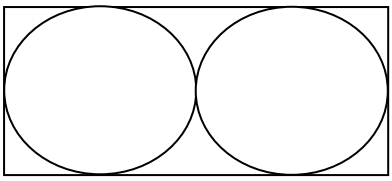
CAT 2005 Answer Key

1.	4	**26.**	4	**51.**	1	**76.**	1
2.	1	**27.**	1	**52.**	3	**77.**	3
3.	2	**28.**	2	**53.**	3	**78.**	3
4.	2	**29.**	3	**54.**	4	**79.**	3
5.	4	**30.**	2	**55.**	3	**80.**	1
6.	4	**31.**	2	**56.**	3	**81.**	2
7.	3	**32.**	2	**57.**	2	**82.**	4
8.	1	**33.**	4	**58.**	3	**83.**	4
9.	3	**34.**	2	**59.**	2	**84.**	4
10.	2	**35.**	3	**60.**	1	**85.**	1
11.	1	**36.**	3	**61.**	4	**86.**	4
12.	2	**37.**	4	**62.**	1	**87.**	1
13.	1	**38.**	1	**63.**	2	**88.**	2
14.	4	**39.**	3	**64.**	2	**89.**	3
15.	3	**40.**	2	**65.**	2	**90.**	2
16.	3	**41.**	1	**66.**	1		
17.	2	**42.**	4	**67.**	1		
18.	1	**43.**	4	**68.**	3		
19.	4	**44.**	3	**69.**	3		
20.	1	**45.**	1	**70.**	3		
21.	3	**46.**	1	**71.**	2		
22.	4	**47.**	4	**72.**	3		
23.	4	**48.**	3	**73.**	3		
24.	3	**49.**	1	**74.**	3		
25.	2	**50.**	2	**75.**	4		

CAT 2005 Solutions

1.

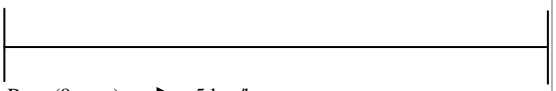


Now one person travels the perimeter of the rectangle and the other travels the circumference of the circle twice. Let the radius of the circle be 7. Then B travels $2 \times 2 \times 22/7 \times 7 = 88$. And A has to travel the perimeter of the rectangle.
The breadth of the rectangle becomes 14 and the length becomes 28. The perimeter thus becomes 84. Now B has to travel 88 in the same time.
s his speed should be greater than A by $100 \times 484 = 4.72\%$.
Thus 4th option.

2.

In 45 games, both were girls $\Rightarrow {}^{n}C_2 = 45 \Rightarrow$ (no. of girls) = n = 10. Similarly in 190 games, both were boys $\Rightarrow {}^{m}C_2 = 190$. $\Rightarrow$ No. of boys = m = 20. $\therefore$ Reqd. answer = ${}^{m}C_1 \times {}^{n}C_1 = 20 \times 10 = 200$.

3.



Ram (9 a.m.) $\longrightarrow$ 5 km/hr
Shyam (9:45 a.m.) $\longrightarrow$ 10 km/hr.
When Shyam leaves at 9:45 a.m.,
Ram has already covered $\frac{15}{4}$ km and $\frac{5}{4}$ km is left to reach B.
At this point, Shyam leaves and now they both are traveling and they cover a combined distance of $5 + \frac{5}{4}$ km in

$$\frac{5+\frac{5}{4}}{10+5} \text{ hrs} = \frac{25}{4\times 15} \text{ hrs} = \frac{25}{60}\times 60 \text{ mnts} = 25 \text{ mnts after}$$

9.45. $\therefore$ 10 : 10 a.m. Hence 2nd option.

4.

At 10 am, Ram reaches Point B whereas at 10:15 am, Shyam reaches Point B. In 15 minutes between 10 and 10:15 am, Ram has moved ahead by $\frac{5}{4}$ km. So Shyam would overtake him in $\frac{\frac{5}{4}}{(10-5)}\times 60$ min. $= \frac{5}{20}\times 60 = 15$ min after 10:15 am.
Hence 10:30 am is the answer. Option (2).

5.

$$R = \frac{30^{65}-29^{65}}{30^{64}+29^{64}} = \frac{(29+1)^{65}-29^{65}}{(29+1)^{64}+29^{64}}$$

$$= \frac{29^{65}\left(1+\frac{1}{29}\right)^{65}-29^{65}}{29^{64}\left(1+\frac{1}{29}\right)^{64}+29^{64}} = \frac{29^{65\left[\left(1+\frac{1}{29}\right)^{65}-1\right]}}{29^{64\left[\left(1+\frac{1}{29}\right)^{64}+1\right]}}$$

$$= 29\left[\frac{\left(1+\frac{1}{29}\right)^{65}-1}{\left(1+\frac{1}{29}\right)^{64}+1}\right]$$

. This figure within bracket is positive.
Hence R > 1.0.

6.

Using Pythagoras theorem in ΔOCD

$$OD = \sqrt{20^2-16^2} = 12.$$

Similarly in ΔOAB, OB = 16 $\Rightarrow$ DB = 4.
Hence answer is 4th option.

7.

$x^2 - y^2 = 0 \Rightarrow x^2 = y^2$. Also $(x - k)^2 + y^2 = 1$. Going by options, putting $k = \sqrt{2}$, we get

$$\left(x-\sqrt{2}\right)^2 + y^2 = 1 \Rightarrow \left(x-\sqrt{2}\right)^2 + x^2 = 1 \Rightarrow x^2 + 2 - 2\sqrt{2}\,x + x^2 = 1 \Rightarrow 2x^2 - 2\sqrt{2}\,x + 1 = 0$$

$$\Rightarrow \left(\sqrt{2}x-1\right)^2 = 0 \Rightarrow x = \frac{1}{\sqrt{2}}.$$ Hence ans. is 3rd option.

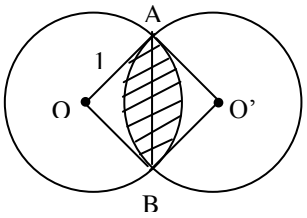
8.

As $a^3 + b^3 + c^3 + d^3$ is divisible by a + b + c + d. $\therefore$ $16^3 + 17^3 + 18^3 + 19^3$ is divisible by 16 + 17 + 18 + 19 = 70. Hence remainder = 0. So answer is option 1.

9.

Going by options, net flow to A = + 90 - 30 = + 60 litres/min.
$\Rightarrow$ It will never get emptied. Net flow to C = 100 - 90 - 50 = - 40 litres/min
$\Rightarrow$ It will get emptied in 25 min. As such there is no option.
Net flow to D = 60 - 110 = -50 litres/min $\Rightarrow$ It will get emptied in 20 min. Hence 3rd option.

10.



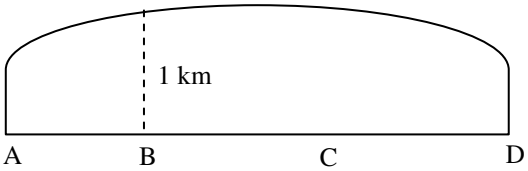
r = 1 cm = side of the square.
So area of the shaded portion is $\rightarrow$ (Area of sector OAB - Area of ΔOAB) $\times$ 2.

$$= \left[\pi(1)^2 \times \frac{1}{4} - \frac{1}{2}\times 1\times 1\right]\times 2. = \frac{\pi}{2} - 1.$$ Hence option (2).

11.

$30^{2720} = 3^{2720} \times 10^{2720}$. Power cycle of 3 is 3, 9, 7, 1. So $3^{2720} = 3^{4\times 680}$. So it is 1. Hence answer is 1st option.

12.

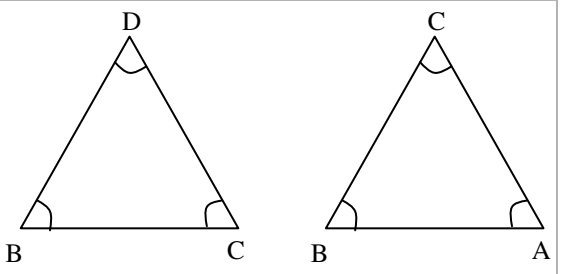


AB = BC = CD = 1m.
The minimum distance that the ant will travel is as shown in the figure i.e. in circular motion from A-B, then straight line from B-C and then again circular from C to D.
$\therefore$ For circular motion, radius = 1 mtr. $\therefore$ Length of arc =

$$2\pi r \times \frac{1}{4} = 2\pi(1)\times\frac{1}{4} = \frac{\pi}{2}\text{m}$$

From A-B = $\frac{\pi}{2}$m, B-C = 1 m. (Straight line), C-D = $\frac{\pi}{2}$m.
Hence Total = (π + 1)m. Hence Option 2.

13.



In Δ(ABC) and Δ(BCD)

$\angle B = \angle B$

$\angle C = \angle A$

$$\frac{BD}{BC} = \frac{BC}{BA} = \frac{CD}{CA}$$

$$\frac{9}{12} = \frac{12}{BA} = \frac{6}{CA}$$

BA = 16 CA = 8

$\therefore$ AD = 7, $\therefore$ Perimeter of ΔADC = 7 + 8 + 6 = 21

$\therefore$ Perimeter of ΔBDC = 9 + 6 + 12 = 27

$\therefore$ Ratio = $\frac{21}{27} = \frac{7}{9}$. Hence 1st option.

14.

$P_n + S_n = n$. Between 10 and 1000, we have to solve for 2 digit numbers. Let the number be xy

$\therefore xy + x + y = 10x + y \Rightarrow xy = 9x$

$\Rightarrow y = 9$. So there are 9 two digit numbers which satisfy these conditions. These numbers are 19, 29, 39, 49, 59, 69, 79, 89, 99. There are no three digit numbers which satisfy these conditions. Hence answer is 4th option.

15.

We have to actually fit-in the tiles.
Actual fitting gives us the maximum number of tiles as 6.
Hence answer is 3rd option.

16.

$|x + y| + |x - y| = 4$

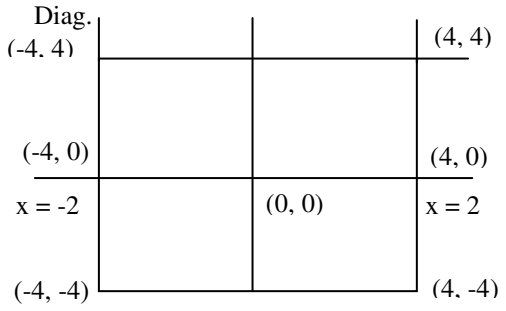
$\Rightarrow x + y + x - y = 4 \Rightarrow x = 2$

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

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

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

Area = 4 × 4 = 16

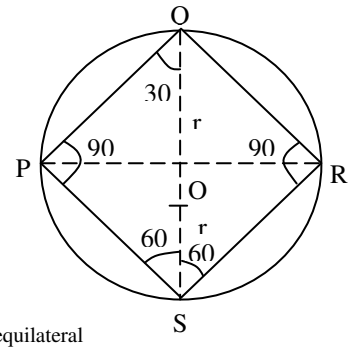


17.

Join OD. Now OD = 1.5. LN : LM = 1 : 2. NL = 1 and OL = 0.5 and OM = 1.5. Now by the similar logic. HL = 0.5. Let DH = x. $\therefore \left(x + \frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2 = \left(\frac{3}{2}\right)^2 \Rightarrow x = \frac{2\sqrt{2} - 1}{2}$.

So answer is 2nd Option.

18.



ΔPQR is equilateral

Thus $\angle PQR = 60°$

$\Rightarrow \angle PSR = 120°$

From ΔPQS, $\angle PQS = 30°$

$\angle PSQ = 60°$ & $\angle QPS = 90°$

Thus PQ = $\sqrt{3}r$, PS = r & QS = 2r

Thus Perimeter = 2 × (PQ + PS)

$= 2(\sqrt{3}r + r)$

$= 2r(\sqrt{3} + 1)$

19.

$\text{Log}_x\left(\frac{x}{y}\right) + \text{Log}_y\left(\frac{y}{x}\right) = \text{Log}_x{}^x - \text{Log}_x{}^y + \text{Log}_y{}^y - \text{Log}_y{}^x$

$= 2 - \left(\text{Log}_x{}^y + \text{Log}_y{}^x\right) = 2$ - (Number added to its reciprocal ≥ 2). Thus $\text{Log}_x\left(\frac{x}{y}\right) + \text{Log}_y\left(\frac{y}{x}\right)$ can never be +ive. Hence 4th option.

20.

The possible elements of S are 1155, 1179, 1197, 1137, 1173, 1119, 1191, 1113 and 1131. They are 9 in number. Hence answer is 1st option.

21.

$x = \sqrt{4 + \sqrt{4 - \sqrt{4 + 4 -}}}$ to infinity. $\therefore x$ can be expressed as $x = \sqrt{4 + \sqrt{4 - x}}$. Putting the value of x as $\frac{1 + \sqrt{13}}{2}$, we get LHS = RHS. Hence answer is 3rd option.

22.

$g(x + 1) + g(x - 1) = g(x)$

Thus g(1) + g(-1) = g(0) ---------- (i)

g(2) + g(0) = g(1) ---------- (ii)

g(3) + g(1) = g(2) ---------- (iii)

g(4) + g(2) = g(3) ---------- (iv)

g(5) + g(3) = g(4) ---------- (v)

g(6) + g(4) = g(5) ---------- (vi)

Solving g(3) = -g(0) and g(6) = -g(3)

Thus g(6) = g(0), Similarly g(7) = g(1)

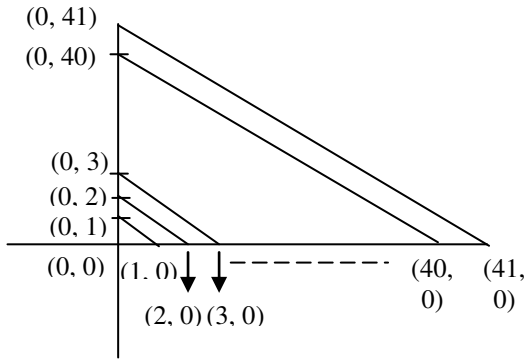
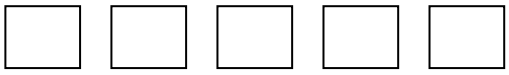
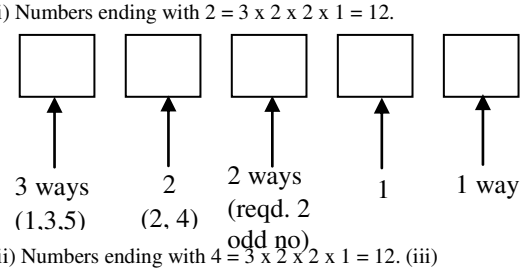
Thus $g(x + 6) = g(x)$, Option (4).

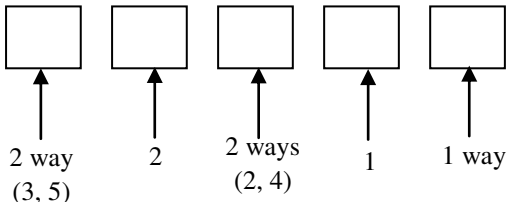
23.

Going by options. If we take 1st option, we take 15 males. They would answer 15 × 40 = 600 calls. The remaining 400 calls would be answered by 8 females. Each male operator costs Rs. 850 (250 + 15 × 40) and each female operator costs Rs. 800 (300 + 10 × 50). We can calculate the cost of option 1. Now options 2 and 3 are not possible as the number of female operators would not be an integral number. For 4th option, the cost comes out to be (850 × 10) + (800 × 12) = Rs. 18100 which is the minimum. Hence answer is 4th option.

24.

Let Englishmen be E_1, E_2 and E_3 and Frenchmen be F_1, F_2 and F_3. Presuming E_3 knows French, so 5 calls are required so that E_3 knows everybody's secret and everybody knows E_3's secret. One call would from E_1 to E_2. Besides this, 3 calls i.e. F_1 to F_2, F_2 to F_3 and F_1 to F_3. Hence total number of calls = 5

	+ 1 + 3 = 9. So answer is 3rd option.
25.	Consider the dimensions of the floor = 12 × 5 and the dimensions of the tile = 1 × 1 As per the question, outside dimensions = 12 × 5, inside dimensions = 10 × 3. A possible value along one edge = 12.
26.	If p was given to = 1! + (2 × 2!), its value becomes 5. When you add 2 in that, it becomes 7. When this is divided by 3! you get a remainder of 1. Similarly taking the next prime number 5, take p as 4. You find the value of p becomes 1! + (2 × 2!) + (3 × 3!) + (4 × 4!) = 119. Adding 2 in that you get 121, which is 1 more than (p +1) ! = 120. Thus remainder is again 1. Similarly for all such p + 2 numbers (where p + 1 happens to a prime number), when values are calculated these are always equal to (p + 1)! + 1. Now when it is divided by (p + 1)!, the remainder is 1. Thus 4th option.
27.	In this question, leaving the Border Points, total number of integer points inside the triangle are Between coordinates (1, 0) – (0, 1) and (2, 0) – (0, 2), we have 1 point. [1, 1] Between line (0, 2) – (2, 0) and (0, 3) – (3, 0) we have 2 points [1, 2] [2, 1] and so on. Till (0, 40) and (40, 0) coordinates connecting line which has 39 vertices. ∴ Sum is 1 + 2 + 3 + 4 …… 39 $= \frac{n(n+1)}{2} = \frac{39 \times 40}{2} = 780$ Option (1). 
28.	The four numbers which satisfy the given conditions are 108, 118, 239 and 299. So the answer is 2nd option.
29.	$a_1 = 1$, $a_{n+1} - 3a_n + 2 = 4n$. Putting n = 1, we get $a_2 - 3 + 2 = 4$ $\Rightarrow a_2 = 5$. Similarly $a_3 = 21$. Now $a_1 = 1$ can be written as $3^1 - 2 \times 1$, $a_2 = 5$ can be written as $3^2 - 2 \times 2$, $a_3 = 21$ can be written as $3^3 - 2 \times 3$. So general term becomes $a_n = 3^{100} - 2 \times n$. So $a_{100} = 3^{100} - 200$. Hence answer is 3rd option.
30.	 We have 1, 2, 3, 4, 5 (5 digits) and 5 places viz 1st, 2nd, 3rd, 4th, 5th i.e. 2 even (2nd & 4th place), 3 odd (1st, 3rd, 5th place) (i) Numbers ending with 2 = 3 x 2 x 2 x 1 = 12.  (ii) Numbers ending with 4 = 3 x 2 x 2 x 1 = 12. (iii) Numbers ending with 1 = 2 x 2 x 2 = 8

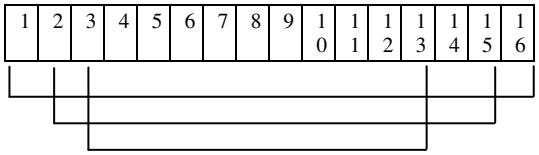
	 (iv) Numbers ending with 3 = 2 × 2 × 2 × 1 = 8 (v) Numbers ending with 5 = 2 × 2 × 2 × 1 = 8 Case (iii), (iv) & (v) will have repitition when odd digits are placed at 3rd & 5th place. The sum of digits = 12 × 2 + 12 × 4 + 8 × (1 + 3 + 5) × 2 = 216. So option (2).
31.	Line C represents a culmination of the idea of prices being describable in line D. E-B is a good combination.
32.	E is a brilliant opening line, while B exemplifies the ideas contained in E, resulting in E-B. Note the word *these* in line C carefully, which refers to class deprivation and gender discrimination of line D.
33.	If C talks of *similar neglect*, this line has to be preceded by an example of neglect, which is found only in B. E presents a beautiful contrast with C.
34.	In terms of the third paragraph, interesting psychology is one which involves an inner conflict. Only option 3, which involves a conflict between cooperation and competition is a suitable example. The rest exemplify purely rational situations, which are not interesting, in terms of the author's ideas..
35.	"The effort of solving the ……..." from the 4th paragraph is ample indication to this effect.
36.	Please refer back to the 2nd para from the top, starting from the line "Psychologically……."
37.	Please read the contents of the first passage, wherein all the points are duly mentioned.
38.	"I have my hands full….."
39.	Option 3
40.	*"She and her dear friend"* could have been a possible right construction.
41.	It represents in one line the essence of the entire article. Option 2 is certainly narrower in scope as compared to the first one while options 3 and 4 are not justifiable in terms of the contents given.
42.	The author's quotation about Cooper is satirical, implying his skepticism regarding its truth.
43.	The first para talks of prosperity being challenged by economic strain, dominance being challenged and the subsequent para explaining this idea.
44.	Please refer back to the 6th para.
45.	Please go back to lines 8-10 of the 3rd paragraph in the reading selection.
46.	Go back to the last paragraph, especially the first and the last few lines.
47.	Please refer to the third paragraph, especially ther last few lines.
48.	The answer lies in a careful reading of the third paragraph.
50.	When you mix people with differing abilities in a group, the result is *not* always a disaster, ruling out option 1. Option 3 is ridiculous as a group with average ability is never an expert group nor is it innovative because that would presuppose exceptionally creative minds (which are not there in predominant numbers in a mixed group.) One can expect only average results from a mixed group, an idea represented by option 2.
51.	You can easily get the right answer if you pay heed to the

	word *numerous* in the last line of the paragraph. Obviously, you have to chooe a contrasting idea, given only by option 1.
53.	Note the word *sensitive* carefully. Obviously, sensitive people will not be amused by the constant presence of beggar everywhere nor will they be irritated.
54.	The ideas of the briefest possible and the most meaningful response should lead you to rule out options 1 and 2. One does not need to spend much effort in sifting the right answer from the options left out.
55.	The answer emanates from the the words, *new gloss*, which help you decode that an old idea has been presented in a fresh form.
57.	*"Rarely has the economic ascent of two nations been watched ...", "In the complete spectrum ...."*
59.	B is wrong as "*....individual stars harness themselves to the product....*" does not make any sense. So is true of sentence C "*.... and become a plurality...*"
60.	It should have read like "*.....assist the chemical reactions...*" in line A *",... causing them to break...."* in line B, and "*Many an offending chermical has now .....* " in line C.
61.	e.g. Himachal Pradesh Rice Production = $\frac{1.2 \text{ mn}}{6 \text{ mn}} = \frac{12 \times 10^5}{6 \text{ mn}} =$ [200000/ 1mn]. Comparing this way we get states like, Haryana, Gujarat, Punjab, Madhya Pradesh, Tamil Nadu, Maharashtra, Uttar Pradesh, Andhra Pradesh. Hence '8' states. Option (4).
62.	Haryana $\frac{19.2}{80\%\,(4)}$ Punjab $\frac{24}{80\%\,(5)}$ A. P. $\frac{112}{80\%\,(28)}$ U. P. $\frac{67.2}{70\%\,(24)}$ Haryana and Punjab have higher productivity.
63.	Gujrat's per capita production = $\frac{24}{51} = .47$. The states which have the ratio greater than (.47) are :- Haryana, Punjab, Maharasthra, Andhra Pradesh. Hence 4 states.
64.	Out of three workshop, one cannot attend a workshop if one is busy in Jan, Feb or Mar. Gayatri is busy in Feb & Mar thus she can only attend one workshop on communication skills, which she is not interested in. Exactly the same is case for Urvashi. Only Zeena can attend only one workshop. Thus 2nd option. Mind it question is talking about executives and not employees.
65.	As calculated in the above question Gayatri & Urvashi cannot attend any workshop and these both have been given only in the 2nd option. Thus it becomes the answer.
66.	In the 2nd, 3rd and 4th choices Dinesh, Anshul & Fatima cannot attend the workshop on communication skills because they all busy in internal projects in the month of January.
67.	There is only one faculty member who retires. So in all the four categories, the category from which a faculty member retires should have a drop in average twice from period 2000-2003. This happens only in Finance. Hence
68.	In 2002, the huge difference in average is a indicator which gives us the answer to be 2002 itself. Calculation : 4 members are left in finance in 2001. By 2002 their average age is 50. Suppose the new faculty (Age 25) join in 2002, Average = $\frac{50 \times 4 + 25}{5} = 45$. [Avg in 02].
69.	New faculty joined OM in 2001 at age of 25. So by April 1, 2003. His age should be 27. Option (3).
70.	Considering that both were born in the month of November, so by April 1 -2000 ,the age of Naresh and Devesh would be 52.33 and 49.33 years(approximately) of age respectively. So the age of the third faculty in year 2000 of marketing field is :- $49.33 \times 3 - 52.33 - 49.33 = 46.33$. So by year 2005, his age should be 51.33. Hence he would have completed exactly 51 years.
71.	Condition (1) Honest /Aggr Profitbl Truthfl Hones /Aggr Condition (2) Truthfl Honest/Aggr Honest/Aggr Profitbl

	A	B	C	D
UP	49	82	80	55
Bihar	69	72	70	65
MP	72	63	72	65
	190	217	222	185

Two conditions of arrangements are possible. Given that Truthful Ltd. has the highest market share in the state of MP. 72 in MP, comes under 2 places, either A or C. So for both conditions we can have two arrangements as shown in the figure above as Condition(1) and Condition(2)
Statement I if true, Profitable Ltd (P) has lowest share in MP. Then P should be B.
Hence we go to condition 1. In condition (1), Honest Ltd can be either A on D, and in both cases its total would be less than that of P (217). Hence option (2).

72.	According to first statement condition (1) can be followed where Honest Ltd can be either B or C. According to Second statement, condition (2) can be seen where Aggressive Ltd can be firm D. So either of (2) may be true but not both. Both can also be false. But we can go for option (3). Atmost one statement can be true. Hence option (3).
73.	In option (3), If statement 1 is true, then only one option, firm 'B' is minimum in HP. So it should be aggressive. So we come to condition (2) where if Aggressive Ltd is B, then Honest Ltd should be firm 'C', where lowest is from Bihar. Hence Option (3).
74.	Lowest of Profitable Ltd is from UP means, it should be firm D, and we follow condition 2. Here Truthful Ltd has lowest from UP. Hence Option (3)
75.	Winners of the 1st round



Matches will be played in the 2nd round between (1, 16) (2, 15) (3, 14) and so on.
Therefore 2nd round matches are

1	2	3	4	5	6	7	8
(1, 16)	(2, 15)	(3, 14)	(4, 13)	(5, 12)	(6, 11)	(7, 10)	(8, 9)
↓	↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	11	10	9

Matches 6, 7, 8 had upsets. So now in quarterfinals, 1 will play with 9. 9th seed = Nadia Petrova. Lindsay Davenport is 2nd seed and she will play with seed 10 (versus Williams). Hence option (4).

76.	After 1st round, winners are :-

1	31	3	29	5	27	7	25	9	23	11	21	13	19	15	17

2nd round matches :-
(1, 17) (31, 15) (3, 19) (28, 13) (5, 21) (27, 11) (7, 23) (25, 9)
No upsets in 2nd round, so winners are

1, 15, 3, 13, 5, 11, 7, 9

Quarterfinal Matches are between

(1, 9) (15, 7) (3, 11) (13, 5)

Maria sharapova will face one of the winner of the 4th match, that is between seed 13 or seed 5. Minimum is seed (13) as upset case might be possible here. Hence option (1).

77. Winners of 1st round :-

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Matches in the 2nd round

(1, 16) (2, 15) (3, 14) (4, 13) (5, 12) (6, 11) (7, 10) (8, 9). 6 and 8 loose and 7 and 9 win.

Winners of 2nd Round:-

1	x	x	x	x	11	7	9

In quarterfinals, 1 plays with 9. Hence Option (3).

78. Quarterfinal seeds

1 2 3 4 5 6 7 8

Quarterfinal matches are between

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

1 x x 4/5

Now semifinal is between

1 x x 4/5

If Maria sharapova reaches final then she has definitely beaten either seed 4 or seed 5. Hence option (3).

79. Take the people involved in all the three as Y and thus people involved in ER only become 2Y and people involved in TR only also becomes 2Y. As there are 17 people involved in TR and given 10 people out of these are involved at least one more project. That leaves 7 people involved in TR only. Equating it with 2Y – 1, you get Y = 4. Thus only TR = 7 and only ER = 8. Taking the values of only TR & ER only as x and TR & FR only as z. Their sum happens to be 6. Taking it and solving only FR becomes 8 and the portion representing only FR & ER becomes 4. Now As FR is given to be having maximum involvements the value of Z cannot be taken as 3 or less. Thus it will be minimum 4. Hence 3rd option.

80. As calculated above, knowing that 20 people are involved in FR. The people involved in TR & ER but not in FR are 2. This means there are 4 people involved in TR & FR but not in ER. Similarly all the other values can also be calculated. Thus 1st option.

81. There are four possibilities for the people involved only in TR & ER it could be 0, 1, 2, 3. Taking all the possibilities into account only the 2nd option happens to be always true.

82. From the information given there are four possibilities, but none of them can be definitely concluded. Thus it cannot be determined.

83. The no. of votes Paris got is 24. Thus 4th option.

84.

Round	Total Votes Cast	Maximum Votes Cast		Eliminated	
		City	No. of votes	City	No. of votes
1	82*	London	30	New York	12
2	83	Paris	32	Beijing	21
3	75	London	38#	Paris	37#

Just see the # given in the above table.

From the second round the composition of votes for Beijing is (0.75 × 16 = 12) + (9 from New York as calculated above). Now out of these 21, 9 are not eligible to cast vote (because their contending cities have lost twice). As the no. of voters, who are voting for London, will keep on doing so (as stated in the information). The no. of total votes for London could be either 37 or 38 (because a difference of 1 is given in the information). Now 37 is not possible as 7 cannot be any percentage of 12 (eligible voters of Beijing from second round). Thus London must have 38 votes. Hence 8 out of 12 votes means 100 × 8/12 = 66.67%. Thus 4th option.

85. From previous question, in round 1 Paris had 24 votes, which increases to 32 in the second round. 8 (3 votes from New York, 4 from Beijing and 1 from IOC member from New York) more votes are added. Out of the two statements given only (a) is true. Thus first option is the answer.

86. Reading the information the following table can be made

Round	Total Votes Cast	Maximum Votes Cast		Eliminated	
		City	No. of votes	City	No. of votes
1	82*	London	30	New York	12
2	83	Paris	32	Beijing	21
3	75				

*We reached at the figure of 82 since all the members of the contending cities did not vote in the first round. Now as New York was eliminated its member votes in the second round and because in the second round the no. of votes are 83, the same no. should be 1 less in the first round.

Now work with options to eliminate choices. 1st and 3rd options are not possible because it does not provide us with an integral number of votes for Beijing in the first round (because votes cannot be fractions). Now between 2nd & 4th option, with 2nd option we get 20 votes for Beijing and 20 votes for Paris in the first round. But it cannot be true as from the next question it can be deduced that 20 cannot be the votes for Paris in the first round. That leaves us with only the 4th option, which gives 16 votes for Beijing and 24 votes for Paris.

87.

A	B	C	D
20	10	30	40

For Min. Average return

B would give double return

A would one and a half time return =

$$\frac{20(1.5)+10(2)+30+40}{4} = \frac{120}{4} = 30\%$$

88. 35% Return = Total 140 for A, B, C and D. This is possible if A gives double and D gives 1.5 times return OR A gives 1.5 times return and C gives double return. So, A gave extraordinary return in both cases. C and D may or may not have given extraordinary return. B did not give extraordinary return in either case. Hence option (2) is true.

89. 38.75% Return = Total 155 for A, B, C and D. This is possible if D gives double and C give 1.5 times return. D Cement or IT. C Auto or steel.

90. Since C belong to Cement or IT so it should give 60% return. For maximum average return D gives 1.5 times return hence 60% return and maximum average return becomes = 20 + 10 + 60 + 60 / 4 = 150 / 4 = 37.5%.

For minimum average return B gives 1.5 times return hence minimum average return is = 20 + 15 + 60 + 40 = 135 / 4 = 33.75%. So, we can say option 2 and option 4 is true. Hence choice is (2).