Mock CAT – 10

Answers and Explanations

1	3	**2**	2	**3**	2	**4**	4	**5**	1	**6**	2	**7**	1	**8**	1	**9**	2	**10**	3
11	2	**12**	1	**13**	3	**14**	1	**15**	4	**16**	3	**17**	2	**18**	2	**19**	2	**20**	2
21	4	**22**	3	**23**	4	**24**	3	**25**	4	**26**	1	**27**	1	**28**	4	**29**	3	**30**	1
31	3	**32**	4	**33**	4	**34**	4	**35**	3	**36**	3	**37**	1	**38**	4	**39**	2	**40**	2
41	2	**42**	1	**43**	4	**44**	1	**45**	4	**46**	1	**47**	2	**48**	3	**49**	1	**50**	1
51	3	**52**	3	**53**	3	**54**	3	**55**	4	**56**	2	**57**	1	**58**	1	**59**	2	**60**	3
61	3	**62**	2	**63**	3	**64**	3	**65**	4	**66**	2	**67**	2	**68**	3	**69**	2	**70**	4
71	4	**72**	4	**73**	2	**74**	2	**75**	4	**76**	1	**77**	4	**78**	3	**79**	4	**80**	4
81	1	**82**	1	**83**	2	**84**	2	**85**	2	**86**	4	**87**	3	**88**	3	**89**	3	**90**	2
91	2	**92**	4	**93**	4	**94**	2	**95**	4	**96**	4	**97**	2	**98**	3	**99**	4	**100**	2
101	2	**102**	2	**103**	3	**104**	1	**105**	2	**106**	4	**107**	1	**108**	4	**109**	3	**110**	3
111	2	**112**	4	**113**	2	**114**	2	**115**	1	**116**	3	**117**	2	**118**	1	**119**	4	**120**	2
121	3	**122**	2	**123**	2	**124**	4	**125**	3	**126**	2	**127**	3	**128**	4	**129**	1	**130**	3
131	2	**132**	2	**133**	3	**134**	1	**135**	2	**136**	1	**137**	2	**138**	2	**139**	4	**140**	1
141	2	**142**	3	**143**	1	**144**	2	**145**	4	**146**	1	**147**	4	**148**	3	**149**	1	**150**	4

Scoring table

Section	Question number	Total questions	Total attempted	Total correct	Total wrong	Net score	Time taken
DI + DS + AR	1 to 50	50					
QA	51 to 100	50					
EU + RC	101 to 150	50					
Total		150					

For questions 1 to 4: The number of people playing different games

	1 game	2 game	Total
Basketball	8	1	9
Volleyball	16	2	18
Football	24	3	27
Hockey	32	4	36
Athletics	30	10 (Total of above)	40

1. 3   40

2. 2   10

3. 2   Only Hockey = 32
Volleyball = 18
Hence, ratio = 32 : 18 = 16 : 9

4. 4   No data is given about these 18 hockey players (50%) about which other game they play.

5. 1   There are 10 companies – Reliance, Hindustan Petroleum, Hindalco, Rural Electrification, State Bank, Indian Railway Finance, National Aluminium, Grasim, ICICI, Bank of Baroda.

6. 2   Hindalco = $\dfrac{5083.23}{47} \simeq 108$

Laf arge $= \dfrac{576.54}{5} \simeq 103$

Gujarat Ambuja $= \dfrac{1026.75}{10} \simeq 102.6$

7. 1   Looking at the table, since Grasim has the highest number of equity shares in the portfolio.

8. 1   This is equivalent to finding the top 3 companies in terms of value per equity share. Hence the answer is already worked out in solution 6.

9. 2   Simple annual growth rate

$= \dfrac{55}{84} \times \dfrac{100}{2} \simeq 32.5\%$

Hence the CAGR will be close to this but lower than this. Hence, it is 29%.

10. 3   Difference in net profit in 2003-04 = 774 − 686 = 88
Difference in net profit in 2002-03 = 572 − 457 = 115

Percentage change $= \dfrac{115 - 88}{115} \times 100 = 23.5\%$

11. 2

	Year	Profit × 100 / Share holder's equity
Indian GAAP	2001-02	~ 20
	2002-03	> 21
	2003-04	~ 26
US GAAP	2001-02	~ 12
	2002-03	~ 17
	2003-04	~ 19

12. 1   Number of equity shares in 2003-04 as per Indian

GAAP $= \dfrac{267.7}{13.9} \approx 19.1$

As per US GAAP $= \dfrac{4.206}{218} \approx 19$

No significant difference.

13. 3   Since the input is 100 kgs in R1
A = 50 kg   B = 50 kg
Cost = (50) (10) + 50 (20) = Rs 1500
Processing cost of R1, R2 & R3
= 300 + 200 + 300 = Rs. 800
Total expenses = 1500 + 800 = Rs 2300
We get output of 10 kg A, 10 kg B & 80 kg C
Cost of output = (10) (10) + (10) (20) + (80) (50)
= Rs. 4300

Profit percentage $= \dfrac{4300 - 2300}{2300} \times 100$

= 86.9 %

14. 1   Profit across R1 = 40 %
Profit across R2 = 4.16%
Profit across R3 = 10.2%

15. 4   From the previous solution earning is 4.16% across R2
∴ For 900 kgs, total cost is Rs. 31050.

$\dfrac{4.16}{100} \times 31050 = Rs. 1291.68$

16. 3   In the earlier plant the profit percentage is 86.9% as calculated earlier
In the new plant the profit percentage is
Cost of Input (100 kgs) = Rs 1500
Cost of output (100 kgs)
= (15) (10) + (15) (20) + (70) (50)
= Rs 3950
Profit % = 156.7 %

It is $(\dfrac{156.7 - 86.9}{86.9}) \times 100 = 80.2\%$ more

profitable than the chemical plant.

17. 2   Percentage $\dfrac{119 - 96}{96} = \dfrac{23}{96} \approx 24\%$

18. 2　Average steel price of Tata Steel (India)

$$= \frac{60+16+78+124+158}{5} = 87.20$$

Average steel price of Posco (Korea)

$$= \frac{101+39+119+161+219}{5} = 127.80$$

Ratio $= \frac{87.20}{127.80} \approx 0.68$

19. 2　Selling price $= (1.12 \times 158) = \$176.96$ per tonne.

20. 2　Difference in highest and lowest value per tonne
　　　$= \$68$ for HR Coil
　　　$= \$58$ for Liquid Steel
　　　$= \$56$ for Hot Metal Steel

21. 4　No value of steel produced can be formed in this case for the given four manufacturers.

22. 3　IIT-aspirants $= 0.7377 \times 61 = 45$
　　　'Improved a lot' rating
　　　Among all students $= 0.36 \times 61 \simeq 22$
　　　Among IIT–aspirants $= 0.24 \times 45 \simeq 11$
　　　Hence, among non–IIT aspirants $= (22 - 11) = 11$

23　4　Rating 'improved among
　　　All students $= 0.60 \times 61 \simeq 37$
　　　Among IIT–aspirants $= 0.72 \times 45 \simeq 32$

　　　Hence ratio $= \frac{32}{37} \simeq 0.86$

24. 3　Students who studied the topic earlier $= 29$
　　　Studying for the first time $= 32$
　　　Hence, rating 'improved a lot' among students who studied the topic earlier $= 0.07 \times 29 = 2$
　　　Among students studying the topic for the first time $= 0.63 \times 32 = 20$.
　　　Hence, difference $= 20 - 2 = 18$

25. 4　Data relationship between IIT–aspirants and topic studying status of students is not given.

26. 1　Statement I : $x^2 - 3x - 10 \geq 0$

　　　$\Rightarrow (x - 5)(x + 2) \geq 0$

　　　$\therefore x \geq 5$ or $\therefore x \leq -2$

　　　So, we cannot find the value of x. Hence statement I is not sufficient.

　　　Statement II: $x^2 - 4x + 4 \leq 0$

　　　$(x - 2)^2 \leq 0$

　　　$\Rightarrow x = 2$
　　　Hence statement II is sufficient.

27. 1　Statement I alone is sufficient. Draw the line AC and BC; then $\triangle AOC$ and $\triangle BOC$ are right triangles, since OC is perpendicular to AB.
　　　By the pythagoras theorem, $(AC)^2 = (AO)^2 + (CO)^2$ and $(BC)^2 = (OB)^2 + (CO)^2$. So if AO is less than OB, then AC

is less than BC.
Statement II alone is not sufficient. There is no restriction on where the point D is.

28. 4　There are four pairs of positive integers whose product is 24 : (1 and 24), (2 and 12), (3 and 8), and (4 and 6). From statement I the possible value of q are 24, 12 and 6, and there is a value of p corresponding to each of these three values. Thus, statement I alone is not sufficient.
From I and II together it can be determined only that q can be either 12 or 6. So p can be either 2 or 4. Thus, statement I and II together are not sufficient.

29. 3　Statement I alone is not sufficient since Y > 7 if X < –3 and Y = 7 if –3 ≤ X < 4. This can be found by trying a few values of X. Statement II alone is also not sufficient since Y > 7 if X > 4.
Taken together, statements I and II determine values of X for which Y = 7.

30. 1　As even integer is an integer divisible by 2.
Since 2n + 10p is 2 times (n + 5p), using statement II lets you deduce that X is even.
Statement I by itself is not sufficient. If n were 2 and p were 3, $(n + p)^2$ would be 25 which is not even, but by choosing n to be 2 and p to be 4, $(n + p)^2$ is 36 which is even.

31. 3　Statement II gives 2 values of x, i.e., 3 and 4
But x = 3 satisfies statement I but not x = 4. So statement I helps us to select only one value of x.

32. 4　Combining both statement, we cannot find the number of votes because we don't know about unvalid votes.

33. 4　From statement I, the difference of time between two boats is given but we don't have their actual time taken. So it is not sufficient.
From statement II, the difference of speed between two boats is given but we don't have their actual speeds. So it is also not sufficient.
Combining both statements, we cannot find the distance between the banks.

34. 4　It is not specified which tap is opened and which one is closed, and what part of the tank was initially full.

35. 3　Combining both statement:
From statement I, boy takes 1.5 hr to complete the first half.
From statement II, boy takes 3 hr to complete the second half.
Total time taken $= 3 + 1.5 = 4.5$ hr

36. 3　Note that n must be of the form $3k + 1$ (k being a natural number).
And subsequently the sum of digit of the given number reduced by 1 must be divisible by 3 which only 1438 satisfies.

37. 1 From A_1 to A_n, he counts $(n - 1)$ posts. From A_n to A_1, he counts also $(n - 1)$ posts also. So a cycle of counting ends after $(2n - 2)$.
Therefore the counts $(2n - 1)$ will be at A_2. Then again the counting starts in a similar fashion .
∴. The count $(2n - 1)$ or its multiple will always come on A_2.

38. 4 By the same logic as given in solution (37), count 100 n or $50(2n - 1) + 50$ will end on 50th lampost from A_1. i.e. A_{50}.

39. 2 Competence can be alternatively seen as the probability of getting things done. Let the probabilities that A, B, C deals with the situation be p, q, and r. Then the probability that B and C deals with the situation together is
$1 - (1 - q)(1 - r) = q + r - qr.$ ... (i)
Now, by the conditions of the given problem,
$p = q + r - qr$ and $q = p + r - qr$
Adding we get, $r(2 - p - q) = 0$.
∴. Either $r = 0$ or $p + q = 2$.
∵ $p, q \leq 1$ ∴ either $r = 0$ or $p = q = 1$.

40. 2 The car could have covered only 96 miles by going along the path ABCA again and again.
∴ it would have passed D just once to cover 100 miles as $(3 \times 32 + 4) = 100$ miles. (4 miles on the route ABCDA)

41. 2 First 96 miles can be travelled along ABCA while the last five miles can be travelled as ACBDCA.

42. 1 The car could have gone for
$i = 1$ as (ABCA-----A) 30 miles $\rightarrow$ B
$i = 2$ as (ACBA-----A) 30 miles $\rightarrow$ CB
So it may not pass through D.

43. 4 Let after nth process their shares are given as

A	B	C	D
x_n	x'_n	x''_n	x'''_n

where $x_n + x'_n + x''_n + x'''_n = 100$

After $(n + 1)$th process, share of A will be

$\dfrac{x'_n + x''_n + x'''_n}{3}$, i.e. $\dfrac{100 - x_n}{3}$

∴ $x_1 = \dfrac{100 - 10}{3} = 30$, $x_2 = \dfrac{70}{3} = 23.3$

$x_3 = \dfrac{86.7}{3} = 28.9 \cong 29$,

$x_4 = \dfrac{71}{3} \cong 23.7$,

$x_5 = \dfrac{86.3}{3} = 28.8 \cong 29$

44. 1 For large number of times, $x'''_n = x'''_{n+1}$

∴ $x'''_n = \dfrac{100 - x'''_n}{3}$ $\Rightarrow 4x'''_n = 100$

$\Rightarrow x'''_n = 25$

45. 4 The position of a, b, c, d of the first three processes are respectively.

a b c d , c d b and d b c

Note that after every three processes, the configuration is restored. Therefore after 99 processes, the configuration remains as original and after next process, position 3 is occupied by d.

46. 1 The position of a, b, c, d after first four processes are respectively

b c d a , d a c b a , c b a d and d b c

It is evident that after every four processes the original configuration is restored. Therefore after 100 processes, position 1 will be occupied by a.

47. 2 After every sub processes, the configuration will be respectively

b d a c , b d c a , b a c d

b c a d , c b a d , d b a c

d b c a , d c b a and d b c a

Therefore, the whole process is equivalent to the interchange of letters at first and third positions.

For questions 48 to 50:
Note that at three times,
A_1 ate food of Rs. 100, Rs. 200, Rs. 200 ;
A_2 ate food of Rs. 100, Rs. 100, Rs. 100 ;
A_3 ate food of Rs. 200, Rs. 200, Rs. 200 and
A_4 ate food of Rs. 100, Rs. 100, Rs. 200.

∵ The bills paid by them are Rs. 300, Rs. 400, Rs. 500 and Rs. 600 respectively, we can have

A_1	A_2	A_3	A_4	Total Bill	
100	100	–	100	300	(A_1)
200	–	200	200	600	(A_4)
200	100	200	–	500	(A_3)
–	100	200	100	400	(A_2)

48. 3

49. 1

50. 1

51. 3 If two numbers are a and b

$$\frac{2ab}{a+b} = 4, \ \frac{a+b}{2} = A \text{ and } \sqrt{ab} = G$$

2(a + b) = ab   ...(1)
a + b = 2A   ...(2)
ab = G^2 ...(3)

$\therefore a + b + ab = 2A + G^2 = 27$ (adding (2) and (3))
Using (1) a + b + 2(a + b) = 27
a + b = 9
ab = 18
$\therefore$ The two numbers are 3 and 6.

52. 3 Let' assume they always meet at C at 8 am. As Jayanta was late on that day, Rishi passed C 8 am only. Rishi

takes 25 mins to reach D ($\frac{1}{10}$ km / min, so 2.5 km in

2.5 × 10 = 25 min) after passing C.

Then Jayanta takes 30 mins to reach C ($\frac{1}{12}$ km / min,

so 2.5 km in 2.5 × 12 = 30 min) after passing D.
So Jayanta was 55 mins late.

53. 3 E is towards A as we move from C.
The distance CE = 2.5 km. When Jayanta was at C, on a normal day Rishi should also have been at the same place. But since he was late he was at some other point D closer to A. If CE = 2.5 km , then DE = 3 km (since the distance covered by Jayanta to that of Rishi in the same time must be 5 : 6. So the time taken to reach E from C for Jayanta is 30 min . This is also the time taken by Rishi to reach E from D.
So DC = 5.5 km which Rishi takes 55 min to traverse.
So Rishi is late by 55 min. The normal meeting time should have been 6:30.
Hence distance covered by Rishi from 5: 30 to 6: 30 is 6 km. Distance covered by Jayanta from 4:45 to 6: 30 is 8.75 km.
Total distance = 14.75 km.

54. 3 The number of ways you can choose 7 out of 13

pirates is $\frac{13!}{(7! \times 6!)} = 1716$,

Next put 1716 locks on the safe, one for each way to group 7 pirates. For each lock give 7 keys to a unique group of 7 pirates. This way any given lock will have a keyholder in any group of 7 or more. For any group of 6 there will be exactly one lock in which the other 7 pirates have the key. Obviously any group of less than 6 would also be missing at least one key to at least one lock.

55. 4 The number of terms in the 1st , 2nd, 3rd and 4th brackets are 1, 3, 5, 7 respectively.
So the no of terms in the 37th bracket will be
1 + 36 × 2 = 73.
1st term in the 2nd bracket is 7^1, that in the 3rd and 4th are 7^{1+3}, 7^{1+3+5} respectively.
So the 1st term of the 37th bracket will be
$7^{1+3+5+\cdots+36 \text{ terms}} = 7^{(1+35) \times 36} = 7^{1296}$

Hence the required sum is

$$7^{1296} + 7^{1297} + \cdots \text{to 73 terms } = \frac{7^{1296}(7^{73} - 1)}{7 - 1} = \frac{7^{1296}}{6}(7^{73} - 1)$$

56. 2 Consider $2x^3 + px^2 + qx - 4 = 0$. This can also be like solving the roots of the equation

$$x^3 + \left(\frac{p}{2}\right)^2 + \left(\frac{q}{2}\right)x - 2 = 0 = (x - 2)(x + 1)(x + 1)$$

If all the three roots are real the two equal roots must be −1 or +1. Else, the above equation is inconsistent. Compare the coefficients, you would find that the equal roots have to be 1. If the roots are −1 then P = 0, which violates the given conditions .
So x = 1 must satisfy this equation. Substituting for x = 1 we get p + q = 2.

57. 1 Find the slope of the line joining any two points and compare with the line joining any other two points. You would find that they are same and equal to −1. Hence, the three points are collinear. Which means the area enclosed by the triangle is 0.

58. 1 $\frac{a+b}{2} > \sqrt{ab}$ [$\because$ AM > GM]

$\Rightarrow \ a + b > 2\sqrt{ab}$

Similarly, $b + c > 2\sqrt{bc}$

and $c + a > 2\sqrt{ca}$

Multiplying the 3-inequaities on the corresponding sides, we have (a + b) (b + c) (c + a) > 8 abc

For questions 59 and 60:
Among all the sets of two points it can be proved that A, B, E, C are non collinear. But B, C, D are collinear because
BC = BD + DC.
We can prove that C is not collinear with E and A by using the cosine rule.
Hence the number of triangles formed = $^5C_3 - ^3C_3 = 9$.
The area of the triangle BCD = 0 since they are collinear.

59. 2

60. 3

61. 3 $5 = \frac{X}{(1 - r)}, r = 1 - \frac{X}{5}$

Now since it is an infinite G.P Mod r < 1, implies

$-1 < 1 - \frac{X}{5} < 1$ or 0 < X < 10

For questions 62 and 63:
Let the volume of each solid block = Vcc and let volume of smaller spheres = s and that of larger spheres = 8s (since radius of larger spheres = twice of smaller spheres)
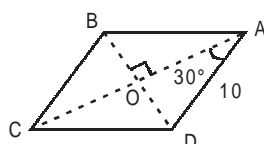
$\frac{V}{s}$ remainder = 14 cc   … (i)

And $\dfrac{V}{8s}$ remainder = 40 cc   ...(ii)

= V = s.n_1 + 14   From (i)
V = 8sn_2 + 40   From (ii) where n1, n2 ∈ N
= s(n_1 – 8 n_2) = 26 = s = 26 or 13 or 1 but only s = 26 is possible.
⇒ 8s = 26 × 8 = 208

62. 2   The volume of the larger spheres = 208 cc.

63. 3   The volume of each block has to be of the form,
    V = 208 × k + 40
    For k = 5
    V = 1040 + 40 = 1080

64. 3   (n – 1) × 10 = (n + 6 – 1) × 8 = Length of the house
    Now use the choices.

65. 4

Δ AOD, $\dfrac{OD}{AD}$ = sin 30

OD = AD sin 30 = 5 cm

And $\dfrac{OA}{AD}$ = cos 30

OA = $5\sqrt{3}$ cm
OD and OA are the diameters of 2 circles

Difference in the areas = $\pi(5\sqrt{3})^2 - \pi(5)^2$
                       = 50 π cm^2

66. 2   Let   a → 2k_1 + 1

        b → 2k_2 + 1

        c → 2k_3 + 1

        d → 2k_4 + 1

    ⇒ 2k_1 + 1 + 2k_2 + 1 + 2k_3 + 1 + 2k_4 + 1 = 28

    ⇒ 2(k_1 + k_2 + k_3 + k_4) = 24

    ⇒ k_1 + k_2 + k_3 + k_4 = 12
    Number of solutions = $^{15}C_3$ = 455

67. 2   Let us assume he wanted to buy 'a' apricots of Rs. A
    each 'p' peaches of Rs. P each
    aA + pP = 65
    But he bought
    aP + pA = 35
    ∴ aA + pP + aP + pA = 100
    (a + p) (A + P) = 100
    but a + p = 40
    ∴ A + P = Rs. 2.50

68. 3   In ΔDEC. DC = AB = 12 cms and CE = 13 cms
    Therefor D E = 5 cms
    But AD = AE + ED = 5 + 5 = 10 cms
    The area of rectangle ABCD = 12 ×10 = 120 cm^2

69. 2   For a quadratic equation we have

$$\alpha + \beta = \left(\dfrac{\text{coefficient of x}}{\text{coefficient of x}^2} \right)$$

    Similarly for 50th degree equation.

$$(\alpha_1 + \alpha_2 + - - - \alpha_{50}) = -\left(\dfrac{\text{coefficient of x}^{49}}{\text{coefficient of x}^{50}} \right)$$

    = –(coefficient of x^{49})
    [∵ Coefficient of x^{50} = 1, in the above expression
    ⇒ coefficient of x^{49} = 1 + 2 + 3 + ... + 50

$$= \dfrac{n(n+1)}{2} = \dfrac{50(51)}{2} = 25 \times 51 = 1275$$

70. 4   It is apparent that if x – 8 = 1 or x – 8 = –1 we get the
    same value which is equal to 10.
    Hence x can either be (7) or (9).

71. 4   AB : BC : AC = $2 : 2\sqrt{3} : 2$

    = $1 : \sqrt{3} : 1$

    = $\dfrac{1}{2} : \dfrac{\sqrt{3}}{2} : \dfrac{1}{2}$

    sin 30° : sin 60° : sin 30°
    But 30° + 60° + 30° = 120°
    The summation of the angles should be = 180°
    Since theorem is valid for acute and right angled
    triangle.
    Figure is drawn according to this theorem which is
    not possible. (As not valid for obtuse angled triangle).

72. 4   Statement I will be true only for non integer values of
    x.
    Statement II is valid for all integral values of x.
    Statement III is valid as long as the values are non
    integral.
    Statement IV is valid for all integral values of x.

73. 2 $13^{19} = 13 \times 13^{18} = 13 \times (13^2)^9$

    = $13 (169)^9$

    = $13 (168 + 1)^9$ [Where 168 = 21 × 8]

    $13^{19} = \dfrac{13 (168 + 1)^9}{21}$

    ∴ Remainder is 13 × 1 = 13

74. 2   Since three events A, B, C are mutually exclusive so

$$P(A \cup B \cup C) = \dfrac{1-3k}{2} + \dfrac{1+4k}{3} + \dfrac{1+k}{6}$$

$$= \dfrac{3-9k+2+8k+1+k}{6} = 1.$$

Now

$$0 \le \frac{1-3k}{2} \le 1 \Rightarrow \frac{1}{3} \ge k \ge -\frac{1}{3} \Rightarrow k \in \left[-\frac{1}{3}, \frac{1}{3}\right]$$

and

$$0 \le \frac{1+4k}{3} \le 1 \Rightarrow -\frac{1}{4} \ge k \ge \frac{1}{2} \Rightarrow k \in \left[-\frac{1}{4}, \frac{1}{2}\right]$$

and

$$0 \le \frac{1+k}{6} \le 1 \Rightarrow -1 \ge k \ge 5 \Rightarrow k \in [-1, 5]$$

Hence the set of values satisfying all the above inequality are $\left[-\frac{1}{4}, \frac{1}{3}\right]$

75. 4   Let $t_a = pq^{a-1}, t_b = pq^{b-1}, t_c = pq^{c-1}$

Given a, b, c are in AP $\Rightarrow$ 2b = a + c
x, y, z are in AP
If d is common difference of this AP
Then y − x = d, x − z = −2d, z − y = d

$$t_a^{y-x} \times t_b^{x-z} \times t_c^{z-y}$$

$$= \left(\left(pq^{a-1}\right) \times \left(pq^{b-1}\right)^{-2} \times \left(pq^{c-1}\right)\right)^d$$

$$= \left(p^{1-2+1} \times q^{a-1-2b+2+c-1}\right)^d = 1$$

76. 1 $(5 \times 25)^2 = (5 \times 24)^2 + (5 \times 7)^2$
So the dimension of 125 will be the diameter since it is the hypotenuse of the right angled triangle formed by these pillars. So the radius is 62.5 m.

For questions 77 to 79:
Let the number of movies watched in the nth week be Mn
Then Mn = (k) (n) (N − n + 1)= K (x − 1) (y + 1) = 6 .....
Note (N − n + 1) because there are so many weeks to go if we include the current week.
Mn + 1 = (k) (n + 1) (N − n)= K (x) (y) = 5
Mn + 2 = (k) (n + 2) (N − n − 1)= K (x + 1) (y − 1) = 3.

Solving for the values we get K = $\frac{1}{2}$, n = 4, N = 6.

77. 4   N i.e is 6 weeks.

78. 3   The total number of movies watched = $\frac{1}{2}$ × (1.6 + 2.5 + 3.4 + 4.3 + 5. 2 + 6.1) = 28

79. 4   The maximum value of Mn = $\frac{1}{2}$ × (n) × (7 − n) for integer values of n is when n = 3 or 4.

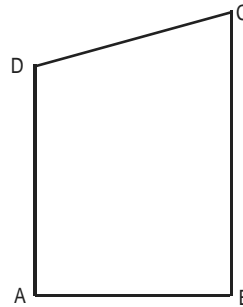80. 4   Let the two roots be p, q.
Then pq = a(a + 1) ; p + q = −1.
We know that $p^2 + q^2 = (p + q)^2 − 2pq = 1 − 2 (a^2 + a)$.
For this value to be maximum the value of 'a' has to be $-\frac{1}{2}$.

81. 1   The series is 1, x, xy, x^2y, x^2y^2, x^3y^2, x^3y^3....
This is same as the sum of 2 G.P s to infinte terms,
$(1 + xy + x^2y^2 + ...) + (x + x^2y + x^3y^2 + ...)$...

Their summation is $\frac{1+x}{1-xy}$.

82. 1

We form the trapezium ABCD with AB = 2, BC = 9 and AD = 4.

The area of trapezium is $\frac{1}{2}$ × 2 × (4 + 9)

= 13 sq. units
Trapezium is the area, which just over estimates the shaded portion. Hence 12 sq. units is the closest among the choices.

83. 2   At station $Q_1 \Rightarrow$ Number of wagons = n
        Number of animals = 12n
At station $Q_2 \Rightarrow$ Number of wagons = n − 2
        Number of animals = 12n − x
        (x = Number of animals taken out)

Number of animals in each wagon = $\frac{12n-x}{n-2}$

Obviously, n > 2 and $\frac{12n-x}{n-2}$ is a prime no.

Also $\frac{12n-x}{n-2} -14 = n - 2$

n = 3 $\Rightarrow \frac{36-x}{1} - 14 = 1$, x = 21, $\frac{12n-x}{n-2}$ = 15
(not a prime)

n = 4 $\Rightarrow \frac{48-x}{2} - 14 = 2$, x = 16, $\frac{12m-x}{n-2} = 16$
(not a prime)

n = 5 = $\frac{60-x}{3} - 14 = 3$, x = 9, $\frac{12m-x}{n-2} = 17$
(is a prime)
Proceeding thus you can find that n can only be 5.
So answer is 60.

84. 2   The number of sets of 3 numbers is $^{10}C_3$ = 120. Each one of these selection has one set of P, Q, R which are strictly in the ascending order. Hence there are 120 such sets.

85. 2   Let the number of wagons attached to the engine in a trip be n, then total profit in the trip
= Rs. $(24 + 7n^2)$ lakh and average profit per wagon

Per trip will be the $\dfrac{\text{total profit in the trip}}{\text{number of wagons in the trip}}$

Rs. $\dfrac{24 + 7n^2}{n}$ lakh wagon per trip

It is required that this value should not fall below 169 lakh

$= \dfrac{24 + 7n^2}{n} \geq 169$ …(i)

$= 7n^2 - 169n + 24 \geq 0$

(Note: Since we know that n (i.e. the number of wagons) is +ve, we can cross-multiply equation (i)

$= (n - 24)(7n - 1) \geq 0$

= n is equal to or lies outside $\dfrac{1}{7}$ and 24

$= n \geq 24$

So, The minimum number of wagons that have to be attached to ensure that the average profit per wagon/per trip does n not fall below 169 lakh in 24.

86. 4   We cannot determine the ratio of total surface area of the solid to that of one pyramid because we donot know the base of the pyramid.

For questions 87 to 89:
After 8 a.m the first signal turns green at every multiple of 4 min, whereas the second turns green at every multiple of 6 min.

87. 3   There can be no waiting time of 5 min at the second signal because there exists no values of m, n which satisfy the condition that 4n + 15 = 6 m.

88. 3   The maximum waiting time at the first and the second signals simultaneously are 3 min and 4 min. Hence from home to crossing the second sinal it could take Gautam 22 min. The minimum crossing time is 15 min.

89. 3   If both the signals have to be green then it must satisy the condition 4n + 10 = 6 m. There exists many solutions that satify this condition. Note that this is also the condition for zero waiting time at the signals. After the first solution for m,n there exists one solution after every LCM (6,4), i.e. 12 min. Hence if he misses the first time he must start 12 min later.

90. 2 $24 = 2 \times 2 \times 2 \times 3$

$= 4 \times 3 \times 2$
$2 \times 2 \times 2$
3×3
5

Smallest number = $(2 \times 2 \times 2)(3 \times 3)(5) = 360$

91. 2   Here each man works at the same rate finally. Therefore only the number of days worked by any person is relevant for finding the wage share of that person.
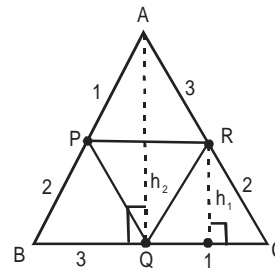So. Maximum possible share is of the person who started i.e.

$= \dfrac{15}{15 + 14 + ... + 2 + 1} \times 10{,}000$

$= \dfrac{15 \times 2}{15 \times 16} \times 10{,}000 = \text{Rs. } 1250$

92. 4   Using the two conditions and dividing one by the other we get
a0a0a = 455 × 111. Hence a = 5. This implies b × c = 91. If b, c are co-prime to each other and b < c then b = 7, c = 13 is the only solution. (note b > 1).

93. 4   Let h_1 and h_2 be the Altitudes of Δs QRC and ΔABC

Now $\dfrac{\text{Area of } \Delta QRC}{\text{Area of } \Delta ABC} = \dfrac{\frac{1}{2} \times h_1 \times QC}{\frac{1}{2} \times h_2 \times BC} = \dfrac{2 \times 1}{5 \times 4} = \dfrac{1}{10}$

$\left[\because \dfrac{h_1}{h_2} = \dfrac{2}{5} \right]$

Similarly $\dfrac{\text{Area of } \Delta PQB}{\text{Area of } \Delta ABC} = \dfrac{3 \times 2}{4 \times 3} = \dfrac{1}{2}$

and $\dfrac{\text{Area of } \Delta PAR}{\text{Area of } \Delta ABC} = \dfrac{1}{3} \times \dfrac{3}{5} = \dfrac{1}{5}$

$\Rightarrow \dfrac{\text{Area of } \Delta PQR}{\text{Area of } \Delta ABC} = 1 - \left(\dfrac{1}{10} + \dfrac{1}{2} + \dfrac{1}{5} \right) = \dfrac{1}{5}$

For questions 94 and 95:
A takes 5 hrs to reach DH. Hence his effective speed against the high tide is 16kmph. So speed of the tide is 8 Kmph.

B should take $\dfrac{80}{32}$ ie 2.5 hrs to reach DK. On his retun journey for the first 2.5 hrs the high tide is still there. So he reaches the mid point. There after the low tide starts. The time taken to cover the rest of the 40 kms is 1.6 hrs. Hence effective speed

$= \dfrac{40}{1.6}$ i.e 25 kmph. So the speed of the low tide is 1 kmph towards the sea.

The distance that A covers on his way back before he meets

B is $\frac{23}{48} \times 40 = 19.2$ Km. Hence they meet 19.2 km from DH.

94. 2

95. 4

96. 4   It cannot be (4) because if the ratio of the speeds is 2 : 1 or 1 : 2 then they would meet at the starting point only. They cannot meet at more than 1 different points.

97. 2   If d is the common difference then

$$\left(\frac{1}{a_{n-1}\,a_n}\right) = \left(\frac{1}{d}\right)\left(\frac{1}{a_{n-1}} - \frac{1}{a_n}\right)$$

So the summation of the series gives $\frac{n-1}{a_1\,a_n}$.

98. 3   The probability that 0 flies were eaten

$$= (5,0) \times \left(\frac{1}{2}\right)^5 = \frac{1}{32}.$$

The probability that 1 fly was eaten

$$= (5,1) \times \left(\frac{1}{2}\right)^5 = \frac{1}{32}.$$

The probability that 2 flies were eaten

$$= (5,2) \times \left(\frac{1}{2}\right)^5 = \frac{10}{32}.$$

So the probability that the spider is still hungry is

$\frac{1}{32} + \frac{5}{32} + \frac{10}{32} = \frac{16}{32} = \frac{1}{2}$. The probability the spider is

full is $1 - \frac{1}{2} = \frac{1}{2}$. Thus the probability of a successful

attempt to pass is $\left(\frac{1}{2}\right) \times 1 + \left(\frac{1}{2}\right) \times 0.5 = 0.75$.

99. 4 $b^2 = ac$

And $2\log\left(\frac{3b}{5c}\right) = \log\left(\frac{5c}{3b}\right) = -\log\left(\frac{3b}{5c}\right)$

$\Rightarrow 3\log\left(\frac{3b}{5c}\right) = 0$

$\Rightarrow \frac{3b}{5c} = 1$

So, $b = \frac{5c}{3}$

Also $b^2 = ac \Rightarrow \frac{25c^2}{9} = ac$

$a = \frac{25c}{9}$

But $b + c = \frac{5c}{3} + c = \frac{8c}{3} < \frac{25c}{9} = a$

Since the sum of two sides is less than a third side, it cannot form a triangle.

100. 2 $\frac{y}{x} = \frac{z}{y} = r$ Therefore $r^2 = \frac{z}{x}$

Also $2(y + z) = x + y + x + z$ or $y + z = 2x$

Dividing by x, $\frac{y}{x} + \frac{z}{x} = 2$

Implies $r + r^2 = 2$
Or $(r-1)(r-2) = 0$ so $r = 1$ or -2 (In a GP, $r \neq 1$)
So $r = -2$.

101. 2   The author quotes Ms Eileen in the last line of the fourth para. Before this, he has discussed the possibilities of catastrophic changes and the concerns raised by many people about the severity of the outcome. Ms Eileen's comment means that this uncertainty should make us feel more paranoid and make efforts to be ready for the catastrophe now. This makes choice (2) correct.

102. 2   The passage carries this quote at the end of the second last para. "There is no silver bullet," says Chris Mottershead, distinguished adviser at BP PLC : "There is a suite of technologies that are required, and we need to unleash the talent inside business" to develop them." The later part of the quote demonstrates what he means that there are a few options available which need to be nurtured for them to fructify into viable options. Choice (3) talks about talent but it is too narrow, and the rest of the options don't make sense in this context. This makes choice (2) correct.

103. 3   The answer to this question is in the second para. The author mentions "In January, the European Union will impose mandatory caps on carbon dioxide and other gases that act like a greenhouse over the earth, and will begin a market-based system for buying and selling the right to emit carbon. By the end of the year, Russia may ratify the Kyoto Protocol, which makes CO2 reductions mandatory among the 124 countries that have already accepted the accord." This makes choice (3) correct.

104. 1   Michael Northrop is quoted in the fifth para and the author further mentions that he is the co-creator of the Climate Group, a coalition of companies and governments set up to share success stories of finding alternate means and hidden benefits to avoid dependence on fossil fuel. He is quoted as having said "It's impossible to find a company that has acted and has not found benefits,…." This makes choice (1) correct.

105. 2   The author details the Bush administration's policy in the third para. "The Bush Administration flatly rejects Kyoto and mandatory curbs, arguing that such steps will cripple the economy. Better to develop new low-carbon technologies to solve problems if and when they appear…". This approach dismisses putting any legal restrictions and ceilings on the agent that causes

the harm, but attempts to make it less harmful and deal with problems as and when they manifest themselves. Choice (2) is the most apt analogy and is the correct choice.

106. 4   The author presents Fred Zyda in the second and the third para of the passage. In the second para "…13-year-old Fred Zyda, son of one of the meeting organizers.." making choice a incorrect. Also, the third para states "He sometimes coaches students in video editing at the Naval Postgraduate School in Monterey, Calif." and "When his sister's school got a gift of 30 Macintosh computers,…", making choices (2) and (3) incorrect. Choice (1) is corroborated by the sentence mentioned in the second para which has been quoted earlier, Also, para one mentions the venue of the meeting as Beckman Conference Center. This makes choice (4) correct.

107. 1   The first line of the sixth para mentions this verbatim. "Perhaps most important, the kids learn to embrace technological changes with equanimity.". This makes choice (1) correct and it is also borne out by the gist of the passage.

108. 4   The author mentions in the ninth para "There's a lot of violence, and children sometimes behave like budding young junkies", making choice (1) true. Choice (2) is also mentioned in the same para ""We know games can get you to focus and help you learn,'' says Peter Bardazzi, coordinator for New York University's Center for Advanced Digital Applications. ''But we still don't know what else they do to you.'' And choice (3) is mentioned as well "High-priced games consume kids' spare time and parents' gift budgets—sometimes at the expense of playing with physical toys such as Legos.". Choice (4) is incorrect because in the twelfth para the author mentions "Does that mean games interfere with linear thinking or the ability to read a book? More research is needed. But some surveys show that games cut into TV time, not reading." This makes choice (4) correct.

109. 3   The author mentions TEN in the first para. The author mentions in the thirteenth para "There's no blood or guts in the addictive new 3-D Mario game from Nintendo. Two top-sellers for rival systems—Sony's Crash Bandicoot and Sega's Nights—are action-packed but less violent than Bugs Bunny." MaMaMedia is mentioned in the fourteenth para as a website for children. This makes choice (3) correct.

110. 3   Choice (1) is too wide and the author has not looked at the interface between popular culture and video games. Choice (2) is too narrow as violence is mentioned as an aspect. Choice (4) is incorrect as education and gaming are mentioned as a part of the overall analysis of gaming on children. Choice (3) is the most apt.

111. 2   The sixth para mentions the paradox. "People who are prepared to accept things that can't be rationally explained in the visual arts are seriously unsettled by the enigmatic and non-linear on the stage. It's a reaction which he recognises in himself: he can feel 'assaulted' by being subjected to the impenetrable on the stage." This makes choice (2) correct.

112. 4   The author talks about Tate modern's contribution while talking about Hytner's work and mentions in the eighth para – "..you could argue that, simply by existing, Tate Modern has actually altered the way in which people talk about modern painting;…". This makes choice (4) correct.

113. 2   The author mentions in the ninth and the tenth para that Hytner believes in the diversity in future. This statement goes against his belief by holding only one art form as being superior and can be inferred as a fundamentalist and unhealthy approach. This makes choice (2) correct.

114. 2   The author mentions this point in the eleventh para. "When some one announces - often with an air of quiet pride - that they hate the theatre, they treat it as if it were one homogeneous thing." This homogeneity while evaluating theater does not occur while reviewing books or movies and therefore choice (2) is correct.

115. 1   The author mentions in para four – "Tropicana is the work of Shunt, a 10-strong artists' collective.."… and it doesn't work from a script". This makes choice a false and hence correct. Choice (4) is mentioned in the fifth para and choice (3) is mentioned in fourth and fifth para.

116. 3   The answer to the specific detail question is in para six. "According to Vincent Chan, the chief economist at UBS Warburg in Beijing, between 1994 and 2000, China's operating surplus (or the portion of GDP which reverts as profit to shareholders) was just 21% of GDP, about the same as in recession-ridden Japan". This makes choice (3) correct.

117. 2   The author makes the point in the seventh para –" If we could only persuade every person in China to lengthen his shirt-tail by a foot," he said, "we could keep the mills of Lancashire working round the clock." This clearly meant that China's market is huge if tapped in the right manner hinting at the potential there. Choice (3) is incorrect because he mentioned that the demand should be created and does not exist automatically. This makes choice (2) correct.

118. 1   The author mentions these caveats. In the tenth para "The most important thing is to know why you want to be in China," says Apco's Horgan. " making choice (4) true. Thirteenth para mentions "Pande says that a focussed objective is critical in choosing the right company structure, …" making choice (2) true. Fourteenth para mentions "Not all segments in all industries are growing." But with reference to the IT sector, the author mentions "Fortunately, most of the industries with potential in China are those where Indian firms have competitive advantages — construction, IT, alternate energy…". This makes choice (1) false and hence correct.

119. 4 The author makes this point in the seventeenth para. "Even in rapidly growing industries, it is essential to assess the level of competition in an industry, segment by segment, before making an investment decision. For example, despite strong demand for white goods, global players such as Maytag and Whirlpool have had to exit the market in the face of stiff competition from local companies such as Haier and Kelon." This makes choice (4) correct.

120. 2 The author mentions a paradox in the twenty fifth para. According to Jaya Shree, the half Indian-half Tibetan head of the India China Trade Centre (ICTC), which helps connect Indian and Chinese businesses, "the interesting thing about China is that exciting opportunities also exist in smaller industries that many people might not even think about." And "Yet "small businesses never even think of China", says Jaya Shree.. This makes choice (2) correct. The rest of the options are not corroborated by the passage.

121. 3 This quote appears in the eighth para followed by – "While leading sportsmen are finding that the business they're in makes ever greater demands on them, their partners are too. " This highlights the fact that their hectic career leaves them less time and their partners also want them to do household chores (more demands) which they cannot. This makes choice (3) correct. The rest of the options are not relevant.

122. 2 According to the ninth para, the author mentions "- the one-word front-page headline the following day read: 'Fleeced'." The dictionary meaning of the word is to swindle and because of the 1.8 million pounds, it was clear that the Sun thought she had swindled a sportsman off his money. This makes choice (2) correct.

123. 2 The author makes this point in the first para and says –"'Footie totty, 'tennis babes', 'brolly dollies' - these cliched images of women for whom the biggest decision of the day is a leg wax or a manicure still persist.". Further, "Yet the reality is that marriage and family life in sport is increasingly under intolerable pressure and the traditional image of the sporting wife who has infinitely more handbags than brains is no longer accurate." This makes choice (2) correct.

124. 4 The author mentions in the fourth para about Nick Faldo and the induced birth. In para three he talks about unreasonable behaviour cited by Colin Montgomerie's wife and in para two he talks about Graham Thorpe's problems where choice (3) is mentioned. Choice (4) is not mentioned and is the correct choice.

125. 3 The seventh para mentions this quote. "Seasoned commentators blame long tours and endemic sexism…". The author is hinting at the inferior sexist attitude that is prevalent and leads to sportsmen's negative attitude to women. This makes choice (3) correct.

126. 2 Imprimatur means "sanction or approval for something to be printed" and castigation means "rebuke". This

makes sense as seeking approval for printing to avoid receiving rebuke. Primature is not a word and adages means a wise saying, which does not fit into the context. This makes choice (2) correct.

127. 3 The word minion means an inferior; carapace means " The hard shell of a tortoise etc." cavil means "to find fault without reason", caveat means a warning, demeanor means "Outward behavior". Caveat and Demeanor fit in to mean a warning sent by the principal regarding the outward behaviour of the students during an inspection. This makes choice (3) correct.

128. 4 Inscrutable means incomprehensible, trite means something clichéd or hackneyed, insidious means stealthy or cunning, Sedulous means diligent and privy means something hidden and not public. In this context, insidious and privy make sense to communicate that the cunning witch was feared because of a certain spell, which was not known to the villagers. This makes choice (4) correct.

129. 1 Fastidious means "not easy to please", condone means to "forgive", fallacious means "misleading", exhume means "to dig out of the ground" and concur means "to agree". In this context, fastidious and condone make sense to mean that the person's grandfather has very high standards when it comes to his academic performance and hence he was reluctant to share his report card. This makes choice (1) correct.

130. 3 Fecund means productive, progeny means offspring, verbose means wordy, sobriquet means nickname. In this context verbose and sobriquet make sense to say that Rakesh uses a lot of words but ironically his nickname is short, as all nicknames are. This makes choice (3) correct.

131. 2 Antipathy means aversion, prevaricating means lying, proclivity means inclination, conceit means self-love, slander means defamation or using words to damage someone's reputation. In this context, proclivity and prevaricating makes sense to say that Shiela's tendency to lie about her social circle disturbed her family. This makes choice (2) correct.

132. 2 The action in A is illustrated in 4. The shift of interest in B is indicated as a career shift in 2. The pendulum motion in C is exemplified in 3. The motion along the 'curve' in D is amply illustrated in 1.

133. 3 The directional notion of A is illustrated in the 'straight road' of 4. Arnab's candid replies link B to 1. The straight method of reasoning links C to 2. Rishi made a lot of money, so the tips came from a reliable source, hence D-3.

134. 1 Ninad comes up with ingenuous points in his arguments and hence, it is difficult to argue with him, so A-3. Akansha wanted her room to look neat and tidy, hence B-1. The accused in 4 systematically plans his crimes hence, C-4. After all deductions, the trio made a 'neat' profit, hence D-2.

135. 2 Mrs. Gupta is satisfied with the service, hence A-2. The jury may admit the piece of evidence if it so desires, hence B-1. The writer was directed to make herself comfortable in the garden if she so pleases, hence C-4. The writer expressed his pleasure with the corner table, hence D-3.

136. 1 The protagonist in 3 was forced to bear the burden of supporting her siblings, hence A-3. The cross-product film that combines two genres supports B-2. C-4 is evident as Arun came over intentionally to meet the writer. D-1 is more appropriate as it was a chance meeting.

137. 2 Inveigh means to denounce and one can understand this through the fact that anti establishment work would be running against what the incumbent government is practicing. This makes (2) the correct choice.

138. 2 The word means, "To free, disentangle". This makes choice (2) correct.

139. 4 Iniquitous means wrong, unfair. This makes choice (4) correct.

140. 1 Pugnacity means disposition to fight or combativeness. This makes choice (1) correct.

141. 2 The meaning of placid is calm. This makes choice (2) correct.

142. 3 The first sentence describes Atacama as the driest place on Earth. Sentence C and D seem to be possible second sentences, but since the latter part of the sentence talks about preserved life forms sentence D should follow sentence C. Sentence E qualifies the statement by introducing the fact that one would see the remains and sentence B is the author's comment on it and seems apt as penultimate to F. This makes choice (3) correct.

143. 1 The first sentence talks about the author's father and out of the options only sentence E talks more about A "him" and is logically the next sentence. Sentence D, out of the three options best introduces the mother and sentence C then goes into how the author perceived her. Sentence F talks about her hair and sentence B is the penultimate sentence. This makes choice (1) correct.

144. 2 Sentence A describes the success of Google and how it seemed to be doing well, the next sentence which continues along the same positive mood is sentence C. Sentence D then introduces another element which is a problem being faced by the company. Sentence B states the problem and sentence E talks about the competitors who aren't facing this problem. Sentence F is a comment on this situation. This makes choice (2) correct.

145. 4 The opening sentence describes the stunning facades of a building and sentence B is next as it compares the interiors and describes them. Sentence D mentions the reputation of the building and sentence E talks about one of the reasons that it has been in a problem, sentence C describes a similar case and sentence F ends by mentioning the enquiry being conducted on these two institutions. This makes choice (4) correct.

146. 1 The author talks about a revelation made by an architect, sentence D mentions where this revelation was made – a book. Sentence B then gives more information about Libeskind's rival and sentence E talks about the treatment given to Childs in the book. Sentence C gives an instance of this and sentence F talks about the shrewd actions of Childs. This makes choice (1) correct.

147. 4 'Everyone' is a singular pronoun and therefore "their" is inappropriate when used with it. Sentence c is too wordy and again mentions "they". Sentence d is the correct choice.

148. 3 'its' refer to the country, 'their' has no reference in the sentence. Moreover, there is parallel construction 'rendered-flashed'. Also, the train flashes 'through', not 'to' various towns.

149. 1 (2), (3) and (4) variously alter the original meaning of the sentence by using doubtful words 'holistic', 'partition' and 'exile'. The original sentence is grammatically correct and expresses the right idea.

150. 4 (4) is correct as it lists two qualities and uses the correct degree of comparison for the third quality.