T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

Ref: AIMCAT1220

INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.

2. This test has three sections with 60 questions – 20, 20, and 20 respectively in the first, second and third sections. The TOTAL TIME available for the paper is **135 minutes**. The student may apportion this time among various sections as he/she wishes. However, the student is expected to show his/her competence in all the three sections.

3. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

SECTION – I
Number of Questions = 20

DIRECTIONS *for questions 1 to 20:* Answer the questions independently of each other.

1. If a and b are real numbers and n is an integer, such that $a < b$, $ab > 0$ and $a^n > b^n$, which of the following statements can be true (not necessarily simultaneously)?
I. n is negative.
II. n is positive and even.
III. n is negative and odd.
(1) Only I (2) Only I and II
(3) Only I and III (4) I, II and III

2. Atul starts from a point S and travels 1 km east, then 2 km north, then 3 km west, then 4 km south, then 5 km east, then 6 km north, then 7 km west, then 8 km south and so on. Continuing this way, if he has travelled a total of 300 km, how far is he from S?
(1) $\sqrt{313}$ km (2) $6\sqrt{2}$ km
(3) $12\sqrt{2}$ km (4) 16 km

3. The product of the sides of a right-angled triangle is 33600. If its perimeter is 112, find its hypotenuse.
(1) 40 (2) 48 (3) 50 (4) 64

4. A boy bought 3 apples, 5 mangoes and 8 bananas for ₹87. Had he bought 5 apples, 7 mangoes and 6 bananas, it would have cost him ₹121. By how much do an apple and a mango together cost more than a banana?
(1) ₹15 (2) ₹17 (3) ₹19 (4) ₹20

5. Prakash and Pramod start simultaneously from the same point on a circular track and run around the track in opposite directions. The radius of the track is 77 m and the speeds of Prakash and Pramod are 22 m/sec and 11 m/sec respectively. When both meet for the 6th time, find the distance that Prakash would have covered more than Pramod.
(1) 242 m (2) 363 m (3) 484 m (4) 968 m

6. If $a, b, c > 0$, $a + b + c = 6$ and $f(x) = \frac{6}{x} - 1$, find the minimum value of $f(a) \cdot f(b) \cdot f(c)$.
(1) 6 (2) 12 (3) 24 (4) 8

7. How many three-digit numbers satisfy all the following conditions?
I. When divided by 29 or 3, they leave a remainder of 2 in each case.
II. When divided by 17 and 38, they leave remainders of 6 and 24 respectively.
III. When divided by 18 and 21, they leave remainders of 14 and 8 respectively.
(1) 1 (2) 2
(3) 3 (4) More than 3

8. In ΔABC, AB = 13 cm, BC = 14 cm, CA = 15 cm and AD is perpendicular to BC. If X and Y are the incentres of triangles ABD and ADC respectively, find XY.
(1) $\sqrt{24}$ cm (2) 5 cm
(3) $\sqrt{26}$ cm (4) $\sqrt{27}$ cm

9. A locomotive requires an energy of E units per second, when it travels at a speed of s m/sec. If $E = s^3 - 20s^2 + 124s$, find the maximum possible distance that the locomotive can travel, given that it has a total energy supply of 72×10^5 units.
(1) 216 km (2) 256 km
(3) 300 km (4) 360 km

10. If ten parallel lines intersect nine other parallel lines, then how many parallelograms are formed on the whole?
(1) 90 (2) 1620 (3) 1260 (4) 2500

11. If the present time in New York is 2:00 a.m., then the time in New York exactly 19199999999915 hours later will be
(1) 1:00 a.m. (2) 1:00 p.m.
(3) 3:00 a.m. (4) 3:00 p.m.

12. N is a natural number greater than 1. A and B are single-digit natural numbers, with $A \geq B$, such that for any value of N, $(A + B)^N$ has the same units digit as $A + B$ and $(A \times B)^N$ has the same units digit as $(A \times B)$. How many pairs of values of A and B exist satisfying these conditions?
(1) 12 (2) 16 (3) 15 (4) 7

13. In a textile shop, the number of shirts having a design is thrice the number of shirts not having a design. It has sarees of three colours – brown, black and yellow. The number of brown sarees is half the number of black sarees and one-fifth of the number of yellow sarees. Find the number of shirts not having a design, given that the total number of shirts and sarees in the shop is 72 and the number of sarees that are hand spun is four times that of those that are not hand spun.
(1) 9 (2) 8 (3) 7 (4) 6

14. If $\log_n 54 = a$ and $\log_n 72 = b$, find $\log_n 1728$ in terms of a and b.
(1) $\frac{1}{5}(15a-7b)$ (2) $\frac{1}{7}(15b-3a)$
(3) $\frac{1}{5}(27a-3b)$ (4) $\frac{1}{7}(12b-27a)$

15. PQRS is a cyclic quadrilateral. Three of the angles of the quadrilateral are in the ratio 1 : 2 : 3.If both its diagonals are shorter than the diameter of its circumcircle, what is the measure of the smallest angle of the quadrilateral?
(1) 36° (2) 45° (3) 60° (4) 18°

16. A spider is on the outer tip of a fan blade and is exactly 24 cm away from the centre of the fan (i.e., the point about which the blades rotate). The spider then walks towards the centre of the fan. After 4 seconds, during which the blade rotates through an angle of 90°, it appears that the spider has been displaced from its original position by 25 cm. What is the speed (in cm/sec.) with which the spider moves towards the centre of the fan? Assume that the centre of the fan and the blades of the fan all lie in the same plane.
(1) 4.75 (2) 4.5 (3) 4.25 (4) 4.15

17. There is a cuboidal box whose body diagonal measures 26 cm. If the sum of all its edges is 152 cm, what is the total surface area of the box?
(1) 864 sq.cm. (2) 768 sq.cm
(3) 960 sq.cm (4) 972 sq.cm

18. In a district, there are exactly 15 towns, grouped into 5 zones, with three towns in each zone. All the possible pairs of towns in the district are now connected with telephone lines, such that any two towns are connected with four direct lines, if they belong to the same zone and with only one direct line, if they belong to different zones. How many direct telephone lines are required in all?
(1) 236 (2) 120 (3) 150 (4) 210

19. Which of the following triplets (a, b, c) does not satisfy the condition $a^{\log_b c} = c^{\log_a b}$?
(1) (2, 2, 1) (2) $\left(\frac{1}{2}, 2, 2\right)$
(3) (1, 2, 2) (4) (2, 3, 1)

20. Indian Airlines has a certain free luggage allowance for each passenger. It charges for excess luggage at a fixed rate per kg. Two passengers, Mohan and Sohan have a total of 50 kg of luggage between them. They were charged ₹2800 and ₹1400 respectively for excess luggage. If the free luggage allowance were halved and the entire luggage belonged to one of them, the excess luggage charge would have been ₹6300. Find the weight of Mohan's luggage (in kg).
(1) 20 (2) 25 (3) 30 (4) 35

SECTION – II
Number of Questions = 20

DIRECTIONS *for questions 21 to 24:* Answer the questions on the basis of the information given below.

As a part of the *Best City* contest, a news channel invited ten eminent personalities – Q, R, S, T, U, V, W, X, Y and Z – and asked each of them to vote for one of the four shortlisted cities – Bangalore, Delhi, Hyderabad and Mumbai – in each of the two categories-*most beautiful city* and *most happening city*. The sum of the number of votes obtained by a city in these two categories put together is considered to be the total number of votes for the city. The city with the maximum total number of votes is finally adjudged as the *Best City*.

After the voting, it was found that,
(i) no two cities got the same number of votes in the *most beautiful city* category and the same was the case in the *most happening city* category. However, every city got at least one vote in each of the two categories.
(ii) No two cities got the same total number of votes and Hyderabad emerged as the winner of the contest.
(iii) In case of S and T, in each of the two categories, S voted for the same city as T. However, the same cannot be said to be true for any other pair of persons.
(iv) In the *most beautiful city* category, no other person voted for the city for which R voted and the same was the case in the *most happening city* category.
(v) Except V, who voted for Hyderabad in both the categories and Y, who voted for Bangalore in both the categories, no other person voted for the same city in both the categories.
(vi) Q did not vote for Hyderabad in the *most beautiful city* category.
(vii) U and W voted for the same city in the *most happening city* category.
(viii) In the *most beautiful city* category, only W and X voted for Mumbai, while S voted for Bangalore.

21. Which city did Z vote for as the *most beautiful city*?
(1) Mumbai (2) Hyderabad
(3) Delhi (4) Bangalore

22. Which of the following pairs of persons voted for Bangalore as the *most beautiful city*?
(1) T and U (2) Q and U
(3) R and U (4) Q and S

23. Which of the following pairs of persons voted for the same city in the *most happening city* category?
(1) V and Q (2) Q and X
(3) Q and U (4) Z and W

24. How many persons voted for Mumbai as the *most happening city*?
(1) 1
(2) 2
(3) 3
(4) Cannot be determined

DIRECTIONS *for question 25:* Select the correct answer from the given choices.

25. Four of the eight vertices of a regular octagon are chosen at random. What is the probability that the quadrilateral formed by the four vertices is a square?
(1) $\frac{1}{35}$ (2) $\frac{1}{70}$ (3) $\frac{3}{70}$ (4) $\frac{2}{35}$

DIRECTIONS *for questions 26 to 28:* Answer the questions on the basis of the information given below.

Four colours – White, Blue, Green and Orange – are used to paint a cube such that each face is painted in exactly one colour and each colour is painted on at least one face. The cube is now perfectly and completely cut into exactly 120 identical cuboids by making the least possible number of cuts.

26. What is the maximum possible number of cuboids which have more than one face painted in the same colour?
(1) 12 (2) 13 (3) 15 (4) 18

27. What is the least possible number of cuboids which have no face painted Green?
(1) 36 (2) 48 (3) 60 (4) 72

28. What is the least possible number of cuboids which have at most one colour on them?
(1) 52 (2) 56 (3) 72 (4) 76

DIRECTIONS *for question 29:* The question below is followed by two statements, I and II, giving certain data. You have to decide whether the information provided in the statements is sufficient for answering the question.

Choose 1 if the question can be answered by using 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 the statements together.

29. Five industrialists – Anand, Anil, Mukesh, Ratan and Sunil – decided to meet at the FICCI headquarters to prepare the final draft to be presented to the Finance Minister regarding their expectations from the union budget. Anand arrived first and took one of the five equi-spaced seats at a circular table. Anil joined him later, followed by Mukesh, Raman and Sunil in that order. Who sits to the immediate right of Anand?
I. No two persons who arrived successively occupied adjacent seats.
II. Anil sits to the immediate right of Sunil.

DIRECTIONS *for question 30:* Select the correct answer from the given choices.

30. In a four-digit number, the sum of the first two digits is four-fifth of the sum of the last two digits, while the sum of the first and last digits equals the sum of the other two digits. If the first digit is less than the second digit, how many such four-digit numbers exist?
(1) 2 (2) 3 (3) 4 (4) 5

DIRECTIONS *for questions 31 to 33:* Answer the questions on the basis of the information given below.

After the debacle of the world cup, the Indian cricket selection panel decided that the only criterion for selecting young batsmen to play at the international level will be their average in the one-day matches that they have played at the national level.

Average of any player

$$= \frac{\text{Total runs scored by the player}}{\text{Number of times that the player was out}}$$

where the number of runs scored and number of times a player is out are positive integers.

At present, the selection panel was considering a young opening batsman, who had played a total of 25 one-day matches at the national level but had not played even one match at the international level. At the national level, the player had batted and got out in each of the 25 matches he played. It was also known that his score in no two matches was the same. Further, the sum of his top five scores was 337.

All the questions that follow are based only on the scores of the above-mentioned batsman in the 25 national level matches he played.

31. Given that his lowest five scores added up to 121 and his average was more than 40, the number of matches in which he scored less than 40 was at most
(1) 13 (2) 12 (3) 18 (4) 17

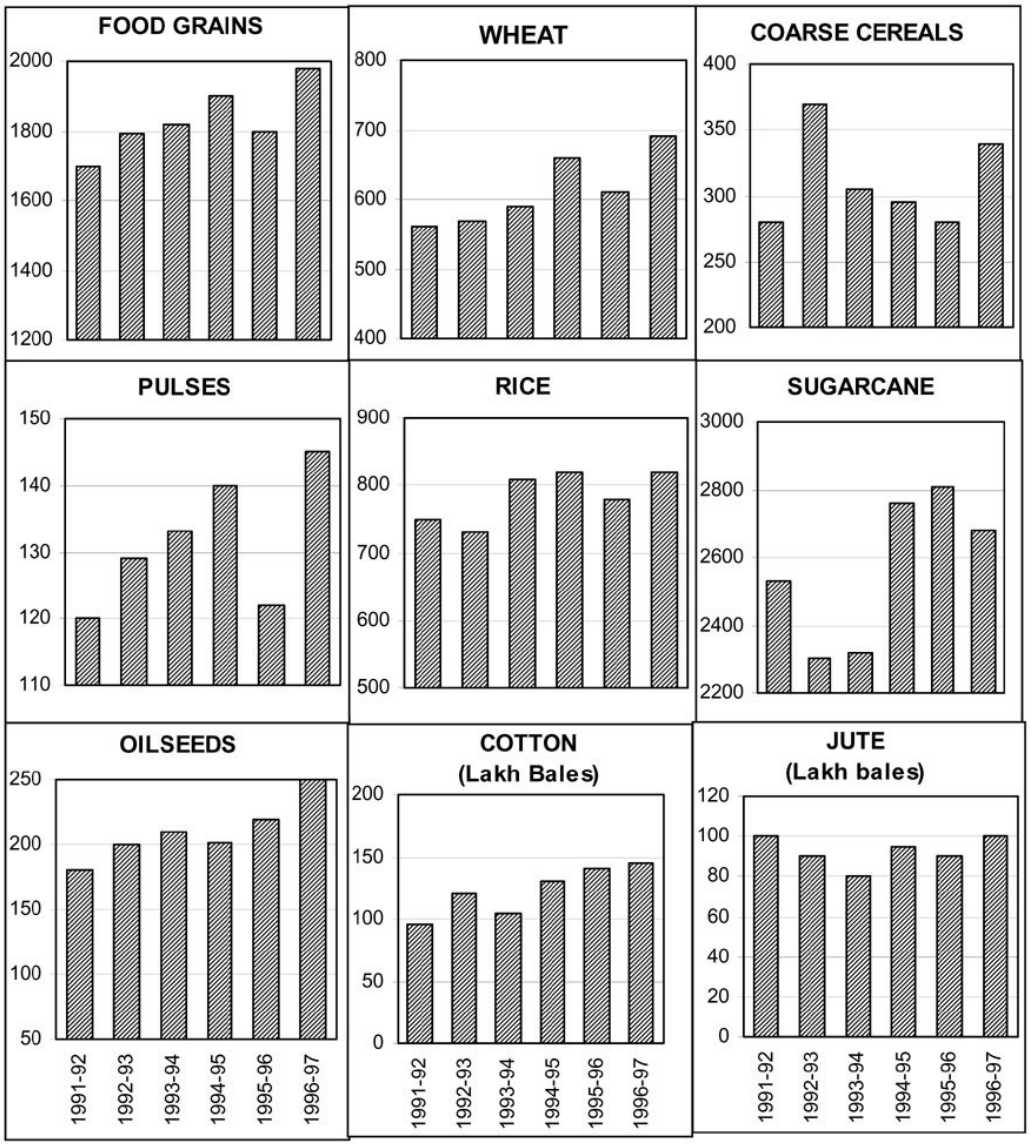
32. If his lowest five scores added up to 121, his sixth highest score was at least
(1) 41 (2) 42 (3) 44 (4) 47

33. If it is known that the total number of runs he made was the maximum possible, which of the following could have been the highest score he made?
(1) 69
(2) 71
(3) 75
(4) More than one of the above

DIRECTIONS *for questions 34 to 37:* Answer the questions on the basis of the information given below.

The following bar graphs give the details regarding the agricultural production in the country across nine categories – Food Grains, Wheat, Coarse Cereals, Pulses, Rice, Sugarcane, Oilseeds, Cotton and Jute – for the period 1992 to 1997.

(In lakh tonnes)



34. How many of the categories have recorded a growth of at least 10% in production from 1993-94 to 1994-95?
(1) 2 (2) 3 (3) 4 (4) 5

35. Which category has shown the highest average annual percentage growth during the period 1991-92 to 1996-97?
(1) Cotton
(2) Oilseeds
(3) Coarse Cereals
(4) Pulses

36. The production of which category (in any one year) has shown the highest percentage growth over the previous year's production?
(1) Pulses (2) Coarse Cereals
(3) Sugarcane (4) None of these

37. In which year did the maximum number of categories follow the same pattern of change (i.e. increase or decrease) in production, when compared with the previous year?
(1) 1992-93 (2) 1994-95
(3) 1995-96 (4) 1996-97

DIRECTIONS *for question 38:* The question below is followed by two statements, A and B. Answer the question using the following instructions.

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.

38. Is 26th January of year X a Sunday?
A. 26th January of the year preceding year X was a Friday.
B. 26th January of the year following year X is not a Monday.

DIRECTIONS *for questions 39 and 40:* Answer these questions on the basis of the information given below.

Table A below gives data about the scores obtained by 100 students in the verbal section of the CAT2006 paper. For the mark given in the first column, the second column gives the number of students (out of the 100 students considered) whose score in the verbal section did not exceed that mark. For example, there are 35 students whose score in verbal was 25 or less. Tables B and C also provide similar data on the scores of the same 100 students in the quantitative and logic sections of the CAT2006 paper respectively. Assume that, for any two students, the student who has a higher score in the quantitative section always has a higher score in the logic section and a lower score in the verbal section.

Table A

Marks	Number of Students
10	9
15	12
20	22
25	35
30	42
35	48
40	60
45	69
50	77
55	86
60	100

Table B

Marks	Number of Students
45	6
50	11
55	24
60	36
65	45
70	53
75	62
80	75
85	81
90	93
95	100

Table C

Marks	Number of Students
35	8
40	13
45	17
50	28
55	33
60	46
65	54
70	67
75	79
80	91
85	100

39. The number of students who scored more than 25 in verbal and more than 50 in quantitative and more than 60 in logic is
(1) 11 (2) 19 (3) 54 (4) 65

40. Among the students who scored more than 20 but not more than 50 in verbal, what percentage had a score of more than 50 in quantitative as well as logic?
(1) 90.90% (2) 80%
(3) 45.45% (4) 100%

SECTION – III
Number of Questions = 20

DIRECTIONS *for questions 41 to 43:* In each question, there are five sentences. Each sentence has pairs of words / phrases that are italicized and highlighted. From the italicized and highlighted word (s) / phrases (s) select the most appropriate word (s)/phrases to form correct sentences. Then from the options given choose the best one.

41. After dinner, he strolled in the garden as was his ***wont*** [a] / ***won't*** [b].
At the end of the movie, the good guys were rewarded and the bad guys got their just ***dessert*** [a] / ***desert*** [b].
You can ask your general physician Dr.Robin about the nesting habits of the baya birds as he is a naturalist by ***vocation*** [a]/ ***avocation*** [b].
The ***notional*** [a] / ***nominal*** [b] cost of the new model of the car was thought to be in the region of 10 lakhs.
After years of struggle Rahul has got himself an ***enviable*** [a] / ***envious*** [b], position in the firm.
(1) ababa (2) bbaab
(3) abbaa (4) babaa

42. The film was so ***turbid*** [a] / ***turgid*** [b] that we walked out of the theatre during the interval.
The police made ***intense*** [a] / ***intensive*** [b] enquiries before they decided to arrest him.
The industrialist's courage and competitive spirit ***compelled*** [a] / ***impelled*** [b] them to take risks.

The mansion ***comprises*** [a] / ***consists*** [b] four reception rooms and eight bedrooms.
A last minute injury ***robbed*** [a] / ***stole*** [b] the cricketer of his place in the team.
(1) bbaab (2) abbba
(3) aabba (4) bbbaa

43. Humid days with hot winds blowing make people feel ***enervated*** [a] / ***energized*** [b] and depressed.
A reference to the missing spouse in any context, is definitely an ***emotional*** [a] ***emotive*** [b] issue.
The author's new novel has ***envisaged*** [a] / ***envisioned*** [b] a day when everyone, the rich as well as the poor, would be treated fairly.
The police sub-inspector ***joined*** [a] / ***enjoined*** [b] the angry agitators to go back quietly to their homes.
The minister ***excoriated*** [a] ***execrated*** [b] his former ally as an unscrupulous leader.
(1) ababa (2) abbba
(3) abbaa (4) babab

DIRECTIONS *for questions 44 and 45:* There are two blanks in each of the following sentences. From the pairs of words given below each sentence choose the pair that fills the blanks most appropriately.

44. Language is a process of free _____; its laws and principles are fixed, but the manner in which the principles of generation are used is free and _____varied.
(1) creation – infinitely
(2) expression – probably
(3) exchange – supremely
(4) communication – significantly

45. The power inherent in the tools of genetic _____calls for special levels of skill, care and foresight, so that the planned applications do not also result in serious _____consequences.
(1) engineering – unpredictable
(2) manipulation – undesirable
(3) explanation – unlimited
(4) formation – unexpected

DIRECTIONS *for questions 46 and 47:* The sentences given in each of the following questions, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. From among the four choices given below each question, choose the most logical order of sentences that constructs a coherent paragraph.

46. a. If technology advances to the point where it supports trade across borders, and if people then choose to trade across borders, you have integration, and because people have freely chosen it, this is a good thing.
b. It is almost never heard, least of all from governments or businessmen.
c. Also, again because people have freely chosen this course, you would expect there to be economic benefits as well.
d. International economic integration, on the liberal view, is what happens when technology allows people to pursue their own goals and they are given the liberty to do so.
e. The strongest case for globalization is the liberal one.
(1) bdeca (2) debca (3) ebdac (4) edacb

47. a. The when part at least is becoming clearer: After some academic skirmishes over the past decade, most biologists agree that the Pilbara Hills of Western Australia contain traces of life dating back nearly 3.5 billion years.
b. The evidence for life gathered so far includes fossilized microbial mats called stramotolites and tiny features embedded in rocks, thought by many researchers to be microfossils.
c. Recently, evidence has been found in the same region for an entire fossilized ecosystem.
d. There are really three puzzles rolled into one here: the when, where and how of biogenesis.
e. Now a focus of intense international research, the ancient rocks jut from arid hillsides in a wild and desolate terrain about four hour's drive through the bush from the coastal town of Port Headland.
(1) daebc (2) bdaec
(3) ebcda (4) dabec

DIRECTIONS *for questions 48 and 49:* The following question 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.

48. Only a few years ago, discussions about cell biology were limited to a handful of scientific experts with little contact with the public. Today, they are in the news for both medical and ethical reasons. There are almost daily reports on stem cells, which may hold the promise of curing numerous diseases; on cloning; on increases in cancer and obesity; and on the use of DNA to detect bad genes and identify criminals. Cell biology is now the focus of general interest or alarm.
(1) Cells are the basis of all life, from thousands of different bacteria to the thousands upon thousands of different animals and plants.
(2) And yet there is no overall controller of this cellular society; it is a true co-operative.
(3) Going up the scale, the collection of cells in our brains would see off all rivals for the complicity prize.
(4) Understanding how cells function helps to clarify these contentious issues.

49. Professor Sherman doesn't just want to understand the biological causes of violent crime: his aim is to find more humane and effective ways to prevent it. Some of his work focuses on the facilitation of better brain functioning in an offender. This might be simpler than it sounds. In an experiment conducted in 2002 by Bernard Gosh of the University of Oxford, prisoners convicted of violent offences were fed fish-oil pills, a source of omega – 3 fatty acids critical for brain functioning.
(1) Among those who took it, the rate of violent behavior went up significantly.
(2) Among those who took it, the rate of offending in prison showed a significant decline.
(3) Among those who took it, there was a lack of emotional component to their moral decision - making process.
(4) Among those who took it were psychopaths who did not know right from wrong.

DIRECTIONS *for questions 50 and 51:* 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.

50. a. Common to all these religions is the anthropomorpic character of their conception of God.
b. In general, only individuals – of exceptional endowments and exceptionally high-minded communities–
c. rise to any considerable extent above this level.
d. But there is a third stage of religious experience which belong to all of them,
e. Even though it is rarely found in a pure form: I shall call it cosmic religious feeling.

(1) d and e (2) c and e
(3) a and c (4) b and d

51. a. Carl Sagan inspired a whole generation of young scientist, especially in America,
b. and his death by cancer in 1996 was a grievous loss to science and the whole world of reality-based thinking.
c. Open any one of his books and you need go no farther
d. than the table of contents to experience the tingling of
e. the poetic nerve endings that will continue throughout the book.

(1) a and d (2) b and e
(3) c and d (4) d and e

DIRECTIONS *for questions 52 to 60:* Read the following passages and answer the questions that follow them.

Above all the translation of books into digital formats means the destruction of boundaries. Bound, printed texts are discrete objects; immutable, individual, lendable, cut off from the world. Once the words of a book appear on screen, they are no longer simply themselves; they have become a part of something else. They now occupy the same space not only as every other digital text, but as every other medium too. Music, film, newspapers, blogs, videogames – it's the nature of a digital society that all these come at us in parallel, through the same channels, consumed simultaneous or in seamless sequence.

There are new possibilities in this, many of them marvelous. As the internet has amply illustrated, words shorn of physical restrictions can instantly travel the world and be searched, shared, adapted and updated at will. Yet when it comes to words that aim to convey more than information and opinions and to books in particular, a paradoxical process of construction is also taking place. For alongside what Morrison calls, "the craving for interactivity", a new economic and cultural structure is arriving that has the power to dismantle many of those roles great written works have long played: as critiques, inspirations, consciences, entertainments, educations, acts of witness and awakening, and much more.

The digitization of the reading experience itself is the least radical aspect of this process. Although a minority of titles offer sounds and images, most e-books ape their paper counterparts. Even on an advanced device like the ipad, the best reading applications emphasise clarity and clutter-free text. What's truly new is the shift in power that the emerging order represents.

Digital culture's single most transforming force is data. Buy an electronic book and the exact details of that purchase are instantly known: exactly how much was paid, and when, and how, and in combination with which other products. What are the trends, the sudden sparks on interest, the opportunities? Which chapter held people's attention for longest; at what point did most readers give up? Answering exactly these kinds of questions lies at the heart of the businesses that players like Amazon, Google and Apple have built over the last decade. And these three companies already overwhelmingly dominate the world's digital publishing transactions.

It has been a truth of publishing that – much as in movies – a small number of hits generate the bulk of revenues, allowing producers to take a punt on future productions. What, though, if there were no longer any need to gamble on success? Book publishing is based on the principle that publishers control access to a scarce, precious resource – print. But digital media models, where the costs of publication and reproduction are almost nothing, tend to function the other way around: material is first published, then the selection process begins among readers themselves.

52. The 'shift in power' caused by the digitization of books implies that
(1) readers are no longer constrained by publishers and can now select what they want to read
(2) authors can now select which website to publish their wok in.
(3) books will no longer be selected for publication on the basis of their content.
(4) critics decide the future of an author and the fate of a work.

53. Which of the following is NOT a consequence of the digitization of books?
(1) The quick and easy access that most people have to a new work.
(2) Books shorn of their role as friend, philosopher and guide.
(3) Books losing their individual identity and becoming a part of the medium.
(4) Books becoming victims of an abundance of data.

54. It can be inferred from the passage that the digital book
(1) will be an entirely different experience from the traditional reading of book.
(2) will be very much like its physical counterpart in appearance and reading experience.
(3) will be as removed from normal reading as a movie is from a still shot.
(4) will use technology to such an extent as to bear no resemblance to its physical version.

Here's a tricky question: one company claims that its green initiative is saving a thousand tonnes of carbon dioxide a year; another, selling a similar product, says it is saving a million tonnes. Which one should you buy from if you care about the environment? The answer is neither because both companies are probably guilty of greenwash.

Even if they are being honest about their savings, these numbers are not enough to indicate which is working harder to save the planet. Such grandiose green statements are meaningless unless you know a company's total emissions and can work out the percentage saving.

Ideally, you also need to know the reduction in emissions per unit of production, because a big cut in total CO_2 could simply be a sign of a failing company losing market share. Companies that just talk about tonnes of CO_2 saved are either trying to mislead customers or else have failed to understand good environmental practice.

Even when companies do spell out the percentage reduction in emissions per product, they usually fail to make clear how much of their product is covered by their commitment. Coca-Cola announced last year that it was reducing its reliance on petroleum-based plastic by introducing a bottle made partly from plant material. They are calling it the PlantBottel, even though only 15 to 30 per cent of the bottle is plant based.

To be fair to Coca-Cola, it stated this low percentage clearly in its press release. However, it failed to state the proportion of its drinks that would come in this partially renewable form of packaging. It said it would produce 2 billion PlantBottles by the end of 2010, which sounds impressive until you realize that Coca-Cola sells 580 billion drinks a year. Only 0.3 per cent of the company's drinks will come in PlantBottles this year. They will, however be consumed conspicuously: Coca-Cola is attempting to secure maximum publicity by sending the bottles to important events. They were launched in December at the Copenhagen climate change summit and will be heavily promoted this month at the Winter Olympics in Vancouver.

When I asked Coca-Cola why it had no plans for much wider distribution of the PlantBottle, it blamed skeptical consumers. Lisa Manley, the company's director of sustainability communications, said: "There is a great deal of skepticism in some markets about green communications. We are working hard to make sure that the communications of the benefits of the bottles are done credibly."

Obviously all good green ideas have to start somewhere and can only be rolled out after thorough testing. But once a company has garnered the positive headlines and taken the pictures of the glossary corporate social responsibility report, there may be little incentive to expand a green initiative, especially if it is more expensive than the traditional practice.

By the end of the year Whitbread, owner of Premier Inns, will have opened two "green hotels" with a carbon footprint 70 per cent lower than standard hotels. Much of the emissions saving comes from ground-source heat pumps, which provide all the hot water, heat and cooling. Whitbread has found that the pumps which cost £150,000 per hotel, pay for themselves in ten years through lower energy bills. It is "considering the possibility" of making them a standard item in new-build hotels.

The real test Whitbread's commitment to the environment will be whether it pledges to install heat pumps at all 580 premier Inns. Presently, Whitbread's green hotels are as limited as PlantBottles in terms of the proportion of the business they cover. Perhaps 0.3 per cent is some kind of magic number in green marketing circles.

There is an enormous difference between doing just enough to forestall tighter regulation and taking the bold steps needed to protect the planet.

55. "Only 0.3 percent of Coca-Cola's drinks will come in PlantBottles this year. They will, however, be consumed conspicuously". By this the author means one of the following.
(1) It is not possible for a company as big as Coca-Cola to make all its bottles from biodegradable materials.
(2) Coca-Cola is taking the first step in the direction of using plant material and more can be expected from it.
(3) Celebrities are enthusiastic about Coca-Cola's initiatives in following eco-friendly practices and willing to lend it support.
(4) Coca-Cola's green practices are more a marketing gimmick than a genuine commitment.

56. As inferred from the passage 'there may be little incentive to expand a green initiative', because
(1) companies are interested in green initiatives only for making headlines and for scoring brownie points
(2) the government does little to back the green initiatives of corporates.
(3) consumers are not willing to pay marginally more to support green practices.
(4) companies can't afford environment-friendly practices when they are more expensive than their traditional counterparts.

57. Which of the following is closest to what the words, 'Perhaps 0.3 percent is some kind of magic number in green marketing circles' mean?
(1) Before adopting new practices most companies try it out on 0.3% of their products.
(2) The green initiative of most companies is a miniscule in comparison to their total output.
(3) No company can afford to go green on its entire range – a 0.3% is a good enough beginning.
(4) Premier Inns would vindicate itself only when it instals heat pumps in all its hotels.

We are used to hearing talk of "the criminal mind". In future we can except to hear more about "the criminal brain". Recent scientific research suggests that criminality may be a trait that some people are born with or acquire very early in life. It's an unsetting thought: examine the prefrontal cortex in the brain of a gurgling infant and you may see the signs of a potential future murderer.

Scholarly interest in the criminal cranium is by no means new. In 1871 the Italian physician and intellectual Cesare Lombroso was performing a post-morterm on the body of a notorious bandit named Giuseppe Villela when he became intrigued by the shape of the skull, which reminded him of those of "apes, rodents and birds." Lombroso concluded that criminals were bad because they were born bad; they were throw-backs to an earlier, more savage stage of our evolution.

Lombroso's theories were soon discredited, and in the 20th century all attempts to link biology with behaviour were tainted by association with eugenics and fascism. So criminologists turned away from the study of individual biology and towards the social contexts of crime. The new discipline of criminology became a branch of sociology, which for the most part it remains. When politicians talk about "the causes of crime", they usually mean factors such as poverty, unemployment and bad neighbourhoods.

In recent years, however, advances in neuroscience and genetics have returned us to the idea that our physical make-up exerts a profound influence on our behaviour. One result is the small but fast-growing field of neurocriminology – the application of neuroscience to understanding criminality. Its pioneer and leading light is Professor Adrian Raine, chair of the department of criminology at the University of Pennsylvania in Philadelphia.

Raine, a former prison psychologist, has been investigating the subtle relationships between criminal behaviour, brains and environments for nearly 30 years. For much of that it has been a lonely quest. Now, though, his hypothesis that "bad brains lead to bad behavior" is gaining credibility and attention. Why?

Raine himself went through what he terms a "rough spot" when, as ten-year-old in Darlington, he joined a gang and took part in petty crimes. Some of his friends from that time graduated to more serious offences and spent time in prison. As an adult, Raine wondered why he had not followed the same path. Purely sociological explanations didn't seem to fit. His scientific work led him to seek answers inside the skull.

58. All of the following about Raine are true EXCEPT:
(1) Raine's personal experience confirmed his hypothesis that 'bad brains lead to bad behaviour'.
(2) Raine studied the influence of heredity and environment on criminal behavior for a couple of decades.
(3) Raine's investigation of the criminal behaviour, mind and environment was a lonely crusade.
(4) Raine felt that he could overcome his childhood delinquency probably because of his genetic makeup.

59. It can be inferred from the passage that in the 20th century
(1) eugenics and fascism blamed the society for the criminal behavior of individuals.
(2) criminology becoming a branch of sociology led to criminality being considered a product of societal influences.
(3) the general belief is that criminality is more the result of environmental factors than of genetic factors.
(4) politicians believed that the causes of crime was anything but heredity.

60. What does 'it' refers to in 'it's an unsettling thought'?
(1) The fact that we can't do anything to change our criminal behavior.
(2) The fact that criminality is inherent in people.
(3) The theory that the shape of the brain determines one's behavior and out look.
(4) The belief that one's violent behavior originates in one's brain.

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(Key and Solutions for AIMCAT1220)

Key

1. 4	7. 1	13. 2	19. 3	25. 1	31. 4	37. 4	43. 2	49. 2	55. 4
2. 3	8. 3	14. 2	20. 3	26. 2	32. 2	38. 3	44. 1	50. 2	56. 1
3. 3	9. 3	15. 1	21. 2	27. 2	33. 2	39. 2	45. 2	51. 4	57. 2
4. 2	10. 2	16. 3	22. 4	28. 4	34. 3	40. 1	46. 3	52. 3	58. 1
5. 4	11. 2	17. 2	23. 3	29. 3	35. 1	41. 3	47. 1	53. 4	59. 3
6. 4	12. 4	18. 3	24. 1	30. 2	36. 2	42. 4	48. 4	54. 2	60. 2

Solutions

SECTION – I

Solutions for questions 1 to 20:

1. The easiest approach to such questions is to consider a couple of numerical possibilities for a, b and n.
Let $a = -3$ and $b = -2$ (i.e. $a < b$)

Case (i):
Let $n = -1$

Here, $\frac{1}{-3} > \frac{1}{-2}$ Hence $(-3)^{-1} > (-2)^{-1}$

Hence $n = -1$, i.e., negative and odd.
$\Rightarrow$ Both statements I and III may be true.
Case (ii):
Let $n = 2$
Here, $(-3)^2 > (-2)^2$
Hence $n = 2$, i.e., positive and even.
$\Rightarrow$ Statement II may also be true.
Hence I, II and III may be true. Choice (4)

2. Let the origin of the x-y place be the initial point. Moving East or West by a certain distance is same as increasing or decreasing the x-coordinate by the same quantity. Similarly, moving North or South is same as increasing or decreasing the y-coordinate accordingly.
The total distance travelled by Atul is 300 km

$\frac{n(n+1)}{2} = 300$

$\Rightarrow n(n+1) = 600$
$\Rightarrow n = 24$
i.e. The person has traveled six cycles of east, north, west and south.
Let Atul finally reach a point whose coordinates are (A, B).
$\Rightarrow$ A = 1 – 3 + 5 – 7 + - - - + 21 – 23 = 6 (–2) = –12
And B = 2 – 4 + 6 – 8 + - - - + 22 – 24 = 6 (–2) = –12
$\therefore$ The distance between S and (A, B) =

$\sqrt{12^2 + 12^2} = 12\sqrt{2}$ Choice (3)

3. Let the perpendicular sides be a and b. Let the hypotenuse be c.
$abc = 33600$

$ab = \frac{33600}{c}$

$a + b + c = 112$
$a + b = 112 - c$
Squaring both sides,
$a^2 + b^2 + 2ab = (112 - c)^2$

$c^2 + 2\left(\frac{33600}{c}\right) = 112^2 - 224c + c^2$

$c^2 - 56c + 300 = 0$
$c = 6$ or 50
As $c = 6$ is not possible, $c = 50$.

Alternate method:
Consider a Pythagorean triplet a, b, c such that $a + b + c$ is a factor of 112.
Hence, by trial and error, $a = 7$, $b = 24$ (or vice versa) and $c = 25$.
Hence the sides of the triangle must be 14, 48 and 50.
Choice (3)

4. Let the cost of an apple, a mango and a banana be A, M and B respectively.
Given that 3A + 5M + 8B = 87 ——— (1)
5A + 7M + 6B = 121 ——— (2)
(2) – (1) $\Rightarrow$ 2A + 2M – 2B = 121 – 87 = 34
$\Rightarrow$ (A + M) – B = 17
$\therefore$ An apple and a mango together cost ₹17 more than a banana. Choice (2)

5. Since the ratio of the speeds is 2 : 1, the distance covered by Prakash will always be twice that covered by Pramod.
When they meet for the 6th time, they would have together covered a distance of 6 times, the circumference of the track (say L). Hence Prakash would have covered 4 L and Pramod 2L.
Hence the difference = 4L – 2L = 2L (where L = $2\pi r$)

$= 2 \times 2 \times \frac{22}{7} \times 77 = 968$ Choice (4)

6. $f(a) = \frac{6}{a} - 1$

$f(b) = \frac{6}{b} - 1$

$f(c) = \frac{6}{c} - 1$

$f(a) \cdot f(b) \cdot f(c) = \left(\frac{6-a}{a}\right)\left(\frac{6-b}{b}\right)\left(\frac{6-c}{c}\right)$

$= \frac{216 - 36(a+b+c) + 6(ab+bc+ca) - abc}{abc}$

$= \frac{6(ab+bc+ca)}{abc} - 1 = 6\left(\frac{1}{c}+\frac{1}{a}+\frac{1}{b}\right) - 1$

As A.M $\geq$ H.M

$\frac{6\left(\frac{1}{c}+\frac{1}{a}+\frac{1}{b}\right)}{3} = \frac{\frac{6}{a}+\frac{6}{b}+\frac{b}{c}}{3} \geq \frac{3}{\frac{a}{6}+\frac{b}{6}+\frac{c}{6}} = 3$

$\Rightarrow \frac{6}{a} + \frac{6}{b} + \frac{6}{c} \geq 9$

$\therefore f(a) \cdot f(b) \cdot f(c) \geq 9 - 1$ (i.e., 8)

Alternate method:
Let $a = b = c = 2$, (to maximise the required parameter) then

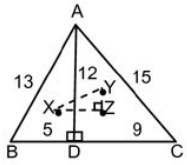
$$\left(\frac{6}{2}-1\right)\left(\frac{6}{2}-1\right)\left(\frac{6}{2}-1\right) = 2\times 2\times 2 = 8$$ Choice (4)

7. As for II the divisors are larger than those for the other conditions, we will obtain the least number of numbers satisfying II when considering the numbers satisfying any one of the conditions alone.
Let the general form of the numbers satisfying II be $17k_1 + 6$ as well as $38k_2 + 24$, where k_1 and k_2 are whole numbers.
$17k_1 + 6 = 38k_2 + 24$
$17k_1 = 38k_2 + 18$

$$k_1 = 2k_2 + 1 + \frac{(4k_2+1)}{17}$$

As k_1 is a natural number, $4k_2 + 1$ must be divisible by 17.
Least value of k_2 satisfying this condition is 4.
$\therefore$ the numbers are of the form L.C.M $(17, 38)k + [38(4) + 24]$, where k is a whole number $= 646k + 176$
If $k \geq 2$, $646k + 176 > 1000$
When $k = 0$ and $k = 1$, possible numbers satisfying II are obtained as 176 and 822 respectively. 176 satisfies the other two conditions while 822 does not satisfy the other 2 conditions. Choice (1)

8. Area of $\Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$
where $(a, b, c) = (14, 15, 13)$
$\therefore s = 21$ and
area $= \sqrt{21(7)(6)(8)} = 7(3)(4)$
$\therefore$ Altitude AD = 12



$\therefore$ BD = 5 and DC = 9
The inradius r of a rightangled triangle is given by the relation.
rs = Area = (1/2) base $\times$ height
In a 5, 12, 13 triangle it is $\frac{(1/2)(5)(12)}{15} = 2$
$\therefore$ inradius of $\Delta ABD = 2$ and
In a 3, 4, 5 triangle, $r = \frac{\frac{1}{2}(3)(4)}{\frac{(3+4+5)}{2}} = 1$
Similarly, inradius of $\Delta ADC = 3(1) = 3$ ($\because \Delta ADC$ is thrice a 3, 4, 5 triangle)
Let Z, be the point such that YZ is parallel to AD and XZ is parallel to BC. Hence $\angle XZY = 90°$
In ΔXYZ, XZ = 2 + 3 = 5 and YZ = 3 – 2 = 1
$\therefore XY = \sqrt{(XZ)^2 + (YZ)^2} = \sqrt{5^2 + 1^2} = \sqrt{26}$
Choice (3)

9. Total energy consumed $= \frac{d}{s}\left(s^3 - 20s^2 + 124s\right)$
$72 \times 10^5 = d(s^2 - 20s + 124) = d[(s-10)^2 + 24]$
d is maximum when $s = 10$
Its maximum value $= \frac{72\times 10^5}{24} = 3\times 10^5$ m = 300 km.
Choice (3)

10. ${}^{10}C_2 \times {}^{9}C_2 = 1620$ Choice (2)

11. 19199999999915 = 19200000000000 – 85
= some multiple of 24 – 85
$\therefore$ 19199999999915 hours later would mean 85 hours less than an integral number of days later, i.e., 13 hours less than an integral number of days later (which is also same as 11 hours more than an integral number of days)
$\therefore$ The time then would be 1 p.m. Choice (2)

12. $A \leq 9$ and $B \leq 9$. Hence $A + B \leq 18$
As A + B and $(A + B)^N$ always have the same units digit, A + B must end with 0 or 1 or 5 or 6.
As $(A \times B)$ and $(A \times B)^N$ always have the same units digit, $A \times B$ must end with 0 or 1 or 5 or 6.
As $A + B \leq 18$, A + B can be 5 or 6 or 10 or 11 or 15 or 16 to satisfy the given conditions. We have the following results for each of these values of A + B.
(1) A + B = 5
Possible values of (A, B) are (4, 1) and (3, 2). However, only when (A, B), is (3, 2) the condition for $A \times B$ is satisfied.
(2) A + B = 6
Possible values of (A, B) are (5, 1) (4, 2) and (3, 3).
Only when (A, B) is (5, 1) the condition for $A \times B$ is satisfied.
(3) A + B = 10
Possible values of (A, B) are (9, 1), (8, 2), (7, 3), (6, 4) and (5, 5). Only when (A, B) is (8, 2), (7, 3) or (5, 5), the condition for $A \times B$ is satisfied.
(4) A + B = 11
Possible values of (A, B) are (9, 2), (8, 3), (7, 4) and (6, 5). Only when (A, B) is (6, 5) the condition for $A \times B$ is satisfied.
(5) A + B = 15
Possible values of (A, B) are (9, 6) and (8, 7). Only when (A, B) is (8, 7) the condition for $A \times B$ is satisfied.
(6) A + B = 16
Possible values of (A, B) are (9, 7) and (8, 8). For neither of these possibilities is the condition for $A \times B$ satisfied.
$\therefore$ A total of 7 possibilities exist for (A, B)
Choice (4)

13. Let the number of brown sarees be x. let the number of shirts not having a design be y.

Shirts	Sarees				
Having Design	$3y$	Yellow	$5x$	Hand spun	$4k$
		Black	$2x$		k
Not having Design	y	Brown	x	Not Hand spun	$5k$
Total	$4y$		$8x$		

Hence total number of sarees = say $N = 8x = 5k$
The least such number is $8 \times 5 = 40$.
Given $4y + N = 72$
$\Rightarrow$ N = 40 itself and $4y = 32$
$\Rightarrow$ Shirts not having design = $y = 8$. Choice (2)

14. $a = \log_n 54 = \log_n 2 + 3\log_n 3$
$b = \log_n 72 = 3\log_n 2 + 2\log_n 3$
$\log_n 1728 = 6\log_n 2 + 3\log_n 3$
Suppose $\log_n 1728 = xa + yb$
Then $x + 3y = 6$ and $3x + 2y = 3$
Solving for x and y, $x = \frac{-3}{7}$ and $y = \frac{15}{7}$ Choice (2)

15. Let the angles be $x°$, $2x°$, $3x°$ and $y°$ respectively.

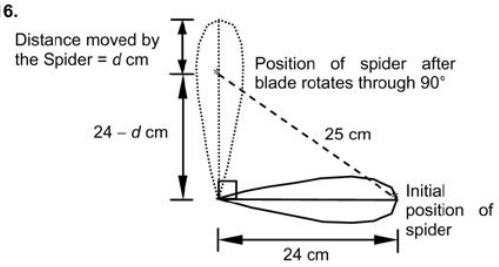
Case 1:
Let $x° + 2x° = 3x° + y° = 180° \Rightarrow x° = 60°$
$\Rightarrow 3x° = 180°$ Not feasible.

Case 2:
$x° + 3x° = 2x° + y° = 180°$

$x° = 45° \Rightarrow 2x° = 90°$. If one angle of a cyclic quadrilateral is 90°, one of its diagonals would be along a diameter (i.e. equal to the diameter). But since, diagonal < diameter, even this case is not feasible.

Case 3:
Let $x° + y° = 2x° + 3x° = 180°$
$x = 36 \Rightarrow 2x = 72$ and
$3x = 108$, $y = 108 - 36 = 144$.
This is the only solution and the smallest angle is 36°.
Choice (1)

16.



The spider has covered d cm.
Now $(25)^2 = (24)^2 + (24 - d)^2$
$\therefore 24 - d = 7$
$d = 17$

$\therefore$ Speed $= \frac{17}{4}$ cm/s = 4.25 cm/s Choice (3)

17. Let ℓ, b and h be the length, breadth and height of the Cubical box.
Given that

Body diagonal $= \sqrt{\ell^2 + b^2 + h^2} = 26$

$\Rightarrow \ell^2 + b^2 + h^2 = 676$ ----- (1)

Sum of its edges $= 4(\ell + b + h) = 152$

$\Rightarrow \ell + b + h = 38$ ----- (2)

Its total surface area $= 2(\ell b + bh + \ell h)$

$= (\ell + b + h)^2 - (\ell^2 + b^2 + h^2) = 38^2 - 676$

$= 1444 - 676 = 768$ Choice (2)

18. Consider the five zones, Z_1, Z_2, Z_3, Z_4 and Z_5. Four lines are required to connect the towns in the same zone and each zone contains 3 towns. The number of lines required to connect the pairs of towns is any one zone is ${}^3C_2$ (4) = 12. The number of lines required to connect pairs of towns in all the five zones = 5(12) = 60.

The number of lines required for one town in zone Z_1 to be connected with any town from the remaining zones is 1. Since zone Z_1 contains three towns, the number of lines required to connect all towns of zone Z_1 to all the towns in the remaining zones is 3(12) = 36. Similarly all the towns in Z_2 will be connected with all the towns in Z_3, Z_4, Z_5, with 3(9) or 27 lines.

Similarly towns in Z_3 are connected with the towns in the remaining zones using 18 lines and towns in Z_4 are connected with the town in the remaining zones (I.e. Z_5) using 9 lines. Hence the number of lines required to connect all the towns in one zone to all other towns in the other zones is 36 + 27 + 18 + 9 = 90

Hence the total number of direct lines required
= 60 + 90 = 150 Choice (3)

Alternate method:
Within a zone, all possible pairs of towns are connected by four direct lines.
In a zone, there are 3 towns $\Rightarrow {}^3C_2$ possible pairs exist in 1 zone.
$\therefore$ In 5 zones, ${}^3C_2 \times 5$ pairs exist.
$\therefore$ Total number of direct lines $= {}^3C_2 \times 5 \times 4 = 60$ lines
Number of indirect lines between two towns located in different zones is 1.
Since there are 3 towns in each zone, for a given pair of zones, number of indirect lines is 9.
Total number of possible pairs of zones $= {}^5C_2 = 10$
$\therefore$ Total number of indirect lines $= 10 \times 9 = 90$
$\therefore$ Total number of direct lines + Total number of indirect lines = 60 + 90 = 150.

19. Clearly, logarithm to the base 1 is not defined, hence neither 'b' nor 'a' can be equal to 1. Choice (4) has $a = 1$.
Hence choice (3) definitely cannot satisfy the equation.

Alternate method:
Given that
$a^{\log_b c} = c^{\log_a b}$
Consider logarithm to the base d on both sides where $d > 0$ and $c \neq 1$.
$(\log_b c)(\log_d a) = (\log_a b)(\log_d c)$
$\frac{\log_k c}{\log_k b} \times \frac{\log_k a}{\log_k d} = \frac{\log_k b}{\log_k a} \times \frac{\log_k c}{\log_k d}$
$\log_k c [(\log_k a)^2 - (\log_k b)^2] = 0$
$\Rightarrow \log_k c = 0$ or $\log_k a = \pm (\log_k b)$
$\Rightarrow c = 1$ or $a = b$ or $a = \frac{1}{b}$

In the choices, except (3), i.e. (1, 2, 2), all other choices satisfy one or more of the above conditions. Choice (3)

20. Let the free luggage allowance be k kgs. Let the weight of Mohan's luggage be x kg.
Weight of Sohan's luggage = (50 – x) kg
Excess luggage charge would vary directly with the excess luggage Excess luggage of Mohan = ($x - k$) kg.
Excess luggage of Sohan = ($50 - x - k$) kg.
Excess luggage if the entire luggage belongs to one of them $= \left(50 - \frac{k}{2}\right) kg$

$\frac{2800}{1400} = \frac{x - k}{50 - x - k} \Rightarrow 3x + k = 100$ .....(1)

$\frac{2800}{6300} = \frac{x - k}{50 - \frac{k}{2}} \Rightarrow 9x - 7k = 200$ .....(2)

Solving (1) and (2), $x = 30$ Choice (3)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	–
Easy	–
Medium	1, 2, 3, 4, 5, 6, 9, 10, 11, 13, 14, 15, 17, 18, 19, 20
Difficult	7, 8, 12, 16
Very Difficult	–

SECTION – II

Solutions for questions 21 to 24:

From the given conditions, the following information can be arrived at as shown. MBC and MHC denote the 'most beautiful city' and 'most happening city' categories.

	MBC	MHC
Q		
R		
S	Bangalore	
T	Bangalore	
U		×
V	Hyderabad	Hyderabad
W	Mumbai	×
X	Mumbai	
Y	Bangalore	Bangalore
Z		

From the above table, it can be seen that in MBC category, all the cities other than Delhi have been voted for by at least one participant. ∴ From (iv), it follows that R voted for Delhi.
Of the remaining people Q, U and Z, whose votes are not determined yet in MBC category, Q has not voted for Hyderabad.
⇒ Hyderabad can get at most 2 out of these 3 votes in the MBC category, i.e., a total of at most 3 votes.
It is given that Hyderabad has obtained the highest number of total votes, and that, in each category, no two cities have the same number of votes and total number of votes is10.
∴ The number of votes obtained by any city must be 1, 2, 3 or 4 in either category.
If Hyderabad has to get highest number of votes it must get exactly 7 votes i.e., 4 votes in MHC category. In case Hyderabad has to get fewer than 7 votes and still get the highest number of votes, condition (ii) would be violated.
∴ Hyderabad gets 3 votes from U, V and Z in MBC category and 4 votes in MHC category.
From the table, it can be seen that in the MBC category, Bangalore has already obtained 3 votes in MBC category. Since one city has to get 4 votes, that city has to be Bangalore. ∴ Q, S, T, Y vote for Bangalore under MBC.
⇒ Mumbai gets 2 votes in MBC category. Since the total votes have to be distinct for each city in each of the categories, the following should be the distribution of votes.

	Delhi	Bangalore	Hyderabad	Mumbai
MBC	1	4	3	2
MHC	3	2	4	1
Total votes	4	6	7	3

From the above table, it follows that R voted for Mumbai in the MHC category.
Also, from (v), (iii) and above discussion, neither U nor Z voted for Hyderabad in the MHC category. Also, they did not vote for the same city in the MHC category.
From (vii), U and W voted for the same city in the MHC category.
They did not vote for Bangalore under MHC.
They must have voted for Delhi under MHC.
∴ X must have voted for Hyderabad under MHC.
∴ Z must have voted for Bangalore under MHC.
∴ S and T voted for Hyderabad under MHC.
⇒ Q must have voted for Delhi under MHC.

∴ The final distribution is as follows.

City	Most beautiful city	Most happening city
Bangalore	Q, S, T, Y	Y, Z
Delhi	R	Q, U, W
Hyderabad	U, V, Z	S, T, V, X
Mumbai	W, X	R

21. Choice (2)

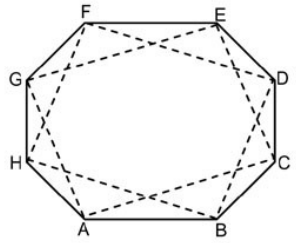
22. Choice (4)

23. Choice (3)

24. Choice (1)

Solution for question 25:

25.

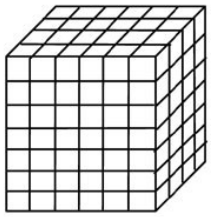


Total number of quadrilaterals that can be formed using the 8 vertices of a regular octagon = $^8C_4 = 70$
Among the quadrilaterals formed,
Only ACEG and BDFH only form squares.

Hence, required probability $= \frac{2}{70} = \frac{1}{35}$ Choice (1)

Solutions for questions 26 to 28:

Here we have to consider the least possible number of cuts needed for getting 120 pieces.
$120 = 4 \times 5 \times 6$
⇒ Least possible number of cuts
$= (4 - 1) + (5 - 1) + (6 - 1) = 12$.



As shown in the above figure, any face can have 30 or 24 or 20 cuboids. Any edge can have 6 or 5 or 4 cuboids.

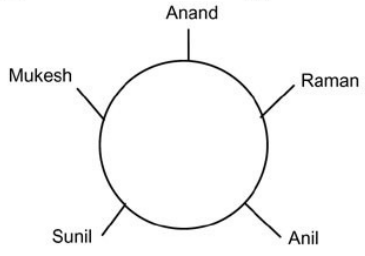
26. To get the maximum possible number of cuboids which have more than one colour on them, we have to use one colour on three faces, such that any two faces are adjacent to each other.
∴ Number of such cuboids at the corners = 1
Number of such cuboids on the edges (but not corners)
= 3 + 4 + 5 = 12
∴ Total required cuboids = 13 Choice (2)

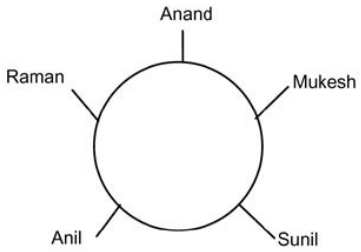
27. To get the least possible number of such cuboids, green is to be painted on three faces (i.e., maximum possible number of faces) such that there are least possible common edges i.e., two.
Maximum possible number of cuboids with green colour on them = 6 [(5 + 4 + 5) –2] = 72
∴The minimum number of cuboids with no green colour on them = 120 – 72 = 48 Choice (2)

28. To get least possible number of such cuboids all the cuboids on the edges (and corners) must have more than one colour which is possible when opposite faces are painted in the same colour. (i.e., two pairs of opposite faces).
Number of cuboids with three colours on them = 8.
Number of cuboids with two colours on them
= 4 × [2 + 3 + 4] = 36
∴ Number of required cuboids (i.e., with exactly one colour or no colour on them) = 120 – [36 + 8] = 76
Choice (4)

Solution for question 29:

29. Using I, alone we have the following possibilities.





Using II alone, we cannot find who sits to the right of Anand.
Combining both, we can see that it is Mukesh who sits to the right of Anand. Choice (3)

Solution for question 30:

30. Let the four-digit number be *abcd*.

$a + b = \frac{4}{5}(c + d)$ ------ (1)

$a + d = b + c$ --- (2)
Also, given $a < b$ ------- (3)
(1) $\Rightarrow$ sum of the digits must be divisible by 9.
(2) $\Rightarrow$ sum of the digits must be even.
$\therefore$ (1) and (2) $\Rightarrow$ the sum of the digits must be divisible by 18 and hence must be 18 or 36.
But the sum cannot be 36 since, in that case $a = b = c = d = 9$ and condition (3) is violated. Hence the sum must be 18.
$\therefore a + b = 8$, $c + d = 10$ and $a + d = b + c = 9$
$a + d - (a + b) = 1$, i.e., $d = b + 1$
As $a < b$, *abcd* can be
1728, 2637, 3546
$\therefore$ 3 possible numbers exist. Choice (2)

Solutions for questions 31 to 33:

31. Total runs scored by him are at least 1001. As the average of the 25 innings is more than 40, with the top five scores amounting to 337 and the lowest five scores amounting to 121, the remaining fifteen innings accounted for 1001 – (337 + 121) = 543 runs. Now to have the maximum number of scores below 40, we have to minimise the fifth lowest score (as total of the lowest five innings is given). The fifth lowest score can be a minimum of 27, when the lowest five scores are (27, 25, 24, 23 and 22) so that the higher scores are 28, 29….upto 42. Now, 121 + (28 + 29 +……42) + 337 = 977
Hence, the scores of 40 and above i.e., 40, 41 and 42 need to be revised upwards to reach a total of 1001.
$\therefore$ He has at most 5 + 12 scores which are below 40.
Choice (4)

32. From the previous solution the least possible value of his 5^{th} lowest score is 27.
$\therefore$The 6^{th} highest (i.e. 20^{th} lowest) score must be at least 42.
Choice (2)

33. As it is known that the number of runs he made was the maximum possible, and as the sum of his top five scores is given along with the fact that he didn't make the same score in any two innings, the runs scored can be the maximum when his scores are as close as possible. In this case, the 5^{th} top score is the highest possible which maximizes the total number of runs scored.
The possible sets of scores which maximize the 5^{th} top score are (70, 69, 67, 66, 65) and (71, 68, 67, 66, 65).
$\therefore$ His highest score can be 70 or 71. Choice (2)

Solutions for questions 34 to 37:

34. At least 10% growth in production from 1993-94 to 1994-95 can be seen in the graphs for:
(i) Wheat (from 590 to 660)
(ii) Sugarcane (from 2320 to 2760)
(iii) Cotton (from 105 to 130)
(iv) Jute (from 80 to 95) Choice (3)

35. The percentage growth during the period 1991-92 to 1996-97 for all the choices are as given below:

(1) Cotton = $\frac{145-95}{95} \times 100 = 52.63\%$

(2) Oilseeds = $\frac{250-180}{180} \times 100 = 38.89\%$

(3) Coarse Cereals = $\frac{340-280}{280} \times 100 = 21.4\%$

(4) Pulses = $\frac{145-120}{120} \times 100 = 20.83\%$

The average annual growth percent would be the highest for Cotton (i.e. $\frac{52.63}{6}$ %) Choice (1)

36. Let us calculate the highest percentage growth over the previous year's production, for each category:
As we can see from the graphs the only possibilities are for Coarse Cereals, Pulses and Sugarcane. If we check for these we can get the answer.

(1) Pulses – year 1996-97 = $\frac{145-122}{122} \times 100$
= 18.85%

(2) Coarse Cereals – year 1992-93 = $\frac{370-280}{280} \times 100$
= 30.2%

(3) Sugarcane – year 1994-95 = $\frac{2760-2320}{2320} \times 100$
= 19%
Hence, required percentage is for Coarse Cereals.
Choice (2)

37. It can be observed that in the year 1996-97, eight of the nine given categories showed an increase in production.
Choice (4)

Solution for question 38:

38. Year X is hereafter referred to as this year. If 26^{th} January of the previous year was a Friday then 26^{th} January of this year can be a Saturday or a Sunday depending on whether the previous year was a leap year. So statement A is not sufficient.
If 26^{th} January of the next year is not a Monday then this year 26^{th} January can be any day of the week depending on whether or not this year is a leap year. So statement B is also not sufficient.
Now taking both together:
If 26^{th} January this year is a Saturday (since last year 26^{th} January was a Friday) then last year cannot be a leap year. Now since next year 26^{th} January cannot be a Monday, this year cannot be a leap year and next year's 26^{th} January has to be a Sunday, and the conditions satisfy.
However if 26^{th} January this year is a Sunday
$\Rightarrow$ Last year is a leap year (26^{th} January is a Friday) means this year is not a leap year.
$\Rightarrow$ Next year's 26^{th} January is a Monday which is a contradiction from statement B.
Hence from both statements we can see that of 26^{th} January this year has to be a Saturday. We can answer the question. Choice (3)

Solutions for questions 39 and 40:

39. The number of students who scored more than 25 in verbal = 65 (100 – 35) (i.e. students with ranks 36 to 100 in the

descending order of ranks based on the marks of the other two sections.
The number of students who scored more than 50 in quantitative = 89 (100 – 11) (i.e. students with ranks 1 to 89) in the descending order of ranks.
Number of students who scored more than 60 in logic is 54 (students with ranks 1 to 54 in the descending order of ranks.)
Number of students common to all the three is 19 (students with ranks 36 to 54 both inclusive). Choice (2)

40. Students whose score was more than 20 in verbal = 78 (100 – 22)
Students whose was more than 50 in verbal = 23 (100 – 77)
Students whose score was between 20 and 50 = 55 (78 – 23)
The higher the score in verbal, the lower the score in logic and DI.
∴ Students among these 55 who scored more than 50 in both logic and quantitative = 50
required percentage = 50/55 = 90.90% Choice (1)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	–
Easy	–
Medium	25, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Difficult	21, 22, 23, 24, 26, 27, 28
Very Difficult	–

SECTION – III

Solutions for questions 41 to 43:

41. If you omit the apostrophe you have wont, either as an adjective meaning 'accustomed' or as a noun meaning 'habit'. In this context it is used as a noun. Won't in [b] is an abbreviation of 'would not'. Hence [a] is apt.
If someone gets their just desert, it means they deserved the unpleasantness that happened to them. Dessert means a sweet dish or friuts. Hence [b].
A vocation is a person's regular occupation, profession or trade; an avocation is a diversion from a person's regular employment – a hobby. Hence [b] is apt.
'Nominal' means 'in name only whereas 'notional' relates to concepts and hypothesis rather than reality. Hence [a] is correct.
Enviable means 'arousing envy or to be worthy of envy'. To be envious is to feel or show envy, to covet. Hence [a] is apt – abbaa. Choice (3)

42. 'Turbid' means cloudy, muddy and opaque while 'turgid' means boring and difficult to understand. Hence [b].
Intense is used to describe an extreme degree – intense heat, power, aroma etc. Intensive is about concentration–a concentrated effort. Hence [b].
If you are compelled to do something, it is because of some outside force or pressure that you can't resist and over which you have little or no control. But if you are impelled to do something you are only encouraged not forced, the decision is yours. Hence [b].
Comprise means 'consist of'. Since the sentence does not have 'of' comprises is apt. Hence [a].
If someone is robbed, then something is taken away from them. If someone is stolen, then he/she is kidnapped. Here [a].
Therefore bbbaa is the right choice. Choice (4)

43. Enervate means 'to drain and weaken'. Energise means the opposite to give enthusiasm and determination to do something. Hence [a].
To be emotional is to be affected by emotion. Emotive means 'to arouse emotion'. Hence [b] is correct in the context.
Envision tends to imply future possibility rather than an image. To envisage is to form a mental image of something in future. Hence [b].
Joined means 'to bring together' whereas enjoined means 'to order, urge or require-to do something'. Hence [b].
Excoriate means to denounce or condemn scathingly. To execrate is to loathe and detest. Hence [a].
Option abbba is correct. Choice (2)

Solutions for questions 44 and 45:

44. "What is language?" It can be a process of free 'creation' 'expression' 'exchange' or 'communication'. The laws and principles of language are fixed. However, the manner in which the principles are used is free and varied. How varied are they is the question? Since the manner in which it is used is 'free', it is likely to be 'infinitely' varied. Hence, choice (1) is appropriate. Choice (1)

45. The context is about inherent power in the genetic tools. Hence, 'formation' is not a relevant option for the first blank. We can therefore rule out option (4). Since we are not explaining the nature of these tools, option (3) can be ruled out. 'Engineering' and 'manipulation' are relevant options for the first blank. The sentence talks about planned applications. Hence, unpredictable is out of context. We can rule out option (1). The power inherent in the tools of genetic manipulation calls for special levels of skill so that undesirable consequences do not occur. Choice (2)

Solutions for questions 46 and 47:

46. Statement e is the first sentence as it introduces the subject. b follows as 'it' in b refers to the 'the strongest case' in e. d follows this as it continues with the liberal view – the words being mentioned and following 'liberal' in e. c follows a – the words 'also, again' in c making this clear. The sequence, therefore, is ebdac. Choice (3)

47. It is clear that da go together linked by 'when'. Similarly bc go together linked by reference to fossils. The reference to 'Port Headland' in e and 'the same region' in c shows that e proceeds bc. The reference to hills in a and 'arid hillsides' in e shows that e follows a. The sequence is therefore. daebc. Choice (1)

Solutions for questions 48 and 49:

48. The para shows how cell biology has moved from the realm of experts to that of the common man, the penultimate sentence says it is now the focus of general interest or alarm. Choice (4) concludes this para since it points out that it has therefore become necessary to understand how cells function (since it is now of interest to all people). These in (4) refers to the issues presented in the para.
Choice (1) introduces a new idea and therefore begins a new para rather than ends this. Choice (2) has the link words 'And yet' which donot link to the para since the contrast is with control or lack of it. Similarly choice (3) has the link words 'going up the scale' and there is no scale in the para. Choice (4)

49. The para refers to Professor Sherman who believed that there was a biological cause to violent crime and wanted to prevent it. The tone is hopeful as it says it might be simpler than it sounds. The result of the experiment, therefore, must be positive especially as the penultimate sentence says that fatty acids are critical for brain functioning. Hence choice (2) concludes the para.
Choice (1) is negative which is not warranted by the para. Choice (3) and (4) are not connected since they talk of moral choices while the para is about biological functioning. Choice (2)

Solutions for questions 50 and 51:

50. Statement a is incorrect as anthropomorphic is spelt incorrectly.
Part b has incorrect punctuation –the two dashes (that separate a part of the sentence) does not make any sense because this part does not give any additional information (as words between dashes, parenthesis and comma often do) about 'individuals'. The right punctuation is as follows

'In general, only individuals of exceptional endowments, and exceptionally high-minded communities…….
Part c is correct as also part e.
Part d should have 'belongs' not 'belong' as the subject is 'a stage'. Choice (2)

51. Part a is incorrect as scientist must be plural – the singular is incorrect since the sentence talks of a whole generation.
Part b is incorrect as the preposition is 'from' not 'by' – death from cancer.
Part c is incorrect as it should be 'further' not 'farther' Part d and e are correct. Choice (4)

Solutions for questions 52 to 60:

Number of words and Explanatory notes for RC:

Number of words : 467

52. The words in quote occur in the last line of para3. A reading of para 2 and 4 shows that while books – when they were physical entities – were selected for publication on the basis of an analysis of their content, now in the digital era, popularity (or the number of clicks that a piece elicits) determines what will be digitized and presented.
Choice (3)

53. While choices (1), (2), (3) are supported by the passage, choice (4) is not. Choice (4)

54. Choice (2) is supported by para 3. The para negates the other options. Choice (2)

Number of words and Explanatory notes for RC:

Number of words : 628

55. Refer to para 5 where the words in quote occur. What follows shows that the idea is to gain publicity – no more. As para 7 shows the companies are not genuine in their green initiatives. Choice (4)

56. The words in quote occur in para 7. The government and the consumers have not been blamed nor is it is said to be unaffordable for the company. Choice (1) is the only implication. Choice (1)

57. Refer to para 9 were the words occur. The author's tone is sarcastic (it is <u>not</u> any magic figure). It merely reflects that abysmally low proportion (of the total) of the product which adheres to eco-friendly standards. Choice (2)

Number of words and Explanatory notes for RC:

Number of words : 411

58. Choice (1) is not true – his childhood experience was not proof of this hypothesis, it merely led him to the hypothesis.
Choice (1)

59. Refer to para 3. This indicates options (2) and (3). In the 20th century criminality was considered a product of societal influence hence it became a branch of sociology and not the other way round. This rules out (2). Choice (3)

60. Refer to the first para where the words occur – 'It' refers to what is said in the preceding sentence . . . . . criminality may be a trait that some people are born with . . . .
Choice (2)

Difficulty level wise summary - Section III	
Level of Difficulty	Questions
Very Easy	–
Easy	45, 48
Medium	44, 46, 49, 51, 52, 53, 55, 56, 60
Difficult	41, 42, 43, 47, 54, 57, 58, 59
Very Difficult	50