

CAT PAPER – 2004

ANSWERS and EXPLANATIONS

1	1	2	4	3	2	4	3	5	3	6	4	7	4	8	1	9	1	10	3
11	1	12	2	13	2	14	3	15	4	16	1	17	4	18	1	19	2	20	4
21	1	22	1	23	1	24	2	25	3	26	4	27	3	28	1	29	2	30	2
31	4	32	3	33	3	34	4	35	4	36	2	37	4	38	4	39	3	40	2
41	1	42	2	43	1	44	2	45	1	46	1	47	3	48	4	49	4	50	2
51	3	52	4	53	2	54	2	55	3	56	4	57	4	58	3	59	4	60	3
61	3	62	2	63	3	64	2	65	1	66	2	67	2	68	4	69	4	70	1
71	3	72	3	73	1	74	2	75	1	76	4	77	3	78	2	79	4	80	3
81	1	82	4	83	1	84	3	85	2	86	1	87	3	88	3	89	4	90	2
91	4	92	2	93	1	94	2	95	4	96	1	97	2	98	1	99	3	100	3
101	1	102	1	103	2	104	4	105	2	106	1	107	1	108	3	109	4	110	4
111	3	112	3	113	3	114	3	115	2	116	3	117	2	118	2	119	3	120	1
121	3	122	2	123	4														

Scoring table

Section	Question number	Total questions	Total attempted	Total correct	Total wrong	Net Score	Time Taken
DI	1 to 38	38					
Quant	39 to 73	35					
EU + RC	74 to 123	50					
Total		123					

SUP-0001/09

1. 1 GPA of Preeti = 3.2
i.e. $\frac{F+D+X+D+Y}{5} = 3.2$
 $0 + 2 + x + 2 + y = 16$
 $x + y = 12$
So only combination possible is A, A.
So Preeti obtained A grade in statistics.
2. 4 Tara received same grade in 3 courses. We already know that Tara has got B grade in one of the subject and GPA is 2.4. So in 3 courses in which he scored same grade is B.
So Tara has received the same grade as Manab.
3. 2 GPA of Gowri is 3.8
i.e. $3 + 3 + 6 + x + 4 = 3.8 \times 5$
 $16 + x = 18$
 $x = 2$
So in strategy, Gowri's grade is C.
Rahul's grade in strategy = $(4.2 \times 5) - 15 = 6$, i.e., A.
Fazal's grade in strategy = $(2.4 \times 5) - 8 = 4$, i.e., B.
Hence, Gowri's grade will be higher than that of Hari.
4. 3 As Fazal GPA = 2.4
So $D + F + B + P + D = 2.4 \times 5$
 $2 + 0 + 4 + P + 2 = 12$
 $P = 4$
So his grade in strategy is B.
So Grade of Utkarsh in marketing is also B.
So for Utkarsh, $x + B + F + C + A = 3 \times 5$
 $x + 4 + 0 + 3 + 6 = 15$
 $x = 2$
So grade of Utkarsh in finance = D.
5. 3 Average income of Ahuja
 $= \frac{700 + 1700 + 1800}{3} = \frac{4200}{3}$
Average income of Bose
 $= \frac{800 + 1600 + 2300}{3} = \frac{4700}{3}$
Average income of Coomar
 $= \frac{300 + 1100 + 1900}{3} = \frac{3300}{3}$
Average income of Dubey
 $= \frac{1200 + 2800}{2} = \frac{4000}{2}$
It's clear that lowest average income is of Coomar. (It is clear visually as well)
6. 4 From the figure draw a line parallel to the expenditure axis and midway between observations of each family's values.
7. 4 From figure the 1st member of Dubey family is on the line indicating income = expenditure.
The 2nd member is just above the line.
8. 1 Look at the leftmost member of Ahuja family.

Solution for questions 9 to 12:

Comparing Table 1 and 2, university 4 corresponds to UK and university 6 corresponds to USA (after as day 3 values are concerned and university 8 corresponds to India and university 3 to Netherlands now Indian or Netherlands can take university 1 or university 5. Now university 2 and 7 belongs to either UK or Canada (only one)

UNIVERSITY	DAY			COUNTRY
	1	2	3	
University 1	1	0	0	India / Netherlands
University 2	2	0	0	UK / Canada
University 3	0	1	0	Netherlands
University 4	0	0	2	UK
University 5	1	0	0	India/Netherlands
University 6	1	0	1	USA
University 7	2	0	0	UK/Canada
University 8	0	2	0	India

9. 1 10. 3 11. 1 12. 2
13. 2 In 1999, total number of Naya mixer-grinder = 124
Number of Naya mixer-grinder disposed = 20% of 30 = 6
Number of mixtures bought
 $124 = [50 + 24] \quad 50$
14. 3 Number of Naya mixer-grinder disposed in 1999 \Rightarrow 6
Number of Naya mixer-grinder disposed in 2000 \Rightarrow 10
Total disposed by end of 2000 = 16
15. 4 Initial number of Purana mixer-grinder not available, hence cannot be determined.
16. 1 20 Purana mixer-grinder were purchased in 1999.
17. 4 Thailand and Japan (Maximum difference of 4 ranks $(5 - 1) = 4$)
18. 1 China (Maximum difference between 2 parameter is 2)
19. 2 Japan (Maximum difference of 4)
20. 4 Japan and Malaysia (Inferring from question 17)
21. 1 Statement A: 20% of Z > 25% of S
 $\frac{Z}{S} > \frac{5}{4}$ Cannot say.
Statement B: 13% of S > 10% of Z
 \Rightarrow 39% of S > 30% of Z. So 40% of S must be greater than 33% of Z.
Hence statement B is sufficient to answer.

22. 1 Assume A, B, C, D get score 10, 8, 6, 4 resp.
 A B C D
 10 8 6 4
 Statement A:
 With the conditions A will give vote to B
 With the conditions B will give vote to A
 With the conditions C will give vote to A
 Even if D gives to A/B/C - 2 situation arises.
 Either A will win or there will a tie when D gives vote to B.
 Even then A will win.
 So we are getting the answer.
 Statement B: Can conclude anything.
 Answer (1) first statement.
23. 1 Statement A: Cannot say anything.
 Statement B: Because amongst the Top 5 3 are boys, 2 are girls. And Rashmi is third among the girls and Kumar is 6th.
 We can conclude.
 Answer (1) statement II is sufficient.
24. 2 Statement A: We can find, there are 12 Tails and 9 Heads.
 After tosses he will reach at blue point. So statement A is sufficient.
 Statement B: 3 more Tails greater than Heads. So he will reach at blue point after tosses.
 So statement B is also sufficient.
25. 3 Statement A: 2 kg potato cost + 1 kg gourd cost < 1 kg potato cost + 1 kg gourd cost
 \Rightarrow 1 kg potato cost < 1 kg gourd cost.
 So statement A is not sufficient.
 Statement B: 1 kg potato cost + 2 kg onion cost = 1 kg onion cost + 2 kg gourd cost 1 kg potato cost + 1 kg onion cost = 2 kg gourd cost.
 So statement B is also not sufficient.
 Combining both statements we get
 1 kg potato cost < 1 kg gourd cost ... (i)
 1 kg potato cost + 1 kg onion cost = 2 kg gourd cost ... (ii)
 So the onion is costliest.
26. 4 Statement A: 13 currency notes will give diff. Values.
 Statement B: Multiple of 10 and by many.
 Even if you combine the statement, we can have various values.
 Answer is (4).

Solution for questions 27 to 30: Go through the following table.

	Pakistan	South Africa	Australia
K	28	51	< 48
R	< 22	49	55
S	< 22	75	50
V	130	< 49	< 48
Y	40	< 49	87
Top 3 batsman	198	175	192
India Total	220	250	240

27. 3 28. 1 29. 2 30. 2

Solutions for questions 31 to 34: For solving these questions make a table like this:

	Africa	America	Australasia	Europe	
L	0	1	1	1	3
H			1	1	6
P			2	1	6
R			1	1	6
	4	8	5	4	
					21

- (i) As the labour expert is half of each of the other, so the only possible combination is
- $$\begin{matrix} L & - & 3 \\ H & & \\ P & & \\ R & & \end{matrix} \left. \vphantom{\begin{matrix} L \\ H \\ P \\ R \end{matrix}} \right\} 6 \text{ each}$$
- (ii) Statement (d): If the number of Australasia expert is 1 less, i.e. total export are 20 American be twice as each of other. The only combined possible is Americas 8.
 Australasia 4 + 1 = 5
 Europe 4
 Africa 4
 Now, we need to workout the various options possible in the blank cells.

	Africa	America	Australasia	Europe	
L	0	1	1	1	3
H	2	2	1	1	6
P	1	2	2	1	6
R	1	3	1	1	6
	4	8	5	4	
					21

	Africa	America	Australasia	Europe	
L	0	1	1	1	3
H	1	3	1	1	6
P	1	2	2	1	6
R	2	2	1	1	6
	4	8	5	4	
					21

	Africa	America	Australasia	Europe	
L	0	1	1	1	3
H	1	3	1	1	6
P	2	1	2	1	6
R	1	3	1	1	6
	4	8	5	4	
					21

31. 4 32. 3 33. 3 34. 4

Solution for question 35 and 36: After 2nd round, team goals for and goals against table can be drawn:

Team	Round 1 and Round 2 combinations	
	Goals for → Goals against	Goals for → Goals against
Germany	2 → 1	1 → 0
Argentina	1 → 0	1 → 0
Spain	4 → 0	1 → 2 Not possible
	5 → 1	0 → 1 Possible
Pakistan	2 → 0	0 → 1
New Zealand	1 → 2	0 → 4 Not possible
	0 → 1	1 → 5 Possible
South Africa	1 → 2	0 → 2

35. 4 36. 2

Solutions for question 37 and 38: From the statements from (a), (b), (c) given in the problem four teams (Spain, Argentina, Germany, Pakistan) appear to win their matches in the fifth round. However, there are only three matches per round and hence only three teams can win their matches in any round. Hence, the data set appears to be inconsistent.

37. 4 38. 4

39. 3 The boats will be colliding after a time which is given by;

$$t = \frac{20}{5+10} = \frac{4}{3} \text{ hours} = 80 \text{ minutes}$$

After this time of 80 minutes, boat (1) has covered

$$80 \times \frac{5}{60} \text{ kms} = \frac{20}{3} \text{ kms},$$

whereas boat (2) has covered

$$80 \times \frac{10}{60} \text{ kms} = \frac{40}{3} \text{ kms}.$$

After 79 minutes, distance covered by the first boat =

$$d_1 = \left(\frac{20}{3} - \frac{5}{60} \right) \text{ kms}$$

After 79 minutes, distance covered by the second

$$\text{boat} = d_2 = \left(\frac{40}{3} - \frac{10}{60} \right) \text{ kms}$$

So the separation between the two boats

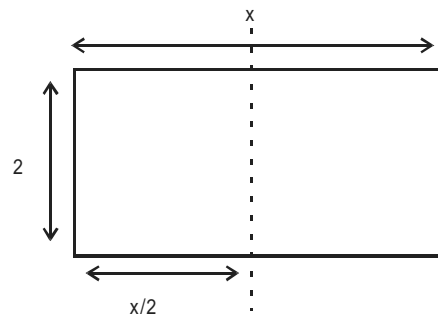
$$= 20 - (d_1 + d_2) = \frac{1}{4} \text{ kms}$$

Alternative method:

Relative speed of two boats = 5 + 10 = 15 km/hr
i.e. in 60 min they cover (together) = 15 km

$$\therefore \text{in 1 min they will cover (together)} \frac{15}{60} = \frac{1}{4} \text{ km}$$

40. 2



$$\text{In original rectangle ratio} = \frac{x}{2}$$

$$\text{In Smaller rectangle ratio} = \frac{2}{\left(\frac{x}{2}\right)}$$

$$\text{Given } \frac{x}{2} = \frac{2}{\frac{x}{2}} \Rightarrow x = 2\sqrt{2}$$

$$\text{Area of smaller rectangle} = \frac{x}{2} \times 2 = x = 2\sqrt{2} \text{ sq. units}$$

41. 1 Given

$$t_1 + t_2 + \dots + t_{11} = t_1 + t_2 + \dots + t_{19} \quad (\text{for an A.P.})$$

$$\Rightarrow \frac{11}{2} [2a + (11-1)d] = \frac{19}{2} [2a + (19-1)d]$$

$$22a + 110d = 38a + 342d$$

$$16a + 232d = 0$$

$$2a + 29d = 0$$

$$\Rightarrow \frac{30}{2} [2a + (30-1)d] = 0$$

$$\Rightarrow S_{30 \text{ terms}} = 0$$

42. 2 When speed of the man = $10 \text{ km/hr} = \frac{d}{t}$ and

$$\text{When speed of the man} = 15 \text{ km/hr} = \frac{d}{t-2}$$

$$\text{Equating the value of } d: 10 \times t = 15 \times (t-2)$$

$$\Rightarrow t = 6 \text{ hours.}$$

$$\text{Finally desired speed} = \frac{d}{t-1} = \frac{10t}{t-1}$$

$$= \frac{10 \times 6}{5} = 12 \text{ km/hr.}$$

43. 1 There will be an increase of 6 times.

No. of members s_1 will be in A.P.

On July 2nd, 2004, s_1 will have $n + 6$ members

$$= n + 6 \times 10.5n$$

$$= 64n$$

No. of members in s_2 will be in G.P

On July 2nd, 2004 Number of members in s_2

$$= nr^6$$

They are equal, Hence $64n = nr^6$

$$\Rightarrow 64 = r^6 \Rightarrow r = 2$$

44. 2 We have

$$f(0) = 0^3 - 4(0) + p = p$$

$$f(1) = 1^3 - 4(1) + p = p - 3$$

If P and $P - 3$ are of opp. signs then $p(p - 3) < 0$

$$\text{Hence } 0 < p < 3.$$

45. 1 We have

$$(1) 10^{10} < n < 10^{11}$$

$$(2) \text{ Sum of the digits for 'n' } = 2$$

Clearly-

(n)min = 10000000001 (1 followed by 9 zeros and finally 1)

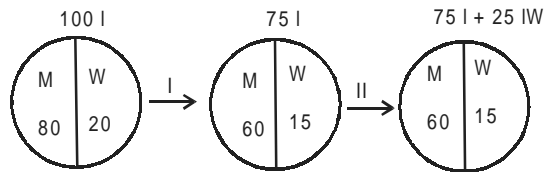
Obviously, we can form 10 such numbers by shifting '1' by one place from right to left again and again.

Again, there is another possibility for 'n'

$$n = 20000000000$$

So finally : No. of different values for $n = 10 + 1 = 11$ ans.

46. 1



The diagram is self explanatory. Removal of 25 litres at stage I will result in volume of milk being reduced by 80% of 25 lit i.e. 20 lit and volume of water being reduced by the remaining 5 lit. So $M = 60$ lit and $W = 15$ lit. Addition of 25 lit water will finally given $M = 60$ lit and $W = 40$ M. Hence the ratio of W and $M = 40 : 60 = 2 : 3$.

47. 3 If $\frac{a}{b+c} = \frac{b}{c+a} = \frac{c}{a+b} = r$

then there are only two possibilities.

(i)

If $a + b + c \neq 0$, then

$$\begin{aligned} \frac{a}{b+c} &= \frac{b}{c+a} = \frac{c}{a+b} = \frac{a+b+c}{(b+c) + (c+a) + (a+b)} \\ &= \frac{a+b+c}{2(a+b+c)} = \frac{1}{2} \end{aligned}$$

(ii)

If $a + b + c = 0$, then

$$b + c = -a$$

$$c + a = -b$$

$$a + b = -c$$

$$\text{Hence } \frac{a}{b+c} = \frac{a}{(-a)} = -1$$

$$\text{Similarly, } \frac{b}{c+a} = \frac{c}{a+b} = -1$$

Therefore option (3) is the correct one $1/2$ or -1

$$48. 4 \quad y = \frac{1}{2 + \frac{1}{3+y}}$$

$$\Rightarrow y = \frac{3+y}{7+2y}$$

$$\Rightarrow 2y^2 + 6y - 3 = 0$$

$$\Rightarrow y = \frac{-6 \pm \sqrt{36+24}}{4}$$

$$= \frac{-6 \pm \sqrt{60}}{4} = \frac{-3 \pm \sqrt{15}}{2}$$

Since 'y' is a +ve number, therefore:

$$y = \frac{\sqrt{15} - 3}{2} \text{ ans.}$$

49. 4 Situation (I):
In whatever time Karan covers a distance of 100 m, Arjun covers 90 m in the same time.

Situation (II):

Now Karan is 10 m behind the starting point. Once again to cover 100 m from this new point Karan will be taking the same time as before. In this time Arjun will be covering 90 meters only. This means that now both of them will be at the same point, which will be 10 meters away from the finish point. Since both of them are required to cover the same distance of 10 m now and Karan has a higher speed, he will beat Arjun. No need for calculations as option (4) is the only such option.

50. 2 Each person will form a pair with all other persons except the two beside him. Hence he will form $(n - 3)$ pairs.

If we consider each person, total pairs = $n(n - 3)$ but here each pair is counted twice.

$$\text{Hence actual number of pairs} = \frac{n(n-3)}{2}$$

$$\text{They will sing for } \frac{n(n-3)}{2} \times 2 = n(n-3) \text{ min}$$

$$\text{Hence } n(n-3) = 28 \Rightarrow n^2 - 3n - 28 = 0 \Rightarrow n = 7 \text{ or } -4$$

Discarding the -ve value: $n = 7$

51. 3 Machine I:

Number of nuts produced in one minute = 100

To produce 1000 nuts time required = 10 min

Cleaning time for nuts = 5 min

Over all time to produce 1000 nuts = 15 min.

Over all time to produce 9000 = 138 min - 5 min = 133 min ... (1)

Machine II:

To produce 75 bolts time required = 1 min

To produce 1500 bolts time required = 20 min

Cleaning time for bolts = 10 min.

Effective time to produce 1500 bolts = 30 min

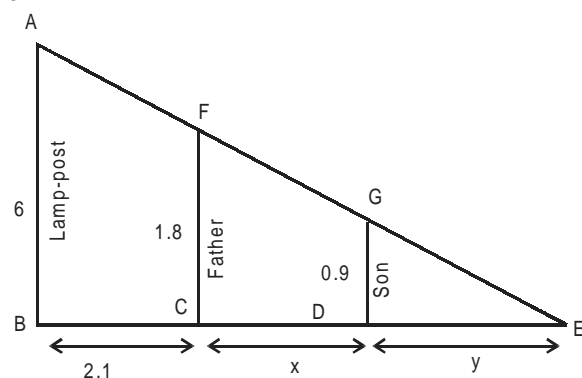
Effective time to produce 9000 bolts = $30 \times 6 - 10$

= 170 min ... (2)

From (1) and (2)

Minimum time = 170 minutes

52. 4



$$\triangle ABE \sim \triangle FCE$$

$$\therefore \frac{6}{1.8} = \frac{2.1 + x + y}{x + y} \dots (i)$$

$$\text{Also } \triangle ABE \sim \triangle GDE$$

$$\therefore \frac{6}{0.9} = \frac{2.1 + x + y}{y} \dots (ii)$$

From (i) and (ii) $x = 0.45$.

$$53. 2 \quad \frac{OP}{OQ} = \frac{PR}{QS} = \frac{4}{3}$$

$$OP = 28$$

$$OQ = 21$$

$$PQ = OP - OQ = 7$$

$$\frac{PQ}{OQ} = \frac{7}{21} = \frac{1}{3}$$

$$54. 2 \quad PR + QS = PQ = 7$$

$$= \frac{PR}{QS} = \frac{4}{3}$$

$$\Rightarrow QS = 3$$

$$55. 3 \quad SO = \sqrt{OQ^2 - QS^2}$$

$$= \sqrt{21^2 - 3^2}$$

$$= \sqrt{24 \times 18} = 12\sqrt{3}$$

56. 4 When $a > 0$, $b < 0$,
 ax^2 and $-b|x|$ are non negative for all x ,
i.e. $ax^2 - b|x| \geq 0$
 $\therefore ax^2 - b|x|$ is minimum at $x = 0$ when $a > 0$, $b < 0$.

57. 4

Family	Adults	Children
I	0, 1, 2	3, 4, 5,
II	0, 1, 2	3, 4, 5,
III	0, 1, 2	3, 4, 5,

As per the question, we need to satisfy three conditions namely:

1. Adults (A) > Boys (B)
2. Boys (B) > Girls (G)
3. Girls (G) > Families (F)

Clearly, if the number of families is 2, maximum number of adults can only be 4. Now, for the second condition to be satisfied, every family should have atleast two boys and one girl each. This will result in non-compliance with the first condition because adults will be equal to boys. If we consider the same conditions for 3 families, then all three conditions will be satisfied.

58. 3 Given equation is $x + y = xy$

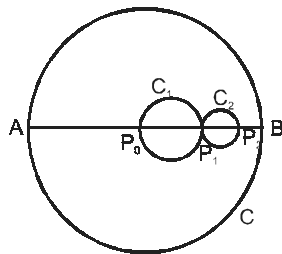
$$\Rightarrow xy - x - y + 1 = 1$$

$$\Rightarrow (x-1)(y-1) = 1$$

$$x-1=1 \& y-1=1 \text{ or } x-1=-1 \& y-1=-1$$

Clearly (0, 0) and (2, 2) are the only pairs that will satisfy the equation.

59. 4



Circle C	Radius r
C_1	$\frac{r}{4}$
C_2	$\frac{r}{8}$
C_3	$\frac{r}{16}$
\vdots	\vdots

$$\Rightarrow \text{either } \frac{\text{Area of unshaded portion of C}}{\text{Area of C}}$$

$$= 1 - \frac{\text{Area of shaded portion}}{\text{Area of C}}$$

$$= 1 - \frac{\pi \left(\left(\frac{r}{4} \right)^2 + \left(\frac{r}{8} \right)^2 + \dots \right)}{\pi r^2}$$

$$= 1 - \left(\frac{1}{4^2} + \frac{1}{8^2} + \dots \right) = 1 - \frac{\frac{1}{16}}{1 - \frac{1}{4}} = \frac{11}{12}$$

60. 3 Given $a_1 = 81.33$; $a_2 = -19$

Also:

$$a_j = a_{j-1} - a_{j-2}, \text{ for } j \geq 3$$

$$\Rightarrow a_3 = a_2 - a_1 = -100.33$$

$$a_4 = a_3 - a_2 = -81.33$$

$$a_5 = a_4 - a_3 = 19$$

$$a_6 = a_5 - a_4 = +100.33$$

$$a_7 = a_6 - a_5 = +81.33$$

$$a_8 = a_7 - a_6 = -19$$

Clearly onwards there is a cycle of 6 and the sum of terms in every such cycle = 0. Therefore, when we add a_1, a_2, a_3, \dots upto a_{6002} , we will eventually be left with $a_1 + a_2$ only i.e. $81.33 - 19 = 62.33$.

61. 3 As options are independent of n

$$\text{Let } n = 2$$

$$\text{Time taken for first round} = \frac{1}{2} + 1 + 2 + 4 = 7.5 \text{ minutes}$$

$$\text{Time taken for second round} = 8 + 16 + 32 + 64 = 120 \text{ minutes}$$

$$\text{Ratio} = \frac{120}{7.5} = 16$$

62. 2 $u = (\log_2 x)^2 - 6 \log_2 x + 12$

$$x^u = 256$$

$$\text{Let } \log_2 x = y \Rightarrow x = 2^y$$

$$x^u = 2^8 \Rightarrow uy = 8 \Rightarrow u = \frac{8}{y}$$

$$\frac{8}{y} = y^2 - 6y + 12 \Rightarrow y^3 - 6y^2 + 12y - 8 = 0$$

$$\Rightarrow (y-2)^3 = 0 \Rightarrow y = 2$$

$$\Rightarrow x = 4, u = 4$$

63. 3 $f_1 f_2 = f_1(x) f_1(-x)$

$$f_1(-x) = \begin{cases} -x & 0 \leq -x \leq 1 \\ 1 & -x \geq 1 \\ 0 & \text{other wise} \end{cases}$$

$$= \begin{cases} -x & -1 \leq x \leq 0 \\ 1 & x \leq -1 \\ 0 & \text{other wise} \end{cases}$$

$$f_1 f_1(-x) = 0 \quad \forall x$$

Similarly $f_2 f_3 = -(f_1(-x))^2 \neq 0$ for some x

$$f_2 f_4 = f_1(-x) \cdot f_3(-x)$$

$$= -f_1(-x) f_2(-x)$$

$$= -f_1(-x) f_1(x) = 0 \quad \forall x$$

64. 2 Check with options

Option (2)

$$f_3(-x) = -f_2(-x)$$

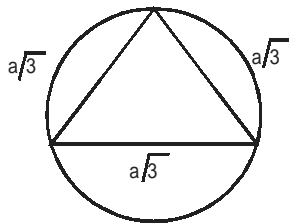
$$= -f_1(x)$$

$$\Rightarrow f_1(x) = -f_3(-x) \quad \forall x$$

65. 1 DF, AG and CE are body diagonals of cube.

Let the side of cube = a

Therefore body diagonal is $a\sqrt{3}$



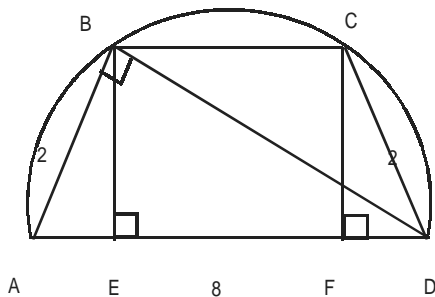
Circum radius for equilateral triangle = $\frac{\text{side}}{\sqrt{3}}$

Therefore $\frac{a\sqrt{3}}{\sqrt{3}} = a$

66. 2 From A to B, there are 8 on-way roads out of which 3 roads are in Northwards and 5 roads are Westwards.

Therefore number of distinct routes is = $\frac{8!}{5!3!} = 56$

67. 2



$$\frac{1}{2} \times AB \times BD = \frac{1}{2} \times AD \times BE$$

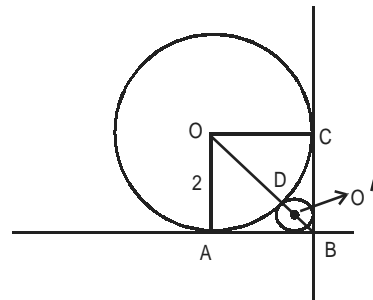
$$2\sqrt{8^2 - 2^2} = 8 \times BE$$

$$BE = \frac{\sqrt{60}}{4} = \frac{\sqrt{15}}{2}$$

$$AE = \sqrt{2^2 - \left(\frac{\sqrt{15}}{2}\right)^2} = \sqrt{4 - \frac{15}{4}} = \frac{1}{2}$$

$$BC = EF = 8 - \left(\frac{1}{2} + \frac{1}{2}\right) = 7$$

68. 4



Let the radius of smaller circle = r

$$\therefore O'B = r\sqrt{2}$$

$$\therefore OB = O'B + O'D + OD$$

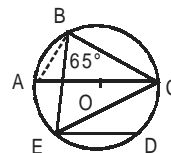
$$= r\sqrt{2} + r + 2$$

$$\text{Also } OB = 2\sqrt{2}$$

$$\Rightarrow r\sqrt{2} + r + 2 = 2\sqrt{2}$$

$$\Rightarrow r = 6 - 4\sqrt{2}$$

69. 4



In $\triangle ABC$,

$$\angle B = 90^\circ \text{ (Angles in semicircle)}$$

$$\text{Therefore } \angle ABE = 90 - 65 = 25^\circ$$

Also $\angle ABE = \angle ACE$ (angle subtended by same arc AE)

$$\text{Also } \angle ACE = \angle CED \text{ [AC \parallel ED]}$$

$$\text{Therefore } \angle CED = 25^\circ$$

70. 1 Since Group (B) contains 23 questions, the marks associated with this group are 46.

Now check for option (1). If Group (C) has one question, then marks associated with this group will be 3. This means that the cumulative marks for these two groups taken together will be 49. Since total number of questions are 100, Group (A) will have 76 questions, the corresponding weightage being 76 marks. This satisfies all conditions and hence is the correct option. It can be easily observed that no other option will fit the bill.

71. 3 Since Group (C) contains 8 questions, the corresponding weightage will be 24 marks. This figure should be less than or equal to 20% of the total marks. Check from the options. Option (3) provides 13 or 14

questions in Group (B), with a corresponding weightage of 26 or 28 marks. This means that number of questions in Group (A) will either be 79 or 78 and will satisfy the desired requirement.

72. 3 $15^{23} = (19 - 4)^{23} = 19x + (-4)^{23}$ where x is a natural number.
 $23^{23} = (19 + 4)^{23} = 19y + (4)^{23}$ where y is a natural number.
 $15^{23} + 23^{23} = 19(x + y) + 4^{23} + (-4)^{23}$
 $= 19(x + y)$
73. 1 The first strip can be of any of the four colours, The 2nd can be of any colour except that of the first (i.e. 3). Similarly, each subsequent strip can be of any colour except that of the preceding strip (=3)
Hence number of ways = $4 \times 3^5 = 12 \times 81$
74. 2 Ramesh makes a direct, blatant statement that he did not file his income tax returns. Devious means scheming, deceitful.
75. 1 The principal tax is already mentioned as Rs. 20000. He hasn't filed his income tax returns. Due to the delay he will also have to pay interest on the principal amount.
76. 4 There are no sanctions involved with the income tax. It's not possible for him to get a refund unless he files his returns. Due to the delay he will be charged a fine and not a fee.
77. 3 To impound means to seize property (usually by force of power). Attached here refers to attaching property by legal writ.
78. 2 Automobiles can only be seized before being auctioned off (and not smashed, dismantled or frozen!).
79. 4 An income tax defaulter is an offender and not a purchaser, victim or investor.
80. 3 The words in the previous sentence and the tone of the passage indicate that the corridors were empty.
81. 1 This choice is appropriate because the men were talking in low-pitched voices.
Stentorian means marked by loud voice.
82. 4 The word 'choler' (which means anger or irritability) in the previous sentence indicates a direct relationship with temper.
83. 1 He couldn't have strolled the corridors because he was angry. The President would not prowl in the corridors. Also one does not storm a corridor but may

storm in and out of a corridor or a room. But one can pace up and down.

84. 3 Sentence B is wrong because efforts 'bear fruit' and not 'give fruit'. Sentence C is incorrect because 'complimented' should have been used, complemented means 'something that completes, makes up a whole'.
85. 2 Sentence B is wrong because you don't plead 'guilty of' but plead 'guilty to' a crime. Sentence D is wrong because one gets 'sentenced to' prison.
86. 1 Sentence B is incorrect because the correct usage of its last part would be - 'thinking what to do'. Sentence C is wrong because the article 'a' should precede 'shower'.
87. 3 In option (1), the usage 'suggest to bring down is incorrect'. In option (4) audiocassette prices 'should' be (and not 'to' be) brought down. Between options (2) and (3), 'incidence' of music piracy can be reduced and not 'incidents'.
88. 3 Option (2) is incorrect due to the usage of the simple present tense in 'they portray'. Option (4) is incorrect due to the usage of the singular 'it' for the plural 'things'. Option (1) is wrong because of the unnecessary usage of 'must have' after using 'essential'.
89. 4 Option (2) is incorrect because we cannot say that 'archeologists ... are estimated'. Options (1) and (3) have the problems of misplaced modifiers.
90. 2 The correct usage would have been - 'he bolted for the gate'.
91. 4 Fallout does not mean failure. It refers to consequence or argument.
92. 2 The usage of 'passing her' is inappropriate, one can simply say 'passing on the road' or 'passing by'.
93. 1 AC is a mandatory pair and DAC is a mandatory sequence.
94. 2 B is the opening statement as it introduces the subject and the date. EDA is a sequence that describes the situation from the east to the west. Statement C is a stand-alone statement.
95. 4 CDBA is a mandatory sequence. "Bush was not fighting just the democrats" in statement D, relates directly with "At times he was fighting..." in statement B.
96. 1 Statement 2 is only partially true. It only talks of requirements and not of what grows in those regions. Similarly, statement 3 talks only of produce and not requirement. The passage is not concerned with what people like or prefer but with what is locally available or required.

97. 2	The last sentence of the passage is only conveyed fully in option (2).	114. 3	If (3) is true and if Tsavo lions are similar to the cave lions, then the Tsavo lions should also be less violent, whereas the hypothesis tries to give reasons for the Tsavo lions being more ferocious.
98. 1	The confusion could be between answer choices (1) and (2). However, answer choice (2) deals with what the author feels about the subject of a painting, whereas we are concerned about a painter and an insecure culture. The second line of the last paragraph confirms the answer choice (1).	115. 2	Refer to the fourth paragraph, first line.
99. 3	Reading the first and the second paragraph quite easily takes us to the answer choice (3).	116. 3	Refer to the fourth paragraph, third-last line.
100. 3	The second sentence of the fifth paragraph says 'the subject may have a personal meaning ... ; but there ... general meaning.' This is quite the opposite of what answer choice (3) states, and so it becomes the answer.	117. 2	The fourth paragraph, first line says Type B malnutrition is the major cause of chronic degenerative diseases. The first paragraph says chronic degenerative diseases are the major causes of ill-health and death, hence answer choice (2) follows.
101. 1	The third paragraph, second line says 'a subject does not start ... or with something which the painter has to remember'.	118. 2	Check the first paragraph for the answer. Answer choices (1) and (4) seem to be very close. However if you look at the first paragraph 4th line it says- " These have a long latency period <u>before symptoms appear and a diagnosis is made.</u> " So the latency period is quite specific. It is not just any latency period as suggested by answer choice (4). What one needs to ask in answer choice (4) is "which latency period?" Also answer choice a includes the latency period i.e. it includes answer choice (4). What this means is that a large number of apparently healthy people are deemed pre-ill because <u>they may have chronic degenerative diseases</u> as "These (<i>chronic degenerative diseases</i>) have a long latency period <u>before symptoms appear and a diagnosis is made</u> ".
102. 1	Refer to the second-last paragraph, first line.	119. 3	Both statements C and B (papyri is the plural for Egyptian papers and documents) are talking about sources of information, making CB a mandatory pair.
103. 2	Quite a direct answer, refer to the fourth paragraph.	120. 1	ED is a mandatory pair as 'the fuel cell efficiency has an efficiency of 30%' in E connects with 'That is twice as good' in D. BA is a pair because 'the way will be open for a huge reduction...' in B connects with 'only such a full-hearted leap will allow the world to cope with mass motorization' in A.
104. 4	Refer to the sixth paragraph.	121. 3	Statements (2) and (4) are partially true, as they do not cover all the examples of preferential treatment. Statement a is incomplete, as it does not mention direct protest.
105. 2	This is a main idea question; if you look at the complete passage, the author through examples of aeroplanes and cars and even telephones etc. is trying to show that innovation has not happened as much as it has been made out to be. The changes have been basically incremental and cosmetic.	122. 2	Statement (3) is factually wrong as we don't know if further research can happen only in Germany. Option (4) wrongly brings out a contest between research and debate. Between options (1) and (2), choice (1) is inappropriate because we don't know if 'research' will help find a 'definitive answer'.
106. 1	Refer to the last two lines of the last paragraph.	123. 4	Option (2) is factually wrong. Option (2) is wrong because Nietzsche does not criticize 'intellectuals'. Option (1) is wrong because he does not talk of 'the decline of modern society' only Option (4) captures the essence of the paragraph.
107. 1	The answer is clearly stated in the fifth line.		
108. 3	The second-last paragraph talks of the various factors that are responsible for this. Answer choice (3) combines all of them.		
109. 4	The centre as can be seen from the first paragraph is the - 'rival centers of capital on the Continent and in America,' therefore none of these is the answer.		
110. 4	The answer can be figured out from the first and the third paragraph.		
111. 3	Refer to the third paragraph, last three lines.		
112. 3	Refer to the first paragraph, second-last line.		
113. 3	All the other three answer choices are in the fourth and fifth paragraphs.		