

**SECTION - I**  
**Number of Questions = 25**

21  
2

**DIRECTIONS for questions 1 to 5:** Answer the questions independently of each other.

1. How many three-digit numbers can be formed using the digits 1, 2, 3, 4, 5, 6, 7 and 8, wherein the tens digit is greater than the hundreds digit but less than the units digit?
- (1) 48      (2) 54      (3) 64      (4) 63      (5) 56
2. Find the remainder when  $((38)^{16!})^{17777}$  is divided by 17.
- (1) 1      (2) 16      (3) None of these      (4) 13      (5) 8
3. From a cuboid of dimensions 4 m  $\times$  6 m  $\times$  8 m, the largest possible cube is cut out. What is the minimum possible number of cubes, all of equal size, into which the remaining part of the solid can be cut, ensuring that no part of the solid remains?
- (1) 2      (2) 4      (3) 8      (4) 16      (5) 20
4. In a theatre, there are 300 seats. The price of each ticket, when the theatre is houseful, is Rs.60. For every Rs.5 increase in the price of the ticket, the number of tickets sold goes down by 10. Find the price of the ticket (in Rs), for which the theatre owner would earn the maximum possible revenue.
- (1) 90      (2) 95      (3) 100      (4) 105      (5) 110
5. Two functions,  $f(x)$  and  $g(x)$ , are defined as  $f(x) = g(x - 1)$  and  $g(x) = \frac{1}{x^2 - 1}$ . How many times do the graphs of these two functions intersect in the coordinate plane?
- (1) 0      (2) 1      (3) 2      (4) 3      (5) 4

**DIRECTIONS for questions 6 and 7:** Answer the questions on the basis of the information given below.

A, B, C, D and E are distinct digits from among 1 to 9, such that  $0.\overline{AB} = \frac{CD}{EE}$

6. If E = 3, how many values can C assume?
- (1) 0      (2) 1      (3) 2      (4) 3      (5) 4
7. How many values can E assume?
- (1) 9      (2) 6      (3) 8      (4) 3      (5) 7

**DIRECTIONS for questions 8 and 9:** Answer the questions on the basis of the information given below.

In a certain class, the number of students who do not study at home or do not attend classes is one-third more than that of those who either study at home or attend classes. Further, the number of students who do not study at home but attend classes is two fifths more than those who study at home but do not attend classes, while the number of students who study at home as well as attend classes is half that of those who neither study at home nor attend classes.

8. If the total number of students in the class is 150, then find the number of students who study at home as well as attend classes.

(1) 35      (2) 30      (3) 25      (4) 45      (5) 50

9. If the total strength of the class is 300, then find the sum of the number of students who study at home and attend classes and those who neither study at home nor attend classes.

(1) 120      (2) 150      (3) 180      (4) 220      (5) 240

**DIRECTIONS for questions 10 to 21:** Answer the questions independently of each other.

10. Akhil has a board, similar to a chessboard, except that it has only  $6 \times 6$  squares. He calculated the number of rectangles (including squares) on the board. How many distinct values can the area of these rectangles assume?

(1) 72      (2) 24      (3) 36      (4) 54      (5) 18

11. In the above problem, how many distinct rectangles have an area equal to one third of the largest possible rectangle?

(1) 34      (2) 30      (3) 15      (4) 17      (5) 16

12. In a right circular cone, AB is a diameter of the base, V is the vertex and  $\angle AVB = 90^\circ$ . Of all the right circular cylinders that can be inserted in the cone, the one with the greatest volume is L.

If the radius of L is  $6\frac{2}{3}$  cm, find the volume of the cone.

(1)  $\frac{100\pi}{3}$  cc      (2)  $\frac{500\pi}{3}$  cc      (3)  $\frac{1000\pi}{3}$  cc

(4)  $\frac{2000\pi}{3}$  cc      (5) Cannot be determined

**13.** Ram went to a shop to buy some synthetic and cotton sarees. Synthetic sarees cost Rs.300 each while cotton sarees cost Rs.400 each. Ram spent a total of Rs.3600 on the sarees. If he had bought as many cotton sarees as the number of synthetic sarees he actually bought and vice versa, he would have saved an amount equal to half the cost of one saree of one of the two types. Find the total number of sarees he bought.

- A (1) 10 (2) 9 (3) 8 (4) 11 (5) 12

**14.** ABC is a triangular field, in which sides AB and BC are perpendicular to each other. A car started from A towards C, along the side AC. On reaching a point D, it was exactly as far from each of B and C as B was from C. Find the ratio BD : AD.

- (1)  $1 : \sqrt{3}$  (2)  $\sqrt{3} : 1$  (3)  $2 : \sqrt{3}$  (4)  $\sqrt{3} : 2$  (5)  $1 : 1$

**15.** A regular hexagon ABCDEF is inscribed in a circle. From a point, P, outside the circle, two tangents are drawn to the circle touching it at A and C. If PE = 30 cm, what is the area (in sq.cm) of the triangle PAC?

- (1)  $225\sqrt{3}$  (2)  $150\sqrt{3}$  (3)  $75\sqrt{3}$   
(4)  $50\sqrt{3}$  (5) Cannot be determined



**16.** If  $p$ ,  $q$  and  $r$  have a product of 1, then  $\frac{1}{1+r^2 p+r^2 q} + \frac{1}{1+p^2 q+p^2 r} + \frac{1}{1+q^2 p+q^2 r} =$

- (1)  $\frac{(p+q+r)^2}{9}$  (2)  $\frac{3}{(p+q+r)^2}$  (3)  $\frac{(p+q+r)^3}{9}$   
(4)  $\frac{3}{(p+q+r)^3}$  (5) 1

**17.** The cost of 20 pens, 22 erasers and 25 sharpeners is Rs.196. The cost of 23 pens, 27 erasers and 30 sharpeners is Rs.233. The cost of 109 pens, 125 erasers and 140 sharpeners is Rs.K. What can be the value of K?

- (1) 1089 (2) 1091 (3) 1093  
(4) 1095 (5) More than one of these

$$\begin{aligned} 20p + 22e + 25s &= 196 \\ 23p + 27e + 30s &= 233 \\ 109p + 125e + 140s &= ? \end{aligned}$$

**18.** There are two tanks, A and B, of the same capacity. A pipe which can fill at the rate of 2 litres per minute takes 165 minutes to fill A. Tank B has N pipes, numbered from 1 to N, fitted to it. The  $i^{\text{th}}$  pipe, where  $1 \leq i \leq N$ , can fill the tank at  $(24 + i)$  litres per hour. All the pipes are opened simultaneously and B is filled after one hour. Find N.

- (1) 10 (2) 11 (3) 12 (4) 13 (5) 14

19. From the first  $n$  natural numbers, three consecutive numbers are left out. The sum of the remaining numbers is 1348. What is the greatest of the three numbers that are left out?

- (1) 11      (2) 10      (3) 16      (4) 15      (5) 18

20. Amy, Bob and Chip are three bees that start from the same flower and fly away in three different directions in search of nectar. After some time Chip is as far from the mid point D of the straight line joining Amy and Bob as Amy is from D. Amy and Bob are 300 m apart while Bob is 180 m from Chip. At this instant Amy sends a distress signal which is received simultaneously by the other two bees. If a bee can fly at a speed of 3 m/sec, then which among Bob and Chip can reach Amy quicker and by how many seconds?

- (1) Chip – by 20 seconds      (2) Bob – by 20 seconds  
(3) Bob – by 18 seconds      (4) Chip – by 18 seconds  
(5) Cannot be determined

21. Aman and Bhanu ran a business after investing some money together. At the end of the first year, out of a total profit of Rs.1000, Aman gets Rs.400, which is Rs.25 more than what he would have got if he had invested Rs.3000 less and Bhanu had invested Rs.1000 less. Find Bhanu's share of the profit, if Aman had invested Rs.3000 more and Bhanu had invested Rs.3000 less. (Assume the same profit in all cases)

- (1) Rs.320      (2) Rs.375      (3) Rs.450      (4) Rs.500      (5) Rs.550

**DIRECTIONS for questions 22 to 25:** Each question is followed by two statements, A and B. Answer each question using the following instructions:

Mark 1 if the question can be answered by any one of the two statements alone but not by the other statement alone.

Mark 2 if the question can be answered by either of the two statements alone.

Mark 3 if the question can be answered only if both the statements are taken together.

Mark 4 if the question cannot be answered even if both the statements are taken together.

22. If the 1<sup>st</sup> of this month was a Sunday, what day of the week was the first day of this year?

- A. The 1<sup>st</sup> of the next month is a Wednesday.  
B. The 1<sup>st</sup> of the previous month was a Saturday.

1

23. A group of 150 students wrote an exam in which there were two papers – Paper I and Paper II. 60 students passed only in Paper I and 70 students passed in Paper II. How many students failed in at least one of the two papers?

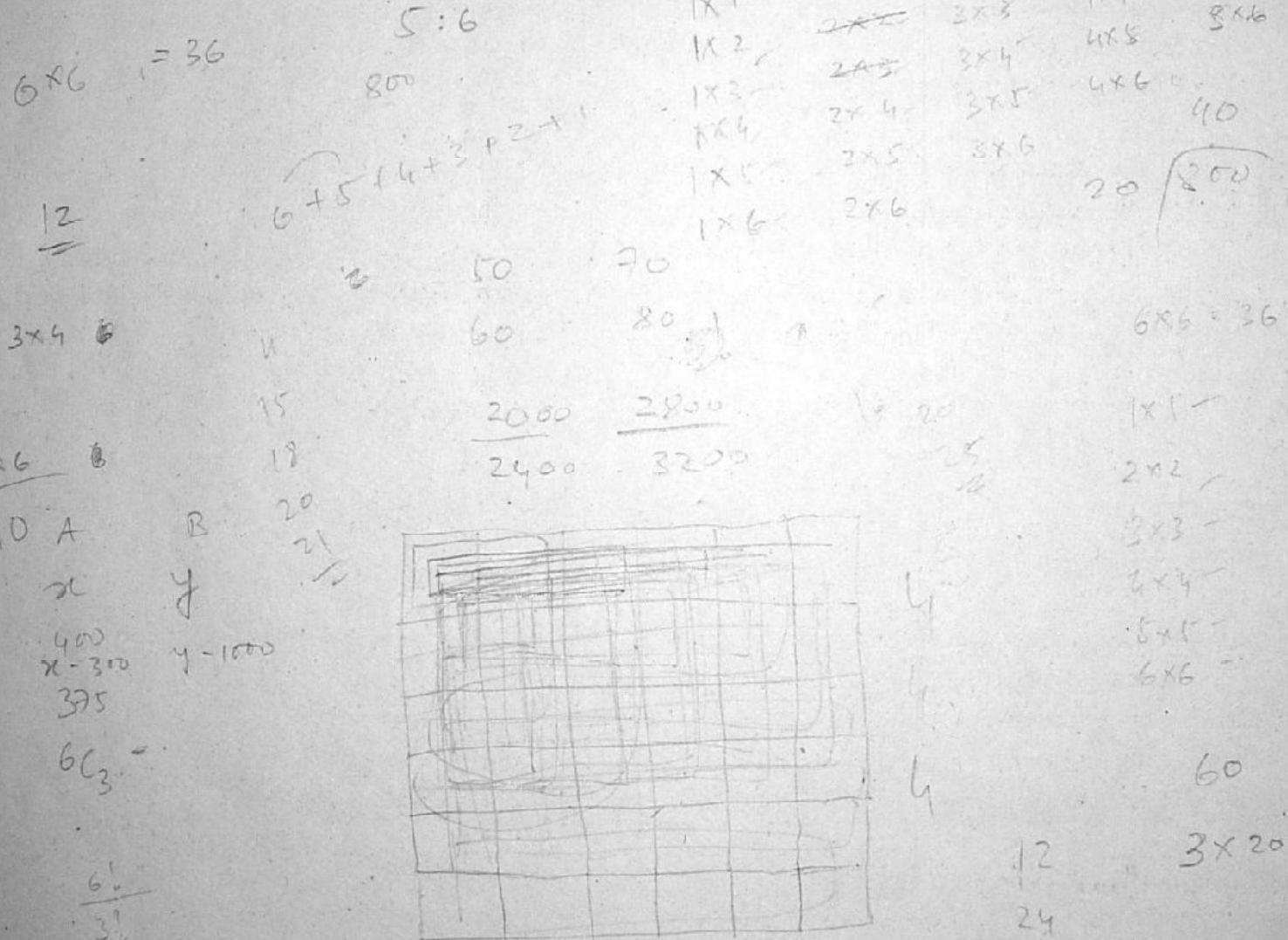
- A. 100 students passed in Paper I.  
B. 40 students passed in both the papers.

24. The cost prices of A and B are in the ratio 5 : 6 and their selling prices are in the ratio 7 : 8. What is the cost price of A?

- A. The difference between the cost price and the selling price of A is equal to that of B, and is equal to Rs.800.
- B. Profit is made on only one of A and B.

25. If  $xy = 60$ , what is the value of  $x$ ?

- A.  $x$  and  $y$  are positive integers;  $y$  is odd and is greater than  $x$ .
- B.  $x$  and  $y$  are positive integers;  $y$  is even and  $x$  is odd.



**SECTION - II**  
**Number of Questions = 25**

**DIRECTIONS for questions 26 to 30:** Answer the questions on the basis of the information given below.

Peoplerach.com is an internet company which is in the business of collecting details of potential employees and selling these details to other organisations. The company collects data regarding people of different categories based on their job profile. For each person in each category, the company collects the details of one or more of the six features, name, age, address, experience, phone number and e-mail ID. The following table gives the information available in the database of the company about the number of people in each category, and the percentage of people in that category for whom the details of each feature are available.

Category	Number of people	Percentage of people for whom the details of the feature are available					
		Name	Age	Address	Experience	Phone number	E-mail ID
School Teachers	16000	100%	85%	70%	90%	65%	80%
Pharmacists	3000	100%	75%	95%	80%	70%	60%
Doctors	60000	100%	50%	60%	70%	65%	100%
Professors	10000	100%	70%	75%	60%	85%	90%
Civil Engineers	25000	100%	40%	60%	50%	65%	85%
MBAs	150000	100%	50%	55%	70%	65%	100%
CAs	2600	100%	80%	50%	40%	50%	90%
Mechanical Engineers	42000	100%	85%	70%	95%	60%	80%
Nurses	18000	100%	50%	40%	60%	75%	40%
Accountants	12000	100%	40%	70%	75%	90%	85%
Ex-Servicemen	15000	100%	65%	75%	40%	80%	60%
Electrical Engineers	22000	100%	70%	65%	60%	70%	90%
Computer Engineers	26000	100%	80%	60%	65%	50%	100%

In the above table, for example, the phone numbers of 65% of the School Teachers in the database (i.e., 65% of 16000) are available. Assume that no person belongs to more than one category.

26. The number of doctors, each of whose name, phone number and address are available, is at least

- (1) 15000. (2) 12000. (3) 18000.  
 (4) 24000. (5) None of these

27. The number of mechanical engineers, for whom the details of exactly four of the six features are available, is at least

- (1) 2100. (2) 6300. (3) 10500.  
 (4) 21000. (5) None of these

~~28.~~ The number of professors for whom at least two of the three features, address, phone number and e-mail ID, are available, is at least

- (1) 8000. (2) 7500. (3) 6000.  
~~(4)~~ 6500. (5) 5000.

~~29.~~ For at most how many of the CAs are the details of exactly five of the six features available?

- ~~(1)~~ 1300. (2) 1950. (3) 2000.  
(4) 1820. (5) None of these

~~30.~~ For at least how many of the given engineers (i.e., Civil, Mechanical, Electrical and Computer engineers, put together) are both the phone number and the e-mail ID available?

- (1) 50000 (2) 56000 (3) 53500  
(4) 59000 ~~(5)~~ 55500

**DIRECTIONS** for questions 31 to 35: Answer the questions on the basis of the information given below.

Each of Praful and Karan has a peculiar habit in making statements. Praful lies on Mondays, Tuesdays and Wednesdays but speaks the truth on the other days of the week, whereas Karan lies on Thursdays, Fridays and Saturdays but speaks the truth on the other days of the week.

Umesh is a common friend of Praful and Karan.

~~31.~~ Today, Umesh wanted to find out what day of the week it is and he got the following responses from his friends to his query.

- Praful : Yesterday was one of my lying days.  
Karan : Yesterday was one of my lying days.

What day of the week is today?

- (1) Tuesday (2) Thursday (3) Saturday  
(4) Sunday (5) Cannot be determined

~~32.~~ On another day, when Umesh wanted to find out what day of the week it was, he met only Praful, who made the following two statements:

- I. I lied yesterday.  
II. I will lie on the third day after today.

What day of the week was it?

- ~~(1)~~ Monday (2) Tuesday (3) Wednesday  
(4) Thursday (5) Friday

**33. On what day(s) of the week is it possible for Praful to make the following two statements?**

- I. I lied yesterday.
- II. I will lie tomorrow.

(1) Monday  
(4) Either (1) or (2)

(2) Wednesday  
(5) No such day is possible

(3) Thursday

**34. On which of the following day(s) of the week is it possible for Praful to make the following statement: "I lied yesterday and I will lie again tomorrow."**

(1) Monday  
(4) Either (1) or (2)

(2) Wednesday  
(5) No such day is possible

(3) Thursday

**35. One day Umesh met two cousins of Praful - Archna and Rachna. One of these two girls is like Praful – i.e., she lies on Mondays, Tuesdays and Wednesdays but speaks the truth on the other days of the week, and the other is like Karan – i.e., she lies on Thursdays, Fridays and Saturdays but speaks truth on the other days of the week. However, Umesh did not know who among the two girls is like Praful and who is like Karan. He also did not know what day of the week it was. They introduced themselves to him one by one, making the following statements:**

First girl : I am Archna.

Second girl : I am Rachna.

Which of the following statements is true?

- (1) The first girl is Archna.
- (2) The first girl is Rachna.
- (3) The day is Wednesday.
- (4) Data is inconsistent
- (5) None of these

**DIRECTIONS for questions 36 to 40:** Answer the questions on the basis of the information given below.

Seeing the huge popularity of the Indian Premier League (IPL) tournament, the All India Football Federation started an Indian Football League (IFL) tournament, to give an impetus to the sport in the country. Eight clubs representing eight cities of the country participate in the inaugural tournament, which comprises three stages. The first stage, called the group stage, is a double round-robin stage, i.e., a stage in which every team plays exactly two matches against each of the other teams. If any match in this stage ends as a draw, both the teams get one point each. Otherwise, the winning team gets three points and the losing team gets no points. If, at the end of the group stage, two or more teams end up with the same number of points, goal differences (goals scored – goals conceded) will be applied to determine their placings. Assume that no two teams end up with the same goal difference. At the end of this stage, the top four teams, in terms of the points scored, would advance to the second stage, i.e., the semifinals.

The winners of the semifinals would advance to the third stage, i.e., the finals. The winner of the finals is the champion of the tournament. It is ensured that there are no draws in the second and the third stages.

36. At least how many points should be scored by a team in the group stage to advance to the semifinals?

- (1) 8                         (2) 10                         (3) 11  
(4) 12                         (5) None of these

37. The number of points scored by a team which does not advance to the semifinals can be at most

- (1) 28.                         (2) 26.                         (3) 30.                         (4) 32.                         (5) 35.

38. At least how many points should be scored by a team to finish sixth in the group stage?

- (1) 4                                 (2) 5                                 (3) 6                                 (4) 7                                 (5) 8

**Additional data for questions 39 and 40:**

In the tournament, at the end of the group stage, it was found that no two teams finished with the same number of points.

39. The number of draws in the group stage is at most

- (1) 52.                                 (2) 50.                                 (3) 48.  
(4) 46.                                     (5) None of these

40. The points scored by the team which finished with the highest points in the group stage is at least

- (1) 18.                                     (2) 19.                                     (3) 20.  
(4) 21.                                     (5) None of these

**DIRECTIONS for questions 41 to 45:** Answer the questions on the basis of the information given below.

Mr. Kapoor, from city A, decided to visit city D, in the month of June. As travel by bus or train was very taxing he decided to go by air to city D from city A. As there were no direct flights between these cities, he had to first fly to either city B or city C and then fly to city D from there. Only a single airline operates flights from A to either B or C and the same was the case with travel from B or C to D. As he wanted to minimize the cost of travel, Mr. Kapoor collected the following information regarding the airfares (in Rs) on each date of the month of June.

Date	Air fare (Rs.)			
	A - B	A - C	B - D	C - D
1 W	1650	2025	4150	5050
2 T	1825	1500	3775	6000
3 F	2100	1850	5050	4850
4	1800	1700	3250	4625
5	1575	1550	3650	4275
6	1875	2625	3225	4025
7 T	1650	2075	3150	4200
8 W	1700	2150	3050	4050
9 T	1900	2000	3975	3775
10 F	2025	1900	4225	3850
11	2150	1800	4100	3900
12	1950	1650	4000	4150
13 M	1775	1925	3825	4175
14 T	1525	2250	3825	3650
15 W	1525	1575	3425	3400

Date	Air fare (Rs.)			
	A - B	A - C	B - D	C - D
16 T	1830	2175	3600	3500
17 F	2150	1750	3525	3300
18	2600	1875	3400	3400
19	2750	1925	3425	3425
20 M	2100	2150	3650	3750
21 T	1850	2075	3750	3850
22 W	1925	2150	3800	4000
23 T	2000	2325	3925	4150
24 F	2150	1975	4025	4050
25	1875	1500	4150	3200
26	1925	1425	4275	3675
27 M	1775	1350	4350	3750
28 T	1850	1750	3875	3800
29 W	1900	1950	3625	3900
30 T	1800	1575	3500	3650

The flights are connected in such a way that a person can go from A to D, via B or C, on the same day.

41. What is the minimum fare for travelling by flight from A to D on any day in the month of June?

- (1) Rs.4650
- (2) Rs.4700
- (3) Rs.4750
- (4) Rs.4900
- (5) None of these

42. The airline offers a 25% discount on its fares for travel from C to D on weekdays, i.e., from Monday to Friday but not on weekends, i.e., Saturdays and Sundays. If June 1<sup>st</sup> is a Wednesday, the minimum possible cost of flying from A to D on any day in the month of June is

- (1) Rs.4050
- (2) Rs.4100
- (3) Rs.4125
- (4) Rs.4225
- (5) None of these

43. If Mr. Kapoor wants to limit his travelling expenses to Rs.5000, then on how many days of the month, does he have the option of travelling from A to D, via B?

- (1) 2
- (2) 3
- (3) 4
- (4) 5
- (5) 6

~~3775~~  
~~8~~  
~~225~~  
~~575~~  
~~480~~  
44. If en route to city D, Mr. Kapoor wants to stop at city B for one day, then the cost of flying from A to D, in the month of June, is at least

- (1) Rs.4600      (2) Rs.4650  
(3) Rs.4700  
(4) Rs.4850      (5) None of these

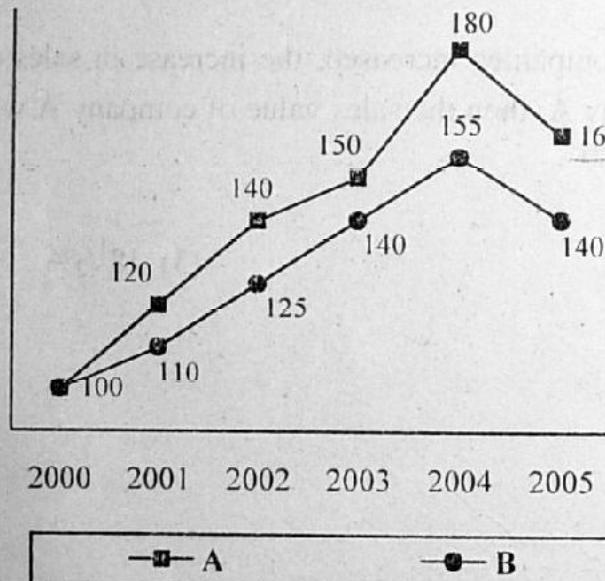
~~7500~~  
~~5600~~  
400  
45. What is the maximum difference in the fares for travel by the routes i.e. A - B - D and A - C - D on any particular day in the month of June?

- (1) Rs.1675      (2) Rs.1750  
(3) Rs.1850  
(4) Rs.1900      (5) None of these

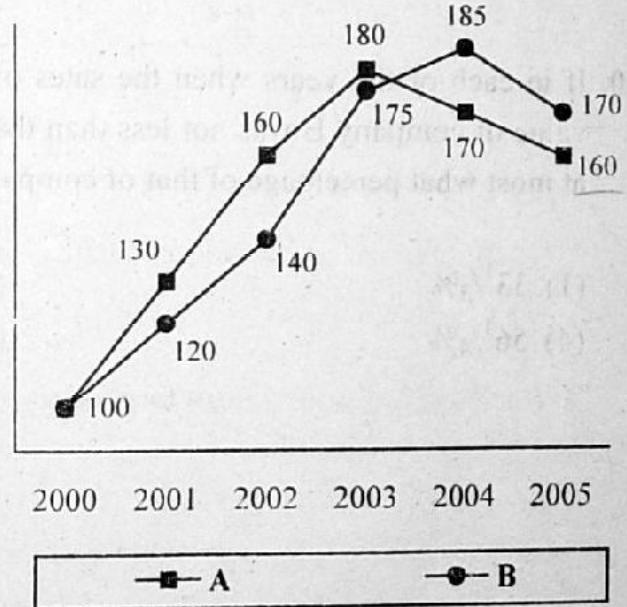
**DIRECTIONS** for questions 46 to 50: Answer the questions on the basis of the information given below.

The following line graphs give the values of sales and expenses for two automobile manufacturers, A and B, from 2000 to 2005. The values of sales and expenses of both the companies are each indexed to 100 in the year 2000.

Sales index



Expenses index



In the above graph, the values of the sales and expenses of company A are indexed to the corresponding values in the year 2000 and same is the case with B. For example, if the sales value of A is  $100k$  in 2000, it is  $120k$  in 2001 and so on and if the sales value of B is  $100p$  in 2000, it is  $110p$  in 2001 and so on.

It is also known that neither A nor B made a loss in any of the years.

$$\text{Profit} = \text{Sales} - \text{Expenses}$$

$$\text{Profitability (in \%)} = \frac{\text{Profit}}{\text{Sales}} \times 100$$

46. The profitability (in %) of company A in the year 2005 was at least

- (1)  $12\frac{1}{2}$  (2) 15 (3)  $16\frac{2}{3}$  (4) 20 (5) 25

47. If the profit earned by company B in 2002 was Rs.12 crore, then in how many years from 2001 to 2005, did the sales of company B increase by more than 10%, when compared to the previous year?

- (1) 0 (2) 1 (3) 2 (4) 3 (5) 4

48. If in the year 2004, the profits earned by companies A and B were in the ratio 5 : 12 and the expenses of the companies were in the ratio 1 : 2, then what was the ratio of their sales values?

- (1) 5 : 12 (2) 7 : 5 (3) 5 : 7  
(4) 7 : 12 (5) Cannot be determined

49. In at least in how many of the given years did company B have a profitability of more than 10%?

- (1) 4 (2) 3 (3) 2 (4) 1 (5) 0

50. If in each of the years when the sales of both the companies increased, the increase in sales of value of company B was not less than that of company A, then the sales value of company A was at most what percentage of that of company B in 2005?

- (1)  $33\frac{1}{3}\%$  (2)  $40\frac{1}{2}\%$  (3)  $48\frac{1}{2}\%$   
(4)  $56\frac{1}{4}\%$  (5)  $57\frac{1}{7}\%$

**SECTION – III**  
**Number of Questions = 25**

7

**DIRECTIONS for questions 51 to 53:** The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

It seems to me a lecturer's duty to speak to you about any remarkable thought at this moment engaging the attention of western philosophers and men of science, - partly because any such new ideas are certain, sooner or later, to be reflected in literature, and partly because without a knowledge of them you might form incorrect ideas in relation to utterances of any important philosophic character. I am not going to discourse about Nietzsche, though the title of this lecture is taken from one of his books; the ideas about which I am going to tell you, you will not find in his books. It is most extraordinary, to my thinking, that these ideas never occurred to him, for he was an eminent man of science before writing his probably insane books. I have not the slightest sympathy with most of his ideas; they seem to me misinterpretations of evolutional teachings; and if not misinterpretations, they are simply undeveloped and ill-balanced thinking. But the title of one of his books, and the idea which he tries always unsuccessfully to explain, that of a state above mankind, a moral condition "beyond mean," as he calls it, - that is worth talking about. It is not nonsense at all, but fact, and I think that I can give you a correct idea of the realities in the case. Leaving Nietzsche entirely alone, then, let us ask if it is possible to suppose a condition of human existence about morality, - that is to say, more moral than the most moral ideal which a human brain can conceive? We may answer, it is quite possible, and it is not only possible, but it has actually been predicted by many great thinkers, including Herbert Spencer.

We have been brought up to think that there can be nothing better than virtue, than duty, than strictly following the precepts of a good religion. However, our ideas of goodness and of virtue necessarily imply the existence of the opposite qualities. To do a good thing because it is our duty to do it, implies a certain amount of resolve, a struggle against difficulty. The virtue of honesty is a term implying the difficulty of being perfectly honest. When we think of any virtuous or great deed, we cannot help thinking of the pain and obstacles that have to be met with in performing that deed. All our active morality is a struggle against immorality. And I think that, as every religion teaches, it must be granted that no human being has a perfectly moral nature.

Could a world exist in which the nature of all the inhabitants would be so moral that the mere idea of what is immoral could not exist? Let me explain my question more in detail. Imagine a society in which the idea of dishonesty would not exist, because no person could be dishonest, a society in which the idea of unchastity could not exist, because no person could possibly be unchaste, a world in which no one could have any idea of envy, ambition or anger, because such passions could not exist, a world in which there would be no idea of duty, filial or parental, because not to be filial, not to be loving, not to do every thing which we human beings now call duty, would be impossible. In such a world, ideas of duty would be quite useless; for every action of existence would represent the constant and faultless performance of what we term duty. Moreover, there would be no difficulty, no pain in such performance; it would be the constant and unfailing pleasure of life. With us, unfortunately, what is wrong often gives pleasure; and what is good to do, commonly causes pain. But in the world which

I am asking you to imagine there could not be any wrong, nor any pleasure in wrong-doing; all the pleasure would be in right-doing. To give a very simple illustration- one of the commonest and most pardonable faults of young people is eating, or drinking, or sleeping too much. But in our imaginary world to eat or to drink or to sleep in even the least degree more than is necessary could not be done; the constitution of the race would not permit it. One more illustration. Our children have to be educated carefully in regard to what is right or wrong; in the world of which I am speaking, no time would be wasted in any such education, for every child would be born with full knowledge of what is right and wrong. Or to state the case in psychological language – I mean the language of scientific, not of metaphysical, psychology – we should have a world in which morality would have been transmitted into inherited instinct. Now again let me put the question: can we imagine such a world? Perhaps you will answer, Yes, in heaven – nowhere else. But I answer you that such a world actually exists, and that it can be studied in almost any part of the East or of Europe by a person of scientific training. The world of insects actually furnishes examples of such a moral transformation. It is for this reason that such writers as Sir John Lubbock and Herbert Spencer have not hesitated to say that certain kinds of social insects have immensely surpassed men, both in social and in ethical progress.

51. Nietzsche's name is brought into the lecture by the speaker chiefly because

- (1) the title of the lecture is taken from one of his books.
- (2) it is about an amorphous idea put forth by Nietzsche.
- (3) he wants to prove that Nietzsche was an eminent man of science.
- (4) he wants to set right incorrect ideas in relation to differences in Nietzsche.
- (5) the subject is an idea propounded but not explained by Nietzsche.

52. A world where human beings are devoid of anything immoral is

- (1) a possible but currently non-existent world.
- (2) a figment of imagination of the author.
- (3) an utopian world.
- (4) a world not only possible but also currently existing.
- (5) a practically impossible world.

53. Writers such as Sir John Lubbock and Herbert Spencer aver that social insects have surpassed men because

- (1) there is no immorality in the world of insects.
- (2) morality is immanent in insects.
- (3) insects seem to possess more morals than humans.
- (4) insects follow universal ethics.
- (5) there seems to be perfect peace in the world of insects.

**DIRECTIONS** for questions 54 to 57: 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 or passage. From the given options, choose the most appropriate option.

54. (A) Faced with its second mass protest by members in its short life span, Facebook, the enormously popular social networking website, is reining in some aspects of a controversial new advertising programme.
- (B) Late on Thursday, the company made an important change, saying it would not send messages about users' Internet activities without getting explicit approval each time.
- (C) Facebook, which is run by Mark Zuckerberg who created it while an undergraduate at Harvard, has built a highly successful service that is free to its more than 50 million active members. But now the company is trying to figure out how to translate this popularity into profit. Like so many Internet ventures, it is counting heavily on advertising revenue.
- (D) 'MoveOn.Org Civic Action', the political group that set up the online petition, said the move was a positive one. "Before, if you ignored their warning, they assumed they had your permission to share information," said Adam Green, a spokesman for the group.
- (E) Within the last 10 days, more than 50,000 Facebook members have signed a petition objecting to the new programme, which sends messages to users' friends about what they are buying on websites such as Travelocity.com, Fandango, etc. The members want to be able to opt out of the programme completely with one click, but Facebook won't let them..

- (1) BCDE      (2) CEBD      (3) EBCD      (4) EBDC      (5) EDBC

55. (A) Malawi hovered for years at the brink of famine.
- (B) In Malawi itself, the prevalence of acute child hunger has fallen sharply. In October, the U.N. Children's Fund sent three tons of powdered milk, stockpiled in Lilongwe to treat severely malnourished children, to Uganda instead.
- (C) After a disastrous harvest in 2005, almost 5 million of its 13 million people needed emergency food aid. But this year, a nation that has perennially extended a begging bowl to the world is instead feeding its hungry neighbours.
- (D) Farmers explain Malawi's extraordinary turnaround – one with broad implications for hunger-fighting methods across Africa – with one word: fertilizer.
- (E) Over the past 20 years, the World Bank and some rich nations Malawi depends on for aid have periodically pressed this small, landlocked country to adhere to free market policies and cut back or eliminate fertilizer subsidies, even as the United States and Europe extensively subsidized their own farmers. But after the 2005 harvest, the worst in a decade, it decided to follow what the West practised, not what it preached.

- (1) CDEB      (2) CDBE      (3) ECBD      (4) ECDB      (5) CBDE

56. (A) Thanks to its foresight in steadily building up infrastructure in Science and Technology, India now has a far stronger technological base than most other developing nations.
- (B) Our stature in the world is steadily going up because of a number of factors. Our economy is booming and our GDP, already about a trillion dollars, is expected to continue growing at 8-9 percent annually.

- (C) While there is genuine concern that vast segments of our population are still untouched by this prosperity, there is nevertheless an expectation that India is emerging as a major world power. We already demand a seat at the high table on every front whether it be the United Nations Security Council or the nuclear club.
- (D) In certain mission-oriented areas such as space and nuclear energy, we have developed large capabilities, and we are making steady gains in IT, pharmaceuticals and many other high-tech sectors.
- (E) We can be justifiably proud of this progress considering where we had to start after Independence. But it would be a mistake if even in the new millennium we continue to applaud ourselves by post colonial, Third World standards. We must shift gears since we are now in a far different situation.

(1) DEBC      (2) DBCE      (3) BEDC      (4) BCDE      (5) DBEC

57. (A) The plains of solidified lava that give the moon its quirky human-like face as seen from the earth were created more than four billion years ago.
- (B) The nature of these chemicals puts the rock into the category of mare salt – a lava that flowed out smoothly onto the lunar surface before solidifying, use only comma forming dark plains that early skywatchers mistakenly took for seas, “Mare” in Latin.
- (C) The evidence comes from an unearthly silvery gray stone that was blasted off from the face of the moon, perhaps by an impacting asteroid, and was captured by the earth’s gravity, prompting it to fall to ground in Botswana.
- (D) The lunar heritage of the rock, named Kalahari 009, has been confirmed by a telltale signature of oxygen isotopes and ratio of iron to manganese in two volcanic minerals, olivine and pyroxene.
- (E) In 1999, the 13.5 kg remnant of this roving rock was found by local people near the village of Kuke, in the grasslands of the sprawling Kalahari Nature Reserve, who then sold it to meteorite hunters.

(1) DEBC      (2) CDBE      (3) DCEB      (4) CEDB      (5) CEBD

**DIRECTIONS for questions 58 to 60:** The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

This week, the “better” democracies are wagging fingers at bad ones, like 17<sup>th</sup> century Popes reprimanding missionaries in the distant jungle. They tut-tut over a stuffed ballot box in Nairobi, a banned radio station in Islamabad or a murdered journalist in Moscow. They condemn a riot here, a bombed polling booth there, and an imprisoned politician somewhere else. The British government is peculiarly unable to resist such finger-wagging. While Tories long to rule a better Britain, the Labour party longs to rule a better world.

Britain instructs Eastern democracies ‘to push ahead with the democratic process’, ‘to avoid any significant delay in the electoral time table’, ‘to have free and fair elections’, and so on. She is ‘appalled’ at events in developing countries and reprimands them ‘to behave responsibly’. Not content with this she goes further to interfere in their internal politics believing that they are Kipling’s “lesser breeds without the law” needing instruction in the democratic catechism. Britain is obviously unaware of the flaws in her own so called ‘better democracy’ to be sermonizing others.

Democracy has never been perfect. From the moment self-government lost touch with "self," it adapted itself to nations and peoples. Its institutions depend more on local history, culture and geography than on Madison, Mill, and De Tocqueville. This week the rituals of heredity, not democracy, decided the leadership of the Pakistan People's Party. Most Asian and African democracies are ballots qualified by assassination, corruption and inheritance. Yet we still grace them with the term. Students of politics are taught to tick off the qualities that award the status of democracy to a polity. Are there free and fair elections? Can the franchise turn a regime out of office? Are there supporting institutions such as an open parliament, security of public assembly, elected local government, a free media, the rule of law? None of these is either sufficient or necessary for democracy, which is rather a sliding scale of liberties, to which constitutions and regimes ascribe varying degrees of priority.

It is thus presumptuous for the post-imperial West to demand that the world take the same route to self-government that it spent bloodthirsty centuries pursuing. We Brits are not so clean that we can lecture others on how they should govern themselves, especially those whom the West has polluted with aid, debt, trade curbs, and wars along their borders. Democracy in Pakistan and Kenya may be looking violently unwell at present, but Western democracy too is qualified by the corruption of party lists, eccentric primaries, and electoral colleges. The British and American constitutions are both currently battered by criticism from their subjects for falling short of democratic ideals, notably in handling accountability and checks on executive power. The outcome of America's 2000 election was decided not by the ballot but by an appointed oligarchy. Americans would hardly have welcomed election monitors from Ukraine, India or Thailand encamped in the Miami Hilton. Democracy is best propagated by example, not by conquest or official admonition. There are too many blots on Britain's escutcheon for its leaders to go lecturing the world in terms redolent of the new interventionism. Pakistan is the sixth most populous country in the world. Its fragile half-democracy is conditioned by the insecurities of its recent past and by desperate poverty. There are a hundred ways of helping it along the rocky path between democracy and dictatorship. But ultimately Pakistan, like Kenya, will be the stronger for taking this path alone. The last thing it needs is hectoring phone calls from a post-imperial nanny.

58. With which of the following statements would the author not agree?

- (1) The western democracies are not free from the shortcomings in electoral practices seen in nascent democracies.
- (2) No country can help another in finding its path to democracy.
- (3) The west is at least partly responsible for the conditions prevailing in developing countries.
- (4) The Britishers do not have the moral right to preach.
- (5) The western democracies have a notion of superiority over democracies in the third world.

59. When the author mentions the British tendency to 'finger wag' he is referring to

- (1) their colonial mindset.
- (2) their self-righteousness.
- (3) their oracular abilities.
- (4) their pontifical attitude.
- (5) their judgemental nature.

**60.** When the author says, "None of these is either sufficient or necessary for a democracy ......." he means

- (1) democracy cannot be defined.
- (2) students of politics attribute some qualities to a polity to refer to it as a democracy.
- (3) no two democracies have any identical attributes.
- (4) every democracy has to set a standard for itself.
- (5) each democracy has its own unique attributes.

**DIRECTIONS for questions 61 to 63:** In each question, there are five sentences or parts of sentence(s) that form a paragraph. Identify the sentence(s), or the parts of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the most appropriate answer.

**61.** (A) United Nation Development Programme's Resident Representative of India Maxine Olson  
(B) on Tuesday called for scaling of efforts to assist the poorest in the country  
(C) in adapting for the threats posed by global climate change  
(D) She said that even as India had made steady progress to improve people's health, education and wealth,  
(E) a large human development backlog still exists.

- (1) A, B and C
- (2) A, B, C and D
- (3) B and E
- (4) C and D
- (5) Only E

**62.** (A) It having already experienced  
(B) unprecedented levels of immigration in recent years,  
(C) the United Kingdom should, apparently, be bracing for millions more in the coming decades.  
(D) Almost all of the coverage of the latest projections have focussed  
(E) on how more immigration could lead to a doubling of the population by 2081.

- (1) A, B and E
- (2) B and E
- (3) Only B
- (4) C and D
- (5) A, C and D

**63.** (A) One can choose to further develop decentralised renewable energy technologies  
(B) that are on the threshold of economic viability  
(C) or go for exotic, risky ventures like capturing carbon dioxide  
(D) to bury deeply in the bowels of the earth or  
(E) spraying the sky with particles that will reflect the sunlight away.

- (1) C and D
- (2) A, B and E
- (3) A and B
- (4) D and E
- (5) Only A

**DIRECTIONS** for questions 64 to 66: The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

The war is on. America is exhibiting all its might. The Taliban is showing all its resilience. There seems to be no end in sight, this will go on and on. Even if America eventually succeeds in wiping out every single human life in Afghanistan, there will still be no permanent peace on earth. Wars are born in the minds of men. It is dangerous to leave a war to the generals alone in the same way as it is not safe to leave governance to politicians alone, as has been competently demonstrated by George Orwell in his celebrated book; *Animal Farm*. The present reductionist science that is taught to our students makes them acquire a narrow, one-sided view of things. It is only a holistic vision of anything that gives man the correct perspective. It is time that the Americans took a holistic view of what happened on 11 September 2001 and the subsequent events, instead of concentrating on their personal horrors associated with that fateful day. Wendell Berry, an octogenarian American eco-philosopher, has expressed similar thoughts recently.

The American public, and to a lesser degree, people in the so called developed 'first world', were continually fed on the idea that their 'new world order' and their 'new economy' would keep on growing, bringing incessant prosperity. Their leaders, politicians, corporate heads and common investors never realized that this prosperity (or its illusion) is restricted to a microscopic minority of the world population and to an even smaller number of people within the US! This has created an ever-widening gulf between the haves and the have-nots in this world. This chasm is at the root of all human ills, including terrorism. The rich live in the constant threat of the poor resorting to all possible methods to get even with them. The poor, on the other hand, have to face a hand-to-mouth existence, and on several nights have to go to bed on empty stomachs.

The greatest stress in life is not knowing where the next meal comes from. That segment of the population which faces this daily stress is amenable to brainwashing by vested interests in the name of religion, caste, creed, region and all such issues. Converts to any way of thinking are more fanatical than their masters as they must prove that they are purer than the original! Every country faces this kind of threat from its misguided and disgruntled youth, who believe that this world is made of two polar opposites, black and white. They never pay heed to the grey areas in between. The truth is that grey areas are the rule rather than the exception. Once man realizes that there are different points of view on every issue, violence recedes. The zen philosophers had what they called the *wu*, or the *mu* concept, which lies between two extremes. The 'wu' concept would generate tranquillity at the end. Our future generations must realize the importance of sharing while caring for others. It is in giving that we get. Rarely does one experience true happiness in getting, but in giving one always gets a sense of satisfaction.

The misguided and frustrated poor and illiterate make up the majority of terrorists. Of course, there are misguided youth from richer families too in the ranks of terrorist organizations but most times, they play the role of leaders. The crime graph of any state or city would prove this point. From the above observations, it becomes clear that the free market economy has resulted in both the rich and the poor living in constant fear of one another. The wider the gulf between the two classes, the worse will be the scenario. A majority of the poor in the third world countries, who do not have any contact with such kinds of anti-social groups, pay for their poverty with their own lives.

The developed countries' economies flourished at the cost of the poor nations. Political colonisation that had formed a part of their history was replaced by economic colonization. While the British took our people to work in their sugar cane fields in the past, the West today takes our youth to work in other areas. This make-believe world where people are fed all kinds of distorted information about consumer goods through expensive advertisement gimmicks, makes the younger generation fall prey to their tricks. Every activity of the advanced nations has a hidden agenda. They never realized that one day the technological monster they had created would try to gobble them up. Technology went unhampered and the resulting stockpiling of weapons, especially the all-powerful nuclear weapons, are their biggest headaches today. The potential threat of biological warfare and, worse still, chemical warfare, stares these countries, that invented them, in their face. The entire American nation is in the grip of the anthrax threat. The wheel has come a full circle.

64. What according to the passage, is the unfounded "belief" of the disgruntled youth of every country?

- (1) That the world is made up of only two races, the white and the black.
- (2) That the world consists of only two classes – the haves and the have nots.
- (3) That the majority of the people in the world approve violence.
- (4) That only extreme opinions are significant.
- (5) That their objectives can be achieved through violent means.

65. When the author advises the Americans to take a holistic view of what happened on 11 September, 2001 and the subsequent events, he asks them to

- (1) have concern for the poor in the undeveloped countries.
- (2) also look into what science has brought them.
- (3) search for the causes of violence.
- (4) understand that technology is a two-edged weapon.
- (5) ponder over what destruction they have wrought on others.

66. 'The wheel has come a full circle' because

- (1) the threatened have become the threateners.
- (2) the feared now know fear.
- (3) the ruler and the ruled have changed their attitudes.
- (4) the rich and the poor have reversed roles.
- (5) justice has finally been done to all.

**DIRECTIONS** for questions 67 to 69: 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.

67. A great deal of funding has become available through donor agencies from the health sector to support studies in migration, that has traditionally been more difficult to support through ornithological or conservation directed sources. This has of course been beneficial to both sectors, not only in increasing our ability to interpret the nature of any role that wild birds could play in dissemination of avian influenza, but also in promoting conservation.

- (1) The drive to understand these patterns of bird migration has received a new impetus and some much needed funding.
- (2) Successful conservation of migratory species requires that the needs and movements of migrants are understood across their ranges.
- (3) Studies had shown that activating the immune system could have severe negative consequences for birds.
- (4) Now the Society's bird ringing has become part of the global avian flu surveillances efforts and is receiving support from the GAINS programme.
- (5) Ornithologists have long sought to trace the route that flocks of migrating birds take and the places where they congregate along the way.

68. A theory of personality is simply a set of presuppositions about human nature. Emphasis must be laid – because of the findings of psychoanalysis, anthropology and the psychology of learning – upon human potentialities. Nothing can be further from the truth than the shibboleth that 'human nature is unalterable', if by human nature is meant the specific form and content of personality.

- (1) In the adult personality there are integrating principles no doubt, but there are also various levels and areas that are more or less central to the structure as a whole.
- (2) New and momentous changes in international organization seem imminent whose implications for individual personality can be seen but vaguely.
- (3) Every personality is capable of more than one mode of expression and that depends upon the total psychological field and upon cultural phrasings.
- (4) Any theory of personality which rests upon such a basis is necessarily weak, for personality is pre-eminently a social product and human society is ever on the march.
- (5) Anthropologists have studied not the uniqueness of each individual but rather personality as the product of the channelling of the desires and needs of the members of social groups.

69. Just as Greenland contributes meltwater and melting icebergs to the sea, the northward flowing surface currents of the Atlantic transport heat from the Tropics to the Arctic and adjacent regions. As this heat is convected to the air, it renders Greenland's coasts relatively mild and helps make northern Europe warm enough that roses can be grown at latitudes that elsewhere support polar bears. As the water chills, it grows denser and sinks.

- (1) The downward flow is the engine that powers a world – spanning oceanic 'conveyer belt' through which sea-water is eventually mixed and recycled.

- (2) The formation of sea ice, which releases the salt in seawater as it forms, makes underlying waters saltier and thus denser.
- (3) Further warming will increase snow fall and add as much frozen water to Greenland as is lost through melting.
- (4) The oceans around the ice-sheet, which is four times the size of California, are peppered with instrument-laden buoys.
- (5) A torrent of salty melt water poured along the bluff of ice, heads toward the Labrador Sea.

**DIRECTIONS for questions 70 to 72:** The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

I cannot avoid the subject any longer. Almost every day I receive a clutch of emails about it, asking the same question. A frightening new report has just pushed it up the political agenda: for the first time the World Food Programme is struggling to find the supplies it needs for emergency famine relief. So why, like most environmentalists, won't I mention the p-word? According to its most vociferous proponents, population is "our number one environmental problem". But most greens will not discuss it.

Is this sensitivity or is it cowardice? Perhaps a bit of both. Population growth has always been politically charged, and always the fault of someone else. Seldom has the complaint been heard that "people like us are breeding too fast." For the prosperous clergyman Thomas Malthus, writing in 1798, the problem arose from the fecklessness of the labouring classes. Through the 19<sup>th</sup> and early 20<sup>th</sup> centuries, eugenicists warned that white people would be outbred. In rich nations in the 1970s the issue was overemphasised, as it is the one environmental problem for which poor nations are largely to blame. But the question still needs to be answered. Is population really our number one environmental problem?

The Optimum Population Trust cites some shocking figures, produced by the UN. They show that if the global population keeps growing at current rates, it will reach 134 trillion by 2300. This is plainly ridiculous: no one expects it to happen. In 2005, the UN estimated that the world's population will more or less stabilise in 2200 at 10 billion. But a paper published in Nature last week suggests that that there is an 88% chance that global population growth will end during this century.

In other words, if we accept the UN's projection, the global population will grow by roughly 50% and then stop. This means it will become 50% harder to stop runaway climate change, 50% harder to feed the world, 50% harder to prevent the overuse of resources. But compare this rate of increase to the rate of economic growth. Many economists predict that, occasional recessions notwithstanding, the global economy will grow by about 3% a year this century. Governments will do all they can to prove them right. A steady growth rate of 3% means a doubling of economic activity every 23 years. By 2100, in other words, global consumption will increase by roughly 1600%. As the equations produced by Professor Roderick Smith of Imperial College have shown, this means that in the 21<sup>st</sup> Century we will have used 16 times as many economic resources as human beings have consumed since we came down from the trees.

So economic growth this century could be 32 times as big an environmental issue as population growth. And, if governments, banks and businesses have their way, it never stops. By 2115, the cumulative total rises to 3200%, by 2138 to 6400%. As resources are finite, this is of course impossible, but it is not hard to see that rising economic activity - not human numbers - is the immediate and overwhelming threat.

Those who emphasise the dangers of population growth maintain that times have changed: they are not concerned only with population growth in the poor world, but primarily with growth in the rich world, where people consume much more. The Optimum Population Trust (OPT) maintains that the "global environmental impact of an inhabitant of Bangladesh ... will increase by a factor of 16 if he or she emigrates to the U.S.A.". This is surely not quite true, as recent immigrants tend to be poorer than the native population, but the general point stands: population growth in the rich world, largely driven by immigration, is more environmentally damaging than population growth in the poor world. In the U.S. and the U.K., their ecological impact has become another stick with which immigrants can be beaten.

Surely there is one respect in which the growing human population constitutes the primary threat? The amount of food the world eats bears a direct relationship to the number of mouths. After years of glut, the storerooms are suddenly empty and grain prices are rocketing. How will another three billion be fed?

Even here, however, population growth is not the most immediate issue: another sector is expanding much faster. The U.N.'s Food and Agriculture Organisation expects that global meat production will double by 2050 (growing, in other words, at two and a half times the rate of human numbers). The supply of meat has already tripled since 1980: farm animals now take up 70% of all agricultural land and eat one third of the world's grain. The rich nations consume three times as much meat and four times as much milk per capita as the people of the poor world. While human population growth is one of the factors that could contribute to a global food deficit, it is not the most urgent.

None of this means that we should forget about it. Even if there were no environmental pressures caused by population growth, we should still support the measures required to tackle it: universal sex education, universal access to contraceptives, better schooling and opportunities for poor women. Stabilising or even reducing the human population would ameliorate almost all environmental impacts. But to suggest, as many of my correspondents do, that population growth is largely responsible for the ecological crisis is to blame the poor for the excesses of the rich.

#### 70. The author in this passage suggests that

- (1) population growth is not the factor responsible for the ecological crises we face.
- (2) the people of the third world countries are to be blamed for the present ecological disaster.
- (3) migration from the poorer to the richer nations must be checked to save the earth.
- (4) if the world population turns vegetarian, the earth would be able to support the population.
- (5) people are not as much of a threat to the environment as their wants are.

71. The author has stayed away from using the p-word so far because

- (1) it is politically charged and more problems could be created than solved.
- (2) the greens don't believe that population is to be blamed for the crisis we face.
- (3) the poor nations have no control over increasing population.
- (4) there are more significant reasons for the threats to our environment.
- (5) we refuse to accept that people like us are breeding fast.

72. Pick the statement that is not true.

- (1) The world is facing a serious shortage of food grains.
- (2) The author believes that the issue of growing population needs to be tackled.
- (3) Steady economic growth of 3% through the century would be the panacea for environmental problems.
- (4) Malthus blamed the fecundity of the working class for the menace of growing population.
- (5) Population is the only environmental problem for which the poor nations can be blamed.

**DIRECTIONS** for questions 73 to 75: In each question, there are four sentences. Each sentence has pairs of words/phrases that are italicized and highlighted. From the italicized and highlighted word(s)/phrase(s), select the **most appropriate** word(s)/phrase(s) to form correct sentences. Then, from the options given, choose the best one.

73. The book was widely *commanded* (A)/*commended*(B) *on* (A)/*for*(B) its realistic portrayal of events.

I went to my friend's house to *condone*(A)/*condole* (B) him on the loss of his father.

You must *rein* (A)/*reign* (B) in your temper if you wish to have marital happiness.

He was *provoked* (A)/ *revoked* (B) into retaliation by the constant needling of his friend.

- (1) BABAB
- (2) ABABA
- (3) BBABA
- (4) BBBAA
- (5) BBBBA

74. The standards *in* (A)/ *of* (B) *morality* (A)/*mortality* (B) of society have sunk to a new low.

It is not easy to *unveil* (A)/ *inveigle* (B) an upright person into criminal conduct.

She felt it was her responsibility to *rare* (A)/*rear* (B) their children to be disciplined individuals.

His first job will be to *project* (A)/*propel* (B) the company's new product as a user friendly one.

- (1) AAAAB
- (2) BABBA
- (3) BABAB
- (4) BABBB
- (5) ABAAA

75. The *sensual* (A)/*sensuous* (B) appeal *through* (A)/*of* (B) the musical score ensured that it became a chart buster.

The claim that inflation has been checked sounds *dubious* (A)/*doubtful*(B) when you see the figures being reeled out by the news channels.

The police confirmed that the boy had not been kidnapped but had run away to escape from parental *yolk*(A)/*yoke* (B).

Thousands of people displaced from their homes spent the night under *canvass* (A)/*canvas*(B)

- (1) BBBBA
- (2) BABAB
- (3) ABBA
- (4) ABAAA
- (5) BBABB

## (KEY AND SOLUTIONS FOR AIMCAT0912)

### Key

1. 5	8. 2	15. 3	22. 1	29. 4	36. 1	43. 2	50. 5	57. 4	64. 4	71. 4
2. 1	9. 3	16. 5	23. 2	30. 5	37. 3	44. 3	51. 5	58. 2	65. 3	72. 3
3. 4	10. 5	17. 2	24. 3	31. 2	38. 1	45. 4	52. 1	59. 4	66. 2	73. 4
4. 4	11. 1	18. 2	25. 1	32. 1	39. 3	46. 3	53. 2	60. 5	67. 2	74. 2
5. 2	12. 3	19. 1	26. 1	33. 5	40. 2	47. 4	54. 4	61. 5	68. 4	75. 5
6. 3	13. 1	20. 1	27. 5	34. 4	41. 2	48. 5	55. 5	62. 2	69. 1	
7. 2	14. 5	21. 5	28. 2	35. 1	42. 3	49. 2	56. 2	63. 3	70. 5	

### Solutions

#### SECTION – I

##### Solutions for questions 1 to 5:

1. There is no repetition of the digits and  $h < t < u$ , where  $h, t, u$  denote the hundreds, tens and units digits. These conditions are equivalent to making a selection of 3 digits from the 8 digits.

This can be done in  ${}^8C_3 = \frac{8(7)(6)}{1(2)(3)}$  or 56 ways.

Choice (5)

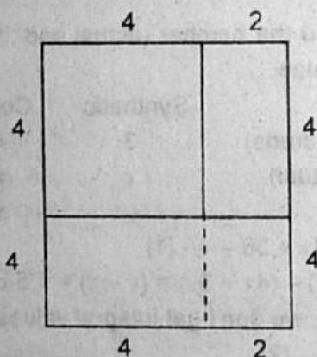
2.  $\text{Rem}(38/17) = 4$

$$\left( (4)^{16!} \right)^{17777} = \left( (16)^{\frac{16!}{2}} (17777) \right) = \left( (17-1)^{\frac{16!}{2}} (17777) \right).$$

As the index is even, the remainder is 1.

Choice (1)

- 3.



After cutting  $4 \times 4 \times 4$  cube which is largest possible the volume remaining portion is  $4 \times 6 \times 4 + 4 \times 2 \times 4 = 128 \text{ m}^3$ . If minimum number of cubes, all of equal size, have to be made the side of cube has to be maximum. The maximum side of the cube can be 2 m.

Volume of 2 m cube is  $8 \text{ m}^3$ .

$$\text{Number of cubes} = \frac{128}{8} = 16.$$

Choice (4)

4. Let the price of the ticket be = Rs.  $(60 + 5x)$ , where  $x > 0$ . The number of people in the audience would then be  $300 - 10x$ .

∴ The revenue of the theatre owner (in Rs)

$$= (60 + 5x)(300 - 10x)$$

$$= (18000 + 900x - 50x^2) = 1800 + 50x[(18 - x)]$$

When the sum of two or more quantities is constant, their product is maximum when all the quantities are equal. In  $x(18 - x)$ ,  $x$  and  $18 - x$  have a constant sum of 18.

∴  $x(18 - x)$ , would be maximum when  $x = 18 - x = 9$ .

The theatre owner realizes the maximum possible revenue at the price of  $60 + (5)(9) = \text{Rs.}105$

Choice (4)

5. Since  $g(x) = \frac{1}{x^2 - 1}$  and  $f(x) = g(x - 1)$ .

We get  $f(x)$  by finding  $g(x - 1)$ , which is obtained by simply substituting  $(x - 1)$  in the place of  $x$  in  $g(x)$ .

$$\Rightarrow f(x) = g(x - 1) = \frac{1}{(x - 1)^2 - 1} = \frac{1}{x^2 - 2x}$$

Now if  $f(x)$  and  $g(x)$  intersect, then  $f(x) = g(x)$ .

$$\Rightarrow \frac{1}{x^2 - 2x} = \frac{1}{x^2 - 1}$$

$$\Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$$

This is the only solution of  $f(x) = g(x)$ .

Hence, the graphs intersect at only one point.

Choice (2)

##### Solutions for questions 6 and 7:

6. Given that  $0 \cdot \overline{AB} = \frac{AB}{99} = \frac{CD}{EE}$

If  $E = 3$ ,  $\frac{AB}{99} = \frac{CD}{33} \Rightarrow AB = 3(CD)$ . As  $AB$  and  $CD$  are 2-digit numbers,  $10 \leq CD \leq 33$ , i.e.,  $C$  can be 1 or 2 or 3.

We have to check that all these values lead to possible values of  $AB$  and  $CD$ . By trial,  $\frac{48}{99} = \frac{16}{33}$  and

$$\frac{78}{99} = \frac{26}{33} \text{ but if we set } CD = 30, 31 \text{ or } 32 \text{ we don't get}$$

distinct values for  $A, B, C, D$  and  $E$ .

∴  $C$  can take the value of 1 or 2, i.e., 2 values.

Choice (3)

7.  $\frac{AB}{99} - \frac{CD}{EE} \Rightarrow \frac{AB}{9} - \frac{CD}{E} \Rightarrow AB = \frac{9}{E}(CD)$   
 If  $E = 1$ ,  $10 \leq CD \leq 11$  (so that AB may be a 2-digit number). If  $CD = 10$ ,  $B = D = 0$ . If  $CD = 11$ ,  $C = D$ .  
 ∴ E can't be 1. The possible values of E and one set of corresponding values of CD and AB are tabulated below.

E	CD	AB
2	14	63
3	16	48
4	28	63
6	18	27
7	28	36
8	64	72

If  $E = 9$ ,  $AB = CD$ , i.e.,  $A = B$ ,  $C = D$ .  
 ∴ E can take only 6 values.

Choice (2)

### Solutions for questions 8 and 9:

No. who don't attend classes	No. who attend classes
No. who don't study at home	a      b
No. who study at home	d      c

Given  $(a + b + d) = (1 + 1/3)(c + d + b)$   
 $\Rightarrow (a + b + d) = 4/3(c + d + b)$  ---- (1)  
 Further  $b = (1 + 2/5)d$  and  $c = a/2$   
 $a = 2c$ ,  $b = 7/5d$  ---- (2)  
 Substituting (2) in (1) gives  
 $2c + 7/5d + d = 4/3(c + d + 7/5d)$   
 $\Rightarrow 2c + 12/5d = 4/3c + 16/5d$   
 $\Rightarrow 2/3c = 4/5d$  ---- (3)  
 $\Rightarrow d = 10/12c = 5/6c$   
 $\Rightarrow b = 7/5(5/6c) = 7/6c$  and  $a = 2c$   
 $a + b + c + d = 5c = 150$  (given)  
 $\Rightarrow c = 30$

Choice (2)

### 9. From above solution,

$$a:b:c:d = 12:7:6:5$$

$$a+b+c+d = 30x \text{ (say)} = 300 \text{ (given)}$$

Hence, required to find  $a+c$ .

$$= (12+6)x = \frac{18}{30} \times 300 = 180$$

Choice (3)

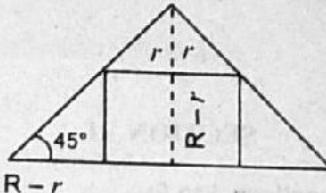
### Solutions for questions 10 to 21:

10. Any natural number A which lies in the interval  $1 \leq A \leq 36$  is capable of being the area of the rectangle formed by considering one or more of the playing squares vertically or horizontally provided it satisfies the following condition.  
 $A = m \times n$ , where  $m, n \in \mathbb{N}$  and  $1 \leq (m, n) \leq 6$   
 ∴ The value that A can take are 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 25, 30 and 36 A can take 18 distinct values.

Choice (5)

11. The largest possible rectangle has  $(6 \times 6)$  36 sq. units area. The area of 12 sq. units comes from the rectangles of size  $2 \times 6$ , and  $3 \times 4$ .  
 A vertical side of 2 units can be selected in 7 – 2 or 5 ways. A horizontal side of 6 units can be selected in 7 – 6 or in only 1 way.  
 ∴ There are 5(1) rectangles of area 6, whose breadth is along the vertical direction. Similarly, there are 5, whose breadth is along the horizontal direction.  
 Similarly, the number of  $3 \times 4$  rectangles is  $2(7 - 3)(7 - 4)$  or 24.  
 The total number of rectangles of area 12 is  $10 + 24$  or 34.  
 Choice (1)

12.



Let  $R$  and  $r$  be the radii of the cone and inscribed cylinder respectively. Volume of cylinder ( $V$ ) =  $\pi r^2 (R - r)$  =  $4\pi \left(\frac{r}{2}\right) \left(\frac{r}{2}\right) (R - r)$ . As the sum of the 3 factors is constant  $\left(\frac{r}{2} + \frac{r}{2} + R - r = R\right)$ , the product is max when

they are all equal i.e., when  $\frac{r}{2} = R - r$  or  $r = \frac{2}{3}R$ . As  $r = 6 \frac{2}{3}$ , it follows that  $R = 10$ .

$$\text{Volume of cone} = \frac{1}{3} \pi R^2 (R) = \frac{1000\pi}{3} \text{ cc}$$

Choice (3)

13. The cost and the number (actual and 'if') of sarees are tabulated below.

Cost (in hundreds)	Synthetic	Cotton
Number (Actual)	x	y
Number (If)	y	x

$$\text{Given } 3x + 4y = 36 \text{ ---- (1)}$$

$$\text{and } (3x + 4y) - (4x + 3y) = (y - x) = 1.5 \text{ or } 2$$

If  $y - x = 1.5$ , we don't get integral values for  $x, y$ .

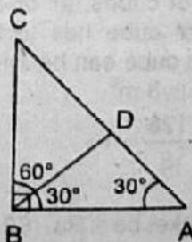
$$\therefore y - x = 2 \text{ ---- (2).}$$

Solving (1), (2) we get  $x = 4, y = 6$ .

$$\therefore x + y = 10$$

Choice (1)

14.



There is a point D on AC, which is such that  $DC = DB = BC$  i.e.,  $\triangle ABC$  is equilateral.

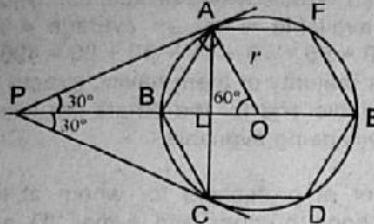
$\therefore \triangle ABC$  is a  $30^\circ, 90^\circ, 60^\circ$  triangle.

$$\angle ABD = \angle B - \angle CBD = 90^\circ - 60^\circ = 30^\circ$$

Hence  $\triangle ABD$  is isosceles and  $BD : AD = 1 : 1$

Choice (5)

15. Let  $r$  cm be the radius of the circle which circumscribes the regular hexagon ABCDEF  
 $\Rightarrow AB = r$  cm



Given that the tangents drawn from P touch the circle at A and C. So,  $\angle OAP = 90^\circ$ . It is known that each side of the regular hexagon subtends an angle of  $\frac{360^\circ}{6} = 60^\circ$

at the centre O, i.e.,  $\angle AOB = 60^\circ$ .

$$\therefore \angle APO = 180^\circ - (90^\circ + 60^\circ) = 30^\circ$$

In the triangle APO,  $\frac{AO}{PO} = \frac{1}{2}$  [ $\because \cos 60^\circ = 1/2$  or alternatively,  $\angle BAP = \angle BPA = 30^\circ \Rightarrow PB = AB = BO = AO$ ]

$$\Rightarrow PO = 2r \text{ cm and } PE = PO + OE = 2r + r = 30 \text{ cm (given)}$$

$$\Rightarrow r = 10 \text{ cm}$$

$$\text{In right triangle OPA, } PA = \sqrt{4r^2 - r^2} = r\sqrt{3} \text{ cm}$$

$$= 10\sqrt{3} \text{ cm}$$

Also PA = PC.

$$\therefore \text{Area of triangle PAC} = \frac{1}{2} (PA \times PC) \sin 60^\circ$$

$$= \frac{1}{2} (10\sqrt{3})^2 \times \frac{\sqrt{3}}{2} = 75\sqrt{3} \text{ sq.cm} \quad \text{Choice (3)}$$

16. The first term on the LHS

$$= \frac{1}{pqr + pr^2 + qr^2} = \frac{1}{r(pq + qr + rp)}$$

We get two similar expressions for the other two terms.

$$\therefore \text{LHS} = \frac{1}{(pq + qr + rp)} \left[ \frac{1}{p} + \frac{1}{q} + \frac{1}{r} \right] = \frac{1}{pqr} = 1$$

#### Alternative solution:

Let  $p = q = 1$ , then  $pqr = 1$ . The given expression equals 1. Among the choices only choices (1) and (5) equal 1.

If  $p = q = -1$  and  $pqr = 1 \Rightarrow r = 1$ .

For these values, the given expression equals 1, but

choice (1) equals  $\frac{1}{9}$ .

$\therefore$  Hence, the correct choice must be choice (5).

Choice (5)

17. Let the costs of each pen, each eraser and each sharpener be Rs.p, Rs.e and Rs.s respectively,  
 $20p + 22e + 25s = 196 \quad (1)$

$$23p + 27e + 30s = 233 \quad (2)$$

$$109p + 125e + 140s = K \quad (3)$$

Suppose multiplying (1) by  $x$  and (2) by  $y$  results in the third equation, then  $(20x + 23y)p = 109$  p i.e.,  
 $20x + 23y = 109 \quad (4)$

and  $(22x + 27y)e = 125$  e i.e.

$$\Rightarrow 22x + 27y = 125 \quad (5)$$

Solving (4) and (5),  $x = 2$  and  $y = 3$ .

Further,  $(25x + 30y)s = 140$  s is also satisfied if  $x = 2$  and  $y = 3$ .

$$\text{Hence, } K = 196(2) + 233(3) = 1091. \quad \text{Choice (2)}$$

18. Capacity of A =  $(165)(2) = 330$  litres.

$$\text{Capacity of B} = 1 \left( \sum_{i=1}^N 24 + i \right) \text{ litres} = 330 \text{ litres.}$$

$$N^2 + 49N - 660 = 0$$

$$(N+60)(N-11) = 0$$

$$\therefore N = 11 \text{ (since } N > 0)$$

Choice (2)

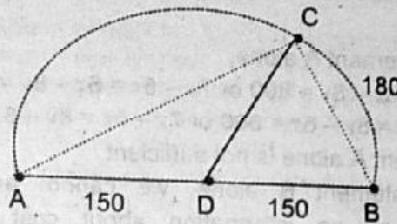
19.  $\frac{n(n+1)}{2} > 1348$  but close to it. By trial,  $\frac{52(53)}{2} = 1378$

So 30 is the difference i.e.,  $9 + 10 + 11$

The greatest of the numbers is 11.

Choice (1)

20.



Let A, B and C be the positions of the bees. Now since AD = DC = DB, construct a semicircle.

$\triangle ACB$  is right-angled at C. If AB = 300, or 5(60) and BC = 180 or 3(60), AC has to be 4(60) or 240 m.

Chip covers 240 m to reach Amy, while Bob covers 300 m. Chip takes  $60/3$  or 20 s less.

Choice (1)

21. Let the capitals of Aman and Bhanu be in the ratio of  $a:b$  i.e.,  $a/b = 400/600 = 2/3 \quad (1)$

$$\text{further } a - 3000/b - 1000 = 375/625 = 3/5 \quad (2)$$

Solving (1) and (2)

$$\text{We get } 3a - 2b = 0$$

$$5a - 3b = 12000$$

$$\text{or } 9a - 6b = 0$$

$$10a - 6b = 24000$$

$$- + -$$

$$\Rightarrow a = 24000$$

$$\text{where } b = 36000$$

If Aman had invested 3000 more and Bhanu had invested 3000 less then  $a:b = (24000 + 3000):(36000 - 3000)$

$$9:11$$

$\therefore$  Bhanu's share = Profit  $\times 11/11+9$

$$= 1000 \times 11/20 = 550$$

Choice (5)

#### Solutions for questions 22 to 25:

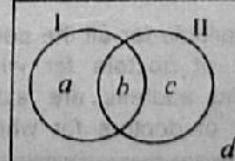
22. From statement (A) alone: 1<sup>st</sup> of this month is a Sunday and 1<sup>st</sup> of next month is Wednesday i.e., the gap between 1<sup>st</sup> of this month and 1<sup>st</sup> of next month is 3 odd days. So, this month has 31 days, i.e., this month can be January, March, May and so on.

From statement (B) alone: 1<sup>st</sup> of previous month is a Saturday and 1<sup>st</sup> of this month is a Sunday i.e., number of odd days is one. So, the previous month has 29 days i.e., it is February and this month is March and hence we can find the day on which 1<sup>st</sup> of January falls.

Hence, B alone is sufficient.

Choice (1)

23. Consider the diagram below:



Given,  $a + b + c + d = 150$  and  $a = 60$  and  $b + c = 70$

$$\Rightarrow d = 150 - (60 + 70) = 20$$

$$a + c + d = ?$$

From statement (A) alone,  $a + b = 100$

$$\Rightarrow b = 100 - a = 100 - 60 = 40.$$

$$\therefore a + c + d = 150 - 40 = 110$$

$\therefore$  A alone is sufficient

From statement B, alone we get  $b = 40$  which gives

$$a + c + d = 150 - 40 = 110$$

$\therefore$  B alone is sufficient

Choice (2)

24. Let the cost prices of articles A and B be  $5x$ ,  $6x$  and selling prices be  $7y$  and  $8y$  respectively. ( $x$  and  $y$  are positive).

Using statement A alone,

$$5x - 7y = 6x - 8y \Rightarrow 7y - 5x = 6x - 8y = 800$$

$$\text{or } 5x - 7y = 8y - 6x = 800 \Rightarrow 7y - 5x = 8y - 6x = 800$$

$\therefore$  Statement A alone is not sufficient.

Using statement B alone, we cannot answer the question as no information about cost prices is mentioned.

Using both the statements, as profit is made on only one article,  $7y - 5x = 6x - 8y = 800$  or  $5x - 7y = 8y - 6x = 800$  are possible but the second possibility gives negative values of  $x$  and  $y$ , hence those equations are invalid.

As we have two equations in  $x$  and  $y$  and their values can be found and then cost price of A can be found.

Choice (3)

25. Given  $xy = 60$

$\therefore$  The possible pairs  $(x, y)$  or  $(y, x)$  when both are positive integers are  $(1, 60)$ ,  $(2, 30)$ ,  $(3, 20)$ ,  $(4, 15)$ ,  $(5, 12)$  and  $(6, 10)$ .

From statement A,  $y$  is odd and also greater than  $x$ . Only  $(x, y) = (4, 15)$  satisfies this condition. Hence,  $x = 4$ . Statement A alone is sufficient to answer the question. Statement B gives that  $y$  is even and  $x$  is odd. All the pairs  $(1, 60)$ ,  $(3, 20)$ ,  $(5, 12)$  satisfy this and we cannot determine the exact value of  $x$ . Statement B alone is not sufficient.

Hence, the question can be answered by statement A alone.

Choice (1)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	-
Easy	14, 25
Medium	1, 3, 4, 5, 6, 13, 16, 17, 18, 19, 21, 22, 23,
Difficult	2, 8, 9, 10, 11, 12, 15, 20, 24
Very Difficult	7

## SECTION - II

### Solutions for questions 26 to 30:

26. As the name is available for all the persons i.e. 100%, the least number of doctors for whom the name, phone number and address are available happens when the number of doctors for whom the address

and phone numbers are available is the minimum, i.e.  $(60 + 65) - 100 = 25\%$ , i.e. 15,000 Choice (1)

27. The number of mechanical engineers for whom exactly four of the six details was available can be zero, as the total data available is on an average 4.9 items per person  $(100 + 85 + 70 + 95 + 60 + 80 = 490)$  and it can be due to a majority of them having exactly five of their details available and for the others on, two or three of the six details being available. Choice (5)

28. The number of professors for whom at least two of address, phone number and e-mail ID are available would be the least when for the maximum number of professors exactly one detail is available and for others all the three details are available.  
 $Total = 75 + 85 + 90 = 250$

$\therefore$  The required value would be the least when for 25% of them exactly one detail is available and for the rest 75% all the three details are available. Choice (2)

29. As one should have exactly five of six features, he should not have one of the features with least percentage values.  
Consider the three least percentages available i.e., 50%, 40% and 50%.  
Exactly two among these three must be available.  
 $\therefore \frac{50 + 40 + 50}{2} = 70\%$  and as other features have more than 70% availability,  $70\% \text{ of } 2600 = 1820$

Choice (4)

30. The least number of engineers for whom both phone number and e-mail ID are available is as follows.  
Civil Engineers =  $(85 + 65) - 100 = 50\% = 12,500$   
Mechanical Engineers =  $(80 + 60) - 100 = 40\% = 16,800$   
Electrical Engineers =  $(90 + 70) - 100 = 60\% = 13,200$   
Computer Engineers =  $(100 + 50) - 100 = 50\% = 13,000$   
Total = 55,500

Choice (5)

### Solutions for questions 31 to 35:

On Mondays, Tuesdays and Wednesdays

- Praful lies and Karan speaks the truth

On Thursdays, Fridays and Saturdays

- Karan lies and Praful speaks the truth

On Sundays

- Both Praful and Karan speak the truth.

31. Praful said yesterday was one of his lying days  
 $\Rightarrow$  Today is a Thursday (i.e., if he is speaking the truth)  
OR

Today is a Monday (i.e., if he is lying)

Similarly, if Karan is speaking the truth, then today is a Sunday

OR

If he is lying, then today is Thursday.

The only common possibility is that today is a Thursday.

Choice (2)

32. Assume that on the given day Praful is lying.

I is a lie  $\Rightarrow$  Praful spoke the truth yesterday

$\Rightarrow$  Today is a Monday

II is a lie  $\Rightarrow$  Today is a Monday or a Tuesday or a Wednesday (since then third day after today could be Thursday, Friday or Saturday and he will be speaking the truth).

II and I  $\Rightarrow$  Today is a Monday

Now, assume that Praful is not lying.

I is true  $\Rightarrow$  Today is Thursday

II is true  $\Rightarrow$  Praful will lie on Sunday. But this is not possible.

$\therefore$  Our assumption that Praful was lying is correct and hence that day is Monday.

Choice (1)

### 33. If Praful is lying

I is a lie  $\Rightarrow$  today is a Monday

II is a lie  $\Rightarrow$  today is a Wednesday

I and II cannot be lies simultaneously

Let Praful be speaking the truth

I is true  $\Rightarrow$  today is Thursday.

II is true  $\Rightarrow$  today is Sunday.

I and II cannot be simultaneously true.

$\therefore$  Such a case is not possible.

Choice (5)

### 34. Here the truth of the compound statement P and Q is to be considered.

where : P  $\rightarrow$  I lied yesterday.

Q  $\rightarrow$  I will lie tomorrow.

Let it be a day on which Praful is lying.

$\Rightarrow$  3 cases are possible

- $\sim(P \text{ and } Q) \Rightarrow$
1.  $\sim P \text{ and } \sim Q$
  2.  $\sim P \text{ and } Q$
  3.  $\sim Q \text{ and } P$

Case (1) is not possible as already seen in solution 33 but for the case (2) or (3) we get today is Monday. Or today is a Wednesday.

Further if we take the case that Praful is speaking the truth i.e. both P and Q are true we see that it is not possible (from solution 33).

$\therefore$  Today is either a Monday or a Wednesday.

Choice (4)

### 35. If it is any day from Monday to Saturday then exactly one out of Archana and Rachana is lying while the other is speaking the truth. For the given statements, it is required that both be lying OR both be speaking the truth. (Failing which the statements are clearly inconsistent). But as mentioned today cannot be a day from Monday to Saturday since both cannot lie or speak the truth simultaneously. Therefore the only possibility being that today is a Sunday and both are speaking the truth.

$\therefore$  The first one is Archana.

Choice (1)

### Solutions for questions 36 to 40:

#### 36. For a team to advance to the semifinals with the least number of points, the top three teams should win the maximum number of matches, while the other five teams should draw all matches among themselves. One among these five teams would advance to the semifinals.

Minimum number of matches between the bottom five teams =  $5 \times 4$ .

Minimum number of total points of the bottom five teams =  $20 \times 2 = 40$  points.

$\therefore$  Minimum points of 4<sup>th</sup> ranked team =  $8 \times 1 = 8$  points.

Choice (1)

#### 37. If five teams equally score the maximum points, one of these five would be eliminated. This can happen if the last three teams only score points in matches among themselves.

Maximum points available for the top five teams =  $(56 - 6) \times 3 = 150$

Each of the five teams can score 30 points and one of them can be eliminated.

Choice (3)

38. The team which finished sixth can have the least points when the last three teams only scored points in matches among themselves and all matches among these teams ended in draws.

$\therefore$  Each team can score four points and the team with the best goal difference would be placed sixth.

Choice (1)

### Solutions for questions 39 and 40:

As the position of each team could be determined at the end of the group stage without checking the goal difference, it means that each team finished with a different total points at the end of the group stage. Now we have to find the minimum number of decisive matches (matches which were not draws), so that the eight teams end up with a different total of points. Let us assign names to the teams as Team 1 to Team 8.

Let us start with the hypothetical case of all matches in the group stage ending in draws. This would mean that all teams end up with the same number of points, i.e. 14. Now in a draw, both teams get one point each. Had it been a decisive game (not a draw), the winner would have got 3 points and the loser zero points, i.e., the winner gets two points more and the loser gets one point less than it would have got had the match been a draw.

#### Initial Level

Team 1 – 14

Team 2 – 14

Team 3 – 14

Team 4 – 14

Team 5 – 14

Team 6 – 14

Team 7 – 14

Team 8 – 14

Now assume that Team 1 had beaten Teams 6, 7 and 8 once each, Team 2 had beaten Teams 7 and 8 once each and Team 3 had beaten Team 8 once. Assuming all other matches are draws, the points tally would be as follows.

Team 1 – 20

Team 2 – 18

Team 3 – 16

Team 4 – 14

Team 5 – 14

Team 6 – 13

Team 7 – 12

Team 8 – 11

Now assume match between Team 5 and Team 6 was not a draw and was won by Team 6.

$\therefore$  The points tally would be

Team 1 – 20

Team 2 – 18

Team 3 – 16

Team 4 – 14

Team 5 – 13

Team 6 – 15

Team 7 – 12

Team 8 – 11

(Remember that a team winning gains two points and the team losing loses one point than had the match been a draw) Now assume that the match between Team 1 and Team 6 was not a draw and was won by Team 6. The points now would be as follows.

- Team 1 - 19
- Team 2 - 18
- Team 3 - 16
- Team 4 - 14
- Team 5 - 13
- Team 6 - 17
- Team 7 - 12
- Team 8 - 11

∴ The number of decisive matches is at least  $6 + 1 + 1 = 8$  and the top team had at least 19 points.

39. The number of draws is at most 48 i.e., (56 - 8).  
Choice (3)

40. The team which finished with highest number of points could have scored at least 19. Choice (2)

#### Solutions for questions 41 to 45:

41. As the first part of elimination, let us select only days on which the cost of travel (on both legs) adds up to less than Rs.5000. It can be seen that by route A - B - D, the cost of travel is less than Rs.5000 only on 7<sup>th</sup>, 8<sup>th</sup> and 15<sup>th</sup> while along the route A - C - D it is less than 5000 on even a single day, i.e. 25<sup>th</sup> June, on which the fare is  $1500 + 3200 = 4700$ . This is the least.  
Choice (2)

42. The minimum cost for flying by route A - C - D is Rs.4975 on 15<sup>th</sup> June, Rs.5050 on 17<sup>th</sup> June, Rs.4700 on 25<sup>th</sup> June and Rs.5100 on 27<sup>th</sup> June. As the discounted fare is applicable only on weekdays, and as the lowest fare would be available on 15<sup>th</sup> June i.e.

$$1575 + \frac{75}{100} \times 3400 = 1575 + 2500 = \text{Rs.}4125.$$

Choice (3)

43. He can travel f A - B - D on 7<sup>th</sup>, 8<sup>th</sup> and 15<sup>th</sup>. A total of three days.  
Choice (2)

44. If he covers the first leg on the 7<sup>th</sup> and the second leg on the 8<sup>th</sup> the cost would be  $1650 + 3050 = \text{Rs.}4700$   
Choice (3)

45. The maximum difference in the fares for travel by the two routes is on 2<sup>nd</sup> June, i.e.  $7500 - 5600 = \text{Rs.}1900$   
Choice (4)

#### Solutions for questions 46 to 50:

46. The indexed values of sales and expenses are as follows.

Company A	
Sales	Expenses
100	100
120	130
140	160
150	180
180	170
160	160

Company B	
Sales	Expenses
100	100
110	120
125	140
140	175
155	185
140	170

It is said that both the companies made a profit in each of the given years.

∴ For company A, in 2003,  $150(\text{Sales}) > 180(\text{Expenses})$   
 $\therefore (\text{Sales}) > 1.2(\text{Expenses})$   
 $\therefore \text{Profitability in 2005 is at least } \frac{1.2(160) - 160}{1.2(160)}$   
 $= \frac{32}{192} \times 100 = 16.67\%$  Choice (3)

47. We can directly find the years in which the sales increased by more than 10%, from the indexed values, i.e. in 2002, 2003 and 2004. Choice (4)

48. As the ratios but not the values of profits and expenses are given, we cannot determine the ratio of their sales. Choice (5)

49. As company B made profits in each of the given years, in the year 2003, its sales must be more than the expenses.  
 $\therefore 140(\text{Sales}) > 175(\text{Expenses})$   
Or Sales  $> 1.25(\text{Expenses})$   
 $\therefore$  The values of sales and expenses of company B assuming sales as (1.25) expenses (least possible value) in terms of expenses is

Year	Sales	Expenses
2000	12.5	100
2001	137.5	120
2002	156.25	140
2003	175	175
2004	193.75	185
2005	175	170

∴ At least in 2000, 2001 and 2002, the profitability of company B was more than 10%. Choice (2)

50. It can be seen that in 2001, sales of company A increased by 20%, while that of B increased by only 10%. The ratio of percentage increase of A and B was the highest in that year. As increase in sales of B in each year was more than that of A, the sales of B in 2000 was at least two times that of A,

$$\therefore \text{In 2005 sales of A is at most } \frac{160}{140 \times 2} = 57.15\% \quad \text{Choice (5)}$$

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	-
Easy	
Medium	26, 27, 31, 32, 33, 41, 43, 44, 45, 46, 47, 49
Difficult	28, 30, 34, 35, 36, 37, 38, 42, 48, 50
Very Difficult	29, 39, 40

### SECTION – III

#### Solutions for questions 51 to 53:

#### Number of words and Explanatory notes for RC:

Passage : 901

51. The first paragraph shows that the subject which the author has chosen for the lecture is an idea stated by Nietzsche but not explained successfully by him. This is what is indicated in choice 5. Choice 2 is inappropriate since the idea is not amorphous or indeterminate. In fact – "it is not nonsense at all, but fact".

Choice (5)

52. The last lines of para 1 show that the author considers such a world possible. The lines at the end of the passage show that it exists, currently, in the world of insects, but not in the world of humans.

Choice (1)

53. 'We should have a world in which morality would have been transmitted into inherited instinct ..... both in social and in ethical progress' (line 7 from the end) shows that (2) is the correct alternative.

Choice (2)

#### Solutions for questions 54 to 57:

54. The phrase '....objecting to the new programme...' in E refers to the new advertising programme initiated by Facebook in A. Hence, it should follow A. Since B presents the company's response, i.e. making a change....', it should follow E. The phrase '....the move' in D refers to the company's decision to change in B. Since C presents a new piece of information it should come at the end. Therefore, the correct order is EBDC.

Choice (4)

55. C presents a change in the condition of the country Malawi, hence it should follow A. B supports what is said in C, hence it follows C. Farmer's crediting their success to the fertilizer subsidization policy of the government should come next; it is followed by E which explains how fertilizers could contribute to country's success. Thus, the correct order is CBDE.

Choice (5)

56. Since D elaborates on our progress in science and Technology, it should follow A. B adds to what is said in D, i.e. it makes it clear that our economy is growing even in other fields apart from S & T. Therefore, it should follow D. C explains how our influence as an emerging world power is increasing. Hence, it should follow B. E presents a caution and thus completes the argument. Therefore, the right order is DBCE.

Choice (2)

57. The phrases 'The evidence....' and '....silvery gray stone...blasted off....' in C refer to solidified lava in A, hence it should follow A. 'Roving stone...in E refers to....silvery gray stone.... in C, hence it should follow C. As 'the chemicals.... ' in B refers to olivine and pyroxene in D, DB form a pair. 'These chemicals' in B makes it clear that it follows D. Thus, the right order is CEDB.

Choice (4)

#### Solutions for questions 58 to 60:

#### Number of words and Explanatory notes for RC:

Passage : 590

58. Refer to the last para. The author's views are echoed in all the options except 2.

Choice is supported by lines 8 - 9 (The outcome of America's .... appointed oligarchy)

Choice 2 is negated by lines 3 - 4 from the end (There are a hundred ways .... dictatorship)

Choice 3 is supported by lines 3 - 4 (... the west has polluted with aid, debt, trade corks and wars along their borders).

Choice 4 is borne out by lines 11 - 12 (there are too many blots on Britain's escutcheon .... new interventionism).

Choice 5 is supported by para 3. Choice (2)

59. When you wag your finger at someone, you are criticizing them and telling them what is right or what should be done. In the context of the passage the best alternative is 'pontifical attitude' – to pontificate means 'to give your opinions about something in a way that shows that you think you are right'. It is used disapprovingly. While 'self-righteous' also means believing yourself to be right, pontificate has the additional meaning of giving your opinion unasked.

Choice (4)

60. Refer to para 3, the last sentence of which has the words in quote. The author points out how democracy may be different in different countries and the features the West consider as essential may not really be so. This is indicated in choice 5. Choice 3 carries this idea too far, saying that each democracy is unique in every aspect.

Choice (5)

#### Solutions for questions 61 to 63:

61. Only E is grammatically consistent. A is wrong because the representative is from the UN and not from India but she is stationed in India. Therefore, it should be ..... in (or for) India.....' and not '..... of India.....' Moreover, since we are referring to the position held by Maxine Olson, we should separate her name from her position with a comma. B is wrong because the context suggests the increase in efforts, hence 'scaling' should be followed by the preposition 'up'. C is wrong because it should be 'adapting to' not 'for'. D is wrong and should read 'has made steady progress in improving .....'

Choice (5)

62. Only B and E are grammatically correct. A is wrong because the subject of the two clauses, i.e., experienced and bracing is the same, so we need not use 'it' in introductory clause that is, the sentence begins with 'Having already....'. C is wrong because 'brace' (prepare oneself) is a transitive verb that requires an indirect object. Therefore, it should be '..... bracing itself.....'. D is also wrong because 'coverage' is an uncountable noun which takes a singular verb. Hence, the correction is '..... has found.....'

Choice (2)

63. Only A and B are grammatically consistent. C has only 2 adjectives in sequence which should read 'exotic and risky' and not 'exotic, risky'. D needs 'deep in the bowels of the earth' and not 'deeply'. E is incomplete - 'reflect the sunlight away' needs to be followed by 'from ..... (something)'.  
Choice (3)

#### Solutions for questions 64 to 66:

##### Number of words and Explanatory notes for RC:

Passage : 811

64. 'Every country faces this kind of threat --- exception, para 3. (1) is incorrect as the discussion is not about races. (3) is not given in the passage. (5) cannot be inferred from the passage. (2) appears close. But in the paragraph, the focus is not on economic disparity. It is about extreme views on any social issues. Hence (4) is the correct answer.  
Choice (4)

65. Refer to the first paragraph. The idea of a holistic view follows the reference to 'one-sided view'. 'Holistic' would mean complete in the matter of causes and effects. The effect was 9/11 and the causes need to be found. The elaboration that follows looks at possible causes for violence. Thus, choice 3 is appropriate. Choice (3)

66. This concluding sentence of the passage follows the anthrax scare in America. Hence it points to the situation wherein those who were once dominant, now know fear.  
Choice (2)

#### Solutions for questions 67 to 69:

67. The second option is the most suitable as it continues the idea of conservation. The first option is not acceptable as it repeats the idea of funding mentioned before. The third option speaks of 'the immune system' and the fourth of 'bird ringing' which is not spoken of in the passage. The fifth option is a general statement not connected with the ideas presented in the passage.  
Choice (2)

68. Option four explains why the shibboleth is weak – it is because human society is always on the march. Hence, the link is clear. The first option talks of 'integrating principles' which is not mentioned in the para. Option 2 talks about changes that are remotely connected. Option 3 and 5 talk of psychological and anthropological studies that do not have an immediate bearing on the theory mentioned in the passage.  
Choice (4)

69. The passage talks of the surface of water of the Atlantic and the dense cold water that sinks along the coast of greenland. Option 1 tells us how the water is mixed and recycled. The other, options tell us about the water 'become saltier', 'melting of snow' and 'the ice sheets' in the oceans around but they do not directly connect with the mixing of water.  
Choice (1)

#### Solutions for questions 70 to 72:

##### Number of words and Explanatory notes for RC:

Passage : 905

70. The author in this passage opines that though population may be an issue (last para), the real problem is the focus on growth which leads to more and more exploitation of resources. He points out that the people of the developed world consume far more than world

those of poorer countries and are therefore more guilty. Choice 1 negates the idea in passage. Choice 2 negates the idea in passage. Choice 3 is not stated. Choice 4 is not stated though he expresses reservations about meat consumption. Choice 5 is true – para 5.  
Choice (5)

71. Para 6 shows that consumption in developed countries is 16 times more than in developing countries, while the 2<sup>nd</sup> last para speaks of the problem based by the growth in number of cattle.  
Choice (4)

72. The author is of the view that economic growth would lead to increase in consumption and, therefore, further pressure on the environment. Thus, choice 3 is not true.  
Choice (3)

#### Solutions for questions 73 to 75:

73. 'Commended' means 'praised' while 'commanded' means 'got by virtue of excellence' which does not suit the context. Hence B.  
'Commanded' is followed by 'for'. Hence B.  
'Condone' is to pardon while 'condole' is to console. Hence B.  
'Rein' in means to control 'reign' means to rule. Hence A.  
'Provoke' is to make someone do something which is apt in the context. 'Revoked' is to withdraw as a law or a ruling. Hence A. BBBAA.  
Choice (4)

74. Standards 'of' something is apt. Hence B.  
'Morality' has to do with ethics and values while 'mortality' refers to longevity of life. Hence A.  
'unveil' is to remove the veil from. 'Inveigle' is to draw someone into doing something they do not really want to do. The word 'upright' suggests that B is the right choice. Hence B. 'Rare' is something uncommon. 'Rear' is to nurture or bring up. Hence B.  
To 'project' is to make people see something in a particular way. To 'propel' is to make something move in a particular direction. 'Project' suits the context.  
Hence A. BABBA.  
Choice (2)

75. 'Sensual' is something that gives pleasure to your physical senses. 'Sensuous' gives pleasure to the mind or body through the senses. Hence B. Appeal is followed by 'of'. Hence B. 'Dubious' which means not really true collocates with claim. 'Doubtful' means 'uncertain'. Hence A.

'Yolk' is the yellow part of an egg. 'Yoke' is the piece of wood which is tied across the necks of two animals eg. oxen. It also means to be forced to live in a difficult or unhappy state. 'Parental yoke' would imply living under suppression by parents. Hence B. 'Canvass' is to persuade people to vote for someone in an election. 'Canvas' is a thick type of cloth used for making tents, which suits the context. Hence B. Ans – BBABB  
Choice (5)

Difficulty level wise summary - Section III	
Level of Difficulty	Questions
Very Easy	—
Easy	—
Medium	66, 69, 71, 72, 73, 74
Difficult	53, 54, 55, 56, 57, 58, 62, 64, 65, 67, 68, 70, 75
Very Difficult	51, 52, 59, 60, 61, 63