).
- 621)** (a) Refer to the last sentence of paragraph 4: the author thinks that the real reason his elders refused to allow him two ice cream cones at once was 'cruelly pedagogical', i.e. one intended to teach him something - in other words, 'didactic'. Note that the author thinks that (b) cannot possibly be the reason, and the other options are completely out of context. Hence, (a).

PASSAGE 106

- 622)** (e) The author starts the passage by negating the popular view of language as stated in option (a) and (c). He then goes on to explicitly negate (b) in paragraph 2. (d) is also stated in the same paragraph. However, in paragraph 1, he states that (e) is the belief of some cognitive scientists, not of people in general. Hence, (e).
- 623)** (b) The spider-web analogy emphasises the author's point that language is an instinct in human beings, not something that has to be consciously taught or learnt. Options (a), (c), (d) and (e) all pertain to animals doing something they have learnt or been trained to do. Only (b) pertains to an animal instinct. Hence, (b).
- 624)** (b) Refer to the last sentence of paragraph 2: option (b) is explicitly stated. On the other hand, (a), (c) and (d) are either not stated at all, or cannot be inferred to be unique to human beings. Hence, (b).

- 625) (a) Refer to the first paragraph. According to the author, language ‘develops in the child spontaneously’. This indicates option (a) as the answer. Hence, (a).
- 626) (d) Option (a) is a minor point, and (e) is not mentioned anywhere. (b) and (c) are only partially correct. Only (d) is the main idea that the author tries to convey through the passage. Hence, (d).

PASSAGE 107

- 627) (a) Refer to paragraph 2, the first sentence, where option (a) is clearly stated in the context of Rwanda and Haiti. (b) is mentioned only later in the paragraph, while the other options are not mentioned at all. Hence, (a).
- 628) (d) Anthropogenic’ means caused or produced by humans. Therefore only option (d) conveys the correct meaning. Hence, (d).
- 629) (c) Refer to the second half of the 3rd paragraph: option (c) is clearly mentioned as the reason the drought at the time of the Maya collapse had a different impact. Hence, (c).
- 630) (d) Refer to the first paragraph: according to the author, Maya archaeologists still have different opinions as to what caused the Maya collapse, and which reason was most important. This implies (d) as the answer. Options (a), (b) and (c) cannot be inferred, and are irrelevant. Hence, (d).
- 631) (e) Options (a) to (d) have been mentioned in the course of the passage. (e) distorts the information in the passage: only the kings and nobles have been mentioned as being focused on short-term concerns, and not the entire Maya population. Hence, (e).

PASSAGE 108

- 632) (c) Refer to paragraph 1, the sentence ‘Many of the concepts of modern art ... certain times and certain places.’ (c) is a paraphrase of the same. Hence, (c).
- 633) (e) Options (a) and (c) contradict the positive attitude of the author towards ‘fossils’ and their worth. (d) is too literal. The word ‘historic’ in (b) is misleading, as it implies a significant event, which is not necessarily what the author implies. Only (e) appropriately encapsulates the metaphorical meaning of the word ‘fossil’ as it is used in the passage. Hence, (e).
- 634) (a) Refer to paragraph 1, the second sentence, where option (a) is clearly stated. Hence, (a).
- 635) (d) Refer to paragraph 1, the sentences ‘Briefly then ... spiritual experience.’ This is what is summarised in option (d). (b) and (c) are only partial answers, (a) is irrelevant, and (e) is not mentioned at all. Hence, (d).
- 636) (e) Refer to the last paragraph, the last two sentences. Options (a) and (d) contradict what is stated in the passage. (b) and (c) are incomplete, as they neglect to mention how the past influences can be shaped to meet present needs. Only (e) covers all these points. Hence, (e).

Practice Sets

1-3

CAT

Common Admission Test

Practice Set 1

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carries equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

Section I Verbal Ability and Reading Comprehension

Directions (Q. Nos. 1-24) Read the following passage carefully and then choose the most suitable option from the given ones.

Passage 1

The origin of India's foreign trade can be traced back to the age of the Indus Valley civilization. But, the growth of foreign trade gained momentum during the British rule. During that period, India was a supplier of food stuffs and raw materials to England and an importer of manufactured goods. However, organized attempts to promote foreign trade were made only after Independence, particularly with the onset of economic planning. Indian economic planning completed five decades. During this period; the value, composition and direction of India's foreign trade have undergone significant changes. In early 1990s, the Indian economy had witnessed dramatic policy changes. The idea behind the new economic model known as Liberalization, Privatization, and Globalization in India (LPG), was to make the Indian economy one of the fastest growing economies in the world. An array of reforms was initiated with regard to industrial, trade and social sector to make the economy more competitive. Earlier India was afraid of global companies and the government ensured high tariff barriers. But, now the scenario is changing and the competition is looked at from the holistic angle.

Post 1991, India faced the worst economic crunch in terms of its FOREX reserves. Foreign exchange crunch made India close to defaulting on loans. The response was a slew of domestic and external sector policy measures partly prompted by the immediate needs and partly by the demands of the multilateral organisations, it was none other than the Finance Minister Dr. Manmohan Singh who gifted India with liberalization. The License Raj and the large number of trade barriers were intended to be done away with. Opening up the economy (to MNCs and foreign investors) including the core and financial sectors to private and foreign companies transformed India into a land of opportunities. The Industrial Policy of 1991 drastically affected the growth of Indian businesses by making trade boundaries more permeable. India is fast emerging as a global leader, what with its vast, natural resources, and huge base of skilled manpower.

Combined with cutting edge technology, Indian trade market is making its presence felt all across the world. Indian products and services are seen as of international standards and globally competitive. Trade in India has made good progress on liberalizing trade regimes and cutting tariffs since the recent times, when most of the countries started with reforms.

1. Pick the incorrect statement from the ones given below:
 - (a) Earlier India was not afraid of global companies and the government had to ensure high tariff barriers.
 - (b) The origin of India's foreign trade can be traced back to the age of the Indus Valley civilization.
 - (c) Post 1991, India faced the worst economic crunch in terms of its FOREX reserves.
 - (d) The License Raj and the large number of trade barriers were intended to be done away with after 1991.
2. The industrial policy of 1991 was intended to
 - (a) To discourage foreign businesses from entering India
 - (b) To provide investment options to domestic corporations
 - (c) To make India's trade boundaries non-permeable
 - (d) To end License Raj
3. The idea behind the new economic model known LPG was
 - (a) To restrict new reform measures
 - (b) To send foreign companies away from India
 - (c) To act as a catalyst for the Indian economy
 - (d) To impose high tariff barriers

Passage 2

Rural India face serious shortages - power, water, health facilities, roads, etc - these are known and recognized. However, the role of technology in solving these and other problems is barely acknowledged and the actual availability of technology in rural areas is marginal. The backbone of the rural economy is agriculture; which also provides sustenance to over half the country's population. The "Green Revolution" of the 1970s was, in fact, powered by the scientific work in various agricultural research institutions. **Which** some **fault** the Green Revolution for excessive exploitation of water and land resources through overuse of fertilizers, it did bring about a wheat surplus and prosperity in certain pockets of the country.

In rural India today, there is a **dire** inadequacy of both science (i.e. knowledge) and technology (which derives from science and manifests itself in physical form). The scope to apply technology to both farm and non-farm activities in rural areas is huge, as are the **potential** benefits. In fact, crop yields are far lower than what they are in demonstration farms, where science and technology are applied more. Technologies that reduce power consumption of pumps are vital; unfortunately, their use is minimal, since agricultural power is free or largely subsidized. Similarly, there is little incentive to optimize through technology or otherwise-water use, especially in irrigated areas (a third of total arable land), given employment and incomes, but at present deployment of technology is **marginal**. Cold storage and cold-chains for transportation to market is of great importance for many agricultural products particularly-fruits and vegetables but are non-existent. These are clearly technologies with an immediate return on investment, and benefits for all; the farmer, the end-consumer, the technology provider. However, regulatory and structural barriers are holding back investments.

Power is a key requirement in rural areas, for agricultural as well as domestic uses. Technology can provide reliable power at comparatively low cost in a decentralized manner. However, this needs to be upgraded and scaled in a big way, with emphasis on renewable and non-polluting technologies. Reliable and low cost means of transporting goods and people is an essential need for rural areas. The bullock-cart and the tractor-trailer are present vehicles of choice. Surely, technology can provide a better, cheaper and more efficient solution? Information related to commodity prices, agricultural practices, weather, etc., are crucial for the farmer. Technology can provide these through technology mobile phones, which is a proven technology; however the challenge to ensure connectivity remains. Thus, there is a pressing need for technology as currently, economic growth though skewed and **iniquitous**, has created an economically attractive market in rural India.

4. According to the author, which of the following is/are the problem/s facing India's rural population?
 - (1) Unavailability of healthcare facilities.
 - (2) The technological advancements which have been borrowed from abroad have not been suitably adapted to the Indian scenario.
 - (3) Lack of awareness about the importance of utilizing technology in the agricultural sector.
- (a) Only (1)
 - (b) Only (3)
 - (c) Both (1) & (2)
 - (d) Both (1) & (3)

5. Which of the following is not an impact of the Green Revolution?
- (a) Over utilization of water resources
 - (b) Application of scientific research only in demonstration farms
 - (c) Wealth creation restricted to certain areas
 - (d) Damage caused to land by inordinate use of fertilizers
6. Why is there no motivation to reduce power consumption?
- (a) Freely available renewable sources of energy
 - (b) Government will have to subsidize the cost technology required to reduce power consumption.
 - (c) Power distribution has been decentralized
 - (d) The cost of implementing power saving technology is exorbitant for the customer.

Passage 3

A new analysis has determined that the threat of global warming can still be greatly diminished if nations cut emissions of heat-trapping greenhouse gases by 70% this century. The analysis was done by scientists at the National Center for Atmospheric Research (NCAR). While global temperatures would rise, the most dangerous potential aspects of climate change, including massive losses of Arctic sea ice and permafrost and significant sea-level rise, could be partially avoided. "This research indicates that we can no longer avoid significant warming during this century," said NCAR scientist Warren Washington, the study paper's lead author. "But, if the world were to implement this level of emission cuts, we could stabilize the threat of climate change", he added.

Average global temperatures have warmed by close to 1 degree Celsius since the pre-industrial era. Much of the warming is due to human-produced emissions of greenhouse gases, predominantly carbon dioxide. This heat-trapping gas has increased from a pre-industrial level of about 284 parts per million (ppm) in the atmosphere to more than 380 ppm today. With research showing that additional warming of about 1 degree C may be the threshold for dangerous climate change, the European Union has called for dramatic cuts in emissions of carbon dioxide and other greenhouse gases.

To examine the impact of such cuts on the world's climate, Washington and his colleagues ran a series of global studies with the NCAR-based Community Climate System Model (CCSM). They assumed that carbon dioxide levels could be held to 450 ppm at the end of this century. In contrast, emissions are now on track to reach about 750 ppm by 2100 if unchecked. The team's results showed that if carbon dioxide were held to 450 ppm, global temperatures would increase by 0.6 degrees Celsius above current readings by the end of the century. In contrast, the study showed that temperatures would rise by almost four times that amount, to 2.2 degrees Celsius above current readings, if emissions were allowed to continue on their present course. Holding carbon dioxide levels to 450 ppm would have other impacts, according to the climate modeling study. Sea-level rise due to thermal expansion as water temperatures warmed would be 14 centimetres (about 5.5 inches) instead of 22 centimetres (8.7 inches). Also, Arctic ice in the summertime would shrink by about a quarter in volume and stabilize by 2100, as opposed to shrinking at least three quarters and continuing to melt, and Arctic warming would be reduced by almost half.

7. What would NOT be one of the impacts of cutting greenhouse gas emissions?
- (a) Temperatures will stop soaring
 - (b) Ice in the Arctic sea would melt at a slower pace
 - (c) The rise in sea level would be lesser
 - (d) None of the above
8. What would be the impact of holding the carbon dioxide level at 450 ppm at the end of this century?
- (1) Global temperatures would increase by 0.6 degrees Celsius.
 - (2) Arctic warming would be reduced by half.
 - (3) Thermal expansion will stop completely.
- (a) Only (1)
 - (b) Only (1) and (2)
 - (c) Only (2) and (3)
 - (d) All the three (1), (2) and (3)
9. What does the scientist Warren Washington mean when he says "we could stabilize the threat of climate change"?
- (a) Climate change can be stopped completely.
 - (b) Climate change can be regularized
 - (c) Climate change and its effects can be studied extensively.
 - (d) The ill-effects of the change in climate can be minimized
10. Why has the European Union called for dramatic cuts in carbon dioxide and greenhouse gas emissions?
- (a) As global warming is not an issue of concern.
 - (b) As the temperatures may rise almost by an additional one degree and this may lead to severe climate change.
 - (c) As the NCAR has forced the European Union to announce the cuts.
 - (d) As all the nations have decided to cut emissions of carbon dioxide.

- 11.** Why did Washington and his colleagues conduct a series of studies?
- Because they realized that the temperature increase was almost about a degree
 - So that they could stabilize the climate change
 - So that they could help the European Union in cutting the carbon dioxide emissions
 - None of these
- 12.** What would be the impact of unchecked greenhouse gas and carbon dioxide emissions?
- The temperature would rise from the current temperature by 2.2 degrees Celsius
 - The sea-level would rise by about 5.5 inches
 - The arctic ice would stabilize by 2100
 - The arctic ice would reduce by one-fourth

Passage 4

Two principles are involved in the controversy about the presence of foreign controlled media in the country; the free flow of ideas and images across national borders and the need to safeguard the national interest and preserve cultural autonomy. Both are valid but both are at loggerheads because each has been used to promote less lofty goals.

The first principle conforms to a moral imperative: freedom to expression cannot rhyme with restrictions imposed by any government. But, the free flow rhetoric also clouds the fact that the powerful Western, and especially American media, can and often do present, subtly or brazenly, news in a manner that promotes Western political, ideological and strategic interests. Besides, Western entertainment programmes present lifestyles and values that run counter to the lifestyles and values cherished by traditional societies. All this explains why so many Indian newspapers, magazines and news agencies have sought protection from the courts to prevent foreign publications and news agencies and operating in the country.

Their arguments are weak on two counts. As the bitter debate on a new world information and communication order demonstrated in the late seventies and early eighties, many of those who resent Western 'invasion' in the fields of information and culture are no great friends of democracy. Secondly, the threat of such an 'invasion' has been aired by those media groups in the developing countries that fear that their business interests will be harmed if Western groups, equipped with large financial and technological resources and superior management skills, are allowed to operate in the country without let.

The fear is valid but it goes against the grain of the economic reform programme. The presence of foreign newspapers and television channels will increase competition, which, in the course of time, can only lead to the upgradation of dynamic Indian newspapers and television channels, even while they drive the rest out of the market. One way to strike a balance between the two antagonistic principles would be to allow foreign media entry into the country, provided the India state treats them at par with the domestic media on all fronts. On the import of technology, for instance, foreign media cannot be allowed duty concessions denied to their Indian counterparts. Foreign media will also have to face legal consequences should they run foul of Indian laws.

Why, for example, should the BBC, or Time magazine or The Economist get away by showing a map of Kashmir, which is at variance with the official Indian map? Why should they go scot-free when they allow secessionists and terrorists to air their views without giving the government the right to reply, or when they depict sexually explicit scenes, which would otherwise not be cleared by the Censor Board? Since the government can do precious little in the matter, especially about satellite broadcasts, what if it should consider attaching the properties of the offending parties? Demands of this kind are bound to be voiced unless New Delhi makes it clear to the foreign media that they will have to respect Indian susceptibilities, especially where it concerns the country's integrity and its culture. It may be able to derive some inspiration from France's successful attempts in the recent GATT to protect its cinematography industry.

- 13.** Which of the following is one of the points weakening the argument to prevent the entry of foreign media?
- Such entry would be against traditional culture
 - The threat is being voiced by those whose business will be harmed by such an entry
 - The arguments being put forth are at loggerheads
 - The foreign media may not be treated on par with the domestic media
- 14.** What will be the impact of increasing competition?
- The domestic media will not be able to withstand it
 - The foreign media will not be allowed duty concessions on import of technology
 - It will improve Indian newspapers and television
 - The Indian newspapers and news agencies will seek protection from the court

15. Which of the following has been cited as having succeeded in protecting country?
(a) GATT (b) News Agencies
(c) Television (d) None of these
16. Which of the following has been the major recommendation regarding the entry of foreign media?
(a) It should not be allowed
(b) It should be welcomed without putting any restrictions
(c) Allow entry, treating them on par with domestic media
(d) Allow entry, provided they do not ask for duty concessions on import of technology
17. In the controversy, involving two principles, regarding allowing foreign media, which of the following is against its entry?
(a) Free flow of ideas
(b) Preserve culture
(c) Government restrictions
(d) Security across national borders
18. According to the passage, which media in particular promotes Western interests?
(a) American (b) Foreign
(c) French (d) Western

Passage 5

Despite the best efforts of those responsible for preventing fraud, one inevitable reality remains: “fraud happens.” Because fraud and misconduct can occur at various levels in any organization, it is essential that appropriate preventive and detective techniques are in place. Although fraud prevention and detection are related concepts, they are not the same. While prevention encompasses policies, procedures, training, and communication, detection involves activities and programs designed to identify fraud or misconduct that is occurring or has occurred. Although preventive measures cannot ensure that fraud will not be committed, they are the first line of defense in minimizing fraud risk.

One key to prevention is making personnel throughout the organization aware of the fraud risk management program, including the types of fraud and misconduct that may occur. This awareness should enforce the notion that all of the techniques established in the program are real and will be enforced. The ongoing communication efforts could provide information on the potential disciplinary, criminal and civil actions that the organization could take against the individual. With this in mind, prevention and deterrence are interrelated concepts. If effective preventive controls are in place, working and well-known to potential fraud perpetrators, they serve as strong deterrents to those who might otherwise be tempted to commit fraud. Fear of getting caught is always a strong deterrent. Effective preventive controls are, therefore, strong deterrence controls.

The system of internal controls in an organization is designed to address inherent business risks. The business risks are identified in the enterprise risk assessment protocol and the controls associated with each risk are noted. COSO’s Enterprise Risk Management Integrated Framework describes the essential ERM components, principles and concepts for all organizations regardless of size.

Establishing internal controls may not address all of an organization’s fraud risks. Fraud risks, although a form of business risk, necessitate specific controls to mitigate them, which makes an organization’s fraud risk assessment process essential to fraud prevention. In addition to implementing fraud preventive controls, it is important that the organization assess and continuously monitor their operational effectiveness to help prevent fraud from occurring.

Prevention is the most proactive fraud-fighting measure. The design and implementation of control activities should be a coordinated effort spearheaded by management with an assembled cast of employees. Collectively, this cross section of the organization should be able to address all of the identified risks, design and implement the control activities and ensure that the techniques used are adequate to prevent fraud from occurring in accordance with the organization’s risk tolerance. The ongoing success of any fraud prevention program depends on its continuous communication and reinforcement. Stressing the existence of a fraud prevention program through a wide variety of media posters on bulletin boards, flyers included with invoices and vendor payments and articles in internal and external communications get the message out to both internal and external communities that the organization is committed to preventing and deterring fraud.

Among the many elements in fraud prevention are HR procedures, authority limits and transaction level procedures. An organization’s HR function can play an important role in fraud prevention by implementing the following procedures. A key business and fraud risk in any organization lies in the people hired to operate the business and promoted into positions of trust and authority. For that reason, it is important to know employees in order to evaluate their credentials and competence, match skills to the job requirements and be aware of any issues of personal integrity that may impact their suitability for the position. Much can be learned about an individual through confirmation of

work history and education presented on a job application or resume or in follow-up with references provided. It is possible to find false or embellished information or undisclosed history and reputation that may represent increased and possibly unacceptable risk.

19. According to the passage, what is the fundamental difference between fraud prevention and fraud detection?

- (a) Background checks should also be performed on new and existing suppliers, customers and business partners to identify any issues of financial health, ownership, reputation and integrity that may represent an unacceptable risk to the business.
- (b) prevention means to stop something from happening, while detection means to figure out the cause of an action
- (c) prevention is not to allow data exchange and detection is to identify the problem
- (d) prevention encompasses policies, procedures, training and communication, detection involves activities and programs designed to identify fraud

20. What will be an appropriate title for this passage?

- (a) Corruption and its repercussions
- (b) Fraud: analysis and recommendations
- (c) Fraud: prevention and detection
- (d) Corruption and hierarchy

21. How the HR department of an organization can play vital role in the prevention of fraud in the company?

- (a) by announcing yearly appraisal and spreading the goodwill among the employees
- (b) by highlighting the activities that are unfavorable in terms of finance
- (c) by evaluating employee's credentials and competence, and being aware of any issues of personal integrity, confirmation of work history and education presented on a job application
- (d) the company can hire a detective to understand the fraud patterns

22. What is the strong deterrent for fraud according to this passage?

- (a) the fear of getting caught
- (b) the fear of not getting paid
- (c) the feeling of being marginalized
- (d) the HR policies and its repercussions

23. Apart from the employees, who are the other entities that have been suggested to keep a watch on fraud purposes?

- (a) the lower-class employees and the transport department of the organization
- (b) on new and existing suppliers, customers and business partners to identify any issues of fraud
- (c) the foreign members for hawala money and other transactions
- (d) high echelon and lower strata of the organization

24. In the following question, find the word that is most similar in the meaning to the word "mitigate"?

- (a) benefactor
- (b) attenuate
- (c) benevolent
- (d) vitriolic

Directions (Q. No. 25-28) Arrange the following sentences in the correct order.

- 25.**
1. Let us take a look at the manner in which the traditional bank adds value to the customer.
 2. The ability to retain deposits, in itself, is not enough to ensure long-term survival and growth.
 3. The ability to deploy invested funds into productive economic activity at a higher rate of return, hence contributing to the prosperity of both the economy and the institution, is the other loop in the banking cycle.
 4. Further, as only a small portion of the actual deposit base is retained with the bank in a liquid form, the very survival of the bank lies in building enough trust with its clientele so as to prevent the occurrence of a sizeable chunk of simultaneous customer withdrawal (a run on the bank).
 5. The bank's basic job is risk absorption- it takes money, which has a lot of attached risk and provides the customer an assured rate of return.
- 26.**
1. They argue that it is this, which has led to the bankruptcy in many states.
 2. Here was a commission whose members worked very hard, did exemplary research and homework, before coming up with a list of recommendations that balanced economic efficiency with safety nets for disadvantaged labour.
 3. It reminds us of the political shenanigans during the implementation of the Fifth pay Commission.
 4. How many times have you heard experts, politicians and the finance minister refer to the implementation of the pay hikes following the commission's report as the singular cause for the increase in government expenditure?
 5. Barring P. Chidambaram, who was then finance minister, every single political party and politician opposed the implementation of the recommendations and are directly responsible for the current fiscal crises in the Centre and the states.

- 27.** 1. The general impressions that skilled negotiators seem to convey is they are people who keep their cards close to their chest and do not reveal their feelings.
2. Hence, they used a surrogate method- they countered the number of times that the negotiators talked about their feelings or motives.
3. This contrasts sharply with the amount of information given about external events such as facts, clarifications and general expressions of opinion.
4. The results showed that contrary to the general impressions, skilled negotiators are more likely to give information about internal events than are average negotiators.
5. Feelings are in themselves not observable and Huthwaite's researchers could not measure them directly.
- 28.** 1. Ignorance is the opposite of knowledge, i.e., want of knowledge.
2. To deal with uncertainty and ignorance economists have recognized the entrepreneur as possessing this non-rational form of knowledge.
3. Like some ancient priest-king, the entrepreneur 'knows' the future and leads his people.
4. Entrepreneurial knowledge is essentially intuitive.
5. It involves seeing and realizing a vision of future markets, products and/or other opportunities.

Directions (Q. No. 29-31) The sentences given in this question, when properly sequenced, form a coherent paragraph. Identify the odd one out. Choose its number as your answer.

- 29.** (a) Picking up where *The Hands of History* left off, Simon Hoggart's brilliant new collection of parliamentary sketches takes us from the dying days of Tony Blair's leadership, through the shadow-filled days of Gordon Brown and on to the utterly bewildering days of that comedy double-act Cameron and Clegg.
- (b) He is a striking representative of a great British tradition, of something we do well and where he stands with his own heroes, George Cruikshank and Thomas Rowland son.
- (c) Above all, he gives us incisive and witty pen-portraits of those responsible for our plight: the belligerent Brown, the unintelligible Prescott, the slippery Cameron and the bemused Miliband.
- (d) He charts the events that made the news, the faux-pas that should have and the myriad mistakes that have landed us all where we are now.

- 30.** (a) Taking his own ignorance as a given, his style of dogged questioning of every certainty and his huge influence over the youths of Athens led to his trial, his defiant comment that "the unexamined life is not worth living for a human being" and ultimately to his execution by hemlock.
- (b) Socrates established a method of probing into the eternal questions of existence and morality by relentless inquiry and debate.
- (c) His demeanour is gentle and slow but his endless questioning of moral norms puts him in direct conflict with authority.
- (d) Socrates is never mentioned in this book and it's not necessary to know anything about him but the parallels are obvious.
- 31.** (a) For this was Dickens with the laughter taken out.
- (b) That *Great Expectations* achieve its seriousness of purpose by sometimes comic means that the language bursts with life, that its gusto leaves you breathless and its shame makes the pages curl that you are implicated in every act of physical and emotional cruelty to the point where you don't know who's the more guilty, you or Pip, you or Orlick, you or Magwitch, goes without saying if you are a reader of Dickens.
- (c) But you would never have guessed any of these things from the BBC's adaptation.
- (d) We must guess that the BBC is embarrassed by the eccentricity of the writing, the hyperbole of the characterization, the wild marginalia and the lunatic flights of fancy?

Directions (Q. No. 32-34) The passage given below is followed by four alternative summaries. Choose the option that best captures the essence of the passage.

- 32.** Orchids can be so difficult to grow that even professional horticulturalists have trouble keeping them alive. And yet orchids are the largest family of flowering plants in existence, comprising 30,000 different species and more than 200,000 hybrid varieties.

Much of this presence has to do with the orchid's ability to thrive in different environments, particularly in the tropics. Nevertheless, orchid lovers who live in colder climates shouldn't be discouraged. With proper equipment and care, many species of orchids can thrive in home environments.

- (a) Horticulturists who wish to grow orchids will have greater success doing so in tropical environments rather than in cold climates.
- (b) Despite the difficulty in cultivating them, orchids can flourish when grown by horticulturists who have the correct equipment.

- (c) Despite the difficulty in cultivating them, orchids belong to a large family, of which some species can grow well in various locations when cared for correctly.
- (d) While there are numerous types of orchids, they cannot be grown outside of homes in the tropics, though many horticulturists attempt to do so.

- 33.** While many students of history associate trench warfare with the First World War, its history actually goes back to the 1600s. At that point, French strategist and engineer Sebastien Le Prestre de Vauban invented and used an early version of the system to attack fortresses.

The increasing power of guns and cannons made development of the trench system more viable by the 18th century, when soldiers in the American Civil War increasingly relied on it. Trench warfare did reach its maximum utilization during the First World War, when trenches shielding millions of soldiers ran along the border of France, from Belgium to Switzerland. The introduction of the military tank in 1918, which did not break down in the face of gunfire, effectively put an end to the viability of this strategy.

- (a) The invention of tanks in 1918 effectively put a stop to trench warfare, which had been going on for more than 300 years in Europe.
- (b) Trench warfare was more common than often thought between 1600 and 1900, as technologies improved and then ended its effectiveness.
- (c) Sebastien Le Prestre de Vauban showed a lack of forethought when planning and designing the trench system.
- (d) Trench warfare took place not only in Europe, but also in the United States, which most people do not realize.

- 34.** While many national fables' origins are shrouded in myth, Great Britain's King Arthur appears to have been a real historical figure at one point, although the legends surrounding him may be more fantasy than fact. Even today, King Arthur provides for his country through a booming tourist industry.

Dozens of attractions claim to be the site of the "real" Camelot, round table, or grave of Arthur and/or his wife Guinevere. Perhaps most famous among these is Glastonbury Abbey, in Western England, where Arthur is supposed to be buried between two stone pyramids, supposedly having died at the hand of his illegitimate son murdered in the battle of Camlann.

Aside from issues of DNA verification with no known living ancestors, many would consider digging in this sacred site a sacrilege, leaving visitors to wonder eternally whether the "Once and Future King" actually rests there.

- (a) Though King Arthur may have been a real person, it has been difficult to substantiate these claims due to lack of evidence.
- (b) Although most people do not believe it, King Arthur was a real person who probably lived near Glastonbury Abbey.
- (c) Mythical figures should not be conflated with mythical figures unless those making the claim can offer evidence.
- (d) Glastonbury Abbey may be the site of King Arthur's court but there are many other places in Great Britain that could also be the location.

Section II Data Interpretation and Logical Reasoning

Directions (Q. Nos. 35-38) Nine horses participated in a horse tournament. Five races were held in this tournament. The winner of a race gets 5 points, 2nd gets 3, and the 3rd gets 1.

1. The table gives the points tally at the end of the races.

Horse	A	B	C	D	E	F	G	H	I
Points	5	5	8	2	5	6	4	10	0

One race is held between five horses. The first race is held among the first 5 horses from the left in the above table. In the next race, out of these horses, A drops out of the race and a new horse F enters into the race. In the next race, B drops out and G enters and so on. It is also given that H is the only horse that scored in 2 consecutive races.

- 35.** What was the position of horse F in race 4?

- (a) 4th (b) 2nd
(c) 3rd (d) Cannot be determined

- 36.** What is the ratio of the points scored by G and E in race 5?

- (a) 1:3 (b) 3:1
(c) 1:5 (d) Cannot be determined

- 37.** The first 3 rankers of race 3 are

- (a) C, E, G (b) D, E, F
(c) C, G, E (d) Either A or C

- 38.** D could have come third in which of the following races?

- (a) Race 1 (b) Race 3
(c) Race 4 (d) Race 5

Directions (Q. No. 39-42) Read the following passage and solve the questions based on it.

Five friends—Umesh, Vishnu, Xinhua, Yogesh and Zeta collected pebbles on the sea shore. They collected a total of 100 pebbles.

None of them collected less than 10 pebbles each. No two among them collected the same number of pebbles. Following information is given regarding the number of pebbles with each one of them

- (i) Umesh collected the same number of pebbles as Vishnu and Xinhua put together.
- (ii) Xinhua collected 3 more pebbles than the cube of an integer.
- (iii) The number of pebbles collected by Umesh was the square of an integer.
- (iv) The number of pebbles collected by Vishnu was either the square or the cube of an integer.
- (v) The number of pebbles collected by Yogesh and Zeta are in the ratio 4 : 3.

39. What was the number of pebbles collected by Umesh?
40. What was the number of pebbles collected by Vishnu?
41. What was the difference in the number of pebbles collected by Xinhua and Yogesh?
42. How many of the individual collection(s) of pebbles was/were prime numbers?

Directions (Q. No. 43-46) Go through the table below and solve the questions based on it.

The chart gives details of flights operated by Indian Airlines in a week from Delhi to various destinations and back.

From	To	Days	Departure	Arrival
Delhi	Coimbatore	Daily	6: 20	7: 35
Delhi	Coimbatore	2, 4, 6	19: 15	21: 15
Delhi	Cochin	Daily	9: 45	11: 20
Delhi	Madurai	1, 3, 5	20: 00	21: 40
Delhi	Mangalore	3, 7	9: 45	13: 20
Delhi	Mangalore	1, 3, 5	7: 00	9: 25
Delhi	Bengaluru	1, 3, 5	9: 30	10: 25
Delhi	Bengaluru	2, 4, 6	9: 30	10: 25
Delhi	Bengaluru	1, 3, 5	7: 00	7: 55
Delhi	Goa	2, 4, 6	9: 30	14: 00
Delhi	Hubli	1, 3, 5	9: 30	12: 05
Delhi	Hyderabad	2, 7	7: 00	11: 40
Delhi	Mumbai	1, 3, 5	9: 30	14: 00
Delhi	Agatti	1, 5	9: 45	13: 20
Delhi	Pune	2, 4, 6	9: 30	15: 20
Delhi	Trichy	2, 4, 6	19: 15	20: 10

From	To	Days	Departure	Arrival
Delhi	Trichy	1, 3, 5	20: 00	20: 50
Delhi	Vijaywada	2, 6	7: 00	8: 20
Delhi	Vizag	2, 6	7: 00	9: 40
Delhi	Bhubneshwar	4, 6	7: 00	11: 20
Delhi	Thiruananth puram	1, 3, 5	19: 00	15: 45
Delhi	Calicut	1, 3, 5	14: 00	17: 10

1. Monday 2. Tuesday 3. Wednesday
4. Thursday 5. Friday 6. Saturday
7. Sunday

Additional Information

In a week

Number of departures delayed by less than 1 h = 12

Number of departures delayed by more than 1 h = 2

Number of arrival delayed by less than 1 h = 11

Number of arrival delayed by more than 1 h = 3

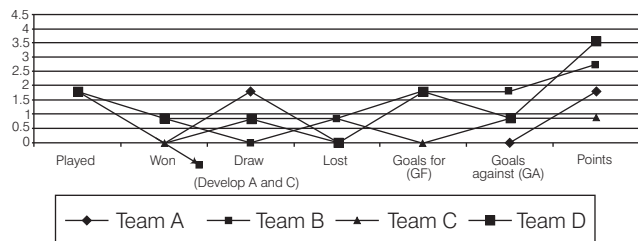
43. An airlines is said to operate at 100% efficiency, if 90% of its flights are on time. The efficiency of IA is
 - (a) 80.9%
 - (b) 88.23%
 - (c) 79.4%
 - (d) 75.4%
44. If the airlines aims to achieve 90% efficiency on arrivals. Then the number of flights arriving on time must increase by (use data of the previous question)
 - (a) 3
 - (b) 2
 - (c) 4
 - (d) 5
45. If the airlines suffers a loss of ₹ 50000 on every flight delayed for more than one hour, the loss suffered by the airlines in a week is
 - (a) ₹ 2 lakh
 - (b) ₹ 2.5 lakh
 - (c) ₹ 3 lakh
 - (d) ₹ 3.5 lakh
46. Average delay in departure is measured by delay occurring in each flight, adding up all delays and dividing by the total number of delayed fights, the average delay in departure for flights operated by IA is
 - (a) 35 min
 - (b) 25 min
 - (c) 40 min
 - (d) Cannot be determined

Directions (Q. Nos. 47-50) Refer to the data given below and answer the questions that follow:

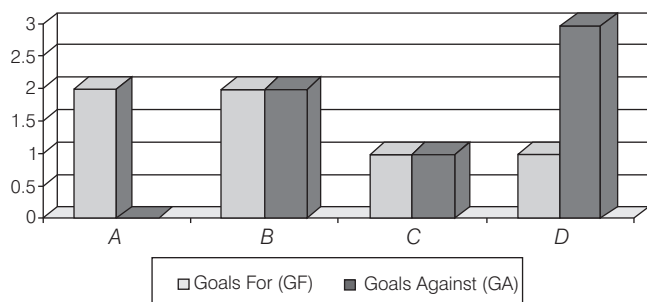
The world cup Hockey tournament is being played between four teams, there are a total of two rounds in the game. In each round a particular team plays one match with each of the opponents. The points that a team receives in the match is as given below:

- A win gives 3 points.
- A draw gives 1 point to each of the contesting teams.
- No points are given for a loss.

The line chart below gives the data of the four matches played in the first round.



The remaining matches of the first round resulted in a draw. The bar graph given below gives the data of the goals made in the matches played in the second round.



The following gives some information regarding the results of the matches played in the second round

1. C draw only one match played against B
2. B won only one match
3. A did not lost the match
4. D lost two of the matches that is played
5. A had 10 points at the end of the second round

47. Which of the following could be the fifth match played in the first round of the tournament?

- (a) A Vs C (b) C Vs D (c) B Vs C (d) B Vs D

48. How many matches did C win in the second round?

- (a) 1 (b) 2
(c) 3 (d) 4

Additional Information Additional Information: When the comparisons of the goals of the teams after the tournament were made, then the following information was obtained.

A had three goals for, B had 5, C had 1, and D had 3 which in term of goals against. A had 1, B had 2, and D 1.

49. What was the score of the match between C and D in the first round?

- (a) 0-0 (b) 1-1
(c) 2-2 (d) Cannot be determined

50. If the goal comparison after the tournament is the same as in the above question, then which team has stood third? For the teams having the same points, the team with the minimum GA holds the higher position

- (a) A (b) B
(c) C (d) D

Directions (Q. Nos. 51-54) Read the following passage and solve the questions based on it.

On the occasion of the New Year celebrations, eight families went to Goa. Each member of the various families spent a particular amount during the carnival, but the total amount spent by any family was always an integer. Given below is the average amount spent by each member of the various families:

Name of the family	Average amount spent per person	Name of the family	Average amount spent per person	Name of the family	Average amount spent per person	Name of the family	Average amount spent per person
Gagan	2.125	Lapa	3.1428	Rio	2.111	Apang	3.25
Kumar	3.166	Zora	4.5	Chaman	5.20	Sarkar	4.33

- (i) The number of members in the Gagan family was four more than that of the Chaman family.
- (ii) The number of members of the Apang family was half of that of the Sarkar family.
- (iii) The number of members in the Chaman family was less than the sum of that of the Lapa and the Zora.
- (iv) Sum of the number of members of the Lapa family and the Zora family was 28.
- (v) The sum of the members of the Sarkar family and the Apang family was equal to the number of the members of the Rio family as well as the Kumar family.
- (vi) The number of persons in any family varied between 12 and 36.

51. What was the total sum of the amount spent by the Lapa and the Zora families?

- (a) 107 (b) 111 (c) 134 (d) 136

52. What was the total amount spent by all the families?

- (a) 595 (b) 677 (c) 744 (d) 750

53. If $\frac{1}{6}$ th of the number of members of the Apang, Gagan and Kumar families were adults and the rest were children, then what was the total number of children in the all three families?

- (a) 60 (b) 70 (c) 80 (d) 90

54. What was the total number of members who visited Goa?

- (a) 210 (b) 200 (c) 190 (d) 180

Directions (Q. Nos. 55-58) Read the following passage and solve the questions based on it.

12 Hockey teams participated in a tournament. These teams were equally distributed into 2 pools, A and B. In the 1st round, each team played a match against all the other teams in the same pool. Top 3 teams with highest average (from both the pools) went to the next round, where all the six teams played against each other once. Again the top 3 teams with highest overall average (for the first 10 games played in the two rounds) qualified to the finals. In the final round, all the 3 teams played against each other and the team with the highest average overall was declared the winner.

Scoring A win earns 4 points, loss earns -2, and a tie will result in 2 each.

Average Total points/Number of matches.

Also, the winner of the tournament won both its matches in the finals and the total points earned by all the teams (played in the second round) after second round are 110. The following table shows the points tally

Teams	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
Total	28	0	10	0	16	6	-6	26	6	12	4	14
Average	2.33	0	1	0	1.6	1.2	-1.2	-2.166	1.2	1.2	0.8	1.16

55. Which 2 teams do not play against each other in the finals?

- (a) A1, B2 (b) A1, B6 (c) A5, B2 (d) B2, B6

56. Find the number of matches won by A2 and A4.

- (a) 0 (b) 1 (c) 2 (d) 3

57. How many points did the second runner up earn in the finals?

- (a) 4 (b) 2 (c) -4 (d) 0

58. After round 2, the highest average of any team can be

- (a) 2 (b) 2.4 (c) 2.6 (d) 2.8

Directions (Q. Nos. 59-62) Read the passage given below and solve the question based on it.

During their stint at IIM Shillong, ten students have opted for various electives named from A to F. In these electives, students are given the points on a scale of 1 to 5 points. Points obtained by the students can be integral points only. It is also known that not all the electives are taken by all the students and not all the students are taking atleast an elective.

The range of scores indicates the maximum and minimum scores in that elective by the students who have chosen that elective. However, if the range of the scores is 1 - 4, then atleast one of students must have got 1 point and atleast one student must have got 4 points in that elective.

The number of elective takers out of the 10 students is given in the last column.

Elective	Range of scores of all the elective takers (Minimum and Maximum Scored)	Average score of the elective takers	Number of elective takers
A	1-4	3.5	6
B	2-4	3	3
C	1-5	4	7
D	1-2	$\frac{4}{3}$	3
E	2-5	4	4
F	3-5	$\frac{11}{3}$	6

59. How many students have scored more than 4 points in atleast 2 electives?

- (a) 4 (b) 7
(c) 2 (d) Cannot be determined

60. What is the minimum number of students who must have scored less than 2 points in atleast one elective?

- (a) 3 (b) 4 (c) 2 (d) 3

61. What is the maximum number of students who have scored more than 3 point in atleast one elective?

- (a) 5 (b) 6
(c) 7 (d) Cannot be determined

62. What is the minimum number of students who have scored more than 3 points in atleast one elective?

- (a) 5 (b) 6 (c) 7 (d) None of these

Direction (Q. Nos. 63-66) Read the following passage and solved the questions based on it.

Two ants start climbing a slippery wall together, from the bottom of the wall. Ant A climbs at the rate of 3 inches per minute. Ant B climbs at the rate of 4 inches per minute. However, owing to the fact that the wall is slippery, ant A slips back 1 inch for every 2 inches climbed and ant B slips back 1.5 inches for every 2 inches climbed. Besides this, ant A takes a rest of 1 minute after every 2 minutes and ant B takes a rest of 1 minute after every 3 minutes. (Assume that both ant A and ant B slip continuously while climbing).

63. At what height on the wall do the two ants meets each other?

64. If the widest gap achieved between the two ants, within the first 10 minutes, is N inches, then find the value of N?

65. If ant B does not have any periods of rest, then how many times do the ants meet in the first 10 minutes?

66. When ant A reaches a height of 12 inches on the wall, how far is ant B behind ant A?

Section III Quantitative Aptitude

67. Sone Lal has 'n' magical eggs whose average weight is 'k' gm. Each of the 'n' eggs produces 'n' eggs next day such that the average weight of 'n' eggs produced is same as that of the parental (previous generation) egg for each 'n' groups individually i.e., each egg produces 'n' eggs in its next generation and the average weight of all the 'n' eggs of next generation is same as the weight of the mother egg.
- This process is continued without any change in pattern. What is the total weight of all the eggs of r^{th} generation, where the initial number of eggs with Sone Lal are considered as the eggs of first generation
- (a) mk (b) $n^r k$
(c) nk^r (d) $n^{r+1} k$
68. A couple got married 9 years ago when the age of wife was 20% less than her husband. 6 years from now the age of wife will be only 12.5% less than her husband. Now they have six children including single, twins and triplets and the ratio of their ages is 2:3:4 respectively. What can be the maximum possible value for the present age of this family?
69. The ratio of water and alcohol in two different containers is 2:3 and 4:5. In what ratio we are required to mix the mixtures of two containers in order to get the new mixture in which the ratio of alcohol and water be 7:5?
- (a) 7:3 (b) 5:3
(c) 8:5 (d) 2:7
70. Distance covered by a train is directly proportional to the time taken and also it varies directly as the square root of fuel used and varies inversely as the number of wagons attached to it. A train covers 192 km journey in 20 hours when there are 10 wagons attached to it and total fuel consumption was 256 litre of diesel. Find the consumption of fuel per km when a train goes 200 km in 25 hours with 15 wagons attached to it
- (a) 1.5 l/km (b) 2 l/km
(c) 2.8 l/km (d) 20 l/km
71. If $a + b + c = 0$, where $a \neq b \neq c$, then $\frac{a^2}{2a^2 + bc} + \frac{b^2}{2b^2 + ac} + \frac{c^2}{2c^2 + ab}$ is equal to
- (a) zero (b) 1
(c) -1 (d) abc
72. Along a road lie on an odd number of stones placed at intervals of 10 m. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. A man carried out the job starting with the stone in the middle, carrying stones in succession, thereby covering a distance of 4.8 km. Then the number of stones is
- (a) 35 (b) 15
(c) 29 (d) 31
73. As a strategy towards retention of customers, the service centre of a split AC machine manufacturer offers discount as per the following rule—for the second service in a year, the customer can avail of a 10% discount, for the third and fourth service within a year, the customer can avail of 11% and 12% discounts respectively of the previous amount paid.
- Finally, if a customer gets more than four services within a year, he has to pay just 55% of the original servicing charges. If Rohan has availed 5 services from the same service centre in a given year, the total percentage discount availed by him is approximately.
- (a) 16.52 (b) 20.88
(c) 22.33 (d) 24.08
74. The average age of Donald, his wife and their two children is 23 years. His wife is just 4 years younger than Donald himself and his wife was 24 years old when his daughter was born. He was 32 years old when his son was born. The average age of Donald and his daughter is:
- (a) 25 years (b) 22.5 years
(c) 26 years (d) can't be determined
75. Sanjay purchased a hotel worth ₹ 10 lakh and purchased a car worth ₹ 16 lakh. The value of hotel year increases by 20% of the previous value and the value of car every year depreciates by 25%. What is the difference between the price of hotel and car after 3 years?
76. Teenagers shoe company sells the shoes whose prices i.e., cost prices and selling prices are the multiples of either 13, 14, 15, 16, 17, 18 or 19, starting from ₹ 399 to ₹ 699 (i.e., $399 \leq \text{CP/SP} \leq 699$). What can be the maximum profit of the company?
77. A train with 120 wagons crosses Arjun who is going in the same direction, in 36 seconds. It travels for half an hour from the time it starts overtaking the Arjun (he is riding on the horse) before it starts overtaking Srikrishna (who is also riding on his horse) coming from the

opposite direction in 24 seconds. In how much time (in seconds) after the train has crossed the Srikrishna do the Arjun meets to Srikrishna?

- (a) 3560 sec (b) 3600 sec
(c) 3576 sec (d) can't be determined

78. A ship leave on a long voyage. When it is 18 miles from the shore, a seaplane, whose speed is ten times that of the ship, is sent to deliver mail. How far from the shore does the seaplane catch up with the ship?

79. Set S contains points whose abscissa and ordinate are both natural numbers. Point P , an element in set S has the property that the sum of the distances from point P to the point $(8, 0)$ and the point $(0, 12)$ is the lowest among all elements in set S . How many such points P exist in set S ?

80. If the string is wound on the exterior four walls of a cube of side a cm starting at point C and ending at point D exactly above C , making equally spaced 4 turns. The side of the cube is [Total length of string = $8n$ cm]

- (a) $a = \frac{2n}{\sqrt{255}}$ (b) $a = \frac{(n)^2}{16}$
(c) $a = \frac{8n}{\sqrt{257}}$ (d) $a = 2\sqrt{15}n$

81. Find the net area between $y = \sin x$ and the x -axis between the values $x = 0$ and $x = 2\pi$.

82. Find the shortest distance from the point $(5, 0)$ to the curve $2y^2 = x^3$.

83. The number of positive integer valued pairs (x, y) satisfying $4x - 17y = 1$ and $x \leq 1000$ is

- (a) 59 (b) 57 (c) 55 (d) 58

84. There is a circle of radius 1 cm. Each members of a sequence of regular polygons $S_1(n)$ $n = 4, 5, 6, \dots$, where n is the number of sides of the polygon, is circumscribing the circle: and each member of the sequence of regular polygons $S_2(n)$, $n = 4, 5, 6, \dots$ where n is the number of side of the polygon, is inscribed in the circle. Let $L_1(n)$ and $L_2(n)$ denote the perimeters of the corresponding polygons in $S_1(n)$ and $S_2(n)$, then $\frac{\{L_1(13) + 2\pi\}}{L_2(17)}$ is

- (a) greater than $\frac{\pi}{4}$ and less than 1
(b) greater than 1 and less than 2
(c) greater than 2
(d) less than $\frac{\pi}{4}$

85. The micro manometer in a certain factory can measure the pressure inside the gas chamber from 1 unit to 999999 units. Lately this instrument has not been working properly. The problem with the instrument is that it always skips the digit 5 and moves directly from 4 to 6. What is the actual pressure inside the gas chamber, if the micro manometer displays 003016?

86. If $\log_{25} 5 = a$ and $\log_{25} 15 = b$, then the value of $\log_{25} 27$ is

- (a) $3(b + a)$ (b) $3(1 - b - a)$
(c) $3(a + b - 1)$ (d) $3(1 - b + a)$

87. A sales executive gets 20% bonus of the total sales value and 10% commission besides the bonus on the net profit after charging such commission.

If the total sales value be ₹ 10 lakh per annum and the total profit of the company be ₹ 1.32 lakh, then his total earning per annum will be, given that he is not entitled to receive any fixed salary from the company.

- (a) 2.3 lakh (b) 3.2 lakh
(c) 2.32 lakh (d) 2.12 lakh

88. The sum of the series is $\frac{1}{1.2.3} + \frac{1}{3.4.5} + \frac{1}{5.6.7}$

- (a) $e^2 - 1$ (b) $\log 2 - 1$
(c) $2 \log_{10} 2 - 1$ (d) None of the above

89. Sailesh is working as a sales executive with a reputed FMCG company in Hyderabad. As per the company's policy, Sailesh gets a commission of 6% on all sales upto ₹ 1,00,000 and 5% on all sales in excess of this amount. If Sailesh remits ₹ 2,65,000 to the FMCG company after deducting his commission, his total sales were worth

- (a) ₹ 1,20,000 (b) ₹ 2,90,526
(c) ₹ 2,21,054 (d) ₹ 2,80,000

90. Find the value of the expression

$$\frac{4^n \times 20^{m-1} \times 12^{m-n} \times 15^{m+n-2}}{16^m \times 5^{2m+n} \times 9^{m-1}}$$

- (a) $\frac{1}{200}$ (b) $\frac{1}{500}$
(c) $\frac{1}{700}$ (d) $\frac{1}{900}$

91. If $13x + 1 < 2z$ and $z + 3 = 5y^2$, then

- (a) x is necessarily less than y
(b) x is necessarily greater than y
(c) x is necessarily equal to y
(d) none of the above is necessarily true

92. There are two cylindrical containers of equal capacity and equal dimensions. If the radius of one of the container is increased by 12 ft and the height of another container is increased by 12 ft, then the capacity of both the container is equally increased by K cubic ft. If the actual heights of each of the container be 4 ft, then find the increased volume of each of the container:

(a) 1680π cu ft
 (b) 2304π cu ft
 (c) 1480π cu ft
 (d) can't be determined

93. A straight line L is perpendicular to the line $5x - y = 1$. The area of the triangle formed by the line L and coordinate axes is 5. Find the equation of the line.

(a) $x + 5y = \pm 5\sqrt{2}$
 (b) $x - 3y = 0$
 (c) $2x + y = 0$
 (d) $x + 4y = 5\sqrt{2}$

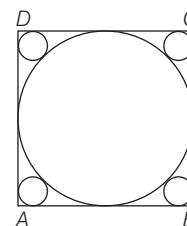
94. If a is a non-zero real number and b is a positive real number and $2ba^4 + ba^3 + a^2 + ba + 2b = ka^2$, then the least possible value of k is

(a) $2b + 1$ (b) $2b - 1$
 (c) $2 - \frac{33b}{4}$ (d) $2 + \frac{33b}{4}$

95. A cylindrical overhead tank is filled by two pumps- P_1 and P_2 . P_1 can fill the tank in 8 h while P_2 can fill the tank in 12 h. There is a pipe P_3 which can empty the tank in 8 hours. Both the pumps are opened simultaneously. The supervisor of the tank, before going out on a work, sets a timer to open P_3 when the tank is half filled so that tank is exactly filled up by the time he is back. Due to technical fault P_3 opens when the tank is one third filled. If the supervisor comes back as per the plan what per cent of the tank is still empty?

(a) 25% tank (b) 12% tank
 (c) 10% tank (d) None of these

96. $ABCD$ is a square, in which a circle is inscribed touching all the sides of square. In the four corners of square, 4 smaller circles of equal radii are drawn, containing maximum possible area. What is the ratio of the area of larger circle to that of sum of the areas of four smaller circles?



(a) $1:(68 - 40\sqrt{2})$
 (b) $1:17\sqrt{2}$
 (c) $3:(34 - 12\sqrt{2})$
 (d) None of these

97. What is the number of solutions for real x , which satisfy the equation $2 \log_2 \log_2 x + \log_{1/2} \log_2 (2\sqrt{2}x) = 1$.

Directions (Q.Nos. 98-99) A function is defined as follows

$$f(a_1 a_2 a_3 \dots a_n) = a_1 2^{n-1} + a_2 2^{n-2} + a_3 2^{n-3} + \dots + a_n 2^0$$

The above function is repeated until the value of function reduces to a single digit number.

98. $f(128)$ equals

(a) 1 (b) 2
 (c) 4 (d) 8

99. What is the value of $f[f(888222) + f(113113)]$?

100. Serena and Venus were only two women participating in a chess tournament. Every participant played two games with every other participant. The number of games that men played between themselves proved to exceed by 66, compared to the number of games the men played with women. How many participants were there?.

ANSWERS

1	(a)	2	(d)	3	(c)	4	(d)	5	(b)	6	(a)	7	(d)	8	(b)	9	(d)	10	(b)
11	(d)	12	(a)	13	(b)	14	(c)	15	(d)	16	(c)	17	(b)	18	(a)	19	(d)	20	(c)
21	(c)	22	(a)	23	(b)	24	(b)	25	(*)	26	(*)	27	(*)	28	(*)	29	(b)	30	(c)
31	(d)	32	(c)	33	(b)	34	(a)	35	(b)	36	(d)	37	(d)	38	(c)	39	(*)	40	(*)
41	(*)	42	(*)	43	(b)	44	(b)	45	(b)	46	(d)	47	(b)	48	(a)	49	(a)	50	(c)
51	(a)	52	(a)	53	(a)	54	(d)	55	(c)	56	(c)	57	(c)	58	(b)	59	(d)	60	(c)
61	(d)	62	(d)	63	(*)	64	(*)	65	(*)	66	(*)	67	(b)	68	(*)	69	(b)	70	(b)
71	(b)	72	(d)	73	(b)	74	(a)	75	(*)	76	(*)	77	(c)	78	(*)	79	(*)	80	(a)
81	(*)	82	(*)	83	(a)	84	(c)	85	(*)	86	(c)	87	(d)	88	(d)	89	(d)	90	(b)
91	(d)	92	(b)	93	(a)	94	(a)	95	(c)	96	(a)	97	(*)	98	(d)	99	(*)	100	(*)

(*) Answers are given below

25. (15423)	26. (34125)	27. (15243)	28. (45123)	39. (36)	40. (25)	41. (5)	42. (1)
63. (3")	64. (3")	65. (3)	66. (3")	68. (103)	75. (1053000)	76. (298)	78. (20)
79. (3)	81. (0)	82. ($\sqrt{3}$)	85. (2201)	97. (8)	99. (7)	100. (13)	

Note For explanations visit the weblink given below :

<https://goo.gl/Xab29h>

CAT

Common Admission Test

Practice Set 2

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carry equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

Section I Verbal Ability and Reading Comprehension

Directions (Q. Nos. 1-24) Read the following passage carefully and then choose the most suitable option from the given ones.

Passage 1

There are good reasons why the 'Heart of Asia' conference, part of a 14-nation process begun in 2011 to facilitate the development and security of Afghanistan, is so named. The obvious one is geographical, as Afghanistan lies at the junction of Central, South and East Asia, and also of the ancient trading routes from China and India to Europe. Today it is also a focal point for the region's biggest challenge of terrorism; some of the far-reaching battles against Al-Qaeda, Islamic State, etc. will be decided on the battlegrounds of Afghanistan. For India, putting terror centre stage at the Heart of Asia declaration in Amritsar was, thus, timely and necessary. In tandem, Afghan President Ashraf Ghani and Prime Minister Narendra Modi focussed their concerns on cross-border terrorism emanating from Pakistan, something even Pakistan's traditional allies at the conference, including China, Saudi Arabia, the UAE and Turkey, found difficult to counter. The case Mr. Ghani made was clear: progress and development in Afghanistan are meaningless and unsustainable without peace, and peace is contingent on Pakistan ending support to terror groups such the Haqqani network and Lashkar-e-Taiba. He dared Pakistan to use its proposed development grant to Afghanistan to fight terror on its own soil.

However, if every window for engagement with Pakistan is closed for India and Afghanistan, the two countries must closely consider what their next step will be. A lack of engagement may, in the short term, yield some pressure on Pakistan's leadership to act, as it did briefly after the Pathankot attack. But, in the long run it may deplete the two countries of their limited leverage as Pakistan's neighbours. It may, for all the affirmations of mutual ties, also succeed in driving more obstacles to trade between India and Afghanistan. In the past year, the cornering of Pakistan by its South Asian neighbours has only yielded deeper ties for Islamabad with Beijing and Moscow, pushed Kabul closer to Central Asia, and moved New Delhi towards multilateral groupings to the east and south. As a result, the measures India and Afghanistan have envisaged in order to avoid Pakistan, such as land trade from the Chabahar port and a dedicated air corridor between Delhi and Kabul, may prove to be insufficient by the time they are put in place, even as Afghanistan is connected more closely via a rail line from China's Yiwu and Tehran. The Heart of Asia process, thus,

remains critical to forging cooperation to realise Afghanistan's potential to be a vibrant Asian "hub".

1. What, according to the author, was the initial agenda for the 'Heart of Asia' conference?
 - (a) To invade the intruders of peace strategically and to wage war against terrorism
 - (b) To make Afghanistan from the Asian 'Hub' to the trading central between East Asia and Europe
 - (c) To bring out Afghanistan's potential as Asian 'Hub' and to facilitate development and security in Afghanistan.
 - (d) To plan the strategy of utilizing its potential as the focal point of terrorism and attack Pakistan
2. In Mr. Ghani's view, what is mandatory for sustainable development and to attain peace in Afghanistan?
 - (a) To wage war against Pakistan and bring this terrorism to a full stop
 - (b) To join hands with Haqqani and Lashkar-e-Taiba
 - (c) India should invade Pakistan for betterment of neighbouring countries
 - (d) Pakistan should end its support to terror groups
3. According to the author; is lack of engagement with Pakistan a good option in the long run?
 - (a) No, because the measures India and Afghanistan have taken may prove to be insufficient by the time they are put in place.
 - (b) No, because this may lead to more trade difficulties among all countries of middle and South East Asia.
 - (c) Yes, because that is the only sure shot solution to get over with terrorism.
 - (d) Yes, as Pakistan is not willing to stop supporting terror groups and by secluding it with international ties, cross-border terrorism will come to a halt.

Passage 2

The happy man is the man who lived objectively, who has free affection and wide interest, who secures his happiness through these interests and affections and through the fact that they, in turn, make him an object of interest and affection to many others. To be the recipient of affection is a potent cause of happiness, but the man who demands affection is not the man upon whom it is bestowed. The man who receives affection is, speaking broadly, the man who gives it. But, it is useless to attempt to give it as a calculation, in the way in which one might lend money at interest, for a calculated affection is not genuine and is not felt to be so by the recipient.

What then can a man do who is unhappy because he is encased in self? So long as he continues to think about the cause of his unhappiness, he continues to be self-centred and therefore does not get outside the vicious circle if he is to get outside it, it must be by genuine interests, not by simulated interest accepted merely as a medicine. Although this difficulty is real, there is nevertheless much that he can do if he has rightly diagnosed his trouble. If, for example, his trouble is due to a sense of sin, conscious or unconscious he can first persuade his conscious mind that he has no reason to feel sinful, and then proceed, to plant his rational conviction in his unconscious mind, concerning himself meanwhile with some more or less neutral activity. If he succeeds in dispelling the sense of sin, it is possible that genuine objective interests will arise spontaneously. If his trouble is self-pity, he can deal with it in the same manner after first persuading himself that there is nothing extraordinarily unfortunate in his circumstances.

If fear is his trouble, let him practise exercises designed to give courage. Courage has been recognised from time immemorial as an important virtue, and a great part of training of boys and young men has been devoted to producing a type of character capable of fearlessness in battle. But, moral courage and intellectual courage have been much less studied, they also, however, have their technique, admit to yourself every day at least one painful truth, you will find his quite useful. Teach yourself to feel that life still be worth living even if you were not, as of course you are immeasurably superior to all your friends in virtue and in intelligence. Exercises of this sort prolonged through several years will at last enable you to admit facts without flinching and will, in doing so, free you from the empire of fear over a very large field.

4. If a man is suffering from a sense of sin.
 - (a) He should invite opinion of others
 - (b) He should admit his sin at once
 - (c) He should consciously realize that he has no reason to feel sinful
 - (d) He should develop a fearless character
5. What happens to a man who demands affection?
 - (a) His feelings are reciprocated by others
 - (b) He tends to take a calculated risk
 - (c) He becomes a victim of a vicious circles
 - (d) He takes affection for granted from others
6. What should a man do who is suffering from the feeling of self-pity?
 - (a) He should control his passions and emotions
 - (b) He should persuade himself that everything is alright in his circumstances
 - (c) He should seek affection from others
 - (d) He should develop a feeling of fearlessness

Passage 3

The task which Gandhiji undertook was not only the achievement of political freedom but also the establishment of a social order based on truth and non-violence, unity and peace, equality and universal brotherhood, and maximum freedom for all. This unfinished part of his experiment was perhaps even more difficult to achieve than the achievement of political freedom. Political struggle involved fight against a foreign power and all one could do was either join it or wish it success and give it his moral support. In establishing the social order of this pattern, there was a lively possibility of a conflict arising between groups and classes of our own people. Experience shows that man values his possessions even more than his life because in the former he sees the means for perpetuation and survival of his descendants even after his body is reduced to ashes. A new order cannot be established without radically changing the mind and attitude of men towards property and, at some stage or the other, the 'haves' have to yield place to the 'have-nots'. We have seen, in our time, attempts to achieve a kind of egalitarian society and the picture of it after it was achieved. But, this was done, by and large, through the use of physical force.

In the ultimate analysis, it is difficult, if not impossible, to say that the instinct to possess has been rooted out or that it will not reappear in an even worse form under a different guise. It may even be that, like a gas kept confined within containers under great pressure, or water held by a big dam, once a barrier breaks, the reaction will one day sweep back with a violence equal in extent and intensity to what was used to establish and maintain the outward egalitarian form. This enforced egalitarianism contains, in its bosom, the seed of its own destruction.

The root cause of class conflict is possessiveness or the acquisitive instinct. So long as the ideal that is to be achieved is one of securing the maximum material satisfaction, possessiveness can neither be suppressed nor eliminated but will grow on what it feeds. Nor will it cease to be such- it is possessiveness, still, whether it is confined to only a few or is shared by many.

If egalitarianism is to endure, it has to be based not on the possession of the maximum material goods by a few or by all but on voluntary, enlightened renunciation of those goods which cannot be shared by others or can be enjoyed only at the expense of others. This calls for substitution of spiritual values for purely material ones. The paradise of material satisfaction, that is sometimes equated with progress these days neither spells peace nor progress. Mahatma Gandhi has shown us how the acquisitive instinct inherent in man could be transmuted by the adoption of the ideal of trusteeship by those who 'have' for the benefit of all those who 'have not' so that, instead of leading to exploitation and conflict, it would become a means and incentive for the amelioration and progress of society, respectively.

7. According to the passage, egalitarianism will not survive, if
 - (a) It is based on voluntary renunciation
 - (b) It is achieved by resorting to physical force
 - (c) Underprivileged people are not involved in its establishment
 - (d) People's outlook towards it is not radically changed
8. According to the passage, why does man value his possessions more than his life?
 - (a) He has an inherent desire to share his possessions with others
 - (b) He is endowed with the possessive instinct
 - (c) Only his possessions help him earn love and respect from his descendants
 - (d) Through his possessions he can preserve his name even after his death
9. According to the passage, which was the unfinished part of Gandhiji's experiment?
 - (a) Educating people to avoid class conflict
 - (b) Achieving political freedom for the country
 - (c) Establishment of an egalitarian society
 - (d) Radically changing the mind and attitude of men towards truth and non-violence
10. Which of the following statements is 'not true' in the context of the passage?
 - (a) True egalitarianism can be achieved by giving up one's possessions under compulsion
 - (b) Man values his life more than his possessions
 - (c) Possessive instinct is a natural part of the human being
 - (d) In the political struggle, the fight was against the alien rule
11. According to the passage, true egalitarianism will last if
 - (a) It is thrust upon people
 - (b) It is based on truth and non-violence
 - (c) People inculcate spiritual values along with material values
 - (d) 'Haves' and 'have-nots' live together peacefully
12. According to the passage, people ultimately overturn the form of a social order
 - (a) Which is based on coercion and oppression
 - (b) Which does not satisfy their basic needs
 - (c) Which is based upon conciliation and rapprochement
 - (d) Which is not congenial to the spiritual values of the people

Passage 4

As increasing dependence on information systems develops, the need for such systems to be reliable and secure also becomes more essential. As growing numbers of ordinary citizens use computer networks for banking, shopping, etc., network security is potentially a massive problem. Over the last few years, the need for computer and information system security has become increasingly evident, as websites are being defaced with greater frequency, more and more denial-of-service attacks are being reported, credit card information is being stolen, there is increased sophistication of hacking tools that are openly available to the public on the Internet, and there is increasing damage-being caused by viruses and worms to critical information system resources.

At the organizational level, institutional mechanisms have to be designed in order to review policies, practices, measures, and procedures to review e-security regularly and assess whether these are appropriate to their environment. It would be helpful if organizations share information about threats and vulnerabilities, and implement procedures for rapid and effective cooperation to prevent, detect and respond to security incidents. As new threat and vulnerabilities are continuously discovered there is a strong need for cooperation among organizations and, if necessary, we could also consider crossborder information sharing. We need to understand threats and dangers that could be vulnerable to and the steps that need to be taken to mitigate these vulnerabilities. We need to understand success control systems and methodology, telecommunication and network security, and security management practice. We should be well versed in the area of application and systems development security, cryptography, operations security and physical security.

The banking sector is poised for more challenges in the near future. Customers of banks can now look forward to a large array of new offerings by banks. From an era of mere competition, banks are now cooperation among themselves so that the synergistic benefits are share among all the players. This would result in the formation of shared payment networks (a few shared ATM networks have already been commissioned by banks), offering payment services beyond the existing time zones. The Reserve Bank is also facilitating new projects such as the Multi Application Smart Card project which, when implemented, would facilitate transfer of funds using electronic means and in a safe and secure manner across the length and breadth of the country, with reduced dependence on paper currency. The opportunities of e-banking or e-power in general need to be harnessed so that banking is available to all customers in such a manner that they would feel most convenient, and if required, without having to visit a branch of a bank. All these will have to be accompanied with a high level of comfort, which again boils down to the issue of e-security.

One of the biggest advantages accruing to banks in the future would be the benefits that arise from the introduction of Real Time Gross Settlement (RTGS). Funds management by treasuries of banks would be helped greatly by RTGS. With almost 70 banks having joined the RTGS system, more large value funds transfers are taking place through this system. The implementation of Core Banking solutions by banks is closely related to RTGS too. Core Banking will make anywhere banking a reality for customers of each bank, while RTGS bridges the need for inter-bank funds movement. Thus, the days of depositing a cheque for collection and a long wait for its realization would soon be a thing of the past for those customers who would opt for electronic movement of funds, using the RTGS system, where the settlement would be on an almost instantaneous basis. Core Banking is already in vogue in many private sector and foreign banks; while its implementation is at different stages amongst the public sector banks.

IT would also facilitate better and more scientific decision making within banks. Information systems now provide decision makers in banks with a great deal of information which, along with historical data and trend analysis, help in the building up of efficient Management Information Systems. This, in turn, would help in better Asset Liability Management (ALM) which, in today's world of hairline margins, is a key requirement for the success of banks in their operational activities. Another benefit which e-banking could provide for, relates to Customer Relationship Management (CRM). CRM helps in stratification of customers and evaluating customer need on a holistic basis which could be paving the way for competitive edge for banks and complete customer care for customers of banks.

13. The content of the passage mainly emphasizes
 - (a) the threat of competition among banks providing tele-banking services
 - (b) the scientific advancements that have facilitated quicker and scientific banking procedures
 - (c) threats to on-line banking and remedies to guard against them
 - (d) e-banking and its impact on global economy
14. What, according to the passage, is the prerequisite to lessen the threats of hacking?
 - (a) Effective measures to combat vulnerability
 - (b) Environment-friendly gadgets to remedy damages
 - (c) Detection and timely prevention of the threat
 - (d) Effective mechanism to evaluate the e-security

- 15.** In what way does IT catalyse better decision-making?
- (1) By providing updated data and trend analysis.
 - (2) By providing increasing opportunities of personal contacts.
 - (3) By ensuring better asset-liability management.
- (a) 1 only (b) 2 only
(c) 3 only (d) 1 and 2 only
- 16.** What is the advantage of RTGS to the customers?
- (a) Anywhere banking
 - (b) Instant realization of cheque
 - (c) Easy withdrawal of cash
 - (d) Availability of transaction facilities at any other bank
- 17.** What, according to the author, should be the ultimate goal(s) of e-banking?
- (1) Customers' convenience.
 - (2) Avoidance of heavy footfall of customers in bank branches.
 - (3) Protection of customers' interests.
- (a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) All the three
- 18.** Why is it obligatory that a system should be perfectly dependable?
- (a) To justify escalating dependence on system
 - (b) To ensure security for the system
 - (c) To disallow any pilferage whatsoever
 - (d) To ascertain proper logistic support

Passage 5

A few weeks ago, I ran into an old friend who is currently one of the mandarins deciding India's economic and financial policies. He asked "And so, how is IIT doing?" As one can only indulge in friendly banter at such gatherings, I responded with 'Not so well actually. Your market-friendly policies have forced up to raise the fee, so we have 50% fewer Ph.D. applicants this year'. Not batting an eyelid, he shot back: "Obviously. Your Ph.D. students don't have any market value." Taken aback, I shifted to a more serious tone and tried to start a discussion on the need for research in these globalised times. But, he had already walked away. The last word on the imperatives of the 'market' had been spoken.

This view of higher education should not have surprised me. Worthies who look at everything as consumer products classify higher education as a 'non-merit' good. Non-merit goods are those where only the individual benefits from acquiring them and not the society as a whole. Multilateral agencies like The World Bank have too been pushing countries like India to stop subsidies to higher education.

When Ron Brown, former US commerce secretary visited India, a public meeting was organized at IIT Delhi. At that meeting I asked him: "I understand that since the 19th century all the way up to the 1970s, most land grant and State universities in the US virtually provided free education to State citizens. Was that good for the economy, or should they have charged high fees in the early 20th century? He replied, "It was great for the economy. It was one of the best things that the US government did at that particular time in American history-building institutions of higher education which were accessible to the masses of the people. I think it is one of the reasons why our economy grew and prospered, one of the way in which the US was able to close some of its social gaps. So, people, who lived in rural areas, would have the same kind of access to higher education as people living in other parts of the country. It was one of the reasons for making America strong."

Our policy-makers seem unaware that their mentors in the US did not follow policies at home which they now prescribe for other countries. Ron Brown's remarks summarise the importance of policy-makers in the US place on higher education as a vehicle for upward mobility for the poorer sectors of their population. Even today, a majority of Americans study in State-run institutions. Some of these institutions, like Berkeley and the Universities of Michigan, Illinois, Ohio, Wisconsin and Texas are among the best in the world. The annual tuition charged from State residents (about \$5000 a year) is about a month's salary paid to a lecturer. Even this fee is waived for most students. In addition, students receive stipends for books, food and hostel charges. The basic principle is that no student who gets admission to a university should have to depend on parental support if it is not available.

Ron Brown's remarks went unnoticed in India. Every other day some luminary or the other opines that universities and technical education institutions should increase their charges and that such education should not be subsidized. Most editorials echo these sentiments. Eminent industrialists pontificate that we should run educational institutions like business houses. Visiting experts from the Bank and the IMF, in their newly emerging concern for the poor, advise us to divert funds from higher education to primary education.

- 19.** The author of the passage seems to be a/an
- official working in economic affairs department
 - financial advisor to government or a bureaucrat in finance department
 - social activist devoted to illiteracy eradication programme
 - educationist in IIT or some such Educational Institution
- 20.** What was the net tangible impact of raising fees on the higher level of technological research?
- The number of prospective researchers was reduced to almost a half
 - The market value of Ph.D. students was almost lost
 - Research studies attained a higher market value
 - Research became more and more relevant to market demands
- 21.** According to the author, the US policy-makers consider education as a
- hindrance in the way to economic growth and prosperity
 - means for achieving upward mobility for the poor
 - wastage of resources and a totally futile exercise
 - matter of concern only for the parents of the students
- 22.** Who among the following support the view that higher education should be free to everyone aspiring for it?
- Editors and Journalists
 - Industrialists
 - Visiting Experts from Banks and IMF
- 1 only
 - 2 only
 - 3 only
 - None of these
- 23.** Which of the following makes the policy-makers classify education as “non-merit” commodity?
- The tendency of people to seek any individual benefit
 - The attitude of giving unreasonably more weightage to society
 - The tendency of viewing everything as mere consumer product
 - Undue pressure from International Agencies like the World Bank, etc.
- 24.** What was Ron Brown’s reaction to the author’s question on free education provided by US universities to their citizens? Ron Brown
- criticized the US government for their action
 - appreciated the author but remained non-committed
 - ignored the fact and gave an ambiguous reaction
 - None of the above
4. It seems a bond rating tells you even less about the price that investors are willing to pay.
5. In 1999, two-third of the debt rated triple B by standard and poor was priced within 20 basis points of the average bond with the same rating.
- 26.** 1. Just as with adults, pessimistic ways of interpreting defeats seem to feed the sense of helplessness and hopelessness at the heart of children’s depression.
2. That people who are already depressed think in these ways has long been known.
3. What has only recently emerged, though, is that children’s beliefs about their own ability to control what happens in their lives.
4. One line of evidence comes from studies of children’s belief about their own ability to control what happens in their lives- for example, being able to change things for the better.
5. This insight suggests a window of opportunity for inoculating them against depression before it strikes.
- 27.** 1. Wonder is marvellous, but it is also cruel, cruel, cruel.
2. We have paid a terrible price for our education, such as it is.
3. Of course, wonder is costly because it is the antithesis of the anxiously worshipped security.
4. The Magian World View, in so far as it exists, has taken flight into science.
5. We have educated ourselves into a world from which wonder has been banished.
- 28.** 1. In 1979, Grenada witnessed the establishment of a socialist government by Maurice Bishop, which survived four years of US-engineered incursions.
2. This was duly appreciated, with some 7,000 US servicemen being designated as heroes and given decorations.
3. This government was overthrown in an internal power struggle among left-wing groups and within three weeks of the Bishop’s ouster and assassination, Reagan launched Operation Urgent Fury against Grenada, claiming that the invasion was “forced on us by events that have no precedent in the eastern Caribbean.”
4. In the end Grenada, just like Cuba and Nicaragua, was no more than the Chomskian “threat of a good example” to other Third World countries in the region.
5. Around 2,000 US Marines “fought” for a week, destroying a mental hospital, killing 84 Cubans building an airstrip, and 400 Grenadians.

Direction (Q. No. 25-28) What is the most logical order of sentences from among the given sentences to construct a coherent paragraph?

- 25.** 1. The credit rating agencies use legions of high trained analyst with access to top management.
2. Their meticulous reports giving ratings for corporate bonds are designed to give an accurate picture of the bonds riskiness and ultimately the probability of default.
3. Lately, the credit-rating agencies have struggled to keep up.

Direction (Q. No. 29-31) The sentences given in this question, when properly sequenced, form a coherent paragraph. Identify the odd one out. Choose its number as your answer.

- 29.** (a) For me paper wealth and tangible wealth amount to the same thing.
- (b) If I get more money, I have more wealth because I can spend the money for other things - real things.

- (c) But if we all get more money overnight, as in a shower of money from helicopters, only our paper wealth increases; our collective tangible wealth doesn't change because there aren't more things to buy with the additional money.
- (d) If it did, the government could cure poverty and increase nation's wealth simply by printing more money.

- 30.** (a) More specifically, it is human beings alone who (a) operate in their everyday activities with an understanding of Being and (b) are able to reflect upon what it means to be.
- (b) But to think of Being in this way would be to commit the very mistake that the capitalization is supposed to help us avoid.
- (c) If we look around at beings in general—from particles to planets, ants to apes—it is human beings alone who are able to encounter the question of what it means to be.
- (d) This gives us a way of understanding statements such as “Dasein is optically distinguished by the fact that, in its very Being, that Being is an issue for it.”
- 31.** (a) Often, those who settled abroad were classified as selfish and self-serving, betraying the homeland.
- (b) Even in the West, all that we seem to be aware of, and revel in, are the Indians who have made good, not the many more working at low-end jobs or in the shadowy grey market.
- (c) Now, not only are they more valued but it is their intellectual labour which defines research fashion and priorities.
- (d) Be it literature or films, social science theorizing or managerial/entrepreneurial models - experience abroad is valorized and sought to be transplanted back home.

Direction (Q. No. 32-34) The passage given below is followed by four alternative summaries. Choose the option that best captures the essence of the passage. Key in the number of the option you choose as your answer.

- 32.** Unreasonableness is a tendency to do socially permissible things at the wrong time. The unreasonable man is the sort of person who comes to confide in you when you are busy. He serenades his beloved when she is ill. He asks a man who has just lost money by paying a bill for a friend to pay a bill for him. He invites a friend to go for a ride just after the friend has finished a long car trip. He is eager to offer services which are not wanted but which cannot be politely refused. If he is present at arbitration, he stirs up dissension between the two parties, who were really anxious to agree. Such is the unreasonable man.

The unreasonable man tends to

- (a) bring a higher bidder to a salesman who has just closed a deal
- (a) disclose confidential information to others
- (c) sing the praises of the bride when he goes to a wedding

- (d) sleep late and rise early

- 33.** In recent report, the gross enrollment ratios at the primary level, that is the number of children enrolled in class I-V, as a proportion of all children aged 6-10 years, were shown to be very high for most states, in many cases > 100%. These figures are not worth anything, since they are based on official enrolment rates compiled from school records. They might as well stand for gross exaggeration ratios.

Which of the following supports the exaggeration above?

- (a) The definition of gross enrolment ratio does not exclude, in its numerator, children below 6 years or above 10 years enrolled in classes one to five
- (b) A school attendance study found that many children enrolled in the school records were not meeting a minimum attendance requirement of 80 percent
- (c) A study estimated that close to 22 percent of children enrolled in the class one records were below 6 years of age and still to start going to school
- (d) Demographic surveys show shifts in the population profile which indicate that the number of children in the age group 6 to 10 years is declining

- 34.** A few of our public institutions foster a culture of transparency and accountability. The Right To Information (RTI) Act was enacted in 2005 to change this tradition of opacity and make governance a transparent process. The Act has been working reasonably well and has become a useful tool for a large cross-section of civil society to examine the working of the government. Since in the process, institutional failures get exposed as well, there is resistance to the RTI culture from various quarters including the government.

Many public institutions that come under the ambit of the Act now want its radical edge blunted. Many state information commissions are starved of funds and personnel, which may lead to a collapse of the institution itself. Many pleas to amend the Act must be seen in this context and handled with caution. It is important that we adhere strictly to its (RTI Act) original aims and refrain from accepting or introducing changes in the legislation on the way it is implemented that would dilute its purpose.

Which of the following is not in consonance with the contents of the passage?

- (a) To give teeth to the RTI legislation, the government must beef up infrastructure at the information commissions
- (b) The push to amend the RTI Act came first from the government itself so that frivolous and vexatious applications could be discarded and disclosures of the file nothings exempted
- (c) The functioning of judiciary is being asked to be exempted from the scope of the Act to safeguard its independence and misuse of the highly confidential and sensitive nature of the information

- (d) The focus must be to restrict the scope of the RTI Act rather than to create a climate of information

Section II Data Interpretation and Logical Reasoning

Direction (Q. Nos. 35-38) Read the following passage and solve the questions based on it.

During one week, a human resource director conducts five interviews for a new job; one interview per day, Monday through Friday. There are six candidates for the job: Ram, Shyam, Trilochan, Usha, Veena and Kishore. Not more than two candidates are interviewed more than once. Neither Shyam nor Usha nor Veena is interviewed more than once, and no other candidate is interviewed more than twice. The schedule of interviews is subject to the following conditions:

- (i) If Trilochan is interviewed, then he must be interviewed on Monday and Friday.
 - (ii) If Shyam is interviewed, then Usha is also interviewed; with Shyam's interview taking place earlier than Usha's interview.
 - (iii) If Ram is interviewed twice, then Ram's second interview takes place exactly two days after his first interview.
 - (iv) If Veena is interviewed, then Kishore is interviewed twice; with Veena's interview taking place after Kishore's first interview and before his second interview.
 - (v) If Usha is interviewed, then Ram is also interviewed; with Usha's interview taking place on a day either immediately before or immediately after a day on which Ram is interviewed.
- 35.** Which of the following could be a complete and accurate list of candidates that the human resources director interviews and the days on which those interviews take place?
- (a) Monday: Shyam; Tuesday: Usha; Wednesday: Ram; Thursday: Kishore; Friday: Ram
 - (b) Monday: Shyam; Tuesday: Kishore; Wednesday: Ram; Thursday: Kishore; Friday: Usha
 - (c) Monday: Trilochan; Tuesday: Ram; Wednesday: Shyam; Thursday: Ram; Friday: Trilochan
 - (d) Monday: Trilochan; Tuesday: Ram; Wednesday: Kishore; Thursday: Veena; Friday: Trilochan
- 36.** If Veena is interviewed on Tuesday, then which one of the following must be true?
- (a) Trilochan is interviewed on Friday
 - (b) Usha is interviewed on Thursday
 - (c) Ram is not interviewed
 - (d) Shyma is not interviewed
- 37.** If Kishore is not interviewed, then which one of the following must be true?
- (a) Ram is interviewed on Thursday

- (b) Shyam is interviewed on Tuesday
- (c) Trilochan is interviewed on Monday
- (c) Usha is interviewed on Wednesday

38. If Shyam is interviewed, then which one of the following could be true?

- (a) Kishore is interviewed on both Tuesday and Wednesday
- (b) Usha is interviewed on Monday
- (c) Veena is interviewed on Tuesday
- (d) Shyam is interviewed on Thursday

Directions (Q. No. 39-42) Read the following statements and solve the questions based on them.

- S1: There is a group of seven persons, viz., A, B, C, D, E, F and G.
- S2: There are four males, three females, two married couples and three unmarried persons in the group.
- S3: These seven persons are seated on the bench in a row.
- S4: Their professions are: engineer, teacher, doctor, psychologist, entrepreneur, architect and student.
- S5: B, The psychologist, is not married and is the most intelligent person in the group.
- S6: The engineer is married to the teacher, who is the least intelligent person out of the group.
- S7: D is an architect and is sitting in the centre.
- S8: The student is sitting on the extreme right hand corner of the bench.
- S9: The doctor is married to C who is the second most intelligent person out of the group, followed by her husband.
- S10: The least intelligent person out of the group is sitting on the immediate left of G. The most intelligent person is sitting on the immediate left of F.
- S11: There are many more and many less intelligent persons than the engineer.
- S12: The student who is a unmarried male has two females sitting next to him.
- S13: The psychologist is a female and is unmarried.
- S14: C, who is an entrepreneur, is sitting immediately to the left of her husband.
- S15: The student is more intelligent than the architect. They have two people sitting in between them.

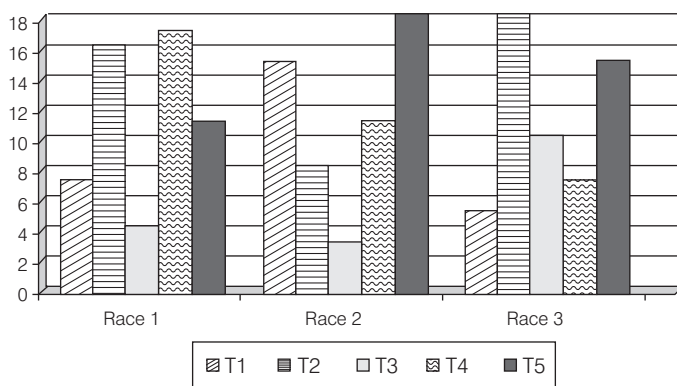
S16: E is married and is sitting at the extreme left-hand corner of the row.

39. Who is sitting to the immediate right of D?
40. What is A's profession?
41. What is F's profession?
42. If all the members are arranged in descending order of their intelligence, then who will be third from the bottom?

Direction (Q. Nos. 43-46) Answer the questions based on the information given below.

Mr. Sharma's home was full of rats. The rat kingdom consisted of five provinces (Mr. Sharma's five rooms in his home). The Rat kingdom decided to have a rat race to decide who the fastest rat was. As per the rat rules, the fastest rat was the heir to the throne of the rat king. Ten rats were called from the five different provinces in Mr. Sharma's home to contest for the race. The ten rats were given the tag of R1, R2, R3, and so on till R10.

Similarly the province that they belong to was tagged as P1, P2, P3, P4 and P5. Rat 1, 2 belonged to P1, rat 3, 4 belonged to P2, and so on till P5. A total of three races were held. The rats that finished 1st, 2nd, 3rd, and so on till 10th were rewarded 10, 9, 8 and so on till 1 point respectively in every race. No two rats got the same points in any race. The total of all the three races for the two rats of each province is listed below:



43. Which of the following rats might have finished third in race 1?
- (a) R7 (b) R8
- (c) R9 (d) Either of (a) or (b)
44. If in race 1, R1 finished before R5 but after R6 while R3 finished before R9 but after R10 then which of the following statements is definitely false?
- I. R1 secured 8th position
- II. R2 secured 7 points
- III. R3 secured 5th position

- IV. R4 secured 9 points
- V. The winner of race 1 was R5
- (a) I, II and IV
- (b) I, II and III
- (c) I, II and IV
- (d) All but III

45. Which of the following statements is true? (Take into consideration the data from the previous question).
- (a) The exact position of R7 cannot be determined
- (b) The exact points secured by R8 cannot be determined
- (c) Both of the above
- (d) None of the above
46. If no rat finished at the same position in any of the three races then which of the following statements is true?
- (a) R6 finished 9th in race 2 while R5 finished 8th in race 1
- (b) R1 finished 6th in race 1 while R5 finished 4th in race 3
- (c) R5 finished 10th in race 1 while R6 finished 8th in race 3
- (d) Both (a) and (b)

Directions (Q. Nos. 47-50) Read the information given below and answer the next five question that follow :

- (i) Six friends Rahul, Kabeer, Anup, Raghu, Amit and Alok were engineering graduates. All six of them were placed in six different location, namely Tisco-Jamshedpur, Telco-Pune, Wipro-Bangalore, HCL-Noida, Mecon-Ranchi and Usha Martin-Kolkata. Each of them has their personal e-mail id's with different email providers i.e., Gamil, Indiatimes, Radiffmail, Yahoo, Hotmail, Sancharnet, though not necessarily in the same order.
- (ii) The one having e-mail account with Sancharnet works in Noida and the one having an e-mail account with indiatimes workers for Tisco.
- (iii) Amit does not stay in Bangalore and does not work for Mecon, the one who works for Mecon has an email id with Gmail.
- (iv) Rahul has an e-mail id with Rediffmail and works at Pune.
- (v) Alok does not work for Mecon and the one who works for Wipro does not have an e-mail account with Yahoo.
- (vi) Kabeer is posted in Kolkata, and does not have an account with Hotmail.
- (vii) Neither Alok nor Raghu work in Noida.
- (viii) The one who is posted in Ranchi has an e-mail id which is not an account of Rediffmail or Hotmail.
- (ix) Anup is posted in Jamshedpur.

47. The man who works in Wipro has an e-mail account with
- (a) Sancharnet (b) Yahoo
- (c) Rediffmail (d) None of these
48. Which of the following e-mail-place of posting-person combination is correct?
- (a) Kabeer-Kolkata-Rediffmail (b) Alok-Bangalore-Indiatimes
- (c) Amit-Noida-Yahoo (d) Raghu-Ranchi-Gmail

49. Which of the following is true?
- Amit is posted at Ranchi
 - Raghu is posted at Jamshedpur
 - Kabeer has an e-mail id with Yahoo
 - Rahul has an e-mail id with Indiatimes
50. Which of the following sequence of location represents Alok, Kabeer, Anup, Rahul, Raghu and Amit in the same order?
- Bangalore, Noida, Pune, Jamshedpur, Ranchi, Kolkata
 - Bangalore, Kolkata, Jamshedpur, Pune, Noida, Ranchi
 - Kolkata, Bangalore, Jamshedpur, Pune, Noida, Ranchi
 - None of these

Direction Q. No. (51-54) Read the given information carefully and answer the questions that follow.

There are exactly ten stores and no other buildings on a straight street in Bistupur market. On the northern side of the street, from West to East, are stored 1, 3, 5, 7 and 9; on the southern side of the street, also from West to East, are stores 2, 4, 6, 8 and 10. The stores on the northern side are located directly across the street from those on the southern side, facing each other in pairs, as follows: 1 and 2; 3 and 4; 5 and 6; 7 and 8; 9 and 10. Each store is decorated with lights in exactly one of the following colours: green, red and yellow. The stores have been decorated with lights according to the following conditions:

- No store is decorated with lights of the same colour as those of any store adjacent to it.
 - No store is decorated with lights of the same colour as those of the store directly across the street from it.
 - Yellow lights decorate exactly one store on each side of the street.
 - Red lights decorate store 4.
 - Yellow lights decorate store 5.
51. Which one of the following could be an accurate list of the colours of the lights that decorate stores 2, 4, 6, 8 and 10, respectively?
- Green, red, green, red, green
 - Green, red, yellow, red, green
 - Green, red, green, yellow, red
 - Yellow, green, red, green, red
52. If green lights decorate store 7, then each of the following statements could be false except
- Green lights decorate store 2
 - Green lights decorate store 10
 - Red lights decorate store 9
 - Red lights decorate store 8
53. Suppose that yellow lights decorate exactly two stores on the south side of the street and exactly one store on the north side. If all other condition remain the same, then which one of the following statements must be true?

- Green lights decorate store 1
- Red lights decorate store 7
- Red lights decorate store 10
- Yellow lights decorate store 2

54. Which one of the following statements must be true?

- Green lights decorate store 10
- Red lights decorate store 1
- Red lights decorate store 8
- Yellow lights decorate store 8
- Yellow lights decorate store 10

Direction (Q.Nos. 55-58) Read the following passage and solve the questions based on it.

Transparency International is UN watch-dog which gives ranks to all the member countries of the UN in terms of the corruption level in the government machinery.

There are 190 member countries of the UN since its establishment in 1945 and all of them are awarded the ranks which are valid for a particular year. The lower the rank, the less corruption infested the country is. And the higher the rank, the more corrupt the country is.

In the following table, the ranks of ten countries for three consecutive years are given. A positive change shows that the ranking has improved over the previous year and a negative change shows that the ranking has worsened over the previous year.

Rank in 2006	Change over 2005	Country	Change over 2004
51	+ 3	Sri Lanka	+ 5
52	+ 4	Zambia	- 3
53	+ 6	New Zealand	- 7
54	- 2	Tango	+ 3
55	+ 2	Austria	- 3
56	- 1	Hungary	- 4
57	A	Australia	D
58	B	Kenya	E
59	C	Mozambique	F
60	Zero	UAE	NA

Somehow the data for Australia, Kenya and Mozambique are missing from the table. NA indicated that the country was not in the list of the given ranks in that particular year.

55. What is the minimum value of $A + B + C$?
56. What is the maximum value of $D + E + F$?
57. What is the minimum value of $D + E + F$?

58. How many countries from the given countries in the table have definitely improved their ranking consistently every year during the given period?

Direction (Q. Nos. 59-62) Read the following Passage and answer the question based on it.

Krishna Reddy was the head of a pharmaceutical company that was trying to develop a new product. Reddy, along with his friend Prabhakar Rao, assessed that such products had mixed success. Reddy and Rao realised that, if a new product (a drug) was a success, it may result in sale of 100 crore but if it is unsuccessful, the sales may be only 20 crore. They further assessed that a new drug was likely to be successful 50% of times. Cost of launching the new drug was likely to be 50 crore.

Now, Reddy and Rao were in a quandary whether the company should go ahead and market the drug. They contacted Raj Adduri, a common friend for advice. Adduri was of the opinion that given the risky nature of launch, it may be a better idea to test the market. Rao and Reddy realised test marketing would cost 10 crore. Adduri told them the previous test marketing result have been favorable 70% of times and success rate of products favorable tested was 80%. Further, when test marketing results were unfavorable; the products have been successful 30% of the times.

59. How much profit can the company expect to earn, if it launches the new drug (suppose there are no additional costs)?
 (a) 12 crore (b) 10 crore
 (c) 10.5 crore (d) 11 crore
60. What is the probability of product failure, if Reddy and Rao decide to test market it?
 (a) 0.21 (b) 0.35 (c) 0.14 (d) 0.28
61. If Rao and Reddy decide to launch the product despite unfavorable test marketing, how much profit/loss can the company expect to earn?
 (a) 13.2 crore (b) 36.8 crore (c) 46.8 crore (d) 16 crore
62. How much profit can the company expect to make, if the product is launched after favorable test marketing results (assume there are no additional costs)?
 (a) 11.5 crore (b) 10 crore (c) 8.5 crore (d) 24 crore

Directions (Q.Nos. 63-66) Given below are the shares of India's export basket to different regions (figure in percentage). Answer the questions on the basis of the following data.

Region	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
EU Countries	22.55	22.74	21.85	22.53	21.21	21.17	21.32	20.16	18.33	17.17
West Africa	2.02	1.99	1.98	1.80	1.93	2.13	1.84	1.76	1.71	2.12
East Africa	1.02	1.35	1.37	1.39	2.33	2.58	2.40	1.97	2.13	2.17
North Africa	1.28	1.21	1.62	1.55	1.47	1.63	1.84	1.75	1.69	1.54
North America	22.49	19.61	17.96	18.25	16.23	13.85	12.57	11.89	10.98	12.48
Latin America	2.06	1.40	2.15	2.47	2.95	3.11	2.96	3.13	3.72	4.00
ASEAN	8.07	9.12	10.09	10.10	9.98	10.05	10.29	10.16	10.12	12.00
West Asia-Gulf Cooperation Council (GCC)	9.32	11.07	11.75	11.42	12.96	13.35	17.21	17.06	16.90	14.85
West Asia (Other than GCC)	3.68	3.68	3.67	3.26	3.81	3.66	3.32	3.22	3.09	3.12
North East Asia	14.92	14.70	15.83	15.74	15.33	16.23	13.80	16.12	14.83	14.86
South Asia	5.28	6.73	5.51	5.38	5.12	5.90	4.62	4.69	4.64	4.37

63. Among the four options mentioned below, export share of India witnessed HIGHEST year-to-year decline in absolute terms in which of the region-period combinations?
- In ASEAN region from 2005-06 to 2006-07
 - In South Asian region from 2004-05 to 2005-06
 - In West Asian (GCC) region from 2008-09 to 2009-10
 - In North African region from 2009-10 to 2010-11
64. Among the four options mentioned below, form which region have the export shares declined maximum number of times in a year-on-year basis?
- South Asia
 - North Africa
 - North America
 - West Africa
65. Between 2009-10 and 2010-11, the annual growth rate in India's (percentage) export share has been LOWEST for
- North Africa
 - North East Asia
 - North America
 - EU Countries
66. Mark the HIGHEST figure from the following options
- India's simple average export share to North Africa during 2008-09 and 2009-10
 - India's simple average export share to East Africa during 2004-05 and 2007-08
 - India's simple average export share to Latin America during 2002-03 and 2004-05
 - India's simple average export share to West Africa during 2007-08 and 2010-11

Section III Quantitative Aptitude

67. A teacher gave sum to his class to find the average of n numbers viz. 1, 2, 3, 4, 5, 6, ... etc. But when the teacher checked the solution, he has found that during the calculation a student just missed a number for the addition thus his average of the n numbers was 15. The value of n is
- 30
 - 26
 - 31
 - not unique
68. 4 kg of a metal contains $\frac{1}{5}$ copper and rest is zinc. Another 5 kg of metal contains $\frac{1}{6}$ copper and rest is zinc. The ratio of copper and zinc into the mixture of these two metals
69. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$, then the value of $\left(\frac{a^n p + c^n q + e^n r}{b^n p + d^n q + f^n r} \right)^{\frac{1}{n}}$
- $\frac{ad}{bc}$
 - $\frac{af}{be}$
 - $\frac{ck}{dk}$
 - None of these
70. At Sahara shopping centre, a person can purchase as much articles at a time as his or her age that is a person of n years age can purchase only n similar articles at a time. Amisha is younger to her elder brother who has just entered into his twenties. One day Amisha went to the Sahara shopping centre, she purchased same toffees at a particular rate on the ground floor. But when she reached on third floor she found that she could purchase double the no. of toffees with the same amount as she had spent on the ground floor. Also to purchase the same no. of toffees on the third floor she had to spend ₹ 2 less than that of on the first floor. How many toffees did she buy?
- 6
 - 12
 - 18
 - 15
71. Dia and Urea are two chemical fertilizers. Dia consists of N , P and K and Urea consists of only N and P . A mixture of Dia and Urea is prepared in which the ratio of N , P and K is 26%, 68% and 6% respectively. The ratio of N , P and K in Dia is 20%, 70% and 10% respectively. What is the ratio of N and P in the Urea?
- 27% and 63%
 - 33% and 67%
 - 35% and 65%
 - 70% and 30%
72. In an equilateral triangle ABC , AO , BO and CO are the angle bisectors meet at the incentre ' O '. D , E and F are the mid-points of AO , BO and CO respectively. A circle with centre ' O ' passes through D , E and F . Area of the circle is $3\pi \text{ cm}^2$. What is the perimeter of triangles $(\Delta)ABC$?
- $12\sqrt{3} \text{ cm}$
 - 18 cm
 - $6\sqrt{3} \text{ cm}$
 - None of these
73. Find the number of pairs for (x, y) from the following equations $\log_{100} |x + y| = \frac{1}{2}$ and $\log_{10} y - \log_{10} |x| = \log_{100} 4$
- 0
 - 1
 - 2
 - None of the above

Directions (Q. No. 74-75) A function $f(z_1, z_2, z_3, \dots, z_n)$
 $= f(z_1, z_n) + f(z_2, z_3, \dots, z_{n-1}) + (z_1 + z_2 + \dots + z_n)$; for
 $n > 0$

$$f(y, z) = f(z, 0) + f(0, y)$$

$$f(y, 0) = y + f(y - 1, 0)$$

$$f(0, y) = y - f(0, y - 1)$$

$$f(0, 0) = 1$$

- 74.** Find the value of $f(1, 1, 3, 1, 1, 3)$.
- 75.** $f(9, 2, k, 0, 9, 4) = 124$, then the value of k is (where, k is a positive integer)
- 76.** Mr. John has x children by his first wife and Ms. Bashu has $x + 1$ children by her first husband. They marry and have children of their own. The whole family has 10 children. Assuming that two children of the same parents do not fight, find the maximum number of fights that can take place among children.
- 77.** If S is the set of all $x \in R$ such that $x^{(\log x)^2 - 3 \log x + 1} > 1000$, then $S =$
 (a) $(-\infty < S < 3)$
 (b) $(1000 < S < \infty)$
 (c) $(-\infty, < S < -1000)$
 (d) $(-\infty < S < 3) \cup (1000 < S < \infty)$
- 78.** Two vertices of a triangle ABC are $B(5, -1)$ and $C(-2, 3)$. If the orthocentre of the triangle is the origin, find the third vertex.
 (a) $\left(\frac{7}{2}, \frac{13}{2}\right)$ (b) $\left(\frac{3}{2}, \frac{11}{2}\right)$
 (c) $(-4, -7)$ (d) None of these
- 79.** A solid metal cylinder of 10 cm height and 14 cm diameter is melted and recast into two cones in the proportion of 3:4 (volume), keeping the height 10 cm. What would be the percentage change in the flat surface area before and after?
- 80.** The minimum value of $3^{\sin x} + 3^{\cos x}$ is
 (a) 2 (b) $2(3^{-1/\sqrt{2}})$
 (c) $3^{1 - \frac{1}{\sqrt{2}}}$ (d) None of these
- 81.** If p, q and r are three unequal numbers such that p, q and r are in AP, and $p, r-q$ and $q-p$ are in GP, then $p : q : r$ is equal to
 (a) 1:2:3 (b) 2:3:4
 (c) 3:2:1 (d) 1:3:4
- 82.** Mr Scindia after selling 5.5% stock at ₹ 92 realizes ₹ 32200. Then he invested $\frac{1}{3}$ of the amount in 4.5% stock at ₹ 92, $\frac{2}{5}$ of the amount at ₹ 115 in 5% stock and the remaining in 6% stock at ₹ 56. The change in his income is

- 83.** Two workers undertake to do a job. The second worker started working 2 hours after the first. Five hours after the second worker has begun working there is still $\frac{9}{20}$ of the work to be done. When the assignment is completed, it turns out that first worker has done rest of the work. How many hours would it take each one to do the whole job individually?
 (a) 10 hours and 12 hours
 (b) 15 hours and 10 hours
 (c) 20 hours and 25 hours
 (d) 18 hours and 20 hours
- 84.** Inspired by the 'Golden quadrilateral project' UP Government recently accomplished a diamond triangular project. Under this project the State Government laid down 6 lane roads connecting three cities Ayodhya, Banaras and Chitrakoot, which are equally separated from each other i.e., in terms of geometry they form an equilateral triangle. Angad and Bajrang start simultaneously from Ayodhya and Banaras respectively, towards Chitrakoot. When Angad covers 100 kms, Bajrang covers such a distance that the distance between Angad and Bajrang makes 90° angle with the road joining Banaras and Chitrakoot. When Bajrang reaches Chitrakoot, Angad is still 150 km away from Chitrakoot. What is the distance between Ayodhya and Banaras?
- 85.** Swetha, Swarna, Sneha and Soumya are four sisters who has an agreement that they share all snacks equally among themselves. One day, uncle Prem gave a box of cookies to Swetha. Since the other sisters were not around, Swetha divided the cookies into four parts, ate her share and put the rest into the box. As she was closing the box, Swarna came in. She divided the cookies into four equal parts. The two of them ate their respective shares and put the rest into the box. Just then Sneha walked in. She took all the cookies from the box, divided them into four equal parts. The three of them ate their respective shares and put the rest into the box. Later, when Soumya came, she divided all the cookies into four equal parts and all the four sisters ate their respective shares. In total, Soumya ate 3 cookies. How many cookies, in total, did Sneha eat?
- 86.** There is a square field of side 500 m long each. It has a compound wall along its perimeter. At one of its corners, a triangular area of the field is to be cordoned off by erecting a straight-line fence. The compound wall and the fence will form its borders. If the length of the fence is 100 m, what is the maximum area that can be cordoned off?
 (a) 2,500 sq m (b) 10,000 sq m
 (c) 5,000 sq m (d) 20,000 sq m

87. The prepaid recharge of Airtel gives 21% less talk time than the same price prepaid recharge of Vodafone. The postpaid talktime of Airtel is 12% more than its prepaid recharge, having the same price. Further, the postpaid talktime of same price of Vodafone is 15% less than its prepaid recharge. How much percent less/more talktime can one get from the Airtel postpaid service compared to the postpaid service of Vodafone?
- (a) 3.9% more (b) 4.7% less
(c) 4.7% more (d) 2.8% less
88. Pratibha printers prepares diaries expecting to earn a profit of 40% by selling on the marked price. But during transportation 8% diaries were got spoiled due to at random rain and 32% could be sold only at 75% of the cost price. Thus the remaining 60% diaries could be sold at the expected price. What is the net profit in the whole consignment?
89. The price of an article reduces to 576 after two successive discounts. The markup is 80% above the cost price of ₹ 500. What is the new profit percentage if instead of two successive discounts the markup price was further increased successively two times by the same percentage?
- (a) 259.2% (b) 59.2%
(c) 159.2% (d) can't be determined
90. If the roots of $10x^3 - cx^2 - 54x - 27 = 0$ are in HP, then find the value of c .
91. What are the roots of the equation $2^{x+2} \cdot 27^{\frac{x}{x-1}} = 9$?
- (a) $2, 1 - \log\left(\frac{3}{2}\right)$
(b) $2, 1 - \log\left(\frac{2}{3}\right)$
(c) $-2, 1 - \left(\frac{\log 3}{\log 2}\right)$
(d) $-2, 1 - \left(\frac{\log 2}{\log 3}\right)$
92. If $|b| \geq 1$ and $x = -|a|b$, then which one of the following is necessarily true?
- (a) $a - xb < 0$ (b) $a - xb \geq 0$
(c) $a - xb > 0$ (d) $a - xb \leq 0$
93. A blacksmith has a rectangular iron sheet 10 ft long. He has to cut out 7 circular discs from this sheet. What is the minimum possible width of the iron sheet if the radius of each disc is 1 ft?
- (a) $2\sqrt{3}$ ft (b) $(2 + \sqrt{3})$ ft
(c) $(3 + \sqrt{2})$ ft (d) $(2 + 2\sqrt{3})$ ft
94. Find the net area between $y = \sin x$ and x -axis between the values $x = \pi$ and $x = 2\pi$
95. If $x(x + y + z) = 9$, $y(x + y + z) = 16$ and $z(x + y + z) = 144$, then value of x will be?
- (a) $\frac{9}{5}$ (b) $\frac{9}{7}$ (c) $\frac{9}{13}$ (d) $\frac{16}{13}$
96. Find the shortest distance from the point $(0, 8a)$ to the curve $ax^2 = y^3$
- (a) $2a$ units (b) $2a\sqrt{11}$ units
(c) $2\sqrt{11}$ units (d) $a/2$ units
97. Mariya was travelling in her boat when the wind blew her hat off and the hat started floating back downstream. The boat continued to travel upstream for twelve more minutes before Mariya realized that her hat had fallen off and turned back downstream. She caught up with that as soon as it reached the starting point. Find the speed of river if Mariya's hat flew off exactly 3 km from where she started:
- (a) 5 km/h (b) 6 km/h
(c) 7.5 km/h (d) can't be determined
98. Two alloys made up of copper and tin. The ratio of copper and tin in the first alloy is 1:3 and in the second alloy it is 2:5. In what ratio the two alloys should be mixed to obtain a new alloy in which the ratio of tin and copper be 8:3?
- (a) 3:5 (b) 4:7 (c) 3:8 (d) 5:11
99. Two trains Punjab mail and Lucknow mail starts simultaneously from Patiyala and Lakhimpur respectively towards each other with the speed of 40 km/h and 60 km/h respectively on the same track Lakhimpur is 500 km due east of Patiyala. A plane starts flying at 200 km/h at the same time from Patiyala to Jalandhar. Jalandhar is 100 km due north of Patiyala. After travelling sometime, two trains Punjab mail and Lucknow mail collides with each other. The plane moves continuously to and fro between Patiyala to Jalandhar till the collision of the trains. How far would the plane have travelled?
100. ICICI lent ₹ 1 lakh to captain Ram Singh at the rate 6% per annual of simple interest for 10 years period. Meanwhile ICICI offered a discount in rate of interest for armed forces. The rate of interest ICICI decreased to 4%. In this way Ram Singh had to pay total amount 1.48 lakh. After how many year Ram Singh got the discount in rated interest?
- (a) 3 years (b) 4 years
(c) 6 years (d) 5 years

ANSWERS

1	(c)	2	(d)	3	(a)	4	(c)	5	(a)	6	(b)	7	(d)	8	(d)	9	(d)	10	(b)
11	(c)	12	(a)	13	(b)	14	(d)	15	(a)	16	(d)	17	(c)	18	(b)	19	(d)	20	(a)
21	(b)	22	(d)	23	(d)	24	(d)	25	(*)	26	(*)	27	(*)	28	(*)	29	(d)	30	(b)
31	(b)	32	(a)	33	(c)	34	(b)	35	(a)	36	(d)	37	(c)	38	(a)	39	(*)	40	(*)
41	(*)	42	(*)	43	(d)	44	(c)	45	(c)	46	(d)	47	(d)	48	(d)	49	(c)	50	(d)
51	(c)	52	(c)	53	(d)	54	(b)	55	(*)	56	(*)	57	(*)	58	(*)	59	(b)	60	(b)
61	(d)	62	(d)	63	(d)	64	(c)	65	(a)	66	(c)	67	(d)	68	(*)	69	(c)	70	(b)
71	(c)	72	(d)	73	(c)	74	(*)	75	(*)	76	(*)	77	(b)	78	(c)	79	(d)	80	(b)
81	(a)	82	(*)	83	(c)	84	(*)	85	(*)	86	(a)	87	(a)	88	(*)	89	(c)	90	(*)
91	(c)	92	(b)	93	(b)	94	(*)	95	(c)	96	(b)	97	(c)	98	(b)	99	(*)	100	(b)

(*) Answers are given below

25. (12345)	26. (12354)	27. (31254)	28. (13524)	39. (B)	40. (Doctor)	41. (Teacher)
42. (G)	55. (12)	56. (16)	57. (9)	58. (Can't be determined)	68. (49:221)	
74. (28)	75. (5)	76. (33)	82. (80)	84. (300 km)	85. (15)	88. (8%)
90. (9)	94. (2)	99. (1000 km)				

Note For explanations visit the weblink given below :

<https://goo.gl/MRtr2Z>

CAT

Common Admission Test

Practice Set 3

Time 3 hrs

M. Marks 300

Instructions

- This test paper contains three sections viz. Section I (Verbal Ability and Reading Comprehension) Section II (Data Interpretation and Logical Reasoning) and Section III (Quantitative Aptitude).
- This paper contains 100 questions. Each question carries equal weightage of three marks.
- One mark will be deducted for each wrong answer and there is no negative marking for TITA questions.
- This paper also contains some non-MCQs. Answers of these questions required to be written in descriptive way.

Section I Verbal Ability and Reading Comprehension

Directions (Q. Nos. 1-24) Read the passages given below and choose the most suitable option from the given ones.

Passage 1

The structure and operations of banks have undergone a rapid transformation in recent years.

Consequent upon the revolution in information technology and the associated increase in competition financial intermediaries have become increasingly global in geographical coverage and universal in the financial operations, encompassing a wide range of activities including banking, securities markets activities and insurance. In the face of widespread concerns about declining profitability of banks, the Basel capital adequacy norms were enacted.

Although the Basel norms helped to arrest the erosion of banks, capital ratios, concerns were raised regarding the mere applicability of baseline capital ratios in the changed environment of operation. The blurring of both functional as well as national divisions among the financial intermediaries and the speed and complexity of adjustment, made it difficult for regulators to keep up with the growing pace change. In particular, the rule of 'one-size-fits-all' aspect of the capital adequacy ratio was the subject of intense debate. Recent banking crisis only emphasized the point that baseline capital, adequacy norms were not adequate to hedge against failures. In response to the same, the Basel Committee on Banks Supervision came out with the new Consultative Paper on Capital Adequacy. It invited suggestions from the policymakers, academia and other institutes all over the world. After taking into consideration manifold suggestions of the various organizations, the second Consultative Paper on Capital Adequacy was released.

The Accord rests on three pillars; the first pillar of minimum capital requirement, the second pillar of supervisory review process and the third pillar of market discipline. The first pillar sets out the minimum capital requirements. The new framework maintains both the current definition of capital and the minimum requirement of 8% of capital to risk-weighted assets. The revised Accord will be extended on a consolidation basis to holding companies of banking groups. The Accord stresses upon the improvement in measurement of risks. The credit risk measurement methods have been made more elaborate than those in the existing Accord. The new framework also emphasizes the

measurement of operational risk. For measuring credit risk, two options have been proposed. The first is the standardized approach and the second is the internal rating based approach. Under the standardized approach, the existing approach for credit risk remains conceptually the same but the risk-weights have been enlarged to encompass exposures to a broad category of borrowers with reference to the rating provided by rating agencies.

1. What necessitated the creation of Basel capital adequacy norms?
 - (a) To study the profitability pattern in the banks.
 - (b) The banks wanted its capital reserve ratios to be kept above 8%.
 - (c) Regulatory body of the banks wanted to have uniform policy.
 - (d) None of the above
2. Which of the following factors are responsible for rapid transformation in banks in recent years?
 - (a) The forces of privatization and international players have compelled the banks to do so.
 - (b) Control from regulators has become meaningless for the banks to survive.
 - (c) Sudden upsurge in economy.
 - (d) The competition has increased and information technology has undergone a sea change.
3. According to the passage, activities encompassed by banks are:
 - (a) insurance, housing finance and low cost funds.
 - (b) market discipline, profit maximization and priority sector banking.
 - (c) securities markets, insurance and banking.
 - (d) geographical coverage, universalization and transformation.

Passage 2

Despite the economic crunch worldwide that saw pulverization of some of the largest banking and finance giants, Indian banking houses have managed to show positive growth this quarter. Some of India's leading national banks have posted a net profit rise of more than 40% over the last quarter amid global turmoil. This would come as a big shot in the arm for the investors and consumers of these banks even though apprehension is mounting on other banking and broking firms worldwide. One of the main reasons behind the success of these banks this quarter would be their direct backing by the Government of India. People take solace in their investments in public sector watching the bailout packages being cashed out by governments all over the world to save big business houses.

Other private banks in India have also reported a substantial net profit over the last quarter. Given the internal and domestic scenario, one cannot put this down as a mundane achievement. While others are on a cost-cutting spree and firing employees, Indian companies are actually working on boosting staffing in banking and broking sector. This can be seen as a big boon in the days to come when the current recession eases and the economy gradually comes back on to the fast track. The finance minister has assured Indian public about the sound health of all Indian banks. This could also be evident from the fact that there have been no mergers and takeovers in Indian banking sector in a contrast to world scenario where finance houses are looking for mergers to cut cost on operations. We, definitely, are not looking to thrive; rather we are looking for growth. It is just that the pace of growth is a little slow now as compared to a year or two before. These are hard times to test the hard. The weak in business and career will be weeded out and it is sometimes very beneficial for business in the long run.

4. What, according to the author, is the reason for the success of Indian national banks in this quarter?
 - (a) Indian national banks do not have any commitments in troubled foreign markets.
 - (b) These banks can never face financial crisis because of their sheer size.
 - (c) These banks are ready to give loans at a very low rate of interest.
 - (d) The public is ready to invest in these banks because of the knowledge that these banks get strong support from the Government.
5. What does the phrase 'shot in the arm' as used in the passage mean?
 - (a) Shock
 - (b) Fear
 - (c) Encouragement
 - (d) Anxiety
6. How, according to the author, is the current recession beneficial?
 - (a) Worldwide companies have realized that India is a strong power to reckon with.
 - (b) India is surging ahead of the other companies throughout the world.
 - (c) After the recession is over international companies will turn to India for investment.
 - (d) None of these

Passage 3

The genesis of service tax emanates from the ongoing structural transformation of the Indian economy, whereby presently more than one-half of GDP originates from the services sector. Despite the growing presence of the services sector in the Indian economy, it remained out of the tax net prior to 1994-95, leading to a steady deterioration in tax-GDP ratio. The service tax was introduced in 1994-95 on a select category of services at a low rate of five percent. While the service tax rate and the coverage of services being taxed have increased ever since, the combined tax-GDP ratio of the Centre and States, nevertheless, deteriorated from 16.4 percent in 1985-86 to 14.1 percent in 1999-2000. It may be noted that between 1990-91 and 1998-99, the share of industrial sector in GDP dropped by 6.4 percentage points whereas almost 64 percent of the tax revenue was generated by indirect taxes for which industrial sector continues to be the principal tax base. On the other hand, during the same period, the share of services sector in GDP has increased by 10 percentage points and this sector has still remained poorly taxed.

The rationale for service tax, therefore, lies not only in arresting the falling tax-GDP ratio but also in ipso facto improving allocative efficiency in the economy as well as promoting equity. Against this backdrop, the service tax needs to be designed taking into account the fact that (i) the share of services in GDP is expanding; (ii) failure to tax services distorts consumer choices and encourages spending on services at the expense of goods; (iii) untaxed service traders are unable to claim value added tax (VAT) on service inputs, which encourages businesses to develop in-house services, creating further distortion and (iv) most services that are likely to become taxable are positively correlated with expenditure of high-income households and, therefore, service tax improves equity.

In the Indian context, taxation of services assumes importance in the wake of the need for improving the revenue system, ensuring a measure of neutrality in taxation between goods and services and eventually helping to evolve an efficient system of domestic trade taxes, both at the Central and the State levels.

The coverage of services under tax net has been progressively widened over the years with effect of the Finance Act, 2004. 71 services are presently contributing to the service tax collections. The service tax is applicable to all parts of India except the State of Jammu and Kashmir and is leviable on the gross amount charged by the service provider from the client. The rate of service tax was increased from 5 percent since September 10, 2004. With the increase in tax rate and base of service tax, the collections from the service tax have shown a steady rise from ₹ 410 crore in 1994-95 to ₹ 8,300 crore in 2003-04; however, they accounted for only 4.4 percent of the total tax receipts of the Centre (0.3 percent of GDP) in 2003-04.

Service tax is envisaged as the tax of the future. The inclusion of all value added services in the tax net would yield a larger amount of revenue and make the existing tax structure more elastic. Once the service sector is adequately covered under tax net, the buoyant services sector will enable the reversal of declining trend in tax buoyancy. Besides raising the revenue buoyancy, appropriate taxation of services sector would also provide equity, efficiency and consistency in the tax administration as well as neutrality for various economic activities. Integration of services sector to the tax net would be the prelude to the introduction of a full-fledged VAT system.

7. What according to the passage was the impact of exclusion of service tax till the first half of the last decade of the past century?
 - (a) There was no impact as there was no service tax.
 - (b) There was a steady deterioration in the GDP.
 - (c) Tax-GDP ratio has steadily and gradually aggravated
 - (d) Service sector used to flourish exorbitantly.
8. The origin of service tax is attributed to _____
 - (a) increase in Gross Domestic Product (GDP)
 - (b) existence of service sector
 - (c) tax of the future
 - (d) metamorphosis of our country's economy
9. Which of the following is most likely to provide neutrality to various economic activities?
 - (a) Increase in revenue buoyancy
 - (b) Fairness in tax administration
 - (c) Consistency in tax structure and revenue buoyancy
 - (d) Equity and efficiency in various activities
10. What is the probable impact of bringing all value added services under the tax net?
 - (1) It will yield larger revenue.
 - (2) It will provide flexibility to the present tax structure.
 - (3) It will progressively decrease tax buoyancy.
 - (a) 1 and 3 only
 - (b) 2 and 3 only
 - (c) 1 and 2 only
 - (d) All the three
11. When the author mentions that the service taxes constitute 0.3 percent of GDP, he implies that
 - (a) it is a substantially high amount
 - (b) the service taxes show a very progressive trend
 - (c) it is a very small amount
 - (d) there is no scope for further increase
12. Levying service tax is most likely to achieve which of the following?
 - (1) Check on reducing Tax-GDP ratio
 - (2) Enhancement in allocative efficiency
 - (3) Promoting equality
 - (a) 1 and 2 only
 - (b) 2 and 3 only
 - (c) 1 and 3 only
 - (d) All the three

Passage 4

To teach is to create a space in which obedience to truth is practised. Space may sound like a vague, poetic metaphor until we realize that it describes experiences of everyday life. We know what it means to be in a green and open field; we know what it means to be on a crowded rush hour bus. These experiences of physical space have parallels in our relations with others. On our jobs, we know what it is to be pressed and crowded, our working space diminished by the urgency of deadlines and competitiveness of colleagues. But, then there are times when deadlines disappear and colleagues cooperate, when everyone has space to move, invent and produce with energy and enthusiasm. With family and friends, we know how it feels to have unreasonable demands placed upon us, to be boxed in the expectations of those nearest to us. But, then there are times when we feel accepted for who we are (or forgiven for who we are not), times when a spouse or a child or a friend gives us the space both to be and to become.

Similar experiences of crowding and space are found in education. To sit in a class where the teacher stuffs our minds with information, organizes it with finality, insists on having the answer while being utterly uninterested in our views, and forces us into a grim competition for grades-to sit in such a class is to experience a lack of space for learning. But, to study with a teacher who not only speaks but also listens, who not only gives answers but asks questions and welcomes our insights, who provides information and theories that do not close doors but open new ones, who encourages students to help each other learn to study with such a teacher is to know the power of a learning space.

A learning space has three essential dimensions: openness, boundaries and an air of hospitality. To create open learning space is to remove the impediments to learning that we find around and within us: we often create them ourselves to evade the challenge of truth and transformation. One source of such impediments is our fear of appearing ignorant to others or to ourselves. The openness of a space is created by the firmness of its boundaries. A learning space cannot extend indefinitely; if it did, it would not be a structure for learning but an invitation for confusion and chaos. When space boundaries are violated, the quality of space suffers. The teacher who wants to create an open learning space must define and defend its boundaries with care because the pursuit of truth can often be painful and discomforting, the learning space must be hospitable. Hospitality means receiving each other, our struggles, our new-born ideas with openness and care. It means creating an ethos in which the community of truth can form and the pain of its transformation be borne. A learning space needs to be hospitable not to make learning painless but to make painful things possible, things without which no learning can occur-things like exposing ignorance, testing tentative hypotheses, challenging false or partial information and mutual criticism of thought.

The task of creating learning space with qualities of openness, boundaries and hospitality can be approached at several levels. The most basic level is the physical arrangement of the classroom. Consider the traditional classroom setting with row upon row of chairs facing the lectern where learning space is confined to the narrow alley of attention between each student and teacher. In this space, there is no community of truth, hospitality or room for students to relate to the thoughts of each other. Contrast it with the chairs placed in a circular arrangement, creating an open space within which learners can interconnect. At another level, the teacher can create conceptual space with words in two ways. One is through assigned reading; the other is through lecturing. Assigned reading, not in the form of speed reading several hundred pages, but contemplative reading which opens, not fills, our learning space. A teacher can also create a learning space by means of lectures. By providing critical information and a framework of interpretation, a lecturer can lay down the boundaries within which learning occurs.

We also create learning space through the kind of speech we utter and the silence from which true speech emanates. Speech is a precious gift and a vital tool but often our speaking is an evasion of truth, a way of buttressing our self-serving reconstructions of reality. Silence must, therefore, be an integral part of learning space. In silence, more than in arguments, our mind-made world falls away and must also create emotional space in the classroom, space that allow feeling to arise and be dealt with because submerged feelings can undermine learning. In an emotionally honest learning space, one created by a teacher who does not fear dealing with feelings, the community of truth can flourish between us and we can flourish in it.

13. Which of the following statements best describes the author's conception of learning space?
- (a) Where the teacher is friendly.
 - (b) Where there is no grim competition for grades.
 - (c) Where the students are encouraged to learn about space.
 - (d) Where the teacher provides information and theories which open new doors and encourages students to help each other learn.
14. The statements 'the openness of a space is created by the firmness of its boundaries' appears contradictory. Which of the following statements provides the best justification for the proposition?
- (a) We cannot have a space without boundaries.
 - (b) Bounded space is highly structured.
 - (c) When space boundaries are violated, the quality of space suffers.
 - (d) A teacher can effectively defend a learning space without boundaries.

15. According to the author, learning is a painful process because:
- (a) It exposes our ignorance.
 - (b) Our views and hypotheses are challenged.
 - (c) It involves criticizing the views of others.
 - (d) Of all of the above reasons.
16. The task of creating learning space with qualities of openness, boundaries and hospitality is multidimensional. It involves operating at:
- (a) Psychological and conceptual levels.
 - (b) Physical, perceptual and behavioural levels.
 - (c) Physical, conceptual and emotional levels.
 - (d) Conceptual, verbal and sensitive levels.
17. According to the author, silence must be an integral part of learning space because:
- (a) Silence helps to unite us with others to create a community of truth.
 - (b) Silent contemplation prepares us to construct our mind-made world.
 - (c) Speaking is too often an exercise in the evasion of truth.
 - (d) Speaking is too often a way of buttressing our self-serving reconstruction of reality.
18. According to the author, an effective teacher does not allow
- (a) feelings to arise within the learning space.
 - (b) silence to become an integral part of the learning space.
 - (c) learning space to be filled by speed reading of several hundred pages of assigned reading.
 - (d) violation of learning space boundaries.

Passage 5

How quickly things change in the technology business! A decade ago, IBM was the awesome and undisputed king of the computer trade, universally feared and respected. A decade ago, two little companies called Intel and Microsoft were mere blips on the radar screen of the industry, upstart startups that had signed on to make the chips and software for IBM's new line of personal computers. Though their products soon became industry standards, the two companies remained protected children of the market leader. What has happened since is a startling reversal of fortune? IBM is being ravaged by the worst crisis in the company's 79-year history. It is undergoing its fifth restructuring in the past seven years as well as seemingly endless rounds of job cuts and firings that have eliminated 100,000 jobs since 1985. Last week, IBM announced to its shell-shocked investors that it lost \$4.97 billion last year-the biggest loss in American corporate history.

And just when IBM is losing ground in one market after another, Intel and Microsoft have emerged as the computer industry's most fearsome pair of competitors. The numbers on Wall Street tell a stunning story. Ten years ago, the market value of the stock of Intel and Microsoft combined amounted to about a tenth of IBM's. Last week, with IBM's stock at an 11 year low, Microsoft's value surpassed its old mentor's for the first time even (\$26.76 billion to \$26.48 billion), and Intel (\$24.3 billion) is not far behind. While IBM is posting losses, Intel's profits jumped 30% and Microsoft's rose 44%.

Both Intel, the world's largest supplier of computer chips, and Microsoft, the world's largest supplier of computer software, have assumed the role long played by Big Blue as the industry's pacesetter. What is taking place is a generational shift unprecedented in the information age - one that recalls transition in the U.S. auto industry 70 years ago, when Alfred Sloan's upstart General Motors surpassed Ford Motors as America's NO.1 car maker. The transition also reflects the decline of computer manufacturers such as IBM, Wang and Unisys and the rise of companies like Microsoft, Intel and AT & T that create the chips and software to make the computers work. Just like Dr. Frankenstein, IBM created these two monster competitors, says Richard Shaffer, publisher of the Computer Letter. Now, even IBM is in danger of being trampled by the creations it unleashed.

Although Intel and Microsoft still have close relationships with Big Blue, there is little love lost between IBM and its potent progeny. IBM had an ugly falling-out with former partner Microsoft over the future of personal-computer software. Microsoft developed the now famous disk operating system for the IBMPC called DOS-and later created the operating software for the next generation of IBM personal computers, the Personal System/2. When PS/2 and its operating system, OS/3, failed to catch on, a feud erupted over how the two companies would upgrade the system. Although they publicly patched things up, the partnership was tattered. IBM developed its own version of OS/3, which has so far failed to capture the industry's imagination, Microsoft's competing version, dubbed New Technology, or NT, will debut in a few months and will incorporate Microsoft's highly successful Windows program, which lets users juggle several programs at once. Windows NT however, will offer more new features, such as the ability to link many computers together in a network and to safeguard them against unauthorized use.

IBM and Intel have also been parting company. After relying almost exclusively on the Santa Clara California company for the silicon chips that serve as computer brains, IBM has moved to reduce its dependence on Intel by turning to competing vendors. In Europe, IBM began selling a low-cost line of PCs called Ambra, which runs on chips made by

Intel rival Advanced Micro Devices. IBM also demonstrated a sample PC using a chip made by another Intel enemy, Cyrix. And last October, IBM said it would begin selling the company's own chips to outsiders, in direct competition with Intel.

IBM clearly feels threatened. And the wounded giant still poses the biggest threat to any future dominance by Intel and Microsoft. Last year, it teamed up with both companies' most bitter rivals—Apple Computers and Motorola—to develop advanced software and microprocessors for a new generation of desktop computers. In selecting Apple and Motorola, IBM bypassed its longtime partners. Just as Microsoft's standard operations system runs only on computers built around Intel's computer chips, Apple's software runs only on Motorola's chips. Although IBM has pledged that the new system will eventually run on a variety of machines, it will initially run only computer programs written for Apple's Macintosh or IBM's OS/2. Its competitive juices now flowing, IBM last week announced that it and Apple Computer will deliver the operating system in 1994—a year ahead of schedule.

- 19.** As a result of greater competition in the US Computer industry:

- (a) Some computer companies are expanding while others are contracting.
- (b) Employment in the industry is going down.
- (c) The industry is becoming more monopolized.
- (d) The share value of IBM is going up relative to that of Intel and Microsoft.

- 20.** Why is something that happened 70 years ago in the US auto industry being mentioned here?

- (a) General Motors broke away from Ford Motors.
- (b) A new company went ahead of an established market leader.
- (c) Like Dr. Frankenstein, Ford Motors created a monster in General Motors.
- (d) Microsoft, Intel and AT & T were originally created by IBM.

- 21.** Who is mentioned as the principal supplier of silicon chips to IBM?

(a) AT & T	(b) Microsoft
(c) Cyrix	(d) Intel

- 22.** The personal computer called Ambra is marketed by :

(a) Cyrix	(b) IBM
(c) Intel	(d) Microsoft

- 23.** What was the original reason for the feud between IBM and Microsoft?

- (a) The two companies developed competing softwares.
- (b) Microsoft and Intel teamed up against IBM.
- (c) IBM began to purchase microchips from Intel instead of Microsoft.
- (d) IBM made losses while Microsoft made profits.

- 24.** Which of the following statements is true?

- (a) IBM plans to introduce a new system that will run on a variety of machines.
- (b) IBM's new generation desktop computers will run only on Motorola's chips.
- (c) IBM is working out a joint strategy with Apple to force Motorola to supply chips at a lower price.
- (d) IBM is going to sell its own chips to Apple and Motorola.

Directions (Q. No. 25-28) Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

- 25.** (1) In his second book 'Manage yourself' Dishu explained how the expectancy theory convinced managers and employees that managing the individual works better than treating everyone the same.

- (2) Earlier on, Dishu had applied his expectancy theory in a step by step process used mainly as a one-on-one approach between the manager and the employees.

- (3) Everyone was flabbergasted by his success.

- (4) Nevertheless, Dishu organized a team and implemented, tested and gathered data to measure results in the corporate environment.

- (5) It was not designed for the entire organizations.

- 26.** (1) In the US about 12 million people are homeless, one-third of the people cannot afford primary health care, 20 percent of the children live below the poverty line and about 23 percent of the people are illiterate with no security of either job or life.

- (2) In capitalism, wealth is concentrated in the hands of a few.

- (3) In the West, men are only capable of seeing the external aspects of things.

- (4) The resultant deprivations are variable even in the developed countries.

- (5) The domination of the capitalist class today is justified in the name of economic growth and population efficiency.

- 27.** (1) Teacher preparation must ensure development of commitment amongst teachers.

- (2) With all the limitations and deficiencies inherent in our educational system has to be achieved only through combined effort of teachers and community.

- (3) It is tough proposition when most of the other sectors are influenced by self-interests and material pursuits everywhere.

- (4) A value based approach must form the backbone of educational system and also the teacher education system.

- (5) However, teacher education needs to emphasise that teachers alone can kindle the value-based growth.

28. (1) Since independence, every political party has played communal card whenever election time draws near.
 (2) In fact, the caste and communal cards have been fine-tuned to an art form in the political games that are played in this country.
 (3) This was seen when the Youth Congress (I) goons were given a free hand to terrorise Sikhs all over the country after Indira Gandhi's assassination.
 (4) When each party carefully selects political candidates on the basis of religion or caste, it is encouraging and continuing the divide-and-rule tactics of its colonial masters.
 (5) And no political party can absolve itself on this count; worse, political parties take on board hoodlums and gangsters who use their clout in political circles to settle scores and extract money.

Directions (Q. No. 29-31) In each of the questions given below, four sentences are given labelled a, b, c and d. Of these, three statements need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the option that does not fit the sequence.

29. a. At other times, it is the repetitiveness more than the variability of the names that makes them seem less than distinctive, an impression sometimes heightened by their transparent meaning.
 b. The heroines of two different myths may have the same name, while the heroine in two versions of the same myth will have a different name.
 c. This apparent contradiction reflects the two poles of the heroine's situation: to be little more than a name in a genealogy, or to be distinct; to suffer, sometimes even to achieve immortality.
 d. On the other hand, a few of the most familiar figures have names that are significant and distinctive.
30. a. Doing research is essentially like solving a puzzle.
 b. Puzzles have rules and predetermined solutions
 c. Research involves extrapolating knowledge to newer territories and unforeseen challenges.
 d. A striking feature of doing research is that the aim is to discover what is known in advance.
31. a. As far as we know, death is a great emptiness for us, a threshold beyond which we can directly perceive nothing.
 b. Such a threshold is inseparable from the sacred, which aids us in our struggles to reconcile our inherent limitedness with our convictions.
 c. Nevertheless, that which is beyond the threshold of death is unavailable to us in any direct or unmediated fashion.
 d. Granted, we readily project our fantasies into and live out of faiths in relation to this void.

Directions (Q. No. 32-34) The passage given below is followed by four alternative summaries. Choose the option that best captures the essence of the passage.

32. The current trend in crude oil prices gives a serious cause for concern and if this persists, many of the calculations indicating further recovery and improved growth for the economy can be nullified. This year, the oil prices have risen from \$70 per barrel to briefly touch \$87, falling back somewhat thereafter. Such levels have not been seen since October 2008. That year, oil crossed a historic \$140 per barrel.

It is the continued upward trend (except for the period of recession in the global economy) through the later part of the last year, which shows no signs of abating. High oil prices, which rein in growth, will be a bad news for India in more than one way.

Slower growth will take away some of the buoyancy that revenue collection is now displaying. But, India's problem is compounded by the fact that oil prices are not fully passed on and thus result in under-recoveries for the oil-marketing companies.

- (a) For India to be on a sustainable growth path, its energy prices will have to be market-determined and go up if global prices go up
 (b) The under-recoveries ruin the finances of the oil marketing companies and sap their energy and desire to run them efficiently
 (c) According to a senior Oil Ministry official, if oil prices again touch \$87 a barrel and refuse to come down, then with the current consumer prices, the current financial year can end up with a massive under-recovery of ₹ 80,000
 (d) Since there is no election round the corner, government has in an arrogant manner raised the prices of oil (both diesel and petrol) and passed on the same to a common man, who is already hard-hit due to a very high level of inflation
33. Delhi is producing close to 7500 tonnes of solid waste per day, an amount which is expected to go up to around 14,300 tonnes by 2021. The state of environment report says that even if a reasonable amount of this waste is collected and disposed of, it will require an 800 hectare landfill site. However, if segregation and treatment of waste is done, properly, only 5 - 10% of the waste will have to be disposed of, the report says. "The most acceptable strategy for solid waste management in Delhi will be to categorize waste streams as biodegradable, re-cyclable and inert matter to maximize recovery and minimize quantity of waste generation." According to the report, municipal solid waste management is in a mess. The three landfill sites have long been exhausted but no workable plan to replace them is in place. The report also suggests that relatively affluent zones generate about 40% organic waste which hints at wasteful habits of residents there. The city also produces

around 5000 tonnes of hazardous waste per year. Though some of it comes from the sludge at common effluent treatment plants; most of it is generated at dyeing and pickling units and electroplating factories. This waste often finds its way to the municipal solid waste dumps, posing a hazard not just to the environment but also to humans.

- (a) Delhi has no hazardous waste management facility and it has led to 23 illegal hazardous waste sites in the city
- (b) Electronic waste is another headache for the capital. Delhi is the second largest generator of e-waste in the country at nearly 9.7 tonnes per annum
- (c) Biomedical waste from hospitals, which is highly infectious, is generated, on an average, to the tune of 10 tonnes per day, which is again treated at common waste disposal facilities
- (d) Hazardous waste should be better managed by relocating the industrial units to the specified conforming areas and preparing an elaborate inventory of the waste and its appropriate disposal

34. Organizations are often defined as groups of people who come together to pursue a common goal. But, more often than not, goals diverge as much as they converge, making the rationality of the overall organization no more than an elusive ideal. Beneath the collective irrationality, however, organizations are often operating in a way that is eminently rational from the standpoint of the individuals, groups and coalitions directly involved.

- (a) As individuals, groups or coalitions in an organization pursue their own interest, the conceptual issues of rational behavior get blurred.
- (b) Although conceptually, an organization may appear to be irrational-behaviors of individuals, groups and coalitions in the organization may be rational
- (c) If all employees of an organization pursue their individual goals, one can never have an organization that behaves rationally
- (d) Since people are essentially irrational, the ideal of building a rational organization is elusive

Section II Data Interpretation and Logical Reasoning

Direction (Q. Nos. 35-38) Read the following passage and solve the questions based on it

Six horses named Aparajit, Bahadur, Chetak, Dhundumar, Pakshiraj and Vijay are entered in a race. The big starting gate is divided into exactly seven positions numbered consecutively 1 to 7. Seven jockeys, also numbered from 1 to 7 are eligible to ride the horses in the race. Each jockey's number corresponds to the numbered position on the starting gate from which that jockey, if assigned to a horse, will ride. Exactly one jockey will not be assigned to any of the horses and the starting gate position corresponding to that jockey's number will remain vacant for the race. Jockeys will be assigned horses and the horses will run from the starting gate position in accordance with the following restrictions.

- (i) Either Aparajit or Chetak must be ridden by Jockey 1.
- (ii) Pakshiraj must be ridden by Jockey 4 or else by Jockey 5.
- (iii) Bahadur and Pakshiraj must have at least one horse separating the two of them at starting gate.
- (iv) Chetak must run from a starting gate position which has a lower number than the starting gate position from which Vijay runs.

- 35.** If the horses complete the race, from the first to the last, in exactly the order 6, 5, 4, 3, 2 and 1 (corresponding to the number of their jockeys); and if Bahadur is the horse that wins the race, then each of the following horses could have been among the top three in the race except
- (a) Chetak
 - (b) Dhundumar
 - (c) Pakshiraj
 - (d) Vijay

36. If Jockey 5 is the one not assigned to any horse, which of the following could be true?

- (a) Aparajit is ridden by jockey 4
- (b) Vijay is ridden by Jockey 6
- (c) Bahadur is ridden by Jockey 6
- (d) Chetak is ridden by Jockey 7

37. If Dhundumar is incapable of running the race and no replacement horse is found; and if the horses that run, finish the race from the first to the last, in the order 1, 2, 4, 6 and 7 (corresponding to the numbers of their jockeys) then which of the following must have finished last in the race?

- (a) Aparajit
- (b) Bahadur
- (c) Chetak
- (d) Pakshiraj

38. If Chetak runs from the starting gate position 5 and the starting gate position 6 is vacant, then which of the following must be true?

- (a) Vijay starts from the starting gate position
- (b) Aparajit starts from the starting gate position-1
- (c) Pakshiraj starts from the starting gate position-3
- (d) Dhundmar starts from the starting gate position-3.

Directions (Q. Nos. 39-42) Read the passage given below and solve the questions based on them.

Five universities—A, B, C, L and K participated in the last year inter-university athlete event. Each of the universities were represented by three members. According to the rules, the total number of athletes participating in the race should be equal to 16. The

rank obtained by the individual will be the points obtained. And similarly the points obtained by an individual university will be equal to the sum of the ranks of the member athletes of the team. Lower the points, better the team and the best team wins the trophy.

The five universities tied for the trophy, their sum being equal, however no two athletes tied for the same position. In order to determine the order in which the universities will hold the trophy (they agreed to hold it for 73 days each), they multiplied the athletes positions together in each university. The university with the smallest product—K— will hold the trophy first and so on the university with the largest product —A— will hold the cup last. Unfortunately, universities B and C were still tied and had to be separated by a toss of coin.

It was also found that the no two athletes of a university finish at the consecutive positions. Had the race-track maker did not come in between two athletes of university B, university B would have achieved this feat of two athletes being at consecutive positions.

39. Which of the following is the position of the race-track maker?
40. What is the product of university A?
41. What is the smallest point obtained by an individual of university L?
42. What is the product of the ranks obtained by all the athletes of university K?

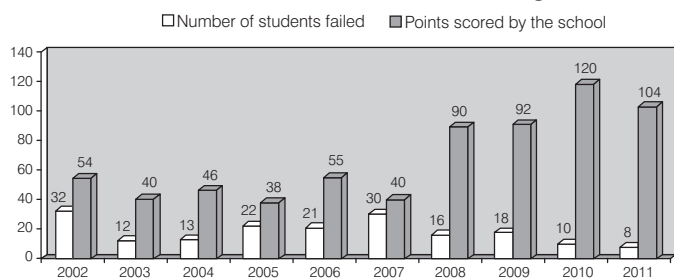
Direction (Q. No. 43-46) Read the information given below and answer the questions that follow.

The following chart shows the performance of the students of St. Xavier's High School, Patna in the Tenth standard board examinations. It is assumed that St.Xavier's High School, Patna, has 799 students in total and the number remained constant over the period.

Points scored = Total number of students passed – Number of students failed

Assume that a student is allowed to attempt the board examination under the school's name only once. If he fails, he is no longer allowed to take the exam under the school's banner.

Performance of Students of St.Xaviers High School



43. SXAA stands for St. Xavier's Alumni Association. Find the students (in %) who could not become a member of SXAA in the years 2002 to 2011?
- (a) 11% (b) 9%
(c) 7% (d) 21%
44. If pass percentage in the best indication of the school's performance, in which year did the school have its best performance?
- (a) 2009 (b) 2010
(c) 2011 (d) Cannot say
45. In how many years has the number of points of the school been higher than the average points scored per year over time period shown?
- (a) Three (b) Four
(c) Five (d) Six
46. In 2004, the principal of the school decided not to throw out the failed students but to give them one more chance. It was then decided that the performance of those candidates would not be counted for the score of the school. If all those students passed the next year, then what would have been the score of the school, if their results had been included in the final tally?
- (a) 22 (b) 16
(c) 12 (d) 68

Direction (47-50) There are 16 boxes in a grid. Each of the 16 boxes has a numbers as shown below. The value of the box is the number on the box.

Four friend Amar, Biren Chandan and Deepak are playing a game, where the objective is to make the maximum addition of the boxes. Each person has exactly 4 boxes with him at point of time

	1	2	3	4
A	22	12	30	6
B	10	16	24	20
C	32	2	28	14
D	18	4	26	8

- Amar did not own any of the boxes in the A-row.
 - Biren's highest number is A-3
 - B-2 & C-1 belong to someone other the Chandan.
 - Chandon doesn't own any of the boxes in the 1-column.
 - In the last round of the game, Amar traded B-4 for B-1
 - D-2, A-2 and D-3 all belong to the same player.
 - C-1 B-3 and 4-D all belong to the same player.
 - Deepak's score was 8 higher than Biren's who has three boxes in the A row.
 - Amar has just one box in B-row, which is B-1.
- Based on the information above answer the questions which follow.

47. Who has the lowest total?
 (a) Amar (b) Biren
 (c) Chandan (d) Deepak
48. To whom does C-4 belong at the end of the game?
 (a) Amar (b) Biren
 (c) Chandan (d) Deepak
49. What is the difference between the total of Deepak and Chandan?
 (a) 4 (b) 8
 (c) 14 (d) 18
50. What is Amar's total at the end of the game?
 (a) 58 (b) 62
 (c) 72 (d) 80

Direction (51-54) Read the following passage and solve the questions based on it.

K.C. Das is preparing special sweet packages for Puja. Different sweet packages are numbered 1 through 5 from left to right, and K.C. Das fills them with different sweets. Each package will contain at least one, but not more than two of the following types of sweets:

Gulabjamun, Kaju Barfi, Petha, Rasgulla, Sohan Halwa and Cham Cham. Each type of sweet will be placed in at least one sweet package. These sweets will be packed either in a bucket, a carton or a tin. K.C. Das fills the packages according to the following conditions.

- (i) At least two packages must contain Rasgulla.
- (ii) Exactly two packages must contain Kaju Barfi, and these packages cannot be adjacent to each other.
- (iii) Both packages that contain Kaju Barfi must be to the left of any package that contains Gulabjamun.
- (iv) Package 2, 3 and 4 cannot contain Sohan Halwa.
- (v) Any package that contains Rasgulla must be packed in a carton.
- (vi) Any package that contains Kaju Barfi must be packed in a bucket.
- (vii) Package 2 is packed in a carton.

51. Which one of the following cannot be true?
 (a) Package 1 is packed in a tin
 (b) Package 2 contains Cham Cham
 (c) Package 3 is packed in a tin
 (d) Package 4 contains kaju Barfi
52. If a package containing sweets packed in a tin is not adjacent to a package packed in a bucket, then which one of the following must be true?
 (a) Package 1 contains Petha
 (b) Package 4 contains Kaju Barfi
 (c) Package 4 contains Rasgulla
 (d) Package 5 contains Gulabjamun

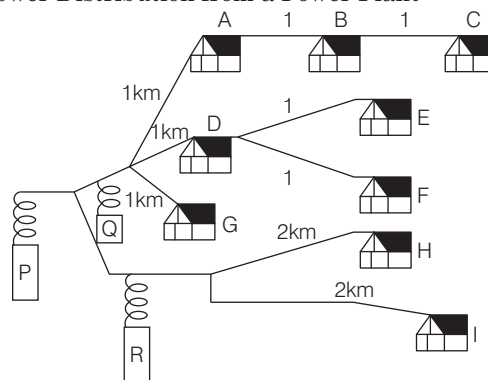
53. If Rasgullas are contained in the maximum number of packages, which one of the following must be true?
 (a) Package 3 is packed in a bucket
 (b) Package 4 is packed in a bucket
 (c) A package containing Sohan Halwa is packed in a bucket
 (d) A package containing Gulabjamun is packed in a carton.
54. If package 4 contains Petha and Cham Cham, which one of the following pairs of sweets must be contained in the same package?
 (a) Kaju Barfi and Sohan Halwa
 (b) Gulabjamun and Petha
 (c) Rasgulla and Cham Cham
 (d) Gulabjamun and Sohan Halwa

Direction Q. No. (55-58) Read the following passage and solve the questions based on it.

Power plant produces certain amount of electricity, which distributes equally to substations *Q* and *R*. They further distribute the obtained electricity equally to the different mini stations A, B, C, D, E, F, G, H and I. It is assumed that after the sub-stations, the wire loses 10% of the original electricity it is carrying for every kilometer, i.e. if 10 A is sent through a wire, after 1 km it will have 9 A and after 2 km it will have 8 A and so on.

Further it is known that every mini-station retains 50% of the electricity that it receives (after the losses) and passes on the remainder 50% of the electricity that it receives to the stations down the line.

Power Distribution from a Power Plant



55. If mini-station I is receiving 10 A, then how much is mini-station 'A' receiving?
56. Approximately how much should P produce, so that C can get 10 A of current? (Rounded off to nearest integer)
57. Mini-station H is using a device which decreases the current losses on the transmission route directly connected to it to 75%. If H is receiving 34 A, then how much is G receiving?
58. If F is receiving 9 A then how much is G receiving?

Direction (59-62) Read the following passage and solve the questions based on it.

An employee has been assigned the task of allotting offices to six of the staff members. The offices are numbered from 1 to 6. The offices are arranged in a row and a 6-foot high divider separates them from each other. Hence, voices, sounds and cigarette smoke flow easily from one office to the other.

Ms Robert needs to use the telephone quite often throughout the day. Mr Mike and Mr Brown need adjacent offices as they need to consult each other often while working. Ms Hardy is a senior employee and has to be allotted the office number 5 which has the biggest window.

Mr Donald requires silence in the offices next to his. Mr Tim, Mr Mike and Mr Donald are all smokers. Ms Hardy is allergic to tobacco smoke and consequently the offices next to her are to be occupied by non-smokers.

Unless specifically stated, all the employees maintain an atmosphere of silence during the office hours.

59. Who would be the ideal candidate to occupy the office farthest from Mr. Brown?
(a) Mr Hardy (b) Mr Mike (c) Mr Tim (d) Mr Donald
60. The three employees who are smokers should be seated in which offices?
(a) 1, 2 and 4 (b) 2, 3 and 6 (c) 1, 2 and 6 (d) 1, 2 and 3
61. Which would be the ideal offices for Mr Mike?
(a) 2 (b) 6 (c) 1 (d) 3
62. In the event of what occurrence, within the period of one month since the assignment of the offices, would a request for a change in office be put forth by one or more employees?
(a) Mr Donald quit smoking
(b) The installation of a noisy machine by Ms Hardy in her office
(c) Ms Robert needing silence in the office(s) next to her own
(d) Mr Tim taking over the duties formerly taken care of by Ms Robert.

Direction (Q. No. 63-66) Answer the questions on the basis of the information given in the following case study.

Tina, a blast furnace expert, who works as a technology trouble-shooter stays in Jamshedpur. She has got an important assignment in Delhi, which required six hours to complete. The work is so critical that she has to start working the moment she reaches the client's premises.

She is considering various options for her onward and return journey between Jamshedpur to Delhi.

A quick search revealed that ticket from Jamshedpur to Delhi is available in two trains. Trains 12801 and

12443 depart from Jamshedpur station at 06:45 h and 15:55 h and reach Delhi next day at 04:50 h and 10:35h respectively. Trains 12444 and 12802 start from Delhi at 17:20 h and 22:30 h and reach Jamshedpur next day at 10:35 h and 20:05 h respectively.

Another option is to reach Ranchi by a three hour road trip and take a flight to Delhi from Ranchi. The distance between Ranchi and Delhi is covered in 105 min both-ways by any of the scheduled flights. Air India operates two flights, AI 9810 and AI 810, which depart from Ranchi at 8:00 h and 15:25 h respectively. Flight number IT-3348 operated by Kingfisher Airlines departs Ranchi at 19:20 h. Return flights operated by Air India, AI 9809 and AI 809, depart Delhi at 5:50 h and 11:00 h respectively. Flight number IT-3347 operated by Kingfisher Airlines departs Delhi at 17:10h.

From Tina's home Jamshedpur railway station is five minutes drive and her destination at Delhi is 90 min and 30 min drive from airport and railway station, respectively. One has to reach the airport atleast one hour before the scheduled departure to complete the boarding procedure. At every railway station she loses five minutes in navigating through the crowd.

63. If Tina wants to minimize the total time out of Jamshedpur, the best option for her from the options given below, is
(a) AI 9810 and return by IT 3347
(b) AI 9810 and return by train number 12802
(c) IT 3348 and return by AI 9809
(d) train number 12443 and return by train number 12444
64. Tina gets a message that her work has to be completed between 9:00 h and 17:00 h. If she wants to minimize the total time out of Jamshedpur, the best option, from the options given below, for her is to go by
(a) train 12801 and return by train 12802
(b) AI 9810 and return by AI 9809
(c) AI 810 and return by AI 9809
(d) IT 3348 and return by IT 3347
65. Tina has to appear for an exam on 8th of January in Jamshedpur and she can start from her residence in Jamshedpur only after 16:00 h of the same day. Choose the option, from the options given below, that will help her to minimize the total time out of Jamshedpur
(a) go by train 12443 and return by train 12444
(b) go by train 12443 and return by AI 9809
(c) go by IT 3348 and return by train 12801
(d) go by AI 9810 and return by AI 9809
66. If Tina decides to minimize the in between waiting period, the option that she should choose from the options given below will be
(a) go by train 12801 and return by IT 3347
(b) go by train 12443 and return by train 12802
(c) go by AI 9810 and return by train 12802
(d) go by AI 810 and return by AI 9809

Section III Quantitative Aptitude

67. There are three categories of jobs A, B and C . The average salary of the students who got the job of A and B categories is 26 lakh per annum. The average salary of the students who got the job of B and C category is 44 lakh per annum and the average salary of those students who got the job of A and C categories is 34 lakh per annum. The most appropriate (or closets) range of average salary of all the three categories (if it is known that each student gets only one category of jobs i.e., A, B and C)

- (a) lies between 30 and 44 (b) lies between 28 and 34
(c) lies between 34 and 43 (d) lies between 29 and 48

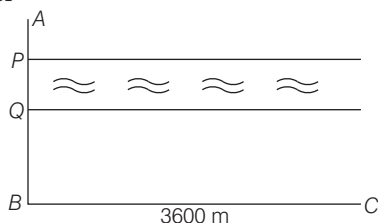
68. Three friends A, B and C decided to share the soda water with D , who had no soda water. A contributed 2 tumbler more than that of B and B contributed 1 tumbler more than that of C and then all of them had equal amount of soda water. In turn D paid money, which was divided among A, B and C in the ratio of their contribution to D . Thus A had gotten thrice as much money as B has gotten. The price of each number of soda water was ₹ 15 and each transaction was integral in numbers either the sharing of money or contribution of soda water. What was the sum of money that B has gotten?

- (a) ₹ 15 (b) ₹ 15
(c) ₹ 22.5 (d) None of these

69. The ratio of petrol and kerosene in the container is 3 : 2 when 10 liters of the mixture is taken out and is replaced by the kerosene, the ratio becomes 2:3. The total quantity of the mixture in the container is

70. Pooja, Shipra and Monika are three sisters. Pooja and Shipra are twins. The ratio of sum of the ages of Pooja and Shipra is same as that of Monika alone. Three years earlier the ratio of age Pooja and Monika was 2 : 7. What will be the age of Shipra 3 years hence?

71. In the given diagram, river PQ is just perpendicular to the national highway AB . At a point B , highway just turns at right angle and reaches to C . $PA = 500$ m and $BQ = 700$ m and width of the uniformly wide river (i.e., PQ) is 300 m. Also $BC = 3600$ m. A bridge has to be constructed across the river



perpendicular to its stream in such a way that person's Car reach from A to C via bridge covering least possible distance. What is the minimum possible required distance from A to C including the length of bridge?

- (a) 4100 m
(b) 3900 m
(c) $3000\sqrt{2}$ m
(d) None of the above

72. The value of x satisfying the equation

$$|x - 1|^{\log_3 x^2 - 2\log_x 9} = (x - 1)^7$$

- (a) $\sqrt{3}$ (b) 3^4
(c) 3 (d) $\log_4 3$

Direction for question number (73 – 74)

$$a \# b = a^2 + b - 1$$

$$a \$ b = a^2 + b^2 + 1$$

$$\text{Max } (a, b) = |a + b|$$

$$\text{Min } (a, b) = |a - b|$$

73. $\text{Max} [(2 \# 3) \$ (3 \# 4), (3 \# 4) \$ (4 \$ 4)]$ is equal to

- (a) 1234 (b) 1236
(c) 1335 (d) None of these

74. $\text{Max} [\text{Min} ((1 \$ 2), (2 \$ 3)), \text{Max} ((3 \# 4), (4 \# 5))]$ is equal to

- (a) 24 (b) 40
(c) 42 (d) None of these

75. The digits 1, 2, 3, ..., 9 are written in random order to form a nine digit number. Find the probability that this number is divisible by 11.

76. If $27\sqrt{2}(6\sqrt{3} + 3) = 6^M 3^N (2\sqrt{3} + 1)$

Find M and N .

- (a) $1, \frac{3}{2}$ (b) $-\frac{1}{2}, \frac{3}{2}$
(c) $\frac{1}{2}, -\frac{7}{2}$ (d) $\frac{1}{2}, \frac{7}{2}$

77. $\log_{\sqrt{2}} (\log_e x + \log_e y + \log_e z) = \log_{\sqrt{2}} \left(M - \frac{17}{2} \right)$

Where,

$$x = (e^3)^{-2/3} (e^2)^{-1}, y = (e^3)^{-1/2} (e^{1/3})z = e^{-1} \text{ find } M.$$

78. Find the point $A(x, y)$ on the graph of the parabola, $y = x^2 + 1$, that minimizes the distance d between the curve and the point $B(4, 1)$.

- (a) (2.5, 3.8) (b) (3.14, 4.56)
(c) (1, 2) (d) (1.12, 2.27)

79. A student appeared in the Mock CAT. The test paper contained 3 sections namely QA, DI and VA. The percentage marks in VA was equal to the average of the percentage marks in all the 3 sections. Coincidentally, if we reverse the digits of the percentage marks of QA we get the percentage marks of DI. The percentage marks in VA scored by the student could be.

(a) 48 (b) 66
(c) 69 (d) 81

80. If x satisfies the inequality $|x - 1| + |x - 2| + |x - 3| \geq 6$, then

(a) $0 \leq x \leq 4$ (b) $x \leq 0$ or $x \geq 4$
(c) $x \leq -2$ or $x \geq 3$ (d) None of these

81. In the Bargain Bazar everyone purchase with a fair bargaining, so traders markup the prices too much. A trader marked up an article at ₹ M expected huge profit, if it is sold on the marked price. But a customer purchased it at $M/2$ with his fine bargaining skills, so the expected profit of the trader diminished by 66.66%. What is the percentage discount fetched by the customer through bargaining?

82. Boston, Churchill and David are three workers, employed by a contractor. They completed the whole work in 10 days. Initially all of them worked together, but the last 60% of the work was completed by only Churchill and David together. Boston worked with Churchill and David only for initial two days then he left the work due to his poor health. Also Churchill takes 20% less time to finish the work alone than that of David working alone. If they were paid ₹ 3000 for the entire work, then what is the share of least efficient person?

83. Akkal and Bakkal are running on a circular track of radius 175 metres. Akkal can complete a round in 100 seconds and the speed of Bakkal is twice the speed of Akkal. They started simultaneously towards each other from two points 350 metres diametrically opposite on the circular path.

If they first meet at a point they called it love point, which is between the two points P and Q from where they have started their race, after how much time from the start do they meet at love point for the third time?

(a) 2 s (b) $216\frac{2}{3}$ s
(c) 221 s (d) None of these

84. The maximum possible value of $y = \min(1/2 - 3x^2/4, 5x^2/4)$ for the range $0 < x < 1$ is

(a) $1/3$ (b) $1/2$
(c) $5/16$ (d) $5/16$

Direction (85-86) Answer the questions based on the given paragraph.

Ghosh Babu has a certain amount of property consisting of cash, gold coins and silver bars. The cost of a gold coin is ₹ 4000 and the cost of a silver bar is ₹ 1000. Ghosh Babu distributed his property among his daughters equally. He gave to his eldest daughter gold coins with worth 20% of the total property and ₹ 25000 in cash. The second daughter was given silver bars worth 20% of the remaining property and ₹ 50000 cash. He then gave each of the third and fourth daughters equal number of gold coins and silver bars both together accounting each for 20% of the property remaining after the previous distribution and ₹ 25000 more than what the second daughter had received in cash.

85. The amount of property in gold and silver possessed by Gosh Babu is

(a) 2,25,000 (b) 2,75,000
(c) ₹ 4,25,000 (d) None of these

86. Total property of Ghosh Babu (in ₹ lakh) is

(a) 5.0 (b) 7.5
(c) 10.0 (d) 12.5

87. Let x, y and z be distinct positive integers satisfying $x < y < z$ and $x + y + z = k$. What is the smallest value of K that does not determine x, y, z uniquely?

(a) 9 (b) 6
(c) 7 (d) 8

88. Let a, b, c distinct digits. Consider a two-digit number 'ab' and a three-digit number 'ccb', both defined under the usual decimal system, If $(ab)^2 = ccb > 300$, then find the value of b .

Direction (89-90) Answer the questions based on the following information.

There are blue vessels with known volumes $v_1, v_2, \dots, v_m$, arranged in ascending order of volume, $v_1 > 0.5$ litre, and $v_m < 1$. Each of these is full of water initially. The water from each of these is emptied into a minimum number of empty white vessels, each having volume of 1 litre. The water from a blue vessel is not emptied into a white vessel unless the white vessel has enough empty volume to hold all the water of the blue vessel. The number of white vessels required to empty all the blue vessels according to the above rules was n .

89. Among the four values given below, which is the least upper bound one, where is the total empty volume in the white vessels at the end of the above process?

(a) mv_m (b) $m(1 - v_m)$ (c) mv_1 (d) $m(1 - v_1)$

90. Let the number of white vessels needed be n_1 for the emptying process described above, if the volume of each white vessel is 2 litre. Among the following values, which is the least upper bound on n_1 ?

(a) $\frac{m}{4}$

(b) Smallest integer greater than or equal to $\left(\frac{n}{2}\right)$

(c) n

(d) Greatest integer less than or equal to $\left(\frac{n}{2}\right)$

91. Rajiv reaches city B from city A in 4 hours, driving at speed of 35 kmph for the first two hour and at 45 kmph for the next two hours. Aditi follows the same route, but drives at three different speeds : 30, 40 and 50 kmph, covering an equal distance in each speed segment. The two cars are similar with petrol consumption characteristics (km per litre) shown in the figure below.

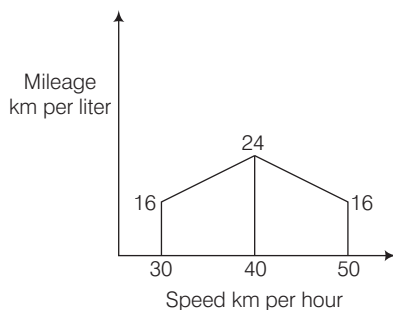
The quantity of petrol consumed by Aditi for the journey is

(a) 8.3 l

(b) 8.6 l

(c) 8.9 l

(d) 9.2 l



92. If the ratio of harmonic mean between two positive numbers to their geometric mean is 12:13; then the numbers could be in the ratio

(a) 12 : 13

(b) $1/12 : 1/13$

(c) 4 : 9

(d) 2 : 3

93. Rotomac produces very fine quality of writing pens. Company knows that on an average 10% of the produced pens are always defective so are rejected before packing. Company promises to deliver 7200 pens to its wholesaler at ₹ 10 each. It estimates the overall profit on all the manufactured pens to be 25%. What is the manufacturing cost of each pen?

94. The real numbers x_1, x_2, x_3 satisfying the equation $x^3 - x^2 + \beta x + \gamma = 0$ are in A.P. Find the intervals in which β and γ lie, respectively.

(a) $(-\infty, 1/3] [-1/27, \infty)$

(b) $(-\infty, 3)$

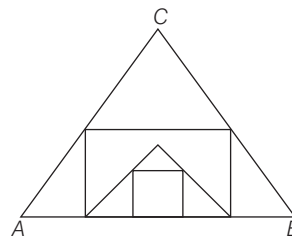
(c) $(-1/3, 1/3) (-1/27, 1/27)$

(d) None of these

95. If λ is an integer and α, β are the roots of $4x^2 - 16x + \frac{\lambda}{4} = 0$, such that $1 < \alpha < 2$ and $2 < \beta < 3$, then

how many values can λ take?

96. In the adjoining figure, ABC is an equilateral triangle inscribing a square of maximum possible area. Again in the square there is an equilateral triangle whose side is same as that of the square. Further the smaller equilateral triangle inscribes a square of maximum possible area. What is the area of the innermost square if the each side of the outermost triangle be 0.01 m?



(a) $(873 - 504\sqrt{3}) \text{ cm}^2$

(b) $(738 - 504\sqrt{3}) \text{ cm}^2$

(c) $(873 - 405\sqrt{2}) \text{ cm}^2$

(d) None of these

97. Two vertices of a triangle ABC are $B(2, -1)$ and $C(-2, 3)$. If the orthocentre of the triangle is the origin, find the third vertex.

(a) $\left(\frac{7}{2}, \frac{13}{2}\right)$

(b) $\left(\frac{3}{2}, \frac{11}{2}\right)$

(c) $(-52, -91)$

(d) None of these

98. Find the area among $y = 7 - x^2$ and the x -axis among the values $x = -1$ and $x = 2$.

99. Satyam took loan from IDIDI Bank for his 2 years course of MBA at IMD. He took the loan of ₹ 6 lakh such that he would charged at 8% per annum at CI during his course and at 10% CI after the completion of course. He returned half of the amount which he had to be paid on the completion of his studies and remaining after 2 years. What is the total amount returned by Satyam?

(a) ₹ 7.73323 lakh

(b) ₹ 7.58 lakh

(c) ₹ 7.336 lakh

(d) None of these

100. If $x + y + z = 0$, then the value of $\frac{x^2 y^2 + y^2 z^2 + z^2 x^2}{x^4 + y^4 + z^4}$ is

ANSWERS

1	(d)	2	(d)	3	(c)	4	(d)	5	(c)	6	(d)	7	(b)	8	(d)	9	(c)	10	(c)
11	(c)	12	(d)	13	(d)	14	(c)	15	(c)	16	(c)	17	(a)	18	(c)	19	(a)	20	(b)
21	(d)	22	(b)	23	(a)	24	(a)	25	(*)	26	(*)	27	(*)	28	(*)	29	(a)	30	(c)
31	(b)	32	(d)	33	(a)	34	(a)	35	(a)	36	(a)	37	(b)	38	(d)	39	(*)	40	(*)
41	(*)	42	(*)	43	(d)	44	(c)	45	(b)	46	(d)	47	(a)	48	(b)	49	(d)	50	(a)
51	(a)	52	(c)	53	(a)	54	(a)	55	(*)	56	(*)	57	(*)	58	(*)	59	(d)	60	(d)
61	(a)	62	(a)	63	(b)	64	(d)	65	(d)	66	(a)	67	(a)	68	(a)	69	(*)	70	(*)
71	(a)	72	(b)	73	(d)	74	(b)	75	(*)	76	(*)	77	(*)	78	(d)	79	(b)	80	(c)
81	(*)	82	(*)	83	(b)	84	(d)	85	(b)	86	(a)	87	(d)	88	(*)	89	(d)	90	(b)
91	(c)	92	(c)	93	(*)	94	(a)	95	(*)	96	(a)	97	(c)	98	(*)	99	(a)	100	(*)

(*) Answers are given below

25. (25431)	26. (32541)	27. (24135)	28. (14253)	39. (11)	40. (455)	41. (2)	42. (128)
55. (7.5)	56. (330)	57. (24)	58. (40)	69. (30)	70. (8)	75. $\left(\frac{11}{126}\right)$	76. $\left(\frac{1}{2}, \frac{7}{2}\right)$
77. $\left(\frac{7}{3}\right)$	81. (50%)	82. (1000)	88. (1)	93. (7.2)	95. (15)	98. (18)	100. $\left(\frac{1}{2}\right)$

Note For explanations visit the weblink given below :

<https://goo.gl/rpSzNQ>

