

SECTION – I (Quant)

Sub-section I-A: Number of Questions = 10

Note: Questions 1 to 10 carry one mark each.

Directions for Questions 1 to 5: Answer the questions independently of each other.

1. If $x = (16^3 + 17^3 + 18^3 + 19^3)$, then x divided by 70 leaves a remainder of
 (1) 0 (2) 1 (3) 69 (4) 35

Solution:

$(16^3 + 18^3)$ is EVEN and
 $(17^3 + 19^3)$ is also EVEN
 Hence $16^3 + 17^3 + 18^3 + 19^3$ is EVEN

$\Rightarrow x$ is even

The divisor is 70, which is even. When an even number is divided by an even divisor, the remainder is even. Among the given options, Choice (1) alone has an even value.
 Choice (1)

2. A chemical plant has four tanks (**A**, **B**, **C** and **D**), each containing 1000 litres of a chemical. The chemical is being pumped from one tank to another as follows:

From **A** to **B** @ 20 litres/minute
 From **C** to **A** @ 90 litres/minute
 From **A** to **D** @ 10 litres/minute
 From **C** to **D** @ 50 litres/minute
 From **B** to **C** @ 100 litres/minute
 From **D** to **B** @ 110 litres/minute

Which tank gets emptied first, and how long does it take (in minutes) to get empty after pumping starts?

- (1) **A**, 16.66 (2) **C**, 20
 (3) **D**, 20 (4) **D**, 25

Solution:

Because each tank receives some quantity of chemical, and simultaneously some quantity of chemical is pumped out, net flow of chemical to each tank can be calculated.

$$\text{Tank A} = [-20 \text{ (to B)}] + [+90 \text{ (from C)}] + [-10 \text{ (to D)}] \\ = -20 + 90 - 10 = +60 \text{ litres/minute}$$

$$\text{Tank B} = [+20 \text{ (from A)}] + [-100 \text{ (to C)}] + [+110 \text{ (from D)}] \\ = +20 - 100 + 110 = +30 \text{ litres/minute}$$

$$\text{Tank C} = [-90 \text{ (to A)}] + [-50 \text{ (to D)}] + [+100 \text{ (from B)}] \\ = -90 - 50 + 100 = -40 \text{ litres/minute}$$

$$\text{Tank D} = [+10 \text{ (from A)}] + [50 \text{ (from C)}] + [-110 \text{ (to B)}] \\ = +10 + 50 - 110 = -50 \text{ litres/minute.}$$

Tank D is getting emptied at the rate of 50 litres/minute.

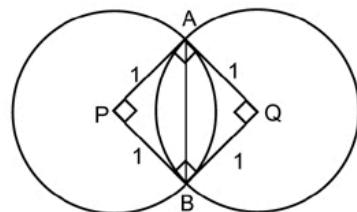
As this is the maximum rate of pumping out, D gets emptied first.

Time taken to empty tank D = $1000/50 = 20$ minutes
 Choice (3)

3. Two identical circles intersect so that their centres, and the points at which they intersect, from a square of side 1 cm. The area in sq.cm of the portion that is common to the two circles is

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

Solution:



Let P and Q be the centres of the circles and let A and B the points of intersection of the circles.

It is given that PAQB is a square of side 1 cm

\Rightarrow the radii of the circles are 1 cm each

The area of sector PAB is

$$\frac{90^\circ}{360^\circ} \times \pi (1)^2 = \frac{\pi}{4} \rightarrow (1)$$

$$\text{Area of } \Delta PAB = \frac{1}{2} (1) (1) = \frac{1}{2} \rightarrow (2)$$

Hence the required area is

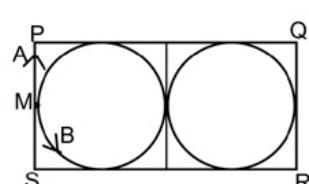
$$2[\text{area of sector} - \text{area of } \Delta PAB]$$

$$= 2 \left[\frac{\pi}{4} - \frac{1}{2} \right] = \frac{\pi}{2} - 1 \quad \text{Choice (2)}$$

4. A jogging park has two identical circular tracks touching each other, and a rectangular track enclosing the two circles. The edges of the rectangles are tangential to the circles. Two friends, **A** and **B**, start jogging simultaneously from the point where one of the circular tracks touches the smaller side of the rectangular track. **A** jogs along the rectangular track, while **B** jogs along the two circular tracks in a figure of eight. Approximately, how much faster than **A** does **B** have to run, so that they take the same time to return to their starting point?

- (1) 3.88% (2) 4.22%
 (3) 4.44% (4) 4.72%

Solution:



Distance covered by A, to complete one round = Perimeter of PQRS = $2(l + b) = 2(2b + b) = 6b$ -----(1)

(length PQ has to be double the breadth b)

Distance covered by B, to complete one round = $2(2\pi r) = 4\pi r = 4\pi (b/2) = 2\pi b = 2(3.1428)b = 6.2856b$ -----(2)

(Approximation of π is used)

As the time of travel is the same, distances are proportional to speeds.

$$\text{Hence, } \frac{\text{speed of A}}{\text{speed of B}} = \frac{6b}{6.2856b} = \frac{6}{6.2856}$$

Hence, approximate percentage by which B is faster than A is $\frac{0.2856}{6} \times 100 = \frac{28.56}{6} \approx 4.72\%$

Choice (4)

By similar logic, the distance of the other chord from the centre can be calculated as 16 cm.

If the two chords are on the same side of a diameter, the distance between the chords is the difference of the above distances, i.e. $16 - 12 = 4$ cm.

If the chords are on either side of the diameter, the required distance is $16 + 12 = 28$ cm. Choice (4)

10. For which value of k does the following pair of equations yield a unique solution for x such that the solution is positive?

$$\begin{aligned}x^2 - y^2 &= 0 \\(x - k)^2 + y^2 &= 1\end{aligned}$$

- (1) 2 (2) 0 (3) $\sqrt{2}$ (4) $-\sqrt{2}$

Solution:

Given that $x^2 - y^2 = 0$.

As value of x is under consideration, let y be eliminated from the two equations.

The second equation can be rewritten as :

$$\begin{aligned}(x - k)^2 + x^2 &= 1 \\ \Rightarrow x^2 - 2kx + k^2 + x^2 - 1 &= 0 \Rightarrow 2x^2 - 2kx + (k^2 - 1) \\ &= 0 \quad (1)\end{aligned}$$

It is given that x is positive and unique.

The solution of a quadratic equation which is

$$\frac{(-b \pm \sqrt{b^2 - 4ac})}{2a}$$

becomes UNIQUE, only when $b^2 - 4ac = 0$.

Hence, in the present case,

$$\begin{aligned}(4k^2) - 4(2)(k^2 - 1) &= 0 \\ \Rightarrow 4k^2 - 8k^2 + 8 &= 0; 4k^2 - 8 = 0, k^2 = 2 \\ k &= \pm \sqrt{2}\end{aligned}$$

If the value $k = -\sqrt{2}$ is taken, value of x becomes

$$\frac{(-\sqrt{2} \pm 0)}{2} \text{ which is negative.}$$

Hence $k = +\sqrt{2}$ is the only possible answer.

Note: (after arriving at the equation (1), values from the options can be substituted to get the result).

Choice (3)

Sub-section I-B: Number of Questions = 20

Note: Questions 11 to 30 carry two marks each.

Directions for Questions 11 to 30: Answer the questions independently of each other.

11. Let $n! = 1 \times 2 \times 3 \times \dots \times n$ for integer $n \geq 1$. If $p = 1! + (2 \times 2!) + (3 \times 3!) + \dots + (10 \times 10!)$, then $p + 2$ when divided by $11!$ Leaves a remainder of

- (1) 10 (2) 0 (3) 7 (4) 1

Solution:

$$p = 1! + (2 \times 2!) + (3 \times 3!) + \dots + (10 \times 10!)$$

We know that,

$$n \times n! = (n+1)! - n!$$

$$\therefore p = 2! - 1! + 3! - 2! - 2! + 4! - 5! + \dots - 11! - 10!$$

$$= 11! - 1! = 11! - 1$$

$$\therefore p + 2 = 11! + 1$$

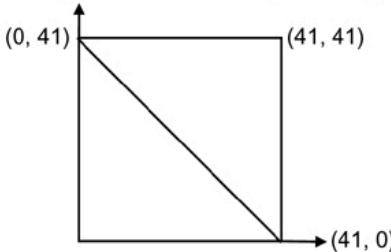
$\therefore (p + 2)$ leaves a remainder of 1 when divided by $11!$

Choice (4)

12. Consider a triangle drawn on the X - Y plane with its vertices at $(41, 0)$, $(0, 41)$ and $(0, 0)$, each vertex being represented by its (X, Y) coordinates. The number of points with integer coordinates inside the triangle (excluding all the points on the boundary) is
 (1) 780 (2) 800 (3) 820 (4) 741

Solution:

The triangle is shown in the figure alongside.



There are all together $42 \times 42 = 1764$ points with integral coefficients in the square region.

Of these 4×41 points are on the square while 40 other points $(1, 40)$ $(2, 39)$... $(40, 1)$ are on the diagonal. Therefore $1764 - 164 - 40$ or 1560 points are within the region. Of these 780 are within each of the two triangular regions.

Choice (1)

13. The digits of a three-digit number A are written in the reverse order to form another three-digit number B . If $B > A$ and $B - A$ is perfectly divisible by 7, then which of the following is necessarily true?

- (1) $100 < A < 299$ (2) $106 < A < 305$
 (3) $112 < A < 311$ (4) $118 < A < 317$

Solution:

Let 'pqr' be the three digit number A .

Then B is 'rqp'

$(B - A) = 99(r - p)$, and it is given that $B > A$; i.e $r > p$.

As $(B - A)$ is divisible by 7,

$99(r - p)$ is divisible by 7.

$\Rightarrow (r - p)$ is divisible by 7.

As r and p are single digit numbers, $r - p = 7$.

Possible values of r are 9 and 8.

Corresponding values of p are 2 and 1.

$(r = 7, p = 0)$ is an invalid set of values.

Hence A = 'pqr'.

i.e A is either '1q8' or '2q9'.

The least value of A 108 and the largest value of A is 299. Only choice (2) includes all the possible values.

(Note: option A excludes 299; hence it is not the solution).

Choice (2)

14. If $a_1 = 1$ and $a_{n+1} - 3a_n + 2 = 4n$ for every positive integer n , then a_{100} equals

- (1) $3^{99} - 200$ (2) $3^{99} + 200$
 (3) $3^{100} - 200$ (4) $3^{100} + 200$

Solution:

Given that $a_1 = 1 = 3^1 - 2(1)$

and $a_{n+1} = 3a_n + 4n - 2$

$$a_2 = 3(1) + 4(1) - 2 = 5 = 3^2 - 2 \quad (2)$$

$$a_3 = 3(5) + 4(2) - 2 = 21 = 3^3 - 2 \quad (3)$$

$$a_4 = 3(21) + 4(3) - 2 = 73 = 3^4 - 2 \quad (4)$$

$$a_5 = 3(73) + 4(4) - 2 = 233 = 3^5 - 2 \quad (5)$$

$$\therefore a_n = 3^n - 2n$$

$$\therefore a_{100} = 3^{100} - 200$$

Choice (3)

15. Let S be the set of five-digit numbers formed by the digits 1, 2, 3, 4 and 5, using each digit exactly once such that exactly two odd positions are occupied by odd digits. What is the sum of the digits in the rightmost position of the numbers in S ?
 (1) 228 (2) 216 (3) 294 (4) 192

Solution:

We have the following sets of possibilities A, B, C (o, e are even and odd)

	1	2	3	4	5
A:	o	o	e		
B:	o	e	o		
C:	e	o	o		

The digits in the right-most position and the number of ways the other digit can be filled up are tabulated below.

	1	2	3	4	5
A	(3)	(2)	(2)	(1)	2
	(3)	(2)	(2)	(1)	4
B	(2)	(2)	(2)	(1)	1
	(2)	(2)	(2)	(1)	3
	(2)	(2)	(2)	(1)	5
C	(2)	(2)	(2)	(1)	1
	(2)	(2)	(2)	(1)	3
	(2)	(2)	(2)	(1)	5

\therefore 2 appears as the units digit in 12 numbers, 4 in 12 numbers and 1, 3, 5 in 16 numbers each.

The required sum is $(2 + 4) \times 12 + (1 + 3 + 5)16 = 72 + 144 = 216$.
 Choice (2)

16. The rightmost non-zero digit of the number 30^{2720} is
 (1) 1 (2) 3 (3) 7 (4) 9

Solution:

$$30^{2720} = 3^{2720} \times 10^{2720}$$

\therefore The right most non zero digit is the last digit in 3^{2720} (since 10^{2720} contributes only zeroes)

If we look at powers of 3 we can observe a pattern in the units digit.

$$\begin{aligned} 3^1 &= 3 \rightarrow \text{last digit} = 3 \\ 3^2 &= 9 \rightarrow \text{last digit} = 9 \\ 3^3 &= 27 \rightarrow \text{last digit} = 3 \\ 3^4 &= 81 \rightarrow \text{last digit} = 1 \\ 3^5 &= 243 \rightarrow \text{last digit} = 3 \\ 3^6 &= 729 \rightarrow \text{last digit} = 9 \end{aligned}$$

we can observe that the last digits repeat in cycle of 4.

For

$$\begin{aligned} 3^{4n+1} &\rightarrow \text{last digit} = 3 \\ 3^{4n+2} &\rightarrow \text{last digit} = 9 \\ 3^{4n+3} &\rightarrow \text{last digit} = 7 \\ 3^{4n} &\rightarrow \text{last digit} = 1 \\ \therefore \text{since } 2720 \text{ is divisible by 4} &\text{ it can be represented} \\ \text{in the form } 4n & \\ \therefore \text{last digit} &= 1 \end{aligned}$$

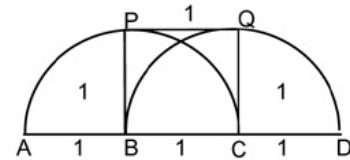
Choice (1)

17. Four points **A**, **B**, **C** and **D** lie on a straight line in the X - Y plane, such that $\mathbf{AB} = \mathbf{BC} = \mathbf{CD}$, and the length of \mathbf{AB} is 1 metre. An ant at **A** wants to reach a sugar particle at **D**. But there are insect repellents kept at points **B** and **C**. The ant would not go within

one metre of any insect repellent. The minimum distance in metres the ant must traverse to reach the sugar particle is

- (1) $3\sqrt{2}$ (2) $1 + \pi$ (3) $\frac{4\pi}{3}$ (4) 5

Solution:



The shortest route for the ant at **A** is $\widehat{AP}\widehat{PQ}\widehat{QD}$ and its length is $\frac{\pi}{2} + 1 + \frac{\pi}{2} = \pi + 1$.

Choice (2)

18. If $x \geq y$ and $y > 1$, then the value of the expression

$$\log_x\left(\frac{x}{y}\right) + \log_y\left(\frac{y}{x}\right)$$

- (1) -1 (2) -0.5 (3) 0 (4) 1

Solution:

$$\begin{aligned} \log_x\left(\frac{x}{y}\right) + \log_y\left(\frac{y}{x}\right) &= \log_x x - \log_x y + \log_y y - \log_y x \\ &= 2 - (\log_x y + \log_y x) \end{aligned}$$

In the bracket in an expression of the form $a + \frac{1}{a}$ where $a \geq 0$.

$$\therefore \log_x y + \log_y x \geq 2$$

\therefore The given expression can't be positive. It cannot be 1.
 Choice (4)

19. For a positive integer n , let p_n denote the product of the digits of n , and s_n denote the sum of the digits of n . the number of integers between 10 and 1000 for which $p_n + s_n = n$ is

- (1) 81 (2) 16 (3) 18 (4) 9

Solution:

We first list the numbers in the range and compute s_n and p_n . We see that the condition $p_n + s_n = n$ is satisfied for $n = 19$.

In the next group of 10 numbers, it is satisfied for $n = 29$.

We can verify that it is satisfied for $x = 39, 49, 59, 69, 79, 89$ and 99. Consider the 3-digit number 'abc'.

From the given condition

$$a + b + c + abc = 100a + 10b + c$$

$$\Rightarrow abc = 9(11a + b)$$

This equation cannot be satisfied by any values of a, b, c , (from 0 to 9).

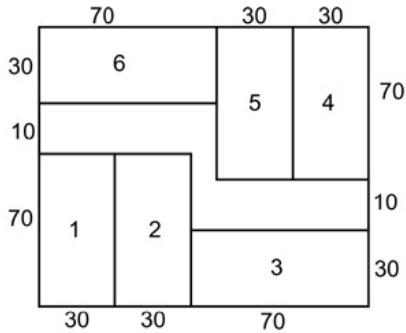
The LHS is always less than the RHS, because $c \leq 9$ and $ab < 11a$

$\therefore abc < 9(11a)$ and abc is definitely less than $9(11a + b)$. Thus there are only 9 values of n that satisfy the condition.
 Choice (4)

20. Rectangular tiles each of size 70 cm by 30 cm must be laid horizontally on a rectangular floor of size 110 cm by 130 cm, such that the tiles do not overlap. A tile can be placed in any orientation so long as its edges are parallel to the edges of the floor. No tile should overshoot any edge of the floor. The maximum number of tiles that can be accommodated on the floor is
 (1) 4 (2) 5 (3) 6 (4) 7

Solution:

We see that the number of tiles can't be more than $(110)(130)/(70)(30) \approx 143/21 \approx 6$.
 We can accommodate 6 tiles as follows.

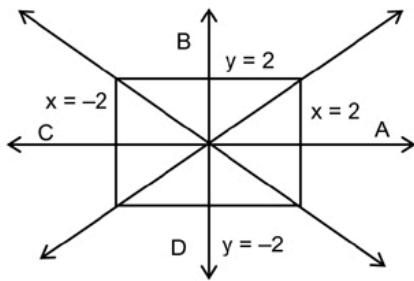


Choice (3)

21. In the X - Y plane, the area of the region bounded by the graph of $|x + y| + |x - y| = 4$ is
 (1) 8 (2) 12 (3) 16 (4) 20

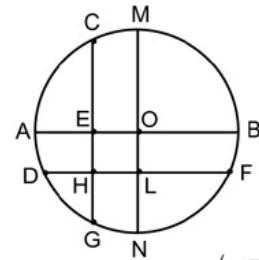
Solution:

The lines $x + y = 0$ and $x - y = 0$ divide the xy plane into 4 regions as shown in the figure.



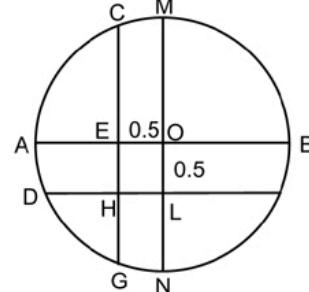
In A, $x + y > 0$ and $x - y > 0$
 In B, $x + y > 0$ and $x - y < 0$
 In C, $x + y < 0$ and $x - y < 0$
 In D, $x + y < 0$ and $x - y > 0$
 \therefore In A, the given equation reduces to $x + y + x - y = 4$ or $x = 2$
 In B, we get $x + y - (x - y) = 4$ or $y = 2$
 In C, we get $-(x + y) - (x - y) = 4$ or $x = -2$
 In D, we get, $y = -2$
 The required area is 16. Choice (3)

22. In the following figure, the diameter of the circle is 3 cm. **AB** and **MN** are two diameters such that **MN** is perpendicular to **AB**. In addition, **CG** is perpendicular to **AB** such that **AE : EB = 1 : 2**, and **DF** is perpendicular to **MN** such that **NL : LM = 1 : 2**. The length of **DH** in cm is



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

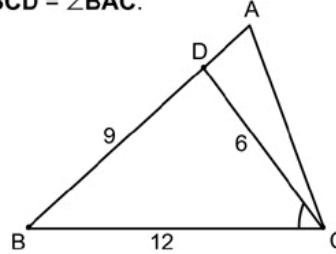
Solution:



$$\begin{aligned} AB &= 3 \text{ and } AE : EB = 1 : 2 \\ \therefore AE &= 1 \text{ and } EB = 2 \text{ (and } EO = 0.5) \\ \text{Similarly, } NL &= 1 \text{ and } LM = L \text{ (and } LG = 0.5) \\ DL &= \sqrt{OD^2 - OL^2} = \sqrt{1.5^2 - 0.5^2} = \sqrt{2} \\ DH &= DL - HL = \sqrt{2} - \frac{1}{2} = \frac{2\sqrt{2} - 1}{2} \end{aligned}$$

Choice (2)

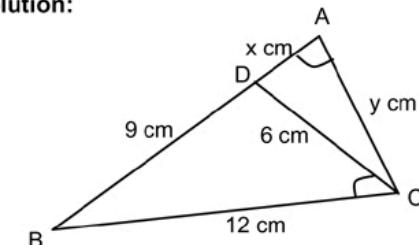
23. Consider the triangle **ABC** shown in the following figure where $BC = 12$ cm, $DB = 9$ cm, $CD = 6$ cm and $\angle BCD = \angle BAC$.



What is the ratio of the perimeter of the triangle **ADC** to that of the triangle **BDC**?

- (1) $\frac{7}{9}$ (2) $\frac{8}{9}$ (3) $\frac{6}{9}$ (4) $\frac{5}{9}$

Solution:



Given that $BC = 12$ cm, $BD = 9$ cm, $DC = 6$ cm and $\angle BCD = \angle BAC$. Consider the triangles **BAC** and **BCD**. In these triangles, $\angle B$ is common and $\angle BAC = \angle BCD$.

28. A telecom service provider engages male and female operators for answering 1000 calls per day. A male operator can handle 40 calls per day whereas a female operator can handle 50 calls per day. The male and female operators get a fixed wage of Rs.250 and Rs.300 per day respectively. In addition, a male operator gets Rs.15 per call he answers and a female operator gets Rs.10 per call she answers. To minimize the total cost, how many male operators should the service provider employ assuming he has to employ more than 7 of the 12 female operators available for the job?

(1) 15 (2) 14 (3) 12 (4) 10

Solution:

Expenditure (in Rs.) of the service provided per call
is $15 + \frac{250}{40} = 21.25$ for a male operator and

$10 + \frac{300}{50} = 16$ for a female operator. To minimise

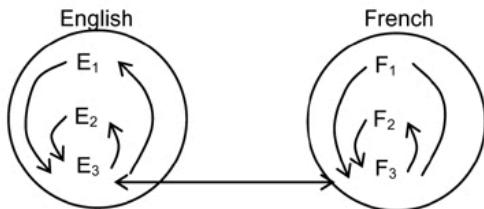
the expenditure, the service provider must employ maximum possible female operators. Since 12 female operators are available $F = 12$. They can handle $12 * 50 = 600$ calls. Since he has to handle 1000 calls, he needs to employ male operators to handle the other 400 calls. Each male operator can handle 40 calls per day, \therefore Number of male operators is 10.

Choice (4)

29. Three Englishmen and three Frenchmen work for the same company. Each of them knows a secret not known to others. They need to exchange these secrets over person-to-person phone calls so that eventually each person knows all six secrets. None of the Frenchmen knows English, and only one Englishmen knows French. What is the minimum number of phone calls needed for the above purpose?

(1) 5 (2) 10 (3) 9 (4) 15

Solution:



SECTION – II (RC & Verbal)

Sub-section II-A: Number of Questions = 10

Note: Questions 31 to 40 carry one mark each.

Directions for Questions 31 to 34: The passage given below is followed by a set of four questions. Choose the best answer to each question.

Number of words in this passage : 508

A game of strategy, as currently conceived in game theory, is a situation in which two or more “players” make choices among available alternatives (moves). The totality of choices determines the outcomes of the game, and it is assumed that the rank order of preferences for the outcomes is different for different players. Thus the “interests” of the players are generally in conflict. Whether these interests are diametrically opposed or only partially opposed depends on the type of game.

Let us assume that the three English men are E_1 , E_2 , E_3 and the Frenchmen are F_1 , F_2 , F_3 respectively.

Let us assume that E_3 is the only English man who knows French. Since our aim is to use the minimum number of calls, and there is only one possible communicator (i.e., E_3) between the two groups, all the information to be exchanged between the two groups can be done with a single call from F_3 to E_3 . Before this E_3 should get the secrets from E_1 and E_2 while F_3 should get the secrets from F_1 and F_2 .

Hence four calls are used till now, two in each group. After this, E_3 calls up F_3 and both exchange the secrets of both the groups.

Now E_3 knows all the secrets of the French group and F_3 knows all the secrets of the English group. Then E_3 uses two calls (to E_1 and E_2) to convey the French secrets. Same is the case with F_3

$$\therefore \text{Total minimum number of phone calls} = (2 + 2) + 1 + (2 + 2) = 9$$

Choice (3)

30. A rectangular floor is fully covered with square tiles of identical size. The tiles on the edges are white and the tiles in the interior are red. The number white tiles is the same as the number of red tiles. A possible value of the number of tiles along one edge of the floor is

(1) 10 (2) 12 (3) 14 (4) 16

Solution:

Let us assume that the room can accommodate x tiles along the length and y tiles along the breadth. Let the dimension of each tile be 1×1 .

\therefore The total number of tiles in the room = $x \times y$ and the total number of red tiles = $(x - 2)(y - 2)$ — (1)

\therefore The number of white tiles along edge = $(xy) - (x - 2)(y - 2)$

Equating the number of red and white tiles we get

$$2(x - 2)(y - 2) = xy$$

$$2xy - 4x - 4y + 8 = xy \Rightarrow xy - 4y = 4x - 8$$

$$\Rightarrow y = \frac{4x - 8}{x - 4}$$

Since x and y are number of tiles, they must be integral values. Now substituting from the choices, we find that only for $n = 12$, we get an integral value for y i.e., 5.

Choice (2)

Psychologically, most interesting situations arise when the interests of the players are partly coincident and partly opposed, because then one can postulate not only a conflict among the players but also inner conflicts within the players. Each is torn between a tendency to cooperate, so as to promote the common interests, and a tendency to compete, so as to enhance his own individual interests.

Internal conflicts are always psychologically interesting. What we vaguely call "interesting" psychology is in very great measure the psychology of inner conflict. Inner conflict is also held to be an important component of serious literature as distinguished from less serious genres. The classical tragedy, as well as the serious novel, reveals the inner conflict of central figures. The superficial adventure story, on the other hand, depicts only external conflict; that is, the threats of the person with whom the leader (or viewer) identifies stem in these stories exclusively from external obstacles and from the adversaries who create them. On the most primitive level this sort of external conflict is psychologically empty. In the fisticuffs between the protagonists of good and evil, no psychological problems are involved or, at any rate, none are depicted in juvenile represents of conflict.

The detective story, the "adult" analogue of a juvenile adventure tale, has at times been described as a glorification of intellectualized conflict. However, a great deal of the interest in the plots of these stories is sustained by withholding the unraveling of a solution to a problem. The effort of solving the problem is in itself not a conflict if the adversary (the unknown criminal) remains passive, like Nature, whose secrets the scientist supposedly unravels by deduction. If the adversary actively puts obstacles in the detective's path toward the solution, there is genuine conflict. But the conflict is psychologically interesting only to the extent that it contains irrational components such as tactical error on the criminal's part or the detective's insight into some psychological quirk of the criminal or something of this sort. Conflict conducted in a perfectly rational manner is psychologically no more interesting than a standard Western. For example, Tic-tac-toe, played perfectly by both players, is completely devoid of psychological interest. Chess may be psychologically interesting but only to the extent that it is played not quite rationally. Played completely rationally, chess would not be different from Tic-tac-toe.

In short, a pure conflict of interest (what is called a zero-sum game) although it offers a wealth of interesting conceptual problems, is not interesting psychologically, except to the extent that its conduct departs from rational norms.

31. According to the passage, internal conflicts are psychologically more interesting than external conflicts because
- (1) internal conflicts, rather than external conflicts, form an important component of serious literature as distinguished from less serious genres.
 - (2) only juveniles or very few "adults" actually experience external conflict, while internal conflict is more widely prevalent in society.
 - (3) in situations of internal conflict, individuals experience a dilemma in resolving their own preferences for different outcomes.
 - (4) there are no threats to the reader (or viewer) in case of external conflicts.

Solution:

The key to this question lies in the second and third paragraphs. The second paragraph explains what an internal conflict is. The first two sentences of the third paragraph state the role that internal conflict plays in 'interesting' psychology. Choice (3)

32. Which, according to the author, would qualify as interesting psychology?
- (1) A statistician's dilemma over choosing the best method to solve an optimisation problem.
 - (2) A chess player's predicament over adopting a defensive strategy against an aggressive opponent
 - (3) A mountaineer's choice of the best path to Mt. Everest from the base camp.
 - (4) A finance manager's quandary over the best way of raising money from the market.

Solution:

Refer to the last line of the penultimate paragraph, where the author suggests that chess is psychologically interesting when played in a manner that is less than rational. Choice (2) talks about

playing chess against an aggressive opponent i.e., who is aggressive no matter what the state of the game is. This suggests that he may be playing the game in a manner that is sub-rational. Hence choice (2) would qualify as interesting psychology. There are rational solutions to the statistician's dilemma, the mountaineer's choice of path and the finance manager's quandary. Also, none of these result in 'inner conflict'. Hence choice (2) is the best answer.

Choice (2)

33. According to the passage, which of the following options about the application of a game theory to a conflict-of-interest situation is true?
- (1) Assuming that the rank order of preferences for options is different for different players.
 - (2) Accepting that the interests of different players are often in conflict.
 - (3) Not assuming that the interests are in complete disagreement.
 - (4) All of the above.

Solution:

The correct choice is (4) – "All of the above" and relates to statements made in paragraph 1.

– "It is assumed that the rank order of preferences for the outcomes is different for different player." In the choice, the word 'option' is used instead of 'outcomes', but this is only a circuitous method of referring to the desired results.

– "Thus (amounts to 'it is accepted') the 'interests' of the players are generally in conflict.

– "Whether these interests are diametrically opposed or only partially opposed depends on the type of the game".

From this we understand that interests may be in partial (and not complete) disagreement. So complete disagreement is not something to be assumed.

Choice (4)

- 34.** The problem solving process of a scientist is different from that of a detective because
- scientists study inanimate objects, while detectives deal with living criminals or law offenders.
 - scientists study known objects, while detectives have to deal with unknown criminals or law offenders.
 - scientists study phenomena that are not actively altered, while detectives deal with phenomena that have been deliberately influenced to mislead.
 - scientists study psychologically interesting phenomena, while detectives deal with "adult" analogues of juvenile adventure tales.

Solution:

Refer to the third and fourth sentences of paragraph 4. The statement 'if the adversary remains passive like Nature, whose secrets the scientist unravels and if the adversary actively puts obstacles in the detective's path', clearly indicate that option 3 is the answer.

Choice (3)

Directions for questions 35 to 37: The sentences given in each question, when properly sequenced from a coherent paragraph. Each sentence is labeled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

- 35.** (A) Similarly, turning to caste, even though being lower caste is undoubtedly a separate cause of disparity, its impact is all the greater when the lower-caste families also happen to be poor.
 (B) Belonging to a privileged class can help a woman to overcome many barriers that obstruct women from less thriving classes.
 (C) It is the interactive presence of these two kinds of deprivation – being low class and being female – that massively impoverishes women from the less privileged classes.
 (D) A congruence of class deprivation and gender discrimination can blight the lives of poorer women very severely.
 (E) Gender is certainly a contributor to societal inequality, but it does not act independently of class.
 (1) EABDC (2) EBDCA (3) DAEBC (4) BECDA

Solution:

Choice (2) is the best answer. Among, statements B, E and D, E is the best candidate to open the paragraph. It introduces the topic of discussion i.e., the interaction between gender and class, that results in social inequality. While statement B can also possibly start the paragraph, it is more in the nature of an explanation of what has been asserted in statement E. Statement D can also possibly start the paragraph, but there is no clear link between statement D and statement A; the former deals with the issue of class and the latter with caste i.e., they deal with completely different topics. Thus we eliminate choices (3) and (4). As mentioned earlier, statement B logically follows statement E, as the former is an explanation for what has been stated in the latter. Thus EB. Statement B talks about how class favours women from the privileged class. Statement D presents the other side of the story i.e., how class can 'blight the lives of poorer women'. Thus EBD. Statement C is a logical continuation of statement D, as statement C essentially restates the

idea expressed in statement D. Thus EBDC. Thus far, the discussion has been limited to the role that class plays in gender discrimination. The author, in statement A adds a new dimension i.e., the role that caste plays in gender discrimination. So statement A which essentially introduces an idea that is different from those expressed in the other statements, can logically fit in, only at the end. Thus EBDCA.

Choice (2)

- 36.** (A) When identity is thus 'defined by contrast', divergence with the West becomes central.
 (B) Indian religious literature such as the *Bhagavad Gita* or Tantric texts, which are identified as differing from secular writings seen as 'western', elicits much greater interest in the West than do other Indian writings, including India's long history of heterodoxy.
 (C) There is a similar neglect of Indian writing on non-religious subjects, from mathematics, epistemology and natural science to economics and linguistics.
 (D) Through selective emphasis that point up differences with the West, other civilizations can, in this way, be redefined in alien terms, which can be exotic and charming, or else bizarre and terrifying, or simply strange and engaging.
 (E) The exception is the *Kamasutra* in which western readers have managed to cultivate an interest.
 (1) BDACE (2) DEABC (3) BDECA (4) BCEDA

Solution:

Choice (4) is the best answer. The answer choices start with either statement B or statement D. Statement D does not introduce the topic clearly. Statement B on the other hand does a good job of introducing the topic of the paragraph: The Western attitude towards Indian literature. Thus we eliminate choice (2). While statement D can follow statement B, statement C makes for a better continuation, the clue there being the phrase 'similar neglect'. The author, in statement B, hints at western neglect of Indian literature, when he states that 'the Bhagavad Gita or the Tantric texts elicit much greater interest than do other Indian writings', thereby implying a neglect of Indian writings other than the Bhagavad Gita etc. Thus BC. Statement C does not gel into the paragraph in any other position. Hence choice (4). Statement E logically follows statement C as it states that Kamasutra is the only Indian writing other than the Bhagavad Gita or the Tantric texts that has managed to avoid neglect. Thus BCE. The author, in Statement D, moves on to a discussion of the way the west analyses and interprets the products of other civilizations. Statement A logically follows statement D, the word 'contrast' in the former being the link. Statement D presents several contrasts: exotic and charming versus bizarre and terrifying etc. Thus DA. Choice (4)

- 37.** (A) This is now orthodoxy to which I subscribe – up to a point.
 (B) It emerged from the mathematics of chance and statistics.
 (C) Therefore the risk is measurable and manageable.
 (D) The fundamental concept: Prices are not predictable, but the mathematical laws of chance can describe their fluctuations.

- (E) This is how what business schools now call modern finance was born.
 (1) ADCBE (2) EBDCA (3) ABDCE (4) DCBEA

Solution:

Choice (2) is the best answer. The choices start with either statement A, statement E or statement D. Of these statements, A and D make for rather abrupt starts; they fail to enlighten us on the topic of the paragraph. Statement E on the other hand, performs the task efficiently. It introduces the topic i.e., 'modern finance'. Thus choice (2) is the answer. 'It' in statement B refers to 'modern finance' in statement E. Thus EB. Statement D logically follows statement B, as it tells us why modern finance emerged from the mathematics of chance and statistics i.e., because prices are not predictable. Thus EBD. Statement C is a logical continuation of statement D; the risk is manageable because the mathematical laws of chance can describe the fluctuations in price. Thus EBDC. Statement A concludes the paragraph; 'orthodoxy' refers to the school of thought that the risk in modern finance can be measured and managed with the help of the mathematical laws of chance and statistics. Thus EBDCA.

Choice (2)

In statement 1, 'a near miss', suggests an attempt to do or achieve something that fails, although it almost succeeds. In statement 3, 'a near doubling of oil prices' means 'almost the doubling of oil prices'. In statement 4, 'they came near to tears' means 'they were nearly moved to tears.'

Choice (2)

39. Hand

1.	I have my hand full, I cannot do it today.
2.	The minister visited the jail to see the breach at first hand.
3.	The situation is getting out of hand here!
4.	When the roof of my house was blown away, he was willing to lend me a hand.

Solution:

Statement 1 is erroneous. 'I have my hand full' is unidiomatic expression. 'To have one's hands full', which is the standard idiomatic expression, means 'to be very busy with something'. The other statements are correct. In statement 2, 'at first hand' means 'experiencing something yourself'. In statement 3, 'getting out of hand', means 'becoming difficult or impossible to control'. In statement 4, 'lend a hand' means 'to offer help'.

Choice (1)

40. For

1.	He has a great eye for detail.
2.	We are waiting for the day.
3.	I can't bear for her to be angry.
4.	It couldn't be done for ever.

Solution:

The error is in sentence 4. 'For ever' is not appropriate – the idea can only be expressed as "It can never be done" or "It cannot ever be done."

Note: While sentence 3 is not a construction in formal use, it is informally or colloquially used.

Choice (4)

Sub section II – B: Number of Questions = 20

Note: Questions 41 to 60 carry two marks each.

Directions for Questions 41 to 44: The passage given below is followed by a set of four questions. Choose the best answer to each question.

Number of words in this passage : 916

Crinoline and croquet are out. As yet, no political activists have thrown themselves in front of the royal horse on Derby Day. Even so, some historians can spot the parallels. It is a time of rapid technological change. It is a period when the dominance of the world's superpower is coming under threat. It is an epoch when prosperity masks underlying economic strain. And, crucially, it is a time when policy-makers are confident that all is for the best in the best of all possible worlds. Welcome to the Edwardian Summer of the second age of globalisation.

Spare a moment to take stock of what's been happening in the past few months. Let's start with the oil price, which has rocketed to more than \$65 a barrel, more than double its level 18 months ago. The accepted wisdom is that we shouldn't worry our little heads about that, because the incentives are there for business to build new production and refining capacity, which will effortlessly bring demand and supply back into balance and bring crude prices back to \$25 a barrel. As Tommy Cooper used to say, 'just like that'.

Then there is the result of the French referendum on the European Constitution, seen as thick-headed luddites railing vainly against the modern world. What the French needed to realise, the argument went, was that there was no alternative to the reforms that would make the country more flexible, more competitive, more dynamic. Just the sort of reforms that allowed Gate Gourmet to sack hundreds of its staff at Heathrow after the sort of ultimatum that used to be handed about by Victorian mill owners. An alternative way of looking at the French "non" is that our neighbours translate "flexibility" as "you're fired".

Finally, take a squint at the United States. Just like Britain a century ago, a period of unquestioned superiority is drawing to a close. China is still a long way from matching America's wealth, but it is growing at a stupendous rate and economic strength brings geo-political clout. Already, there is evidence of a new scramble for Africa as Washington and Beijing compete for oil stocks. Moreover beneath the surface of the US economy, all is not well. Growth looks healthy enough, but the competition from China and elsewhere has meant the world's biggest economy now imports far more than it exports. The US is living beyond its means, but in this time of studied complacency a current account deficit worth 6 percent of gross domestic product is seen as a sign of strength, not weakness.

In this new Edwardian summer, comfort is taken from the fact that dearer oil has not had the savage inflationary consequences of 1973-74, when a fourfold increase in the cost of crude brought an abrupt end to a postwar boom that had gone on uninterrupted for a quarter of a century. True, the cost of living has been affected by higher transport costs, but we are talking of inflation at 2.3 percent and not 27 percent. Yet the idea that higher oil prices are of little consequence is fanciful. If people are paying more to fill up their cars it leaves them with less to spend on everything else, but there is a reluctance to consume less. In the 1970s unions were strong and able to negotiate large, compensatory pay deals that served to intensify inflationary pressure, in 2005, that avenue is pretty much closed off, but the abolition of all the controls on credit that existed in the 1970s means that households are invited to borrow more rather than consume less. The knock-on effects of higher oil prices are thus felt in different ways – through high levels of indebtedness, in inflated asset prices, and in balance of payments deficits.

There are those who point out, rightly, that modern industrial capitalism has proved mightily resilient these past 250 years, and that a sign of the enduring strength of the system has been the way it apparently shrugged off everything – a stock market crash, 9/11, rising oil prices – that have been thrown at it in the half decade since the millennium. Even so, there are at least three reasons for concern. First, we have been here before. In terms of political economy, the first era of globalisation mirrored our own. There was a belief in unfettered capital flows, in free trade, in the power of the market. It was a time of massive income inequality and unprecedented migration. Eventually, though, there was a backlash, manifested in a struggle between free traders and protectionists, and in rising labour militancy.

Second, the world is traditionally at its most fragile at times when the global balance of power is in flux. By the end of the nineteenth century, Britain's role as the hegemonic power was being challenged by the rise of the United States, Germany and Japan while the Ottoman and Hapsburg empires were clearly in rapid decline. Looking ahead from 2005, it is clear that over the next two or three decades, both China and India – which together account for half the world's population – will flex their muscles.

Finally, there is the question of what rising oil prices tell us. The emergence of China and India means global demand for crude is likely to remain high at a time when experts say production is about to top out. If supply constraints start to bite, any declines in the price are likely to be short-term cyclical affairs punctuating a long upward trend.

41. By the expression 'Edwardian Summer', the authors refers to a period in which there is
(1) unparalleled luxury and opulence.
(2) a sense of complacency among people because of all-round prosperity.
(3) a culmination of all-round economic prosperity.
(4) an imminent danger lurking behind economic prosperity

Solution:

The expression 'Edwardian summer' figures in the first and the fifth paragraphs of the passage. In both places the author suggests that a sense of complacency is prevailing. 'Welcome to the Edwardian summer' in para 1 indicates that he is going to elaborate on this idea. In para 5, the sentence 'in this Edwardian summer, comfort is taken from the fact that dearer oil has not had the savage consequences' suggests that we are complacent now. Also, 'Edwardian summer' refers to the present period and not to what the future holds. Choice (4) is incorrect as it erroneously suggests that danger is imminent (about to happen very soon). The passage does not support this claim.

Choice (2)

42. What, according to the author, has resulted in a widespread belief in the resilience of modern capitalism?
(1) Growth in the economies of Western countries despite shocks in the form of increase in levels of indebtedness and inflated asset prices.
(2) Increase in the prosperity of Western countries and China despite rising oil prices.
(3) Continued growth of Western economies despite of a rise in terrorism, an increase in oil prices and other similar shocks.
(4) The success of continued reforms aimed at making Western economies more dynamic, competitive and efficient.

Solution:

Refer to the sixth paragraph of the passage. The first sentence mentions 9/11 and stock market crash – a reference to terrorism and oil price hike as suggested in choice (3).

Choice (3)

43. Which of the following best represents the key argument made by the author?
(1) The rise in oil prices, the flux in the global balance of power and historical precedents should make us question our belief that the global economic prosperity would continue.

- (2) The belief that modern industrial capitalism is highly resilient and capable of overcoming shocks will be belied soon.
- (3) Widespread prosperity leads to neglect of early signs of underlying economic weakness, manifested in higher oil prices and a flux in the global balance of power.
- (4) A crisis is imminent in the West given the growth of countries like China and India and the increase in oil prices.

Solution:

Choice (1) represents the key argument made by the author. The author seeks to caution his readers against complacency. He questions the widespread belief that everything is alright and suggests that the rise of oil prices and other phenomena, indicate that problems lie ahead. The passage is not on modern industrial capitalism and hence choice (2) is incorrect. The passage does not suggest that the rise of oil prices is indicative of any 'underlying economic weakness'. The author suggests that the rise of oil prices and other changes that are taking place in the world order have resulted in economic strain. The author talks about economic weakness, but only in the context of the US economy (last sentence of the fourth paragraph). Choice (3) is erroneous because it does not make clear which economy is showing signs of underlying economic weakness. Option 4 is not the key argument that the author presents in the passage. Choice (1)

44. What can be inferred about the author's view when he states, 'As Tommy Cooper used to say "just like that"?'
 (1) Industry has incentive to build new production and refining capacity and therefore oil prices would reduce.

Directions for Questions 45 to 48: The passage given below is followed by a set of four questions. Choose the best answer to each question.

Number of words in this passage : 818

While complex in the extreme, Derrida's work has proven to be a particularly influential approach to the analysis of the ways in which language structures our understanding of ourselves and the world we inhabit, an approach he termed *deconstruction*. In its simplest formulation, deconstruction can be taken to refer to a methodological strategy which seeks to uncover layers of hidden meaning in a text that have been denied or suppressed. The term 'text', in this respect, does not refer simply to a written form of communication, however. Rather, texts are something we all produce and reproduce constantly in our everyday social relations, be they spoken, written or embedded in the construction of material artifacts. At the heart of Derrida's deconstructive approach is his critique of what he perceives to be the totalitarian impulse of the Enlightenment pursuit to bring all that exists in the world under the domain of a representative language, a pursuit he refers to as *logocentrism*. Logocentrism is the search for a rational language that is able to know and represent the world and all its aspects perfectly and accurately. Its totalitarian dimension, for Derrida at least, lies primarily in its tendency to marginalize or dismiss all that does not neatly comply with its particular linguistic representations, a tendency that, throughout history, has all too frequently been manifested in the form of authoritarian institutions. Thus logocentrism has, in its search for the truth of absolute representation, subsumed difference and oppressed that which it designates as its alien 'other'. For Derrida, western civilization has been built upon such a systematic assault on alien cultures and ways of life, typically in the name of reason and progress.

In response to logocentrism, deconstruction posits, the idea that the mechanism by which this process of marginalization and the ordering of truth occurs is through establishing systems of binary opposition. Oppositional linguistic dualisms, such as rational/irrational, culture/nature and good/bad are not, however, construed as equal partners as they are in, say, the semiological structuralism of Saussure. Rather, they exist, for Derrida, in a series of hierarchical relationships with the first term normally occupying a superior position. Derrida defines the relationship between such oppositional terms using the neologism *difference*. This refers to the realization that in any statement, oppositional terms differ from each other (for instance, the difference between rationality and irrationality is constructed through oppositional usage), and at the same time, a hierarchical relationship is maintained by the difference of one term to the other (in the positing of rationality over irrationality, for instance). It is this latter point which is perhaps the key to understanding Derrida's approach to deconstruction.

- (2) There would be a correction in the price levels of oil once new production capacity is added.
- (3) The decline in oil prices is likely to be short-term in nature.
- (4) It is not necessary that oil prices would go down to earlier levels.

Solution:

Refer to the second paragraph. There is an underlying tone of scepticism. While the general feeling is that there is nothing to be worried about regarding the rocketing fuel prices, as the market mechanism will bring fuel prices down to normal levels, the author is not so sure. Note the phrase 'the accepted wisdom is that we shouldn't worry our little heads.... It suggests that the author is not taken in by this optimism. Also note the use of the word 'effortlessly'. Building new production and refining capacity is not child's play and certainly cannot be done 'effortlessly'. There is just a hint of sarcasm there. The author is suggesting that it is foolhardy to imagine that a steep fall in oil prices is *inevitable* as some suggest. The author seems to suggest that there is nothing inevitable about a drop in oil prices as it is something that is quite difficult to achieve. Hence choice (4) is the best answer. Choice (2) is ruled out, because it uses the word 'would', indicating a greater degree of certainty than the author is willing to concede and because of the word 'correction'; it is not clear whether correction implies an upward correction or a downward one.

Choice (4)

For the fact that at any given time one term must defer to its oppositional 'other', means that the two terms are constantly in the state of interdependence. The presence is one is dependent upon the absence or 'absent-presence' of the 'other', such as in the case of good and evil, whereby to understand the nature of one, we must constantly relate it to the absent term in order to grasp its meaning. That is, to do good, we must understand that our act is not evil for without that comparison the term becomes meaningless. Put simply, deconstruction represents an attempt to demonstrate the absent-presence of this oppositional 'other', to show that what we say or write is in itself not expressively simply of what is present, but also of what is absent. Thus, deconstruction seeks to reveal the interdependence of apparently dichotomous terms and their meanings relative to their textual context; that is, within the linguistic power relations which structure dichotomous terms hierarchically. In Derrida's own words, a deconstructive reading "must always aim at a certain relationship, unperceived by the writer, between what he commands and what he does command of the patterns of a language that he uses. ...[it] attempts to make the not-seen accessible to sight."

Meaning, then, is never fixed or stable, whatever the intention of the author of a text. For Derrida, language is a system of relations that are dynamic, in that all meanings we ascribe to the world are dependent not only on what we believe to be present but also on what is absent. Thus, any act of interpretation must refer not only to what the author of a text intends, but also to what is absent from his or her intention. This insight leads, once again, to Derrida's further rejection of the idea of the definitive authority of the intentional agent or subject. The subject is decentred; it is conceived as the outcome of relations of *differance*. As author of its own biography, the subject thus becomes the ideological fiction of modernity and its logocentric philosophy, one that depends upon the formation of hierarchical dualisms, which repress and deny the presence of the absent 'other'. No meaning can therefore, ever be definitive, but is merely an outcome of a particular interpretation.

45. According to the passage, Derrida believes that:

- (1) Reality can be constructed only through the use of rational analysis.
- (2) Language limits our construction of reality.
- (3) A universal language will facilitate a common understanding of reality.
- (4) We need to uncover the hidden meaning in a system of relations expressed by language.

Solution:

Refer to the last paragraph. The key idea of the passage is that the hidden meaning of text should be uncovered. This is at the heart of Derrida's argument. Logocentrism fails to do this whereas deconstruction helps uncover hidden meaning. Thus choice (4) is the best answer. Choice (2) erroneously implies that **all** language limits our construction of reality. Derrida believes that what he calls '**a representative language**' (refer to the fifth and sixth sentences of the first paragraph) limits our construction of reality. **Choice (4)**

46. To Derrida, 'logocentrism' does not imply:

- (1) A totalitarian impulse.
- (2) A domain of representative language.
- (3) Interdependence of the meanings of dichotomous terms.
- (4) A strategy that seeks to suppress hidden meanings in a text.

Solution:

Refer to the fifth and sixth sentences of the first paragraph of the passage. The fifth sentence of the paragraph indicates that logocentrism implies option 1 (totalitarian impulse) and option 2 (domain of representative language). The passage suggests that logocentrism seeks to suppress hidden meaning and contrasts it with deconstruction, which in turn seeks to uncover hidden meaning. Logocentrism thus implies option 4. Option 3, however, is not implied and is the answer. **Choice (3)**

47. According to the passage, Derrida believes that the system of binary opposition

- (1) represents a prioritization of hierarchy.
- (2) reconciles contradictions and dualities.
- (3) weakens the process of marginalization and ordering of truth.
- (4) deconstructs reality.

Solution:

Refer to the second paragraph of the passage. The third sentence beginning "Rather they exist in a series of hierarchical relationships" indicates that binary opposition represents a prioritisation or hierarchy. **Choice (1)**

48. Derrida rejects the idea of 'definitive authority of the subject' because

- (1) interpretation of the text may not make the unseen visible.
- (2) the meaning of the text is based on binary opposites.
- (3) the implicit power relationship is often ignored.
- (4) any act of interpretation must refer to what the author intends.

Solution:

The correct choice is (1). Refer to the last paragraph. Derrida rejected the idea of the definitive authority of the intentioned agent or subject. This is because according to the idea the subject becomes one that depends upon the formation of hierarchical dualisms which repress, and deny the acknowledgement of what is absent. This would mean that interpretation of text with this idea in mind leaves no room to consider the unseen. This is why Derrida rejects it. **Choice (1)**

Directions for Questions 49 to 52: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

49. The audiences for crosswords and sudoku, understandably, overlap greatly, but there are differences, too. A crossword attracts a more literary person, while sudoku appeals to keenly logical mind. Some crossword enthusiasts turn up their noses at sudoku because they feel it lacks depth. A good crossword requires vocabulary, knowledge, mental flexibility and sometimes even a sense of humor to complete. It touches numerous areas of life and provides an "Aha!" or two along the way. _____

- (1) Sudoku, on the other hand, is just a logical exercise, each one similar to the last.
- (2) Sudoku, incidentally, growing faster in popularity than crosswords, even among the literati.

- (3) Sudoku, on the other hand, can be attempted and enjoyed even by children.
- (4) Sudoku, however, is not exciting in any sense of the term.

Solution:

Choice (1) is the best answer. The passage compares Sudoku and crosswords. It states that crosswords attract the literary-minded and explains why. Sudoku, on the other hand attracts the logical mind. The reason it attracts the logical mind is mentioned in choice (1) i.e., it is a logical exercise. Choice (2) talks about Sudoku's growing popularity, 'even among the literati'. This is not in sync with what is mentioned in the passage. The passage states that 'crosswords attract the literary type, whereas Sudoku attracts the logical type'. Sudoku's popularity among the literati is unexplained. Thus choice (2) is inappropriate. Choice (3) suggests that crossword cannot be attempted and enjoyed by children. This is not implied in the passage. Thus eliminate choice (3). Choice (4) is incorrect as it contradicts the claim that Sudoku appeals to the logical mind.

Choice (1)

50. Most firms consider expert individuals to be too elitist, temperamental, egocentric, and difficult to work with. Force such people to collaborate on a high-stakes project and they just might come to fisticuffs. Even the very notion of managing such a group seems unimaginable. So most organizations fall into default mode, setting up project teams of people who get along nicely. _____

- (1) The result, however, is disastrous.
- (2) The result is mediocrity.
- (3) The result is creation of experts who then become elitists.
- (4) Naturally, they drive innovations.

Solution:

The passage states that highly talented people are often temperamental, difficult to manage and very bad at working in teams. Therefore, in order to get around the problem, most organisations prefer to take people who get along well. There is a subtle suggestion here that organisations settle for a compromise; they sacrifice quality for niceness. Thus it logically follows that such a compromise results in mediocrity. Hence choice (2). Choice (1) is sweeping and categorical in a manner that is unwarranted. Thus eliminate choice (1). As mentioned above, the passage suggests that organisations settle for a compromise. Choices (3) and (4) are not consistent with this suggestion. Choice (3) suggests that setting up project teams of people who get along nicely, is the right thing to do, as this will result in the creation of experts. Similarly, choice (4) states that compromising on quality drives innovation. This is inadmissible. Hence eliminate choice (4).

Choice (2)

51. Federer's fifth grand slam win prompted a reporter to ask whether he was the best ever. Federer is certainly not lacking in confidence, but he wasn't about to proclaim himself the best ever. "The best player of this generation, yes", he said, "But nowhere close to ever. Just look at the records that some guys have. I'm a minnow." _____

- (1) His win against Agassi, a genius from the previous generation, contradicts that.
- (2) Sampras, the king of an earlier generation, was as humble.
- (3) He is more than a minnow to his contemporaries.
- (4) The difference between 'the best of this generation' and 'the best ever' is a matter of perception.

Solution:

Choice (3) is the best answer. Federer states that he is a minnow among the all-time greats. He also states that he is the best among his contemporaries. Choice (3) is a logical conclusion that can be drawn from these statements, as also from the fact that he has won five grand slam titles and is so good a player as to prompt a reporter to ask him whether he is the best ever. Choice (1) is inappropriate, as just one win against a genius from the previous generation does not mean that Federer is not a minnow i.e., this solitary win does not give us sufficient evidence to confidently state that Federer was wrong when he claimed to be a minnow. Choice (2) is incorrect as the paragraph does not focus on Federer's humility, rather on his standing among tennis players. Choice (4) is inappropriate, as it erroneously implies that a decision of who is the best ever is dependant on perception. The paragraph does not talk about perception, it states fact i.e., Federer's fifth Grand Slam win and 'records'. Thus perception plays little role in the determination of who is the best ever. Choice (3)

52. Thus the end of the knowledge and the closing of the frontier that it symbolizes is not a looming crisis at all, but merely one of many embarrassing fits of hubris in civilization's long industry. In the end, it will pass away and be forgotten. Ours is not the first generation to struggle to understand the organizational laws of the frontier, deceive itself that it has succeeded, and go to its grave having failed. _____

- (1) One would be wise to be humble.
- (2) But we might be the first generation to actually reach the frontier.
- (3) But we might be the first generation to deal with the crisis.
- (4) However, this time the success is not illusory.

Solution:

The paragraph essentially deals with what the author terms 'end of knowledge'. Each generation felt that it had reached the end of knowledge, but this feeling turned out to be false and was merely a manifestation of human pride. The author seeks to caution us against such pride. He warns us that ours is not the first generation to grapple with the 'organisational laws of the frontier, deceive itself that it has succeeded and go to the grave defeated'. The only answer choice that is consistent with the cautioning tone is choice (1). The author counsels us that because of all that has happened to previous generations and their hubris, we would do well to be humble. Choices (2), (3) and (4) are inconsistent with this tone. They all suggest a certain triumphalism, which according to the author is unwarranted.

Choice (1)

Directions for Questions 53 to 56: Each question consists of four sentences on a topic. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically correct and appropriate sentence(s).

53. A. When virtuoso teams begin their work, individuals are in and group consensus is out.
B. As project progresses, however, the individual stars harness themselves to the product of the group.
C. Sooner or later, the members break through their own egocentrism and become a plurality with single-minded focus on the goal.
D. In short, they morph into a powerful team with a shared identity.
(1) A&C (2) A&D (3) B&D (4) A, C&D
54. A. Large reductions in the ozone layer, which sits about 15-30 km above the Earth, take place each winter over the polar regions, especially the Antarctic, as low temperatures allow the formation of stratospheric clouds that assist chemical reactions breaking down ozone.
B. Industrial chemicals containing chlorine and bromine have been blamed for thinning the layer because they attack the ozone molecules, making them to break apart.
C. Many and offending chemicals have now been banned.
D. It will still take several decades before these substances have disappeared from the atmosphere.
(1) D (2) B&D (3) A&D (4) A&C
55. A. The balance of power will shift to the East as China and India evolve.
B. Rarely the economic ascent of two still relatively poor nations has been watched with such a mixture of awe, opportunism, and trepidation.
C. Postwar era witnessed economic miracles in Japan and South Korea, but neither was populous enough to power worldwide growth or change the game in a complete spectrum of industries.
D. China and India, by contrast, posses the weight and dynamism to transform the 21st-century global economy.
(1) A, B&C (2) A&D (3) C (4) C&D
56. A. People have good reason to care about the welfare of animals.
B. Ever since Enlightenment, their treatment has been seen as a measure of mankind's humanity.
C. It is no coincidence that William Wilberforce and Sir Thomas Foxwell Buxton, two leaders of the movement to abolish the slave trade, helped found the Royal Society for the Prevention of Cruelty to Animals in 1820s.
D. An increasing number of people go further: mankind has a duty not to cause pain to animals that have the capacity to suffer.
(1) A&D (2) B (3) A&C (4) C&D

Solutions for questions 53 to 56:

This set perhaps underscores the need to read directions to questions, carefully. A test taker who failed to do this would have answered all these questions incorrectly. Unlike the directions for similar questions given in CAT2004 which required test takers to identify

incorrect statements, the directions this time around required the test takers to identify the **correct sentences**. Also, the test setters clearly mentioned that all the four sentences relate to the same context.

53. Statements B and C are incorrect. Statement B should read, 'As the project progresses however, the individual stars harness themselves to the product of the group'. The reference is to a particular project. Hence, it should be preceded by the definite article. Statement C should read 'Sooner or later, the members break through their own egocentrism and become a plurality with a single-minded focus on the goal'. In this statement, 'a focus' is being particularized i.e., 'a single-minded focus' makes the statement correct. Statements A and D are grammatically correct. **Choice (2)**
54. Statements B and C are grammatically incorrect. Statement B should read 'Industrial chemicals containing chlorine and bromine have been blamed for thinning the layer because they attack the ozone molecules, making them break apart'. The verb 'make' does not take the 'to + verb' form (to + break). It takes only the plain verb i.e., 'making them break apart'. Statement C should read 'Many an offending chemical has now been banned'. This is because, 'many + a' takes a singular noun and a singular verb. Statements A and D are grammatically correct. **Choice (3)**
55. Statements 'B' and 'C' are incorrect. Statement B should be corrected as 'Rarely has the economic ascent of two still relatively poor nations been watched with such a mixture of awe, opportunism, and trepidation'. This is because, when a sentence begins with adverbs like 'rarely', 'scarcely', 'hardly', 'no sooner than', they should be followed immediately by an auxiliary verb (verbs like am / is / was / are / were /have/has/had) i.e., (Rarely has ---). The correction for C is 'The post-war era witnessed economic miracles in Japan and South Korea, but neither was populous enough to power worldwide growth or change the game in a complete spectrum of industries'. The sentence talks about a definite period or era i.e (the post-war) era. Therefore, the definite article should precede the word 'Post-war'. Statements A and D are correct. **Choice (2)**
56. Among the four statements, B and C are incorrect. B should read, 'ever since the Enlightenment, their treatment has been as a measure of mankind's humanity'. In statement B, the word 'Enlightenment' begins with a capital 'E', which indicates that the reference is probably to the 18th century philosophy that placed greater emphasis on reason than on tradition. Hence, it takes the definite article. Also, in statement C, the definite article should precede 1820s, because a reference is made to a particular period of time. Statements A and D are grammatically correct. **Choice (1)**

Directions for Questions 57 to 60: Each of the following questions has a paragraph with one italicized word that does not make sense. Choose the most appropriate replacement for that word from the options given below the paragraph.

57. Intelligent design derives from an early 19th-century explanation of the natural world given by an English clergyman, William Paley. Paley was the populariser

of the famous watchmaker analogy. Proponents of intelligent design are *cropping* Paley's argument with a new gloss from molecular biology.

Solution:

The key word is 'proponents' (advocates). One would expect advocates to do good to what they support. Therefore the possibility that they may destroy, test or question what they advocate is inadmissible. This eliminates choices (1), (2) and (4). Resurrect (to bring back into vogue something that has disappeared) is the best answer.

Choice (3)

Solution:

The passage paints a gloomy, dull and unfavourable picture. Note the words 'limp fodder', 'sinners', 'scallywags' (rascals). Hence the words shining, bright and effulgent (bright, luminous) cannot fit into the given context. The most appropriate word is 'sputtering' (weak, varied and lacking in confidence). The use of this word ensures thematic consistency.

Choice (3)

59. It is *klang* to a sensitive traveler who walks through this great town, when he sees the streets, the roads, and cabin doors crowded with beggars, mostly women, followed by three, four, or six children, all in rags and importuning every passenger for aims.

Solution:

The word 'sensitive', which is used to describe the nature of the traveller, holds the key to the question. The sentence speaks about beggars, particularly women, accompanied by children, beseeching passengers for alms. A person who is sensitive will be 'distressed' (pained) but not 'disgusted' (repelled) by such a sight. He would certainly not be amused, or irritated.

Choice (4)

60. Or there is the most *fingummy* diplomatic note on record: when Philip of Macedon wrote to the Spartans that, if he came within their borders, he would leave not one stone of their city, they wrote back the one word – “If”.

- (1) witty (2) rude (3) simple (4) terse

Solution:

The phrase, 'they wrote back the **one word** - If', in the given sentence implies that the focus is on brevity or terseness. Hence the most appropriate word which fits into the context is terse (succinct, brief). While there may be an element of wit, terming the statement 'the most witty diplomatic note ever', is an overstatement. Hence choice (1) is inappropriate. There is no element of rudeness or simplicity in the statement. Hence the words rude and simple are inappropriate. Choice (4)

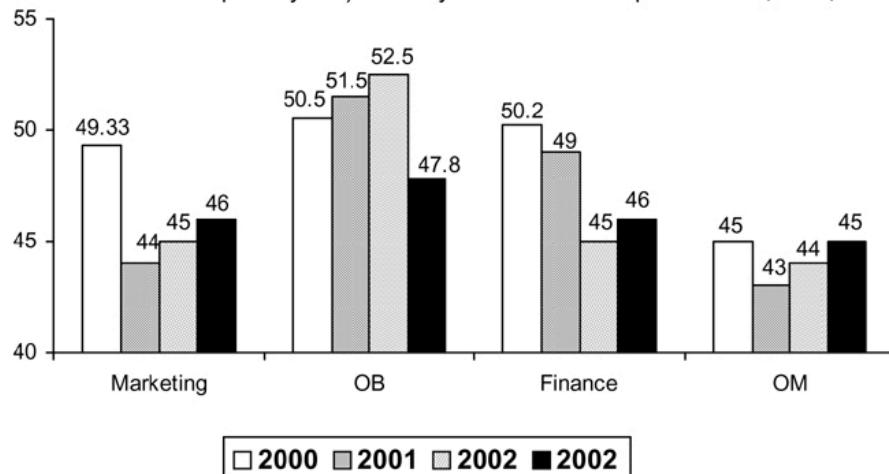
SECTION – III (DI)

Sub-section III-A: Number of Questions = 10

Note: Questions 61 to 70 carry one mark each.

Answer Questions 61 to 64 on the basis of the information given below:

A management institute was established on January 1, 2000 with 3, 4, 5 and 6 faculty members in the Marketing, Organisational Behaviour (OB), Finance, and Operations Management (OM) areas respectively, to start with. No faculty member retired or joined the institute in the first three months of the year 2000. In the next four years, the institute recruited one faculty member in each of the four areas. All these new faculty members, who joined the institute subsequently over the years, were 25 years old at the time of their joining the institute. All of them joined the institute on April 1. During these four years, one of the faculty members retired at the age of 60. The following diagram gives the area-wise average age (in terms of number of completed years) of faculty members as on April 1 of 2000, 2001, 2002, and 2003.



Solutions for questions 61 to 64:

In the data given whenever there is a decrease in the average age of the faculty members we can say that, in that particular year a new faculty member could have joined or an old faculty member could have retired, or both.

61. Since one break in each of the trends (of the average age) in four areas is due to the new faculty member, we can say that the area which has two breaks in the trend must be the area from which the faculty retired. Two breaks in the trend occurred only for Finance. Choice (1)

62. The new faculty joined marketing in year 2001 (i.e. the year in which the trend broke). The faculty

member will be $25 + 4 = 29$ years old on 1 April 2005.
 Also the average age of all the faculty member in marketing on 1 April 2005 = $46 + 2 = 48$
 \Rightarrow total age = $48 \times 4 = 192 \Rightarrow$ total age of members since inception = $192 - 29 = 163$
 Age of Naresh + Denesh = $54 + 57 = 111$
 \Rightarrow Age of third faculty member = $163 - 111 = 52$.
 Choice (4)

63. By observing the data, the new faculty member could have joined in 2001 or 2002 as there are two breaks in the trend i.e., decrease in the average age. In 2000, total age of the faculty members is $50.2 \times 5 = 251$ yrs. In 2001, the total age would be $251 + 5 \times 1 = 256$ years. Now if a new faculty member joins, total age becomes $256 + 25 = 281$ and average age becomes $281/6$ which is not matching with the given value, 49. Moreover if the new faculty member joins and a 60 year old faculty member leaves in 2001, there cannot be a drop in average ages next year. So the only possibility is that a 60 year old faculty retires in 2001 and a new faculty member joins in 2002. If a 60 year old faculty leaves in 2001, total age of the faculty member $= 256 - 60 = 196$ years, which is consistent with the given data i.e., average age is 49 years. This satisfies the given data. The only other year when there is a break in the trend (of average age increasing by 1 each year) is in the year 2002. Hence the new faculty member must have joined in 2002. Choice (3)

64. The break in the trend of the average age happened in the year 2001. Hence, on April 2001, he was 25 years old and this means he was 27 years old in April 2003. Choice (3)

Answer Questions 65 to 67 on the basis of the information given below:

The table below reports annual statistics related to rice production in select states of India for a particular year.

State	Total Area (in million hectares)	% of Area Under Rice Cultivation	Production (in million tons)	Population (in millions)
Himachal Pradesh	6	20	1.2	6
Kerala	4	60	4.8	32
Rajasthan	34	20	6.8	56
Bihar	10	60	12	83
Karnataka	19	50	19	53
Haryana	4	80	19.2	21
West Bengal	9	80	21.6	80
Gujarat	20	60	24	51
Punjab	5	80	24	24
Madhya Pradesh	31	40	24.8	60
Tamilnadu	13	70	27.3	62
Maharashtra	31	50	48	97
Uttar Pradesh	24	70	67.2	166
Andhra Pradesh	28	80	112	76

65. Which two states account for the highest productivity of rice (tons produced per hectare of rice cultivation)?

 - (1) Haryana and Punjab
 - (2) Punjab and Andhra Pradesh
 - (3) Andhra Pradesh and Haryana
 - (4) Uttar Pradesh and Haryana

Solution:

The states given in the choices are Haryana, Punjab, Andhra Pradesh and Uttar Pradesh. The required values for different states is

$$\text{Punjab} = \frac{24}{5 \times 0.8} = 6$$

$$\text{Haryana} = \frac{19.2}{4 \times 0.8} = 6$$

$$\text{Andhra Pradesh} = \frac{112}{28 \times 0.8} = \frac{112}{22.4} < 6$$

$$\text{Uttar Pradesh} = \frac{67.2}{24 \times 0.7} = \frac{67.2}{16.8} < 6$$

∴ It is highest for Punjab and Haryana. Choice (1)

66. How many states have a per capita production of rice (defined as total rice production divided by its population) greater than Gujarat?
 (1) 3 (2) 4 (3) 5 (4) 6

Solution:

The per capita production of rice of Gujarat is $\frac{24}{51}$. The states which have more value compared to Gujarat are

$$\text{Haryana} \left(\frac{19.2}{21} \right) > \frac{24}{51};$$

$$\text{Punjab} \left(\frac{24}{24} \right) > \frac{24}{51}$$

$$\text{Maharashtra} \left(\frac{48}{97} \right) > \frac{24}{51}$$

$$\text{Andhra Pradesh} \left(\frac{112}{76} \right) > \frac{24}{51}$$

Hence, four states.

Choice (2)

67. An intensive rice producing state is defined as one whose annual rice production per million of population is at least 400,000 tons. How many states are intensive rice producing states?

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

Solution:

We have to look for the states where the production (in million tonnes) is at least 0.4 times that of population (in million). It happened for

$$\text{Haryana} \left(\frac{19.2}{21} \right) > 0.4;$$

$$\text{Gujarat} \left(\frac{24}{51} \right) > 0.4;$$

$$\text{Punjab} \left(\frac{24}{24} \right) > 0.4;$$

$$\text{Madhya Pradesh} \left(\frac{24.8}{60} \right) > 0.4;$$

$$\text{Tamil Nadu} \left(\frac{27.3}{62} \right) > 0.4$$

$$\text{Maharashtra} \left(\frac{48}{97} \right) > 0.4$$

$$\text{Uttar Pradesh} \left(\frac{67.2}{166} \right) > 0.4;$$

$$\text{Andhra Pradesh} \left(\frac{112}{76} \right) > 0.4$$

A total of 8 states.

Choice (4)

Answer Questions 68 to 70 on the basis of the information given below:

The table below reports the gender, designation and age-group of the employees in an organization. It also provides information on their commitment to projects coming up in the months of January (Jan), February (Feb), March (Mar) and April (Apr), as well as their interest in attending workshops on: Business Opportunities (BO), Communication Skills (CS), and E-Governance (EG)

Sl. No.	Name	Gender	Designation	Age group	Committed to projects during	Interested in workshop on
1	Anshul	M	Mgr	Y	Jan, Mar	CS,EG
2	Bushkant	M	Dir	I	Feb, Mar	BO,EG
3	Charu	F	Mgr	I	Jan, Feb	BO, CS
4	Dinesh	M	Exe	O	Jan, Apr	BO, CS, EG
5	Eashwaran	M	Dir	O	Feb, Apr	BO
6	Fatima	F	Mgr	Y	Jan, Mar	BO, CS
7	Gayatri	F	Exe	Y	Feb, Mar	EG
8	Hari	M	Mgr	I	Feb, Mar	BO, CS, EG
9	Indira	F	Dir	O	Feb, Apr	BO, EG
10	John	M	Dir	Y	Jan, Mar	BO
11	Kalindi	F	Exe	I	Jan, Apr	BO, CS, EG
12	Lavanya	F	Mgr	O	Feb, Apr	CS, EG
13	Mandeep	M	Mgr	O	Mar, Apr	BO, EG
14	Nandlal	M	Dir	I	Jan, Feb	BO, EG
15	Parul	F	Exe	Y	Feb, Apr	CS, EG
16	Rahul	M	Mgr	Y	Mar, Apr	CS, EG
17	Sunita	F	Dir	Y	Jan, Feb	BO, EG
18	Urvashi	F	Exe	I	Feb, Mar	EG
19	Yamini	F	Mgr	O	Mar, Apr	CS, EG
20	Zeena	F	Exe	Y	Jan, Mar	BO, CS, EG

M – Male, F = Female, Exe = Executive, Mgr = Manager, Dir = Director, Y = Young, I = In-between, O = Old

For each workshop, exactly four employees are to be sent, of which at least two should be Females and at least one should be Young. No employee can be sent to a workshop in which he/she is not interested in. An employee cannot attend the workshop on.

- Communication Skills, if he/she is committed to internal projects in the month of January;
- Business Opportunities, if he/she is committed to internal projects in the month of February;
- E-governance, if he/she is committed to internal projects in the month of March.

68. Assuming that Parul and Hari are attending the workshop on Communication Skills (CS), then which of the following employees can possibly attend the CS workshop?

- (1) Rahul and Yamini (2) Dinesh and Lavanya
(3) Anshul and Yamini (4) Fatima and Zeena

Solution:

The person who can attend workshop on communication skills with Parul and Hari must be from among Lavanya/Rahul/Yamini. Choice (1)

69. How many Executives (Exe) cannot attend more than one workshop?

- (1) 2 (2) 3 (3) 15 (4) 16

Solution:

There are only 6 executives in the organisation. The executives who cannot attend more than one workshop i.e., can attend zero or one workshop are
(i) Gayatri (can attend one workshop)

- (ii) Urvashi (can attend no workshop)
(iii) Zeena (can attend one workshop)

A total of 3 executives.

Choice (2)

70. Which set of employees cannot attend any of the workshops?

- (1) Anshul, Charu, Eashwaran and Lavanya
(2) Anshul, Bushkant, Gayatri and Urvashi
(3) Charu, Urvashi, Bushkant and Mandeep
(4) Anshul, Gayatri, Eashwaran and Mandeep

Solution:

Employees who cannot attend any of the workshops are

- | | |
|-----------------|---------------|
| (i) Anshul | (ii) Bushkant |
| (iii) Charu | (iv) Eshwaram |
| (v) Gayatri and | (vi) Urvashi |

The given group must be from this six only.

Choice (2)

Sub-section III-B: Number of Questions = 20

Note: Questions 71 to 90 carry two marks each.

Answer Questions 71 to 74 on the basis of the information given below:

In the table below is the listing of players, seeded from highest (#1) to lowest (#32), who are due to play in an Association of Tennis Players (ATP) tournament for women. This tournament has four knockout rounds before the final, i.e., first round, second round, quarterfinals, and semi-finals. In the first round, the highest seeded player plays the lowest seeded player (seed # 32) which is designated match No.1 of first round; the 2nd seeded player plays the 31st seeded player which is designated match No.2 of the first round, and so on. Thus, for instance, match No. 16 of first round is to be played between 16th seeded player and the 17th seeded player. In the second round, the winner of match No. 1 of first round plays the winner of match No.16 of first round and is designated match No. 1 of second round. Similarly, the winner of match No. 2 of first round plays the winner of match No. 15 of first round, and is designated match No. 2 of second round. Thus, for instance, match No. 8 of the second round is to be played between the winner of match No. 8 of first round and the winner of match No. 9 of first round. The same pattern is followed for alter rounds as well.

Seed #	Name of player	Seed #	Name of player	Seed #	Name of player
1	Maria Sharapova	12	Mary Pierce	23	Silva Farina Elia
2	Lindsay Davenport	13	Anastasia Myskina	24	Tatiana Golovin
3	Amelie Mauresmo	14	Alicia Molik	25	Shinobu Asagoe
4	Kim Clijsters	15	Nathalie Dechy	26	Francesca Schiavone
5	Svetlana Kuznetsova	16	Elena Bovina	27	Nicole Vaidisova
6	Elena Dementieva	17	Jelena Jankovic	28	Gisela Dulko
7	Justine Henin	18	Ana Ivanovic	29	Flavia Pennetta
8	Serena Williams	19	Vera Zvonareva	30	Anna Chakvetadze
9	Nadia Petrova	20	Elena Likhovtseva	31	Ai Sugiyama
10	Venus William	21	Daniela Hantuchova	32	Anna-lena Groenefeld
11	Patty Schnyder	22	Dinara Safina		

71. If there are no upsets (a lower seeded player beating a higher seeded player) in the first round, and only match Nos. 6, 7 and 8 of the second round result in upsets, then who would meet Lindsay Davenport in quarter finals, in case Davenport reaches quarter finals?

- (1) Justine Henin (2) Nadia Petrova
(3) Patty Schnyder (4) Venus Williams

Solution:

Lindsay Davenport being the second seed was scheduled to meet seed 7, i.e., Justine Henin in the quarter finals. But in the second round since match 7 – involving seed 7 (Justine Henin) and seed 10 (Venus Williams) – resulted in an upset, Davenport will meet Venus Williams in the quarter finals. Choice (4)

72. If Elena Dementieva and Serena William lose in the second round, while Justine Henin and Nadia Petrova make it to the semi-finals, then who would play Maria Sharapova in the quarterfinals, in the event Sharapova reaches quarterfinals?

- (1) Dinara Safina (2) Justine Henin
(3) Nadia Petrova (4) Patty Schnyder

Solution:

All top sixteen seeds reach the second round. Elena Dementieva, seed 6, will meet seed 11 in the second round while Serena Williams, seed 8, will meet seed 9 in the second round. In the quarterfinals, Maria Sharapova, seed 1, would meet the winner of the match between seed 8 and seed 9, i.e. Nadia Petrova. Choice (3)

- 73.** If, in the first round, all even numbered matches (and none of the odd numbered ones) result in upsets, and there are no upsets in the second round, then who could be the lowest seeded player facing Maria Sharapova in semi-finals?

(1) Anastasia Myskina (2) Flavia Pennetta
(3) Nadia Petrova (4) Svetlana Kuznetsova

Solution:

All odd numbered seeds upto 15 reach the 2nd round while instead of seeds 2 to 16 the players who reach the second round are seeds 31, 29, 27, 25, 23, 21, 19 and 17.

The second round matches are between seeds 1-17, 31-15, 3-19, 29-13, 5-21, 27-11, 7-23 and 25-9. Since there are no upsets in that round the winners are seeds 1, 15, 3, 13, 5, 11, 7 and 9.

The quarter final line up would be

1-9, 15-7, 3-11 and 13-5.

If seed 13 wins her match in the quarters she will next meet seed 1, i.e. Marie Sharapova in semifinals.

Choice (1)

- 74.** If the top eight seeds make it to the quarterfinals, then who, amongst the players listed below, would definitely not play against Maria Sharapova in the final, in case Sharapova reaches the final?

(1) Amelie Mauresmo (2) Elena Dementieva
(3) Kim Clijsters (4) Lindsay Davenport

Solution:

If the top eight seeds make it to quarterfinals, Sharapova being top seed will meet seed 8 in the quarterfinals, and in the semifinals she will meet the winner of the match between seeds 4 and 5. So she will not meet seeds 4, 5 or 8 in the finals.

Choice (3)

Answer Questions 75 to 78 on the basis of the information given below:

Venkat, a stockbroker, invested a part of his money in the stock of four companies --- A, B, C and D. Each of these companies belonged to different industries, viz., Cement, Information Technology (IT), Auto, and Steel, in no particular order. At the time of investment, the price of each stock was Rs.100. Venkat purchased only one stock of each of these companies. He was expecting returns of 20%, 10%, 30%, and 40% from the stock of companies A, B, C and D, respectively. Returns are defined as the change in the value of the stock after one year, expressed as a percentage of the initial value. During the year, two of these companies announced extraordinarily good results. One of these two companies belonged to the Cement or the IT industry, while the other one belonged to either the Steel or the Auto industry. As a result, the returns on the stocks of these two companies were higher than the initially expected returns. For the company belonging to the Cement or IT industry with extraordinarily good results, the returns were twice that of the initially expected returns. For the company belonging to the Steel or the Auto industry, the returns on announcement of extraordinarily good results were only one and a half times that of the initially expected returns. For the remaining two companies, which did not announce extraordinarily good results, the returns realized during the year were the same as initially expected.

- 75.** What is the minimum average return Venkat would have earned during the year?

(1) 30% (2) 31 1/4%
(3) 32 1/2% (4) Cannot be determined

- 76.** If Venkat earned a 35% return on average during the year, then which of these statements would necessarily be true?

- I. Company A belonged either to Auto or to Steel Industry.
 - II. Company B did not announce extraordinarily good results.
 - III. Company A announced extraordinarily good results.
 - IV. Company D did not announce extraordinarily good results.
- (1) I and II only (2) II and III only
(3) III and IV only (4) II and IV only

- 77.** If Venkat earned a 38.75% return on average during the year, then which of these statement(s) would necessarily be true?

- I. Company C belonged either to Auto or to Steel Industry.
 - II. Company D belonged either to Auto or to Steel Industry.
 - III. Company A announced extraordinarily good results.
 - IV. Company B did not announce extraordinarily good result.
- (1) I and II only (2) II and III only
(3) I and IV only (4) II and IV only

- 78.** If Company C belonged to the Cement or the IT industry and did announce extraordinarily good results, then which of these statement(s) would necessarily be true?

- I. Venkat earned not more than 36.25% return on average.
 - II. Venkat earned not less than 33.75% return on average.
 - III. If Venkat earned 33.75% return on average, Company A announced extraordinarily good results.
 - IV. If Venkat earned 33.75% return on average, Company B belonged either to Auto or to Steel Industry.
- (1) I and II only (2) II and IV only
(3) II and III only (4) III and IV only

Solutions for questions 75 to 78:

Companies	A	B	C	D
Expected returns	20%	10%	30%	40%

Between Cement and IT, one company gave double the expected returns.

Between Steel and Auto, one company gave one and half times the expected returns.

His initial investment = Rs.400.

- 75.** The minimum returns occurs when Company B announced good results from Steel or Auto Industry and Company A announced good results and is in the Cement or IT Industry. The double gain came from the company expected to give the least return, while one and half times gain came from the company expected to give the second lowest return.

$$\text{Minimum} = 100 + (10 \times 1) + (20 \times \frac{1}{2}) = 120$$

$$\therefore \text{Minimum gain} = \frac{120}{400} \times 100 = 30\% \quad \text{Choice (1)}$$

76. For 35% returns, his gain is $\frac{35}{100} \times 400 = \text{Rs.}140$.

$$\text{Expected returns} = 20 + 10 + 30 + 40 = \text{Rs.}100.$$

He is getting an extra Rs.40 which can be got from Company A (20×1) and Company D ($40 \times 1/2$), which means company A is in Cement or IT Industry and Company D is in Steel or Auto Industry.

Or the extra Rs.40 can come from Company C (30×1) and Company A ($20 \times 1/2$), which means Company C is in Cement or IT Industry and Company A is in Steel or Auto Industry.

Only statements II and III are necessarily true.

Choice (2)

77. If his return is 38.75%, he gets $\frac{38.75}{400} \times 100 = \text{Rs.}155$

as profit which is Rs.55 more than the expected. The extra 55 can only come from Company D (40×1) and Company C ($30 \times 1/2$)

So, Company C belonged to Auto or Steel Industry and Company D belonged to Cement or IT Industry. Among the given statements only statements I and IV are true.

Choice (3)

78. If Company C announced extraordinarily good results, there is an extra gain of Rs.30.

$$\text{Total Gain} = 100 + 30 = 130$$

Now the worst case happens when Company B announces good results and we get Rs.5 more than expected in which case gain becomes Rs.135 and the best case happens when Company D announced good results and gain becomes Rs.20 more or Rs.150.

$$\therefore \text{minimum gain} = \text{Rs.}135 \text{ and}$$

$$\text{maximum gain} = \text{Rs.}150$$

$$\therefore \text{minimum return} = \frac{135}{400} \times 100 = 33.75\% \text{ and}$$

$$\text{maximum return} = \frac{150}{400} \times 100 = 37.5\%$$

\therefore Statement II is necessarily true and if gain is 33.75% Company B announced good results and is in the Auto or Steel Industry. \therefore Statement IV is also true.

Choice (2)

Answer Questions 79 to 82 on the basis of the information given below:

The year is 2089. Beijing, London, New York, and Paris are in contention to host the 2096 Olympics. The eventual winner is determined through several rounds of voting by members of the IOC with each member representing a different city. All the four cities in contention are also represented in IOC.

- In any round of voting, the city receiving the lowest number of votes in that round gets eliminated. The survivor after the last round of voting gets to host the event.
- A member is allowed to cast votes for at most two different cities in all rounds of voting combined. (Hence, a member becomes ineligible to cast a vote in a given round if both the cities (s)he voted for in the earlier rounds are out of contention in that round of voting.)
- A member is also ineligible to cast a vote in a round if the city (s)he represents is in contention in that round of voting.
- As long as the member is eligible, (s)he must vote and vote for only one candidate city in any round of voting.

The following incomplete table shows the information on cities that received the maximum and minimum votes in different rounds, the number of votes cast in their favour, and the total votes that were cast in those rounds.

Round	Total votes cast	Maximum votes cast		Eliminated	
		City	No. of votes	City	No. of votes
1		London	30	New York	12
2	83	Paris	32	Beijing	21
3	75				

It is also known that:

- All those who voted for London and Paris in round 1, continued to vote for the same cities in subsequent rounds as long as these cities were in contention. 75% of those who voted for Beijing in round 1, voted for Beijing in round 2 as well.
- Those who voted for New York in round 1, voted either for Beijing or Paris in round 2.
- The difference in votes cast for the two contending cities in the last round was 1.
- 50% of those who voted for Beijing in round 1, voted for Paris in round 3.

79. What percentage of members from among those who voted for New York in round 1, voted for Beijing in round 2?

- (1) 33.33 (2) 50 (3) 66.67 (4) 75

vote in round 3, voted for London?

- (1) 33.33 (2) 38.10 (3) 50 (4) 66.67

80. What is the number of votes cast for Paris in round 1?

- (1) 16 (2) 18 (3) 22 (4) 24

82. Which of the following statements must be true?

- IOC member from New York must have voted for Paris in round 2.
 - IOC member from Beijing voted for London in round 3.
- (1) Only a (2) Only b
 (3) Both a and b (4) Neither a nor b

81. What percentage of members from among those who voted for Beijing in round 2 and were eligible to

Solutions for questions 79 to 82:

All the four cities mentioned i.e. New York, London, Paris and Beijing are represented in I.O.C.

- In round 1, all the four cities are ineligible to cast their votes.
- In round 2, of these four, only the city that is eliminated in round 1 can cast its vote.
- In round 3, the cities that are eliminated in rounds 1 and 2 can also cast their votes.

The total number of votes cast in the 1st round must be exactly one less than in the 2nd round, where the extra vote is that of New York. Of the total votes polled in the 1st round i.e. 82, London got 30, New York got 12 and Paris and Beijing together got 40. The three countries that reached round 2 are Paris, Beijing and London. Since Paris got 32 and Beijing got 21 votes, London would have got 30 votes. The total number of votes cast in round 3 must be 1 more than that in round 2 (as Beijing participates in the last round). But it is actually 8 less, which is due to the ineligibility of members who voted for New York in round 1 and Beijing in round 2.

∴ The number of cities which voted for New York in round 1 and Beijing in round 2 must be $(8 + 1) = 9$. Of the total 75 votes, either London or Paris will get 38 votes and the other one will get 37 votes.

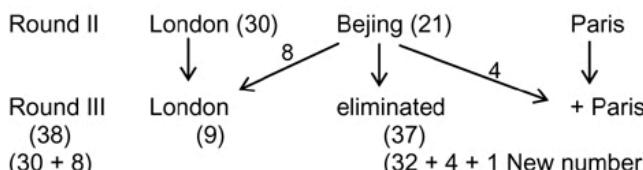
	Total votes	Team contended			
Round I	82	London (30)	Paris/Beijing	Paris/Beijing	New York (12)
Round II	83	Paris (32)	London (30)	Beijing (21)	
Round III	75	London/Paris (38)	London/Paris (37)		

The total number members voting for London did not change from round 1 to round 2. We also know that those who voted for New York in the 1st round voted for Beijing or Paris in the 2nd round. So out of the members who voted for New York in the first round, 9 voted for Beijing in the second round and the remaining 3 voted for Paris in the round 2.

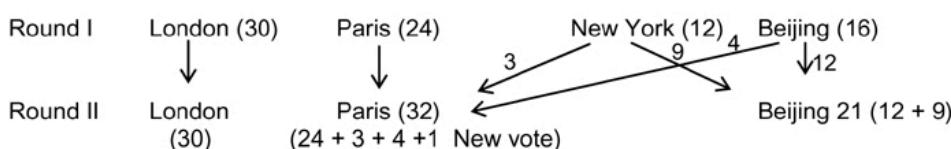
Of the 21 votes got by Beijing in the second round, 9 are from those who voted for New York and the remaining 12 is the 75% of those who voted for Beijing in the first round (As the persons who voted for Paris in round 1 did not shift to any other city). ∴ Beijing got a total of $12/75\% = 16$ votes in round 1 and New York got a total of 24 votes.

Now in round 3, given that 50% of those who voted for Beijing in round 1 voted for Paris in round 3, the other 50% voted for London in round 3.

∴ London got 30 votes + 8 votes = 38 votes. Paris got 37 votes of which 32 are from those who voted for Paris in round 2 and 4 are from those who voted for Beijing in the round 2 and the remaining is by the IOC member of Beijing.



Paris in the round 2 got those 24 votes that it got in round 1, 3 votes from those voted for New York, 4 votes from those voted for Beijing in round 1 and , the remaining one vote must be from the IOC member of New York, who voted in round 2 but not in round 1.



79. Of the 12 persons who voted for New York in round I, 9 voted for Beijing in round II.
i.e. $9/12 = 75\%$ Choice (4)

80. Number of votes cast for Paris in round I is 24.
Choice (4)

81. Of the 21 persons voted for Beijing in round 2, only 12 are eligible for voting in round 3 and of which 8 voted for London.
∴ Required percentage = $8/12 \times 100 = 66.67\%$
Choice (4)

82. IOC member from New York voted for Paris in round 2. Hence a is true.
IOC member from Beijing voted for Paris but not London in round 3.
∴ b is not true. Choice (1)

Answer Questions 83 to 86 on the basis of the information given below:

The table below presents the revenue (in million rupees) of four in three states. These firms, Honest Ltd., Aggressive Ltd., Truthful Ltd. And Profitable Ltd. are disguised in the table as A, B, C and D, in no particular order.

States	Firm A	Firm B	Firm C	Firm D
UP	49	82	80	55
Bihar	69	72	70	65
MP	72	63	72	65

Further, it is known that:

In the state of MP, Truthful Ltd. has the highest market share. Aggressive Ltd.'s aggregate revenue differs from Honest Ltd.'s by Rs.5 million.

- 83.** What can be said regarding the following two statements?

Statement 1: Profitable Ltd. has the lowest share in MP market.

Statement 2: Honest Ltd.'s total revenue is more than Profitable Ltd.

- (1) If statement 1 is true then statement 2 is necessarily true.
- (2) If statement 1 is true then statement 2 is necessarily false.
- (3) Both statement 1 and statement 2 are true.
- (4) Neither statement 1 nor statement 2 is true.

- 84.** What can be said regarding the following two statements?

Statement 1: Aggressive Ltd.'s lowest revenues are from MP.

Statement 2: Honest Ltd.'s lowest revenues are from Bihar.

- (1) If statement 2 is true then statement 1 is necessarily false.
- (2) If statement 1 is false then statement 2 is necessarily true.
- (3) If statement 1 is true then statement 2 is necessarily true.
- (4) None of the above.

- 85.** What can be said regarding the following two statements?

Statement 1: Honest Ltd. has the highest share in the UP market.

Statement 2: Aggressive Ltd. has the highest share in the Bihar market.

- (1) Both statements could be true.
- (2) At least one of the statements must be true.
- (3) At most one of the statements is true.
- (4) None of the above.

- 86.** If Profitable Ltd.'s lowest revenue is from UP, then which of the following is true?

- (1) Truthful Ltd.'s lowest revenues are from MP.
- (2) Truthful Ltd.'s lowest revenues are from Bihar.
- (3) Truthful Ltd.'s lowest revenues are from UP.
- (4) No definite conclusion is possible.

Solutions for questions 83 to 86:

Given that,

In the state of MP, Truthful Ltd. has the highest market share. Hence, Truthful Ltd must be either Firm A or Firm C. Now, let us analyse the questions by considering these two cases.

Case (i)

Truthful Ltd is Firm A

		Revenue
Truthful	Firm A	190
Profitable	Firm D	185
Honest	Firm B/ Firm C	217/222
Aggressive	Firm C/ Firm B	222/217

Case (ii)

Truthful Ltd is Firm C

		Revenue
Truthful	Firm C	222
Profitable	Firm B	217
Honest	Firm A/ Firm D	190/185
Aggressive	Firm D/ Firm A	185/190

83. Statement 1:

Profitable Ltd has the lowest share in M.P. market i.e., Profitable Ltd is Firm B, with a total revenue of 217 million rupees.

⇒ Honest Ltd is either Firm A or Firm D with a total revenue of 185 million rupees or 190 million rupees. In any case, the total revenue of Honest Ltd cannot be more than the revenue of Profitable Ltd.

Hence, if statement 1 is true then statement 2 is false.

Choice (2)

84. Statement 1:

If statement 1 is true, i.e., Aggressive Ltd's lowest revenues are from M.P., then Aggressive Ltd must be Firm B. In that case Honest Ltd must be Firm C and for firm C i.e., the lowest revenues are from Bihar i.e., statement 2 is true.

∴ If statement 1 is true, statement 2 is true.

From choices only choice (3) is satisfied.

Choice (3)

85. Statement 1:

Honest Ltd has the highest share in UP market i.e., Honest Ltd must be Firm B i.e. Case (i) is applicable and Honest Ltd has a total revenue of 217 million rupees.

Statement 2:

Aggressive Ltd has the highest share in Bihar market i.e., Aggressive Ltd is Firm B and has a total revenue of 217 million rupees.

∴ Now considering both the statements, at most one of the statement can be true as only one among Aggressive Ltd and Honest Ltd can have a total revenue of 217 million rupees.

Choice (3)

86. Profitable Ltd has its lowest revenue from UP.

∴ Profitable Ltd must be Firm D.

∴ Truthful is firm A and its lowest revenue is from U.P.

Choice (3)

Answer Questions 87 to 90 on the basis of the information given below:

Help Distress (HD) is an NGO involved in providing assistance to people suffering from natural disasters. Currently, it has 37 volunteers. They are involved in three projects: Tsunami Relief (TR) in Tamil Nadu, Flood Relief (FR) in Maharashtra, and Earthquake (ER) in Gujarat. Each volunteer working with Help Distress has to be involved in at least one relief work project.

- (i) A Maximum number of volunteers are involved in the FR project. Among them, the number of volunteers involved in FR project alone is equal to the volunteers having additional involvement in the ER project.
- (ii) The number of volunteers involved in the ER project alone is double the number of volunteers involved in all the three projects.
- (iii) 17 volunteers are involved in the TR project.
- (iv) The number of volunteers involved in the TR project alone is one less than the number of volunteers involved in ER project alone.
- (v) Ten volunteers involved in the TR project are also involved in at least one more project.

- 87.** Based on the information given above, the minimum number of volunteers involved in both FR and TR projects, but not in the ER project is:

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

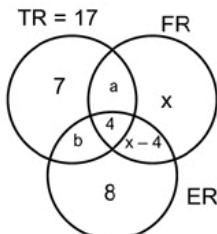
88. Which of the following additional information would enable to find the exact number of volunteers involved in various projects?
- Twenty volunteers are involved in FR.
 - Four volunteers are involved in all the three projects.
 - Twenty three volunteers are involved in exactly one project.
 - No need for any additional information.
89. After some time, the volunteers who were involved in all the three projects were asked to withdraw from one project. As a result, one of the volunteers opted out of the TR project, and one opted out of the ER project, while the remaining ones involved in all the three projects opted out of the FR project. Which of the following statements, then, necessarily follows?
- The lowest number of volunteers is now in TR project.
 - More volunteers are now in FR project as compared to ER project.
 - More volunteers are now in TR project as compared to ER project.
 - None of the above.
90. After the withdrawal of volunteers, as indicated in Question 89, some new volunteers joined the NGO. Each one of them was allotted only one project in a manner such that, the number of volunteers working in one project alone for each of the three projects became identical. At that point, it was also found that the number of volunteers involved in FR and ER projects was the same as the number of volunteers involved in TR and ER projects. Which of the projects now has the highest number of volunteers?
- ER
 - FR
 - TR
 - Cannot be determined

Solutions for questions 87 to 90:

FR project has the maximum number of volunteers. Let number of volunteers involved in all the three projects be V. Then the number of people involved in ER project alone will be $2V$, and number of volunteers in TR alone will be $2V - 1$.

Since 17 volunteers are involved in the TR project and 10 of them are involved in at least one other project, 7 of them are involved in TR project alone. So number of volunteers involved in ER project alone is $1 + 7 = 8$ and number of volunteers involved in all the projects is $8/2 = 4$. We also know that the number of volunteers in FR alone is the same as those who have additional involvement in ER. Let each of these be x.

Drawing a venn diagram for the available information, we have



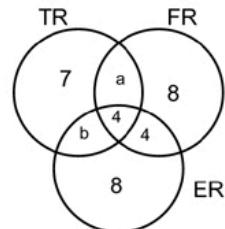
$$a + b = 17 - 7 = 4 = 6 \quad \text{--- (1)}$$

$$\text{Also } 7 + (a + b) + 4 + 8 + x + (x - 4) = 37$$

$$\Rightarrow 7 + 6 + 4 + 8 + 2x - 4 = 37 \Rightarrow 2x = 16$$

$$x = 8$$

The final venn diagram would be



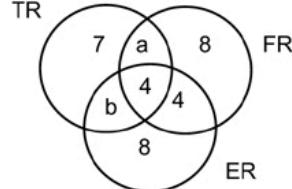
87. Since FR has a maximum number of volunteers $FR(16 + a)$ must be not less than $ER(16 + b)$ or $TR(17)$.
 \therefore Least possible value of a, satisfying the above condition is $a = b = 3$ ($\because a + b = 6$)

Minimum value of a = 3

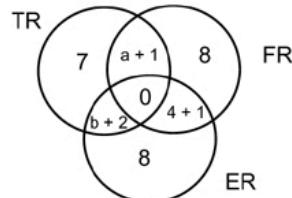
Note: The students must observe that the interpretation CAT has given to the phrase "A maximum number " is that "there is no other number greater than it". This interpretation is different from the conventional interpretation, which reads as "There is no other number either equal to or greater than it." Choice (2)

88. If it is known that twenty volunteers are involved in FR, we can find the value of 'a' and 'b' and hence the number of volunteers in each project. Choice (1)

89.



If one volunteer drops out of the TR project among the four who are involved in all the projects, he will be working only on FR and ER, So $FR + ER$ becomes $4 + 1 = 5$. Similarly when one opts out of ER project, $FR + TR$ becomes $a + 1$ and when two opt out of FR project among the four, $TR + ER$ becomes $b + 2$. So the new venn diagram becomes



From the previous question $3 \leq a \leq 6$.

\therefore FR can be 17, 18, 19 or 20. Also, since $0 \leq b \leq 3$, ER can be 15, 16, 17 or 18. Now the possibilities are $(FR, ER, TR) = (17, 18, 16)$ or $(18, 17, 16)$ or $(19, 16, 16)$ or $(20, 15, 16)$ From above four cases, none of the three choices need not be true. Choice (4)

90. Since the addition of volunteers was such that they were allotted to only one project each and the number of volunteers working in one project alone for each of the three projects became identical, let us take it as k. Here, the number of volunteers in $(FR + ER)$ and $(TR + ER)$ will not be effected.

Given $(FR + ER) = (TR + ER)$

$$\Rightarrow (4 + 1 + 0) = b + 2 \text{ (from the figure in solution 89)}$$

$$\Rightarrow b = 3 \text{ and hence } a = 3 \Rightarrow FR = (a + 1) + k + (4 + 1)$$

$$= k + 9; ER = (b + 2) + k + (4 + 1) = k + 10$$

$$TR = (b + 2) + k + (a + 1) = k + 9$$

ER has the highest number of volunteers.

Choice (1)

