

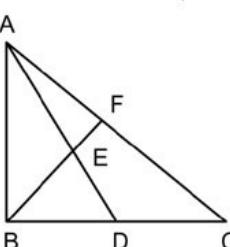
Ref: AIMCAT1110-Form-4

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 11: Answer the questions independently of each other.

1. What is the remainder when 7^{700} is divided by 100?
(1) 1 (2) 61 (3) 41 (4) 21
2. Ram has four children whose nicknames are Honey, Sunny, Moni and Bunny. He had a total of 12 mangoes to distribute among them such that each child got at least one mango. Find the number of ways of distributing the mangoes such that Bunny receives exactly 5 mangoes.
(1) 4 (2) 9 (3) 15 (4) 24
3. If the roots of the equation $(x + 1)(x + 9) + 8 = 0$ are a and b , then the roots of the equation $(x + a)(x + b) - 8 = 0$ are
(1) 1 and 9 (2) -4 and -6
(3) 4 and 6 (4) Cannot be determined
4. If the non-reflex angle between the hour hand and the minute hand of a clock 10 minutes from now will be the same as what it was 30 minutes ago, what is the non-reflex angle between the hands of the clock now?
Note: Any angle that is less than 180° is called a non-reflex angle.
(1) 60° or 120° (2) 55° or 125°
(3) 55° or 155° (4) 110° or 70°
5. A natural number n is such that $120 \leq n \leq 240$. If HCF of n and 240 is 1, how many values of n are possible?
(1) 24 (2) 32 (3) 36 (4) 40
6. In the figure below, $BD = 8$ cm and $DC = 6$ cm. $AE : ED = 3 : 4$. If $AF = 12$ cm, find AC (in cm).

 (1) 28 (2) 38 (3) 44 (4) 40
7. Three dogs D_1 , D_2 and D_3 undergo a training programme to walk. After the training, the dogs had the following pattern of walking: the distances covered by 3 steps of D_1 , 4 steps of D_2 and 5 steps of D_3 are all equal. Further, in the time taken by D_1 to take 5 steps, D_2 takes 4 steps and D_3 takes 6 steps. What is the ratio of the speeds of walking of D_1 , D_2 and D_3 respectively?
(1) $25 : 15 : 18$ (2) $15 : 18 : 25$
(3) $25 : 18 : 25$ (4) $18 : 25 : 15$
8. 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
(1) $96 \leq n < 104$ (2) $104 \leq n < 107$
(3) $107 \leq n < 111$ (4) $111 \leq n < 116$
9. R is a recurring decimal of the form $p_1.p_2\overline{p_3}$, where p_1 , p_2 and p_3 are single digits. If not more than one of p_1 , p_2 and p_3 can be zero, then which of the following always assumes an integer value?
(1) $54R$ (2) $396R$ (3) $324R$ (4) $144R$
10. Consider two figures A and C that are defined in the co-ordinate plane. Each figure represents the graph of a certain function, as defined below:
A: $|x| - |y| = a$
C: $|x| = c$
If $a = 2$ and $c = 5$, then find the area of the region enclosed by A and C.
(1) 0 (2) 4.5 (3) 9 (4) 18
11. During a parade, 289 soldiers were standing in a square formation, with 17 ranks and 17 files. Bullets were handed out to each of these soldiers for shooting practice. The number of bullets with the soldiers in each rank, as well as in each file, were in arithmetic progression. If the number of bullets with the 4th and the 14th soldiers in the first rank were 831 and 861 respectively, while the number of bullets with the 2nd and the 16th soldiers in the 16th rank were 60 and 102 respectively, find the average number of bullets with all the soldiers.
(1) 438 (2) 435
(3) 441 (4) Cannot be determined

DIRECTIONS for questions 12 and 13: Answer the questions on the basis of the information given below.

A robot is designed to move in a peculiar way and it can be set in motion by a microprocessor program. The program can be initiated by assigning a positive rational value to its variable n . The program directs the robot to move in the following way. As soon as the program is started, the robot starts from the point O, moves $2n$ metres northward and changes its direction by n° to the right. It then moves $2n$ metres forward and again changes its direction by n° to the right and continues in this manner till it reaches the starting point O, or till it covers a total distance of 1000 m, whichever happens first, and then it stops.

12. I assigned a value for n and started the program. If the robot finally came back to O and stopped, what is the total distance that it has covered?
 (1) 180 m (2) 360 m
 (3) 720 m (4) Cannot be determined
13. For how many values of n in the intervals [1, 60] does the robot cover less than 1000 m, before it stops?
 (1) 19 (2) 60 (3) 355 (4) Infinite

DIRECTIONS for questions 14 to 20: Answer the questions independently of each other.

14. Let T_1 be an equilateral triangle of side a . Another equilateral triangle T_2 is formed by joining the midpoints of T_1 . Another equilateral triangle T_3 is formed by joining the midpoints of T_2 and so on. Let X denote the sum of the perimeters of all the triangles and let Y denote the sum of the areas of all the triangles. The ratio $Y/X = \frac{\sqrt{3}a}{18}$.

- (1) $\frac{\sqrt{3}a}{12}$ (2) $\frac{\sqrt{3}a}{24}$ (3) $\frac{\sqrt{3}a}{36}$ (4) $\frac{\sqrt{3}a}{18}$

15. Five numbers are written in the descending order in a row. The averages of all the possible quadruplets (i.e., sets of four) of these numbers are written, in

the descending order, in a second row. This process is repeated for the second row, the third row and so on for subsequent rows. The difference of the first and the last numbers in the first row is 41 and the difference of the second and the fourth numbers in the second row is 4.1. Find the approximate difference of the first and the last numbers in the seventh row.

- (1) 0.01 (2) 0.002 (3) 0.004 (4) 0.001

16. A, B, C and D are four integers having a sum of 4. Find the minimum possible value of the sum of their reciprocals.

- (1) 4 (2) 0 (3) $-2\frac{6}{7}$ (4) $-3\frac{1}{3}$

17. At how many distinct points do the two curves given below intersect above the x-axis?

$$y = 2x^4 + x^3 + x$$

$$y = x^4 + x^3 + 5x^2 + x - 4$$

- (1) One (2) Two (3) Three (4) Four

18. If the sum to infinity of the series $2 + (2-d)/2/3 + (2+d)/4/9 + (2+3d)/8/27 + \dots \infty$ is $5/2$, what is the value of d ?

- (1) $7/12$ (2) $-7/12$ (3) $-5/12$ (4) $5/12$

19. A regular polygon has an even number of sides. If the product of the length of its side and the distance between two opposite sides is $\frac{1}{4}$ th of its area, find the number of sides it has.

- (1) 6 (2) 8 (3) 20 (4) 16

20. 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?

- (1) 7 (2) 6 (3) 9 (4) 8

SECTION – II

Number of Questions = 20

DIRECTIONS for question 21: Each question is followed by two statements, I and II. Answer each question using the following instructions.

Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered 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 statements together, but cannot be answered using either statement alone.

Choose 4 if the question cannot be answered even by using both statements together.

21. Two of the three cricketers Pavan, Rajan and Tarun are selected to the national team. Each of these three persons scored a different number of centuries and a different number of runs. Further, among these three, Tarun scored the highest number of centuries. Who among Pavan, Rajan and Tarun is not selected to the national team?

- I. The person with the higher number of runs between Tarun and Pavan, is the person who scored the lesser number of centuries between the two persons selected.

II. The person with the least number of runs between Rajan and Tarun, is the person who scored the higher number of centuries between the two persons selected.

DIRECTIONS for question 22: Each question is followed by two statements, I and II. Answer each question using the following instructions.

Choose 1 if the question can be answered by using statement I alone but not by using II alone.

Choose 2 if the question can be answered by using statement II alone but not by using I 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 alone.

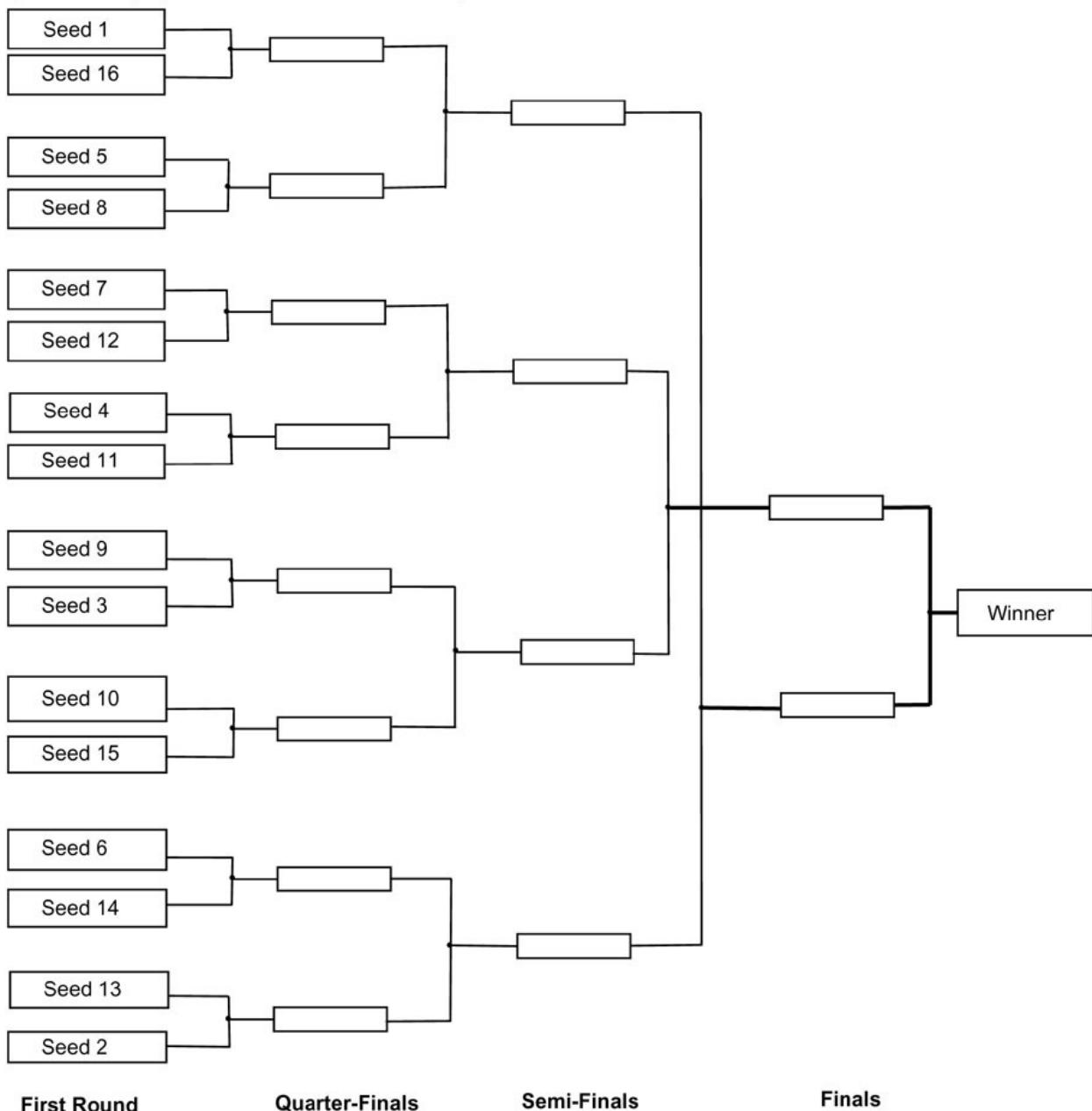
22. The students of a class contributed equally to pay Rs.10000 for a tour. How much did each one pay?

- I. If there had been ten fewer students, each would have paid an additional Rs.50.

- II. There were at least 40 students in the class, and each one paid no more than Rs.250.

DIRECTIONS for questions 23 to 26: Answer the questions on the basis of the information given below.

Sixteen players participated in a tennis tournament. The players were seeded from 1 to 16, with seed 1 being the highest seed and seed 16 being the lowest seed. The following figure gives the draw of matches for the tournament, comprising four rounds – First Round, Quarter-Finals, Semi-Finals and Finals. In each round, the winners of the matches advanced to the next round, while the losers were eliminated. In any match, if a lower seeded player defeats a higher seeded player, the match is termed as an upset.



First Round

Quarter-Finals

Semi-Finals

Finals

23. If the player seeded 11 reached the finals, what is the minimum number of *upsets* that happened in the tournament?

(1) 2 (2) 3 (3) 4 (4) 5

24. The lowest seeded player who can win the tournament without himself causing an *upset* is

(1) Seed 6 (2) Seed 7
(3) Seed 2 (4) None of these

25. If the player seeded 3 is one of the persons who reached the finals, who among the following can be the other player who reached the finals?

(1) Seed 10 (2) Seed 7
(3) Seed 14 (4) Seed 15

26. If it was known that the player seeded 6 was the winner of one of the semi-finals, who among the following was definitely not the winner of the tournament?

(1) Seed 3 (2) Seed 15
(3) Seed 1 (4) Seed 4

DIRECTIONS for questions 27 to 30: Answer the questions on the basis of the information given below.

Mr Suzuki, a car dealer, sold cars of only two brands, A and B, in the previous year. This year, he introduced a new brand, C. The number of cars of brand A and brand B sold in the previous year were in the ratio 3 : 2, and

the ratio of the number of cars sold in the previous year to that sold in this year is 2 : 3 for brand A and 2 : 5 for brand B. Further, the number of cars of brand C sold this year forms 81% of the total number of cars sold this year.

27. Find the number of cars of brand C sold this year, given that a total of 24 cars of brand A were sold in the previous year.

(1) 324 (2) 648 (3) 162 (4) 243

28. What is the percentage increase in the total number of cars sold this year when compared to the total number of cars sold in the previous year?

(1) 400% (2) 600% (3) 900% (4) 1000%

29. In the next year, Mr.Suzuki wants to increase the total sales by 80%, compared to the total sales this year, by keeping the sales of each of A, B and C at the same level as that in this year and introducing a new brand D. By what percent will the number of cars of brand D (to be sold next year) be more than the total number of cars sold last year?

(1) 400% (2) 600% (3) 900% (4) 700%

30. If a total of 380 cars were sold this year, and the sales of C this year were nil, instead of 81% of total sales, then how many cars of brand A were sold in the previous year?

(1) 140 (2) 120 (3) 100 (4) 160

DIRECTIONS for question 31: Each question is followed by two statements, I and II. Answer each question using the following instructions.

- The following instructions:

Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered 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 statements together, but cannot be answered using either statement alone.

Choose 4 if the question cannot be answered even by using both statements together.

31. Each of Ankit and Bhanu belong to one of the tribes between truth tellers i.e., those who always speak the truth, and liars i.e., those who always lie. Do both of them belong to the same tribe?

 - I. Ankit : I am a liar, only if Bhanu is a truth teller.
 - II. Bhanu : I am a truth teller, only if Ankit is a liar.

DIRECTIONS for question 32: Each question is followed by two statements, I and II. Answer each question using the following instructions:

- Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered 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 statements together, but cannot be answered using either statement alone.
 - Choose 4 if the question cannot be answered even by using both statements together.

32. Ram is standing in a row of boys arranged from left to right. Are there more boys on Ram's left than on his right?

 - I. Ram is 16th from the left and there are at least 12 boys to his right.
 - II. Ram is 13th from the right and there are at least 14 boys to his left.

DIRECTIONS for questions 33 to 36: Answer the questions on the basis of the information given below.

Harish and Sachin are playing a game of matchsticks. There are N matchsticks on the table to start with. Each player, in his turn, picks up at least one matchstick and at most eight matchsticks. The two players take turns alternately. The player who clears the table loses. Assume that each player plays intelligently with an objective of winning. The first move is made by Harish. No player is allowed to pass his turn without picking up any matchsticks.

Additional information for questions 35 and 36:

Instead of a minimum of one matchstick, each player has to pick up at least two matchsticks in his turn. The only instance that a player is allowed to pick up one matchstick is when there is only one matchstick left on the table.

35. If it is known that N is greater than 6 but less than 44, for how many values of N will Harish certainly lose the game, irrespective of how he plays?
(1) 4 (2) 5 (3) 6 (4) 8

36. If it is known that N is greater than 128 but less than 138 and that Harish picked up 6 matchsticks in his first move and eventually won the game, then what is the value of N?
(1) 137 (2) 133
(3) 134 (4) Cannot be determined

DIRECTIONS for questions 37 to 40: Answer the questions on the basis of the information given below.

A team must be selected from ten probables – A, B, C, D, E, F, G, H, I and J. Of these, A, C, E and J are forwards, B, G and H are point guards and D, F and I are defenders.

Further the following conditions need to be observed:

- The team must have at least one forward, one point guard and one defender.
 - If the team includes J, it must also include F.

- The team must include E or B, but not both.
- If the team includes G, it must also include F.
- The team must include exactly one among C, G and I.
- C and F cannot be members of the same team.
- D and H cannot be members of the same team.
- The team must include both A and D or neither of them.

There is no restriction on the number of members in the team.

- 37.** What could be the size of the team that includes G?

- 4
- 5
- 6
- More than one of the above

- 38.** What would be the size of the largest possible team?
 (1) 4 (2) 5 (3) 6 (4) 7
- 39.** Who cannot be included in a team of size 6?
 (1) A (2) H (3) J (4) E
- 40.** What can be the size of the team that includes C?
 (1) 3
 (2) 4
 (3) 5
 (4) More than one of the above

SECTION – III

Number of Questions = 20

DIRECTIONS for questions 41 to 43: Read the following passage and answer the questions that follow it.

Humanity's relationship with alcohol has never been easy. Now it is about to undergo as great a change as our attitude to tobacco, which has seen smoking plummet from the height of cool to the lowest of unpleasant habits.

That at least is the hope of the World Health Organization, which, will be honing its draft of the first global strategy on reducing health damage from alcohol abuse, the fifth leading cause of premature death and disability worldwide.

Unveiled last week in Geneva, Switzerland, the document is the culmination of talks between representatives from the WHO's 193 member states. "It is a landmark document," says Peter Anderson, a health consultant and adviser on alcohol to the WHO and the European Union.

Member states will be invited to ratify the finalised version of the document at the meeting of the World Health Assembly in May, but the document will not be legally binding. Its purpose instead is to raise awareness among governments about the importance of reducing alcohol abuse and to provide data that will persuade electorates that new laws are required – thereby emboldening governments to take action. The document will also present a menu of legal and governmental strategies that have been shown to work. "It will provide knowledge and awareness about the size of the problem, and advice about the most cost-effective policies," says Anderson.

The impetus for action is founded on the growing realisation that alcohol doesn't harm only those who drink and is combined with a better knowledge of intervention strategies. For example, in March the U.K. government's chief medical officer, Liam Donaldson, devoted a chapter of his 2008 annual report to "passive drinking", the damage that heavy drinkers wreak on others. To illustrate the extent of the problem in the U.K., he reported that in 2008, there were 125,000 "alcohol-related instances of domestic violence", that an estimated 6000 babies are born annually with fetal alcohol syndrome and that in 2006, 7000 people were injured and 560 killed as a result of drink-driving, not including the drivers.

Sally Casswell of Massey University in Auckland, New Zealand, who helped produce the WHO document, says a focus on passive drinking is key to winning public acceptance for more stringent alcohol legislation. "It challenges the neoliberal ideology which promotes the drinker's freedom to choose his or her behaviour," she says.

Persuading governments and citizens of the problem is just the first step, though. What, if anything, can be done to stop people drinking to excess?

To some extent, strategies will depend on location. In rich countries, for example, the focus is likely to be on stopping young people from binge drinking, whereas introducing drink-driving laws may be a priority in rapidly developing countries, where newly acquired wealth is increasing ownership of cars and access to alcohol.

Generally, however, the WHO says the most effective measures are to raise prices through heavy taxation based on alcohol content, and to reduce the availability of alcohol through strict licensing schemes limiting opening times and the number of outlets.

Such strategies may smack of overactive government, but recent findings suggest these measures work. Alex Wagenaar of the University of Florida, Gainesville, and colleagues reviewed 112 studies examining the effects of price and tax on alcohol consumption and found that, on average, a 10 per cent increase in the price of beer reduced consumption by 5 per cent, of wine by 7 per cent and spirits by 8 per cent.

From another study, in which Wagenaar's team surveyed 800 students leaving a campus bar over four nights, and took breadth alcohol readings, the researchers calculated that each 10-cent increase in the cost of a drink, per game of ethanol, was associated with a 30 per cent decrease in the chance that students would leave the bar drunk.

Meanwhile, at the behest of the Scottish government, Petra Meier of the University of Sheffield, U.K., used Scottish data on levels of alcohol consumption and the prices paid by different people for different types of drink to calculate the social effects of introducing minimum prices on alcohol.

She estimates that setting the minimum price at 40 pence per unit of alcohol (a small glass of wine or half a pint of beer), which is still at least twice as expensive as the cheapest alcohol available in Scotland, could save the nation £950 million in healthcare and policing costs over 10 years, to avoid 3600 hospital admissions and 1100 criminal offences each year.

As for light drinkers who complain they would be unfairly set back by price increases, Meier claims that a 40p minimum would hit heaviest drinkers hardest, as they often drink the cheapest booze, costing them £137 extra per year compared with just £11 extra for a moderate drinker.

Of course, taxing booze and restricting its availability are not new ideas and such strategies are already deployed to some extent in most developed countries. But the WHO document argues that many countries do not implement them effectively.

41. The objective of WHO's landmark document on alcohol is

- A. to embolden governments to take action against those who drink excessively and abuse others.
- B. to facilitate government regulations on alcohol in member countries by creating a favourable ambience.
- C. to make it legally binding on the signatories to bring down alcohol consumption in their respective countries.
- D. to provide information on the magnitude of the problem and strategies that are effective in controlling it.

(1) Only D (2) A and C (3) A and B (4) C and D

42. Pick the statement that is NOT true as per the passage.

- (1) Passive drinking refers to the harm that heavy drinkers inflict on others.
- (2) An increase in the price of alcohol is inversely proportional to the number of people leaving the bar drunk.

(3) Alcohol abuse is the most important cause of premature death and debility worldwide.

- (4) A focus on passive drinking would help to convince people on the need for regulation on drinking.

43. The WHO hopes that

- (1) its global strategy on reducing health damage from alcohol would have the desired effect.
- (2) governments of both developed and developing countries would use regulations to decrease the dangers of passive drinking.
- (3) the industry would play an active role in making people conscious of the dangers of excessive drinking.
- (4) from being perceived as fashionable and cool, drinking would soon be seen as something disagreeable.

DIRECTIONS for questions 44 to 47: Read the following passage and answer the questions that follow it.

Nobody wants to be thought of as materialistic. Back in the late 1970s, academics Mihaly Csikzentmihalyi and Eugene Rochberg-Halton conducted lengthy interviews with several dozen families about their possessions, asking them a battery of detailed questions about which were most important to them and why. A number of their subjects insisted that the researchers had their priorities out of whack—material objects aren't important, people and human relationships are. But one of the themes that eventually emerged from their work, described in their book, *The Meaning of Things: Domestic Symbols and the Self*, is that some objects matter a great deal. It's worth lingering a moment over what it was that made some things mean more than others—and why not all materialism is the same. Csikzentmihalyi and Eugene Rochberg-Halton interviewed members of three generations of 82 families, asking their subjects: "What are the things in your home which are special to you?" Their interviewees mentioned a total of 1,694 objects, divided into 41 categories. Objects in the top 10 categories accounted for around half of the total mentioned: Visual art, photographs, books, stereos, musical instruments, TVs, sculptures, plants and plates. The subjects gave 7,875 reasons why their chosen things were special, and these were divided into 11 broad "meaning classes," such as "memories."

Part of what the authors found was that the most meaningful objects were rarely chosen on the basis of some intrinsic, rational property, like marketplace value, cutting-edge quality, simple aesthetic pleasure or anything that an economist might describe as "use-value" or "utility." They were chosen instead for connections to something else: family or social ties, a particular episode in the narrative of the subject's life, perhaps religious faith or some other belief system affiliation. That is to say, their "meaning" tended to be a function of what the thing represented.

Csikzentmihalyi has continued to address materialism in some of his work, extending ideas from that earlier study, in particular by way of what he calls "psychic energy." This essentially means attention, or simply what we choose to think about. "Objects are generally tools," he wrote in his contribution to a book Psychology and Consumer Culture: *The Struggle for a Good Life in a Materialistic World*.

Devoting "psychic energy" to objects can make sense, he argued, if it is part of an effort to "transcend self-interest" and "reach outside (our) own needs and goals and invest in another system, thus becoming a stakeholder in an entity larger than (our) previous selves". Problems arise when people use "material goals and experiences" not to reflect, but to construct who they are. *The meaning of Things* drew a distinction between "instrumental" materialism and "increasingly expensive symbolic demonstrations of our autonomy and power," which the authors gave the label "terminal materialism." If you are a terminal materialist, you surround yourself with what you wish you were.

Those two versions of materialism seem vastly different, but in practice they are easily confused, especially in contemporary, ad-soaked consumer culture. We are thirsty for meaning, for connection, for individuality, for ways to tell stories about ourselves that make sense. Meanwhile, all brand-makers generally have to sell is a product that may have use-value, but is hardly equipped to fulfil those needs. We know customized sneakers or a new car or deodorant can't really make us more of an individual; we know that mutual admiration for the same T-Shirt brands or electronic devices aren't really forms of community. But as one contemporary ad agency executive has put it: "Few stronger emotions exist than the need to belong and make meaning. And brands are poised to exploit that need."

There's no point, of course, in demonizing branding professionals, simply doing their jobs as effectively as they can. But there's also no point in decrying "materialism" in general, either. Chances are there are objects in your life that do mean something to you. The crucifix, the wedding ring, the diploma and the trophy are some obvious examples of things that exist purely to join us to-to symbolize—something else (a belief system, a union, an achievement, a memory). It's up to us to make sure we're being the right kind of materialist.

- 44.** According to the passage, devoting psychic energy to objects means to
 (1) deliberate on objects.
 (2) give symbolic value to objects.
 (3) go beyond self-interest and reach outside our needs.
 (4) use objects as thinking tools.
- 45.** In the sentence 'A number of their subjects insisted that the researchers had their priorities out of whack', the expression "out of whack" most probably means:
 (1) Out of ignorance.
 (2) Skewed and awry.
 (3) Out of place.
 (4) Jumbled and muddled.
- 46.** Based on the passage, which of the following statements can be understood regarding a terminal materialist?
 (A) He has utilitarian leanings.
 (B) He appreciates the aesthetic value of objects.
 (C) He acquires objects to build his identity.
 (D) He attaches importance to the symbolic value of objects.
 (E) He admires the brand culture.
 (1) Only A and B (2) Only B and C
 (3) Only C and D (4) Only C, D and E
- 47.** Which of the following ideas have been suggested in the passage?
 (1) Materialism is a product of the consumer age.
 (2) Materialism and consumerism cannot be differentiated.
 (3) People do not like to be viewed as materialistic and possessive.
 (4) Treating objects as valuable is not reprehensible.
- 48.** (i) Intelligence agencies feel that the latest move made by the hostile neighbouring country as a diplomatic **gambit** (A) / **gamut** (B).
 (ii) A sedentary lifestyle can have an **adverse** (A) / **averse** (B) effect on a person's health.
 (iii) After spending several days in the library **poring** (A) / **pouring** (B) through volumes of books we got the information that we wanted.
 (iv) In most Indian households it is generally the husband who keeps a tight **rein** (A) / **reign** (B) on the family's finances.
 (v) The lopsided policies of the government attracted a lot of **flack** (A) / **flak** (B) from the people.
 (1) AAAAA (2) AAAAB (3) BAABA (4) AAABA
- 49.** (i) While evacuating people from the flood ravaged areas **precedence** (A) / **precedent** (B) was given to women and children.
 (ii) The best way to reach the summit is by trekking up the hill, **alternately** (A) / **alternatively** (B) you can go on horse back.
 (iii) His impeccable manners perfectly **complimented** (A) / **complemented** (B) his polished looks and fashionable attire.
 (iv) There has been a **noticeable** (A) / **notable** (B) improvement in Tarun's academic performance lately.
 (v) You must be **discreet** (A) / **discrete** (B) about your plans.
 (1) AABAB (2) ABBBB (3) BABAA (4) ABBA

DIRECTIONS for questions 48 and 49: In each question, there are five sentences. Each sentence has pairs of words/phrases that are italicised and highlighted. From the italicised 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.

DIRECTIONS for questions 50 and 51: 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.

- 50.** (A) While nuclear power and non-conventional energy from the sun, wind, and other as yet untested sources will be an essential part of India's energy security in the long run, there is no getting away from the fact that the short and medium term is going to be dominated by oil and gas.

- (B) While the acquisition of oil and gas assets abroad has been an article of faith, India's efforts in this direction have been plagued by stiff competition from other global players, official indifference and plain bad luck.
- (C) Despite some onshore oil finds and the promise of major flows of natural gas from the Krishna – Godavari basin, the country remains dependent on overseas producers for the bulk of its hydrocarbon needs.
- (D) Energy relations with Iran remain fraught in the face of the threat of international sanctions.
- (E) Despite political goodwill, the country has not managed a major breakthrough in Russia.
- (1) BCED (2) CEBD (3) DECB (4) CBED
51. (A) As the oceans warm and the glaciers melt, one of the definitive impacts of climate change will be a rise in sea levels.
- (B) Unfortunately since the models for ice – sheet melting are in their infancy more accurate estimates are not available
- (C) When those areas are just a few metres above sea level even less than a metre of sea level will make them uninhabitable and result in forced migration. Tens to hundreds of millions of people will have to move out of their homes permanently thus becoming climate migrants or exiles.
- (D) Scientists expect sea level rise to the extent of one to several metres by the end of this century.
- (E) Sea level rise results in an increase in the frequency and intensity of cyclones and hurricanes, storm surges coastal inundation, salt water intrusion, and damage to coastal ecosystems, all of which will make life along low lying coasts and small islands difficult or impossible
- (1) DEBC (2) DBEC (3) BDEC (4) BECD

DIRECTIONS for questions 52 to 54: Read the following passage and answer the questions that follow it.

In a short film that opens the new exhibit "Le Corbusier: the Art of Architecture" at the Barbican Centre in London, the dapper, bespectacled Swiss-born architect stands before a grand plan of Paris and draws a thick black line across the map, blocking out a vast, rectangular swath of the city. His "Plan Voisin"—conceived with the belief that modern man required modern cities in which to live—involved razing part of the capital's Right Bank to make way for nearly 20 high-rise residential towers neatly arranged on an expansive grid of wide avenues and green lawns, in stark contrast to Paris's dense warren of charming medieval lanes. Thankfully, Le Corbusier's plan was considered as preposterous then as it sounds now, and the city's Marais district, where the monolithic development would have stood, remains largely intact.

For better and worse, Le Corbusier certainly had vision. The Barbican exhibit, neatly arrayed in photos, films and architectural models illustrates how he has earned his place as both the most revered and most reviled figure in modern architecture. His sensational proposals—like the plan for central Paris—helped him win the attention he wanted and guided the principles of urban design for decades to come. But he was a better architect than urban planner; Le Corbusier produced some of the most important buildings of the 20th century—including the pilgrimage chapel he designed at Ronchamp in western France and the Philips Pavilion at the 1958 World's Fair in Brussels—inspiring generations of future designers. His detractors, however, blame him for many of the ills of contemporary urban life: crime-ridden social housing projects and an overreliance on the automobile—an invention Le Corbusier was infatuated with, which his designs always took into account. Although the grandest of his schemes were never realized, his ideas for concentrating urban living in high-rise towers to make way for open green space below has ultimately shaped the look of nearly every city today.

Like many urbanists before him, Le Corbusier seemed not to like cities. Unlike his contemporaries, who favoured far more suburban ideals, his manifesto for the "Radiant City" pushed for dense urban populations and modern transport systems. He envisioned airplanes landing amid soaring skyscrapers connected by elevated highways where automobile traffic could flow unimpeded. But his visions were often just fantasies. In a proposal for Algiers, even the French colonial government noted it would need the powers of an "absolute dictator" to level the Casbah for Le Corbusier's utopia.

The need to reconstruct Europe's battle-torn cities after the Second World War opened up the kind of tabula rasa the Corbusian model called for. By the early 1950s, the architect's concern for humankind was evident in far more modest projects like the Unité d'Habitation in Marseille, which was heavily influenced by communal housing in the Soviet Union. He went to great lengths to secure his own legacy; as Charles Knevitt of the Royal Institute of British Architects points out, "He was the first star architect." A precursor to the likes of Frank Gehry and Norman Foster, he skillfully harnessed the mass media to brand "Le Corbusier" as a household name.

As we know now, the public housing projects, largely disconnected from the cities around them, became bleak ghettos of poverty and, sooner than anyone thought possible, the great modernist vision failed. Many developments were torn down not long after they were built. As the American writer Jane Jacobs poignantly observed, the Corbusian city was not only isolating, it stunted the normal growth of urban areas. Even his admirers concede that Le Corbusier understood very little about the actual economies of cities. By the time of his death in 1965, the backlash against modernism had begun in earnest.

Today, the most desirable addresses lie at the heart of the urban centers the Corbusians wanted to tear down. Current schools of architectural thought, such as the New Urbanists, emphasize remixing the old divisions between work and play that Le Corbusier tried to bulwark. Architecture, while maintaining some of its hubris, has retreated to the role of simply trying to create beautiful buildings. Lately more altruistic concerns have begun to creep back in—albeit with a smaller footprint—in the form of groups like Architecture for Humanity and the Rural Studio, which have begun turning their skills again toward housing the world's poor.

For all his shortcomings, Le Corbusier's sparse and unadorned esthetic—he deemed that the home should be "a machine for living"—remains alive and well. Many of the new loft-style condominiums that have sprung up in urban centers around the world over the past decade borrow directly from him. And in places like China and Dubai, where newfound prosperity and optimism coincide with strong governments—recall Beijing's Olympic Village—architects are once again venturing into the business of remaking society through architecture and urban planning. The Radiant City may find a home yet.

52. Le Corbusier comes under the critical gaze of the passage for all of the following reasons EXCEPT:
- his understanding of urban economics.
 - his isolated sense of housing.
 - his altruistic motives in architecture.
 - his tendency to destroy traditional styles of living.
53. Which of the following options bear testimony to the fact that Corbusier was a better architect than urban planner?
- His designs are blamed for the high rates of crime in urban life.
 - He regarded cities as crowded, dirty places.
 - His buildings inspired generations of future designers.
 - He was a star architect and his was a household name.
54. Which of the following choices support the statement that Corbusier's blueprint for city life still reigns?
- His 'Plan Voisin' for central Paris is yet to see the light of day.
 - New urbanists have embraced the Corbusian ideology to mix work and play.
 - Architecture has shed itself of its hubris and retreated to the role of designing beautiful buildings.
 - Many new housing styles are inspired by his vision of urban planning.

DIRECTIONS for questions 55 and 56: Each question has a set of five 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 statements.

55. (A) The Law Minister's excellent suggestion – to set up fast track courts to deal with litigations relating to bouncing of cheques – merits serious consideration by the government.
(B) Cheque payments will cease to have any sanctity if there is no mode of ensuring that they are honoured.
(C) It was with this in mind that the Negotiable Instrument Act that governs cheque payment

- was amended to make the dishonour of cheques a cognizable offence.
(D) While the objective was undoubtedly good, given the huge pile of cases in our courts, and the long delays in the Indian legal system, the outcome has not been an entirely happy one.
(E) The law minister's suggestion of fast-track courts to deal specifically with such cases should thus go a long way to address both these problems.
(1) JJFII (2) IJIJI (3) JIJII (4) JFIFI
56. (A) The proposed central legislation to regulate international schools could turn out to be fatal for several city schools which call themselves international without holding required recognition.
(B) With the proposed regulation suggesting that each of the international schools should have recognition from international boards, several schools in the city are trying hard to get IGCSE or IB recognition years after they were set up.
(C) Currently only nine international schools out of 45 located in the city and surrounding areas are registered with international boards.
(D) However, there is a rising demand for international schools in the city, and several managements are hard selling the international tag even when they do not have recognition to run international curriculum.
(E) As the CBSE syllabus is now offered in countries in the Middle East and hence the CBSE could be considered an international board, schools can be called international even if the CBSE syllabus is offered by them.
(1) IJFIJ (2) JIFJI (3) JIFJF (4) IIFFI

DIRECTIONS for questions 57 to 59: In each of the following questions, the word at the top is used in four different ways, numbered 1 to 4. Choose the option in which the usage of the word is INCORRECT or INAPPROPRIATE.

57. PULL
(1) Pull aside the curtains and let in some fresh air.
(2) I decided to pull away from the venture due to differences of opinion with my partners.
(3) Being a charismatic leader that he is, he can certainly pull the crowds.
(4) The municipal corporation has decided to pull down all illegal constructions in the city.
58. SPOT
(1) The two teams contending for the top spot are equally competent
(2) The two pictures looked so similar that it was difficult to spot the subtle difference between the two.
(3) On the spot jogging helps you remain fit and trim.
(4) The question posed by the journalists put the minister in the spot.

59. NEAR

- (1) With the exams drawing near most students are seen poring over their books.
 - (2) A near neighbour of mine was very helpful to me when I was confined to bed with a bout of fever.
 - (3) It is not likely that Vivek will return to India in the near future.
 - (4) I had a near encounter with death when I met with an accident a couple of months ago.

DIRECTIONS for question 60: In the following 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.

(Key and Solutions for AIMCAT1110-Form-4)

Key

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

Solutions

SECTION – I

Solutions for questions 1 to 11:

1. Consider 7^4 , whose value is 2401
 $\therefore 7^{100} = (7^4)^{175} = (2401)^{175}$

Any power of 2401 will end with 1 as the units digit and 0 as the tens digit.

\therefore When it is divided by 100, the remainder is 1.
 Choice (1)

2. If Bunny receives exactly 5 mangoes, then $12 - 5 = 7$ mangoes need to be distributed among Honey, Sunny and Moni.

The possible ways of dividing 7 mangoes in 3 parts and the corresponding number of ways of distributing the parts among the children are given below.

$$7 = 1 + 1 + 5 \rightarrow 3 \text{ ways}$$

$$7 = 1 + 2 + 4 \rightarrow 6 \text{ ways}$$

$$7 = 1 + 3 + 3 \rightarrow 3 \text{ ways}$$

$$7 = 2 + 2 + 3 \rightarrow 3 \text{ ways}$$

Hence a total of $3 + 6 + 3 + 3 = 15$ ways are possible.
 Choice (3)

3. $(x+1)(x+9) + 8 = 0$

$$x^2 + 10x + 17 = 0$$

The roots of the equation are a and b

$$\therefore a + b = -10$$

$$ab = 17$$

$$(x+a)(x+b) - 8 = 0$$

$$x^2 + (a+b)x + ab - 8 = 0$$

$$x^2 - 10x + 9 = 0$$

Therefore, roots of $(x+a)(x+b) - 8 = 0$ are 1 and 9.

Choice (1)

4. Let the present time be t . Then, it is given that the angle between the minute hand and the hour hand was the same at $(t - 30)$ minutes and $(t + 10)$ minutes. Hence exactly midway between these two times, i.e., at $(t - 10)$ minutes, the two hands of the clock must have either coincided or must have been at 180° to each other.

Hence, angle between the hands of the clock now, i.e., 10 minutes after $(t - 10)$ minutes, would be either $(0^\circ + 5\frac{1}{2}^\circ \text{ per min} \times 10 \text{ min}) = 55^\circ$ (in case the hands coincide at $(t - 10 \text{ min})$) OR $(180^\circ - 5\frac{1}{2}^\circ \text{ per min} \times 10 \text{ min}) = 125^\circ$ (in case the two hands were at 180° to each other at $(t - 10) \text{ min}$).

Choice (2)

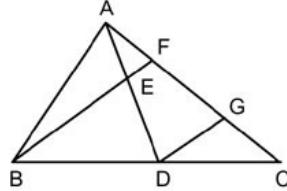
5. Given that $120 \leq n \leq 240$.

$$120 = 2^3(3) \quad (5) \text{ and } 240 = 2^4(3) \quad (5)$$

So, the prime factors involved in 120 and 240 are the same. We want the number of co-primes of 240 lying between 120 and 240 = $\phi(240) - \phi(120)$.

$$= 240 \left(1 - \frac{1}{2}\right) \left(1 - \frac{1}{3}\right) \left(1 - \frac{1}{5}\right) - 120 \left(1 - \frac{1}{2}\right) \left(1 - \frac{1}{3}\right) \left(1 - \frac{1}{5}\right) \\ = (240 - 120) \left(\frac{1}{2}\right) \left(\frac{2}{3}\right) \left(\frac{4}{5}\right) = 32 \quad \text{Choice (2)}$$

6. Let G be a point on AC such that DG is parallel to BF.



$$\frac{AF}{FG} = \frac{AE}{ED} = \frac{3}{4}, \quad \frac{FG}{GC} = \frac{BD}{DC} = \frac{4}{3}$$

$$\therefore AF : FG : GC = 3 : 4 : 3.$$

$$\therefore AC = \frac{10}{3}(AF) = \frac{10}{3}(12) \text{ cm} = 40 \text{ cm} \quad \text{Choice (4)}$$

7. Let ℓ be the length covered by D_1 in 3 steps

$$\Rightarrow \text{step length of } D_1 = \frac{\ell}{3}.$$

By the same logic, step lengths of D_2 and D_3 are respectively $\frac{\ell}{4}$ and $\frac{\ell}{5}$. Distances covered by D_1 , D_2 and D_3

$$\text{in 5 steps, 4 steps and 6 steps are } 5\left(\frac{\ell}{3}\right), 4\left(\frac{\ell}{4}\right) \text{ and } 6\left(\frac{\ell}{5}\right)$$

respectively.

As these distances are covered in the same time interval, the

$$\text{ratio of speed of } D_1 : D_2 : D_3 = \left(\frac{5}{3}\right) : (1) : \left(\frac{6}{5}\right) = 25 : 15 : 18$$

$$\therefore \text{Required ratio } (D_1 : D_2 : D_3) = 25 : 15 : 18$$

Choice (1)

8. $[\log_{10}x] = 0$, for any value of $x \in \{1, 2, \dots, 9\}$, ——— (1)

Similarly $[\log_{10}x] = 1$, for $x \in \{10, 11, 12, \dots, 99\}$ ——— (2) and

$[\log_{10}x] = 2$, for $x \in \{100, 101, 102, \dots, 999\}$ ——— (3)

Now consider, $1 \leq n \leq 9$, then

$$[\log_{10}1] + [\log_{10}2] + [\log_{10}3] + \dots + [\log_{10}n] = 0 \text{ (i.e., } \neq n\text{)}$$

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 (1) and (2), 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.
Hence $90 + 2(n - 99) = n$
 $\Rightarrow n = 198 - 90 = 108$

Choice (3)

9. $R = P_1 \cdot \bar{P}_2 \bar{P}_3 \dots \quad (1)$

$$100R = P_1 P_2 P_3 \cdot \bar{P}_2 \bar{P}_3 \rightarrow (2)$$

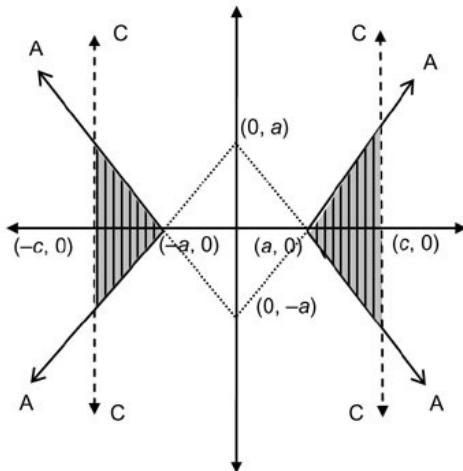
$$\text{Subtracting (1) from (2), } 99R = P_1 P_2 P_3 - P_1$$

$$R = \frac{P_1 P_2 P_3 - P_1}{99}$$

As $99R$ is an integer, any multiple of $99R$ is always an integer. Hence of the options, only $396R$ is a multiple of $99R$.

Choice (2)

10. The lines represented by A and C are shown in figure given below, (where $a > 0$).



The region enclosed by A and C comprises of two separate congruent triangles. The area of each triangle is $\frac{1}{2}(c-a)$

$$2(c-a) = (c-a)^2$$

Therefore the total area is $2(c-a)^2 = 2(5-2)^2 = 18$.
Choice (4)

11. Let us visualise the soldiers in the following matrix.

$$\begin{array}{cccc} 1, 2 & \dots & 8, 9, 10, \dots & 17 \\ 18, 19 & \dots & 25, 26, 27, \dots & 34 \end{array}$$

$$\begin{array}{cccc} 256, 257 & \dots & 263, 264, 265, \dots & 272 \\ 273, 274 & \dots & 280, 281, 282, \dots & 289 \end{array}$$

Let us denote the i^{th} soldier as S_i and the number of bullets with him as x_i .

Now, $x_4 = 831, x_{14} = 861 \Rightarrow$ middle term = $x_9 = 846$ (i.e., the average of the fourth term from the left and the fourth term from the right)

Similarly, $x_{257} = 60, x_{271} = 102 \Rightarrow x_{264} = 81$

Now, the numbers $x_9, x_{26}, \dots, x_{264}, x_{281}$ are in AP (an AP with 17 terms)

The 1^{st} term is 846.

The 16^{th} term is 81.

$\therefore 15d = 765$ or $d = -51$. Hence, the average, i.e., the middle term (or 9^{th} term of 17)

$$= 846 - 51(8) = 438$$

This is the average number of bullets with the soldiers.
Choice (1)

Solutions for questions 12 and 13:

If n is a factor of 360, then according to the pattern of movement followed by the robot, it will cover a regular polygon of an external angle of n° and number of sides = $\frac{360}{n}$. The length of each side will be $2n$ metres. Hence the robot will come back to

O in this case. However, if n is not a factor of 360° , then the robot will not come back to O, but will continue moving till it covers 1000 metres and then stop.

Note: The robot may come back to O for other values of n , which are not factors of 360° but are factors of $720^{\circ}, 1080^{\circ}$ etc. However, in such cases the distance required to be covered before reaching O will be greater than 1000 m.

12. Since the robot came back to O, n must be a factor of 360° and also the total distance covered = (number of sides of the regular polygon) \times (length of each side) = $\frac{360}{n} \times 2n = 720$ m

Choice (3)

Note that the distance is independent of N.

13. If the robot covered less than 1000 m, then it must have come back to O. The factors of 360 in the range [1, 60] are $\frac{360}{1} \Rightarrow 360$ sides to $\frac{360}{60} = 6$ sides. All other rational values of n , for 359 sides, 358 sides and so on till 6 sides are possible.
Hence a total of $(360 - 6) + 1 = 355$ values are possible.
Choice (3)

Solutions for questions 14 to 20:

14. Perimeter of $T_1 = 3a$

$$\text{Perimeter of } T_2 = \frac{3}{2}a$$

$$\text{Perimeter of } T_3 = \frac{3a}{4} \text{ and so on.}$$

$$\text{Area of } T_1 = \frac{\sqrt{3}}{4}a^2$$

$$\text{Area of } T_2 = \frac{\sqrt{3}}{16}a^2$$

$$\text{Area of } T_3 = \frac{\sqrt{3}}{64}a^2 \text{ and so on.}$$

$$x = \frac{3a}{1 - \frac{1}{2}} = 6a$$

$$y = \frac{\frac{\sqrt{3}}{4}a^2}{1 - \frac{1}{4}} = \frac{\sqrt{3}}{3}a^2$$

$$\therefore \frac{y}{x} = \frac{\sqrt{3}}{18}a.$$

Choice (4)

15. Let the numbers in the i^{th} row be P_i, Q_i, R_i, S_i and T_i .

It is given that $P_i > Q_i > R_i > S_i > T_i$.
Given : $P_1 - T_1 = 41$ and $Q_2 - S_2 = 4.1$

Row

I st :	P_1	Q_1	R_1
II nd :	$\frac{P_1 + Q_1 + R_1 + S_1}{4}$	$\frac{P_1 + Q_1 + R_1 + T_1}{4}$	$\frac{P_1 + Q_1 + S_1 + T_1}{4}$

I st :	S_1	T_1
II nd :	$\frac{P_1 + R_1 + S_1 + T_1}{4}$	$\frac{Q_1 + R_1 + S_1 + T_1}{4}$

Difference between the first and the last numbers in the second row = $P_2 - T_2$

$$= \frac{P_1 - T_1}{4} = \frac{1}{4} \times (\text{Difference for the previous row})$$

$$\therefore P_n - T_n = \frac{P_{n-1} - T_{n-1}}{4} = \frac{P_1 - T_1}{4^{n-1}}$$

$$P_7 - T_7 = \frac{P_1 - T_1}{4^6} = \frac{41}{4096} \approx 0.01$$

Choice (1)

16. $A + B + C + D = 4$

$\frac{1}{A} + \frac{1}{B} + \frac{1}{C} + \frac{1}{D}$ must be minimum. This would be minimum, if its magnitude is maximum and sign is negative. These conditions would be satisfied if three of A, B, C and D are -1 each. The fourth would be 7.

$\frac{1}{A} + \frac{1}{B} + \frac{1}{C} + \frac{1}{D}$ would then be $-2\frac{6}{7}$. Choice (3)

17. Solving

$$2x^4 + x^3 + x = x^4 + x^3 + 5x^2 + x - 4$$

$$x^4 - 5x^2 + 4 = 0$$

$$\Rightarrow (x^2 - 1)(x^2 - 4) = 0 \Rightarrow x = \pm 1, \pm 2$$

But for $x = -1, y = 0$. For $x = 1, 2, -2, y > 0$.

∴ The curves intersect above the x-axis at three distinct points. Choice (3)

18. Let $S = (2-d)\left(\frac{2}{3}\right) + (2+d)\left(\frac{4}{9}\right) + (2+3d)\left(\frac{8}{27}\right)$

$$\therefore S\left(\frac{2}{3}\right) = (2-d)\left(\frac{4}{9}\right) + (2+d)\left(\frac{8}{27}\right) + \dots$$

Subtracting,

$$\frac{S}{3} = (2-d)\left(\frac{2}{3}\right) + 2d\left(\frac{4}{9}\right) + 2d\left(\frac{8}{27}\right) + \dots$$

$$= (2-d)\left(\frac{2}{3}\right) + 2d\left[\frac{4}{9} + \frac{8}{27} + \dots\right]$$

$$= (2-d)\left(\frac{2}{3}\right) + (2d)\left[\frac{4}{9}\left(\frac{3}{1}\right)\right] = \frac{4}{3} + 2d$$

$$\Rightarrow S = 4 + 6d. \text{ Given } S = \frac{5}{2} - 2 = \frac{1}{2} \therefore d = \frac{-7}{12}$$

Choice (2)

19. 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 $2P$.

$$\text{Also, area of the polygon (A)} = 2n\left(\frac{SP}{2}\right) \quad \text{--- (1)}$$

Given that $S(2P) = A/4$ or $SP = A/8$

$$\therefore (1) \Rightarrow A = n(A/8)$$

$$\Rightarrow n = 8 \text{ or } 2n = 16$$

Choice (4)

20. Let the 4-digit 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 $1000a + 100b + 10c + d$.

Given $4(216a + 36b + 6c + d)$

$$= 1000a + 100b + 10c + d$$

$$\Rightarrow 136a = 44b + 14c + 3d \quad \text{--- (A)}$$

By trial $a = 1, b = 2, c = 3, d = 2$

If $a = 2$, the 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 $a = 3$, the LHS = 408, while $44b + 14c + 3d$ can at the most be $(44 + 14 + 3)5$ or 305.

∴ There are no other possible values that satisfy (A)]

$$\therefore abcd = 1232 \text{ and } a + b + c + d = 8 \quad \text{Choice (4)}$$

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

SECTION – II

Solution for question 21:

21. Given Tarun scored the highest number of centuries among Tarun, Rajan and Pavan.

∴ From I, we can say that Pavan scored more runs than Tarun and is one of the persons selected.

But we cannot say who is the other person selected.

∴ I alone is not sufficient.

From II, we can only say that, Pavan is not the person who scored the highest number of centuries between the persons selected.

∴ II is not sufficient.

Using both the statements Tarun or Rajan is one of the other persons selected.

∴ Either Tarun or Rajan is not selected. Choice (4)

Solution for question 22:

22. Let the number of students be x and let he amount contributed by each be Rs.y.

$$\therefore xy = 10,000 \quad \text{--- (1)}$$

From I,

$$(X - 10)(Y + 50) = 10,000 \quad \text{--- (2)}$$

By solving (1) & (2), we get the value of x

I alone is sufficient

From II, $x \geq 40, y \leq 250$.

There are more than one values which satisfy this.

II alone is not sufficient. Choice (1)

Solutions for questions 23 to 26:

23. If the player seeded 11 reached to finals, the minimum number of upsets are as follows;

(1) First round – seed 11 beats seed 4,

(2) Quarter finals – seed 11 beats seed 7 and

(3) Semi-finals – seed 11 beats seed 3. Choice (2)

24. To find the lowest seeded player, check from player seeded 16th. It can be seen that seeds 16, 15, 14, 13, 12 and 11 cannot advance to the next round without causing an upset. Seed 10 will face either seed 9 or seed 3 in the next round and so will need an upset to advance seed 9 and seed 8 will need upsets in the first round itself to advance. Seed 7 is the lowest seeded player who can win the tournament without himself causing an upset. Choice (2)

25. If the player seeded 3 reached the finals all players in his half of the draw, i.e. seed, 7, 12, 4, 11, 9, 10 or 15 could not have reached the finals. Choice (3)

26. If player seeded 6 was the winner of one of the semi-finals, i.e., reached the final, none of the players in his half of the draw i.e., seeds – 1, 16, 5, 8, 14, 13 or 2 wouldn't have reached the finals. Choice (3)

Solutions for questions 27 to 30:

Given that the ratio of the number of cars of brand A and B sold in the last year is 3 : 2

Last year	A	B
3	:	②
Last year		Present year
A	2	: 3
B	②	: 5

In the above numbers, the underlined numbers represent the same value. Similarly the encircled numbers also represent the same value. So make them same.

Last year	A	B
6	:	4
Last year		Present year
A	6	: 9
B	4	: 10
C	—	81

27. From the above ratio it is clear that for every 6 cars of A sold last year, 19 cars of A and B are sold this year and 81 cars of C are sold this year.

$$\therefore \text{Number of cars of 'C' sold this year is } \frac{24}{6} \times 81 = 324$$

Choice (1)

28. From the previous question and the given ratios, it is clear that for every 10 cars sold last year, 100 cars are sold this year.

\therefore The percentage increase is 900%. Choice (3)

29. For every 10 cars sold last year, 100 cars are sold this year and he wants to sell 180 cars in the next year. It is clear that out of this 180, 80 cars will be of brand D.

\therefore Number of cars to be sold in the next year will be 700% more than the total sales of last year. Choice (4)

30. Given that a total of 380 cars are sold this year. From the above ratios it is clear that for every 19 cars sold this year 6 cars of brand A were sold in the last year.

$$\therefore \text{Number of cars of brand A sold last year is } \frac{380}{19} \times 6 = 120$$

Choice (2)

Solution for question 31:

31. Neither of the statements alone is sufficient, as each statement gives only partial information.

Combining both the statements, if Ankit is a truth teller, Bhanu cannot be a truth teller.

\therefore Bhanu is a liar.

If Ankit is a liar, then Bhanu can be a truth teller or a liar.

\therefore We cannot answer the question. Choice (4)

Solution for question 32:

32. From statement I we know that Ram has 15 boys to his left and 12 or more boys to his right. Since the number of boys on the right is not exactly known hence the given question cannot be answered with statement I alone.

From statement II we know Ram has 12 boys to his right and 14 or more boys on his left, therefore we know that Ram has more boys on his left than on his right.

Choice (1)

Solutions for questions 33 to 36:

Let us say that A and B are playing the game and the first move is A's. A's target is to leave exactly one matchstick on the table, finally, such that B would have to take it and lose the game.

Let us assume a case, where the number of matchsticks on the table is more than one and less than 10. Then A picks up all the matchsticks except one and B picks up the last matchstick. A finds this kind of situation only when B is left with exactly 10 matchsticks on the table in his move. (Because if B has 11 matchsticks, he picks up exactly one and leaves 10. Then, whatever be the number of matchsticks that A picks, B would pick up the remaining matchsticks minus one and thus ensure that A loses the game. Also because, if B has 9 matchsticks, he picks up 8 and A loses the game). In other words, if there are 10 matchsticks when B has to move, A sees to it that the total number of matchsticks picked up by him and B put together would be 9, so that B is left with exactly one matchstick. Before these two moves A has to leave 9 more matchsticks for B (i.e. 19 matchsticks). In this case no matter whatever number of matchsticks B picks up, A can pick up some matchsticks and leave 10 matchsticks on the table for B's move.

\Rightarrow A has to leave $9n + 1$ matchsticks on the table before each of B's moves. ($n = 0, 1, 2, \dots$).

33. Harish always sees to it that the sum of the number of matchsticks picked up by him and Sachin consecutively is always 9. (Except the first move). i.e., if Sachin picks up n

matchsticks, Harish picks up $(9 - n)$ matchsticks. In his first move Harish picks up 6 matchsticks then Sachin picks up 5 matchsticks and Harish picks 4 ($5 + 4 = 9$). Then Sachin picks up 6 matchsticks and Harish picks 3 ($6 + 3 = 9$). Then Sachin picks up 3 matchsticks and Harish picks 6 ($3 + 6 = 9$). Choice (1)

34. In the last move, the loser always picks up exactly one matchstick. In the first move, the beginner always picks up 8 or less matchsticks. In between these two moves in every pair of consecutive moves both of them would pick up 9 matchsticks in total.

$$\Rightarrow 9x + 1 + n \text{ (Where } n \leq 8)$$

$$\Rightarrow 63 + 1 + n = 64 + n$$

The maximum value of $n = 8$

$$\Rightarrow 64 + 8 = 72$$

Choice (3)

Solutions for questions 35 and 36:

In this case, Harish should manage to play in such a way that Sachin and himself should take 10 matchsticks in two consecutive moves (First move in the pair being Sachin's) And the target of Harish is to leave $10n + (1 \text{ or } 2)$ matchsticks on the table before each of Sachin's moves.

35. Harish loses the game if he has $10n + 1$ matchsticks or $10n + 2$ matchsticks before he picks up.
Numbers satisfying this rule are 11, 12, 21, 22, 31, 32, 41 and 42. Choice (4)

36. The objective is to leave 121 or 122 or 131 or 132 matchsticks for the opponent to pick up from. This can be done only when there are 137 matchsticks. ($137 - 6 = 131$).
Choice (1)

Solutions for questions 37 to 40:

37. The conditions related to G are, if G is included, F also must be included and C and I cannot be included. There are no other conditions related to G. Hence, a team that includes G can be

(1) AEJGDF (2) ADGFE (3) EGFH

More arrangements are also possible. Hence, the number of members in the team is not unique. Choice (4)

38. The largest possible team can have six members. As one of, (E, B) and (D, H) and two of (C, G, I) must definitely be excluded. Hence, a minimum of four members must be excluded.
Choice (3)

39. If a team includes H, neither A nor D can be included in that team and further one of (E, B) and two of (C, G, I) must be excluded making the size of the team as 5. Choice (2)

40. If C is included, G, I and F must be excluded.
As F is excluded, J also must be excluded.
As F and I are excluded, the only remaining defender D must be included.
As D is included, A must be included and thus H must be excluded.
As G and H are excluded, the only remaining point guard B must be selected.
As B is included, E must be excluded.
 \therefore The team is (A, B, C, D)
Choice (2)

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

SECTION – III

Solutions for questions 41 to 43:

Number of words and Explanatory notes for RC:

Number of words : 830

41. Refer to para (4). The last sentence of the para supports only statement D. So, choice (1) is the answer. Statement 4 is partially apt (who drink excessively and abuse others is not suggested). The word 'facilitate' and the phrase 'creating favourable ambience' make statement B invalid.
Choice (1)

42. Choice 1 is true – para 5.
Choice 2 is true – para 11.
Choice 4 is true – para 6.
Choice 3 is not true – para 2 says alcohol is the fifth leading cause of premature death.
Choice (3)

43. Refer the first sentence of para 2, which begins with the relative pronoun 'that', which specifies WHO's hope. Para (1), is the antecedent and provides the answer.
Choice (4)

Solutions for questions 44 to 47:

Number of words and Explanatory notes for RC:

Number of words : 698

44. The idea of psychic energy is discussed in para (4) and we can arrive at option (1) as the answer. While options (2) and (3) are easy eliminations, option (4) seems right. But it is distorted. Our thinking about objects does not aid our thinking. Note that the phrase "thinking tool" in the fourth option conveys this idea and hence is incorrect.
Choice (1)

45. The idiomatic phrase "out of whack" is used in para (1) and option (2) is the correct pick in the given context. Other options do not suit the context.
Choice (2)

46. Refer to para (4), where the term "terminal materialist" is introduced. Statements (C) and (D) can be surmised. The sentence "problems arise who they are" and the phrase "symbolic demonstrations of autonomy and power" support statements (C) and (D) and hence option (3) is the answer. While statements (A) and (B) can be eliminated easily, statement (E) seems right. But, the idea "admires the brand culture" does not suggest "acquisition and possession" of branded goods. So, (E) is invalid.
Choice (3)

47. Choice (1) is not suggested. Choice (2) is categorical (can't be differentiated). The word possessive renders choice (3) wrong. Choice (4) is supported by the last para.
Choice (4)

Solutions for questions 48 and 49:

48. Only the word gambit – a thing that somebody does or something that somebody says at the beginning of a situation or conversation that is intended to give them some advantage – makes sense in the given context. Gamut (a wide range) does not make sense here, Hence A is apt. It is said that something has an adverse effect on something. An adverse effect is an unfavourable effect. If you are averse to something it means that you are not favourably inclined to it and you detest it. Only A makes sense here.
To pore over something is to look at or read something very carefully. Hence A is apt. Pouring which refers to the act of pouring (a liquid etc) is inapt here.
To keep a rein on something or someone is to control them firmly. Hence A.

The word flak which means criticism is more apt in the given context when compared to the word flack. Hence B. Therefore the sequence is AAAAB. Choice (2)

49. The word precedence which means the condition of being dealt with before other things or of being considered more important than other things is apt in the given context. Hence A.

Alternately means alternating between two things. Alternatively which is used to suggest another possibility is apt in the context. Hence B. Compliment is a remark that expresses approval admiration or respect. Complement which means to make something else seem better or more attractive when combining with it. Only B is apt here. Notable means important and demanding attention. Noticeable means easy to see or recognize. Only A is apt. The word discreet means to keep something several Discrete means having a clear, independent shape or form. Only the former makes sense here. Hence the correct sequence is ABBA. Choice (4)

Solutions for questions 50 and 51:

50. Statement A says that India is dependent on oil and gas for its short and medium term needs of energy. C follows A by stating that the bulk of the country energy needs is dependent on overseas producers. India's efforts to procure energy resources from abroad is 'plagued by stiff competition from other global players as stated in C. Hence B follows C. India's effort to this effect have been plagued by various factors as mentioned in B. E follows B by saying India's efforts have not been successful in Russia. D follows E by citing the example of Iran. Hence CBED.
Choice (4)

51. Statement A talks about the rise in sea levels. D supports A by saying that the scientists expect the sea level to rise by several metres. B follows, D by saying that more accurate results are not available, Thus suggesting that B is an extension of the idea stated in B. E which talks about the consequences of sea level rise follows B. C concludes the para by talking about what impact will the rise in sea levels have on people. Hence DBEC is the correct sequence.
Choice (2)

Solutions for questions 52 to 54:

Number of words and Explanatory notes for RC:

Number of words : 816

52. (1) is stated in the passage – 'understood very little about the actual economies of cities'. (2) is also be inferred from '...housing... largely disconnected from the cities around them...' (3) is stated as '... the architect's concern for humankind...' but this is a point deserving commendation, not criticism. So, choice (3) is the answer. (4) can be inferred – 'level the Casbah for Le Corbusier's utopia'.
Choice (3)

53. (1) is not tenable, Corbusier did not incorporate crime in his designs. (2) is true, but this has little to do with his proficiency, or lack of it. (3) is correct – 'Corbusier produced... most important buildings... inspiring... designers'. (4) is true as per the passage but this is an opinion, not evidence.
Choice (3)

54. (1) is irrelevant, as 'Plan Voisin' may never see the light of day. (2) is not correct, as Corbusian ideology sought to 'bulwark' and not 'mix' work and play. (Refer to the penultimate para). Choice (3) does not support architecture's venture into urban planning and restricts its role to designing appealing buildings. Option (4) finds support in the passage – 'Many... condominiums... urban centers... borrow directly from him'.
Choice (4)

Solutions for questions 55 and 56:

55. A. Words like 'excellent', 'merit serious consideration' makes it clear that the author's opinion is involved. Hence judgement – J.
- B. This is also the author's personal opinion, hence judgement – J.
- C. In this statement the author is indicating the objective of the act – F.
- D. The huge pile of cases in our courts and the long delays is a fact, the objective and the outcome are the author's reading of the situation. Hence inference – I.
- E. The law minister's suggestion is a fact. That is would go a long way in addressing the problem is the author's understanding of the situation – I. Hence JJFII
Choice (1)
56. A. The proposed legislation is a fact, the consequence of it is the author's understanding. Hence I.
- B. What the proposed legislation says and what the schools are trying to do are both facts but the link between them is the author's understanding. Hence I.
- C. The figures in the statement show it to be a fact – F.
- D. The rising demand is a fact, that several management's are hand selling is also a fact – both being presented as observations. Hence fact – F.
- E. Here again the latter half is fact, the first half is the reason as inferred by the author – I. Hence IFFI
Choice (4)

Solutions for questions 57 to 59:

57. Choice 2 is erroneous. 'Pull away from...' is an incorrect expression in this context. The correction is '.... pull out of or 'from'. To pull out of something is to move away from something or stop being involved in it. Choice (2)
58. The usage of spot is incorrect in choice 4. The correction is 'The question posed ... put the minister on the spot'. To put somebody on the spot is to make somebody feel awkward or embarrassed.
Choice (4)
59. Choice (4) is incorrect because near does not collocate with encounter. The correction is '... close encounter with death'.
Choice (4)

Solution for question 60:

60. A is erroneous because sentence continues into B, and the full stop should therefore be replaced by a semi-colon. Statement C is incorrect because the verb 'splash' does not agree with the subject riot. The correction is 'A riot of wild flowers splashes ... the floor. B, D and E are free of errors.
Choice (4)

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