CAT 1990 Actual Paper

Answers and Explanations

1	d	**21**	c	**41**	c	**61**	a	**81**	d	**101**	d	**121**	a	**141**	c	**161**	c
2	c	**22**	c	**42**	c	**62**	b	**82**	c	**102**	d	**122**	a	**142**	c	**162**	c
3	c	**23**	c	**43**	d	**63**	c	**83**	b	**103**	c	**123**	a	**143**	d	**163**	c
4	a	**24**	b	**44**	a	**64**	c	**84**	a	**104**	b	**124**	d	**144**	c	**164**	c
5	b	**25**	c	**45**	b	**65**	a	**85**	d	**105**	b	**125**	d	**145**	b	**165**	c
6	b	**26**	b	**46**	c	**66**	a	**86**	d	**106**	b	**126**	c	**146**	d	**166**	a
7	b	**27**	c	**47**	d	**67**	b	**87**	a	**107**	b	**127**	c	**147**	d	**167**	c
8	a	**28**	b	**48**	c	**68**	b	**88**	c	**108**	a	**128**	b	**148**	c	**168**	a
9	d	**29**	a	**49**	d	**69**	a	**89**	d	**109**	a	**129**	c	**149**	c	**169**	b
10	a	**30**	a	**50**	b	**70**	b	**90**	a	**110**	b	**130**	c	**150**	c	**170**	c
11	b	**31**	a	**51**	b	**71**	A	**91**	a	**111**	c	**131**	d	**151**	c	**171**	b
12	d	**32**	d	**52**	c	**72**	a	**92**	a	**112**	b	**132**	b	**152**	d	**172**	c
13	b	**33**	a	**53**	c	**73**	c	**93**	b	**113**	b	**133**	d	**153**	b	**173**	a
14	a	**34**	d	**54**	c	**74**	b	**94**	c	**114**	b	**134**	d	**154**	d	**174**	c
15	a	**35**	c	**55**	d	**75**	c	**95**	b	**115**	b	**135**	c	**155**	d	**175**	
16	b	**36**	d	**56**	d	**76**	c	**96**	d	**116**	a	**136**	d	**156**	a		
17	a	**37**	d	**57**	d	**77**	b	**97**	c	**117**	c	**137**	d	**157**	b		
18	a	**38**	b	**58**	b	**78**	a	**98**	d	**118**	b	**138**	b	**158**	b		
19	b	**39**	b	**59**	a	**79**	b	**99**	c	**119**	d	**139**	b	**159**	c		
20	c	**40**	d	**60**	d	**80**	a	**100**	d	**120**	b	**140**	b	**160**	d		

1. d The first blank should have a plural. Hence either b or d is the right choice. And genes are hereditary particles, making d. the right option.

2. c 'Backed up' a claim is the correct idiomatic usage.

3. c Only 'ventured' fits in the first blank properly.

4. a A scarcity of goods is often accompanied by high prices.

5. b The correct usage is - disturbances 'blow over'.

6. b Misalliance refers to an alliance between people not normally looked upon as suitable for each other.

7. b 'Reflexes' implies a movement made in response to something.

8. a The art and science of good eating and drinking is called gastronomy.

9. d 'Horror' as a noun can mean an enjoyable feeling of fear from listening to a story or from watching a movie, and is thus different from 'terror', which cannot be enjoyable.

10. a 'Phalanx' means a number of people standing close together for a specific purpose.

11. b "Enhanced' means to increase or improve the quality or value of something. The correct usage here would be 'increased'. The contracted form 'its' and not 'it's' shows the possessive form of the pronoun.

12. d The sentence is divided into three different clauses hence each should be separated by a semicolon.

13. b We need to use 'who' for the subject Mr. Som. Choice d. is not correct due to the wrong placement of the comma after 'who'.

14. a The plural pronoun ‘those’ should take a plural verb ‘believe’.

15. a ‘Its’ and not ‘it’s’ is the correct contracted possessive form for ‘it’.’It’s’ means ‘it is’.

16. b The nouns or pronouns used after a preposition are treated as an object so they are not our subject. So our verb is going to get agree with the noun or pronoun used before the preposition. So our subject is "state" which is singular in number so the verb must be "was" so the answer is (b).

17. a If we use 'one' as our subject all following pronouns must be according to 'one' i.e One (Subjective); One (Objective); One's (Possessive); Oneself (Emphatic or Reflexive) etc.

18. a We are talking about each individual student among a group of students, so the verb should be singular.

19. b None can be used as a singular or a plural number pronoun. In this sentence it is used to represent 'no one' so requires a singular number verb. Therefore, the right answer is (b).

20. c Because we are talking about a particular king we should use ‘the king’. Moreover the verb should be consistent with the noun after ‘nor’. The noun is a plural one hence should take a plural verb desire.

21. c Choice c. is the most concise and appropriate sentence. Others are vague, confusing or too wordy.

22. c All other options are either confusing or unnecessarily wordy. Choice c. uses the phrase ‘are better in quality’ instead of a more appropriate ‘are of better quality’ as used in choice b.

23. c Choice c. uses the simplest and most concise words.

24. b Choice b. uses the appropriate degree of politeness. Choice d. is wrong as it does not tell how much milk powder is required. Others are overtly polite.

25. c ‘Whenever’ implies at any time, hence c. is a better choice than d. Other choices are unnecessarily wordy.

26. b ‘Unexpected’ and ‘unanticipated’ are synonyms, so using both in a sentence is redundant. Moreover ‘consequence’ is a better word to suggest the result of something on something else.

27. c The appropriate idiomatic use is ‘definition should agree with’.

28. b “Much obliged’ serves the same purpose as ‘very much obliged’ and is thus preferable.

29. a Choice a. is the most concise and appropriate option.

30. a “Looking back’ is the correct idiomatic usage.

31. a Just as a road is a medium for a car, a cable is a medium for electricity.

32. d Both the pairs are synonyms with two nouns.

33. a A fleet is a part of navy, just as a chapter is a part of a book. Moreover, both a fleet and a chapter are complete entities in themselves unlike a drop, a letter or a chair.

34. d Many feathers together make a wing and many bricks together make a wall.

35. c Just as sugar goes into tea, a button goes into the buttonhole.

36. d Just as one pays rent when one takes something on a lease, one pays interest on borrowing something, pays salary on employing someone and pays a price to buy something. But one does not pay tax on governing someone.

37. d In all other pairs the first word is used to measure the second.

38. b Just as a progressive person leads to progress, the second word of the pair in all other choices except b. leads to the first word of the pair. A sympathizer ‘gives’, and not ‘leads to’ sympathy.

39. b All others pairs have words that are opposites of each other.

40. d In all other pairs, the first word holds the second together. For example clips hold papers together and a ribbon holds hair together. But vegetables are put inside a bag.

41. c If some of my closest friends are aardvarks, but all of them disapprove of me, it implies that some of those who disapprove of me are aardvarks.

42. c All those who achieve good ends are happy and all young people achieve good ends. Therefore all young people are also happy.

43. d If some learned men are candid but all candid men recognize merit in a rival, it follows that some men recognize merit in a rival are learned.

44. a Because all roses are plants and all plants need air, it follows that roses need air.

45. b If all men are men of scientific genius and some men are men of artistic ability, it follows that all the men of artistic ability are men of scientific genius.

46. c If no fishes breathe through lungs and all whales breathe through lungs it implies that no whales are fishes.

47. d Because all whales are mammals and some of them are aquatic animals, it follows that some of the aquatic animals are mammals.

48. c If all students of this college rank as university students, and all university students are entitled for the prize, it follows that even the first year students can enter for the prize.

49. d If nothing that is uncertain is worth dying for and all beliefs are uncertain than it implies that no belief is worth dying for.

50. b Anyone who is sane can do logic, and anyone who can do logic is fit to serve on a jury. Therefore anyone who is sane is fit to serve on a jury.

51. b From the question we can figure out that P lies between 2371 and 2379. From the 1^{st} statement it can be said that P can be 2372 or 2376 and hence R can be 2 or 6. But from the 2^{nd} statement it can be said that P can only be 2376 and hence R = 6. So from the 2^{nd} statement alone we can have a unique value for R.

52. c From the first statement we can find that number of chocolates given to children more than 5 years old is 5a (where a is the number of children above 5 years old). From the second statement we can find that number of chocolates given to children 5 years or younger is 6b (where b is the number of children equal to or less than 5 years old). So using both statements together we have : 5a + 6b = 43. Since a and b have to be integers, there is only one pair of values that satisfies above equation, viz. a = 5 and b = 3.

53. c If the distance between Calcutta and Madras is x, then the distance between Madras and Trivandrum = 0.3x and total distance between Calcutta and Trivandrum is 1.3x. If the average speed between Calcutta and Madras is y, then the average speed between Madras and Trivandrum = 2y. Hence total time taken = (x/y + 0.3x/2y). Average speed = Total Dstance/Total Time = 1.3x/(x/y + 0.3x/2y) = 1.3/(1/y + 0.3/2y) = 40 kmph. Since y is the only unknown, its value can be determined and hence the average speed between Madras and Trivandrum can be found. Thus we require both statement to answer the question.

54. c (x + z) can be written as (y – x) + (z – y) +2x = 2x + 2 + 2 = 2x + 4. For this to be divisible by 4, 2x has to be divisible by 4 or x has to be even. But x is odd integer and hence (x+z) is not divisible by 4. Thus using both statement together, we can determine the answer to the given question.

55. d Although using both the statements we can find out by how much has the price of P1 and P2 changed over the 5 years, we cannot answer the question that is being asked as it is no where mentioned that the rate of change is uniform.

56. d X > Y, Z < W and V > Y. If we were to look at all of them we can say that, X,V > Y & W > Z. The first statement gives a uncertain situation using “may”, hence we cannot definitely say about the answer. The second statement says, V > W and hence V > Z. This again does not say anything because we do not know whether X>Z or X<Z. Hence the answer is (d)

57. d From the 1st statement we can find that the stopping time was $1^2 + 2^2 + 3^2 + 4^2 + \ldots\ldots + 10^2$, minutes (we can determine this as this is the sum of squares of 1st 10 natural numbers). But this statement alone is not sufficient. From the 2nd statement, average speed between stopovers is given. We cannot find total time from the source stop to the destination stop. Thus, this statement alone is also not sufficient.
We cannot answer the question even by using both the statement together.

58. b $[(x^{-1} - y^{-1})/(x^{-2} - y^{-2})] = (1/x - 1/y)(1/x^2 - 1/y^2) = (1/x - 1/y)/[(1/x - 1/y)(1/x + 1/y)]$.
$= 1/(1/x + 1/y)$.For this to be > 1, $(1/x + 1/y)$ has to be < 1. For this both 'x' and 'y' have to be greater than 2. The first statement doesn't tell you anything about this, but the second statement clearly specifies this. Hence only 2nd statement is required to answer the given question.

59-60 :

Students please note that the best way to answer this question is by finding generally what would ensure a win for B. If B has to win, A has to pickup the last matchstick. This can be forced upon A if there are 2 or 3 matchsticks left on the table when it is B's turn. As then, B could pickup 1 or 2 matchsticks and force upon A to pickup the last one. For this to happen there should always be odd number of matchsticks initially. Eg. If there are 7 match sticks initially any of the following combinations will leave either 2 or 3 matchsticks on the table when it is B's turn.

A	B	B	A			
1	2	3	4	5	6	7

A	B	B	A	A		
1	2	3	4	5	6	7

A	A	B	A			
1	2	3	4	5	6	7

A	A	B	A	A		
1	2	3	4	5	6	7

Hence the smallest value of N (greater than 5) to ensure a win for B is 7. Also the largest value of N (less than 50) to ensure a win for B is 49.

59. a

60. d

61. a For the bird keeper to figure out that at least 1 pigeon had escaped, the number of mynahs has to be less than 7. In other words, $y < 7$. Hence the pair (10,8) is not a valid one.

62. b The last digit of the powers of 2 repeat in the order 2, 4, 8, 6, 2, 4, 8, 6 …Thus every power of 2 which is a multiple of 4 has last digit 6. The 60th power will hence have 6 as the last digit, and hence the remainder when divided by 5 is 1.

63. c If we find the repeated square root of a positive integer, the answer always tends to 1.

64. c $1/(1\times 2)+1/(2\times 3)+1/(3\times 4)+---+1/(100\times 101)=(1-1/2)+(1/2-1/3)+(1/3-1/4)+$ --- + (1/99 – 1/00) + (1/100-1/101) = 1 – 1/101 = 100/101.

65. a $1/(1-x)+1/(1+x)+2/(1+x^2)+4/(1-x^6) = 2/(1 - x^2) + 2/(1 + x^2) + 4/(1 + x^4) = 4/(1- x^4) + 4/(1 + x^4)$
$=8/(1 - x^8)$.

66. a Students please note that the best way to solve this example is the method of reverse substitution. And hence we find that the answer is (a).

67. b If there is only one box containing black ball, the boxes can be filled in 6 ways. If there are two boxes containing black ball, the boxes can be filled in 5 ways. (The two black balls in either of the boxes (1,2), (2,3), (3,4), (4,5), (5,6)). If there are 3 boxes containing black ball the boxes can be filled in 4 ways viz.(123), (234), (345), (456). Similarly if there are 4 boxes, it can be done in 3 ways viz.(1234), (2345), (3456), if there are 5 boxes it can be done in 2 ways viz.(12345), (23456) and all 6 boxes can have a black ball only in 1 way. Hence total number of ways = 6+5+4+3+2+1 = 21.

68. b The successive values of x and y are as follows:

Cycle	X	Y	XY	Y+1
1	1	2	2	3
2	2	3	6	4
3	6	4	24	5
4	24	5		

69. a Let there be 100 products in the stockpile. Hence products from M1 = 40, from M2 = 30 and from M3 = 30. Number of defective products from M1 = 0.03 x 40 = 1.2, from M2 = 0.01 x 30 = 0.3 and from M3 = 0.05 x 30 = 1.5. Therefore total number of defective products = 3, and percentage defective = 3%.

70. b $x*x = 1.5x - x^2$ and $y*y = 1.5y - y^2$.
For $x*x < y*y$ to be true, $1.5x - x^2 < 1.5y - y^2$
$\Rightarrow x(1.5 - x) < y(1.5 - y)$

Option I: $1 > x > y$
Thus, x*x and y*y must be greater than 0.5.
If x = 0.6 and y = 0.9
In this case x*x = y*y
Thus, this condition is not always true.

Option II: $x > 1 > y$
Here, y*y must be greater than 0.5 and x*x must be less than 0.5.
This condition is always true.

Option III: $1 > y > x$
Thus, x*x and y*y must be greater than 0.5.
If x = 0.6 and y = 0.9
In this case x*x = y*y
Thus, this condition is not always true.

Option IV: $y > 1 > x$
Here, x*x must be greater than 0.5 and y*y must be less than 0.5.
This condition can never be true.

71. a Since the summation of all terms = $p/(p - 1) = -p/(1 - p)$, this looks familiar to the formula of summation of a GP of a infinitely diminishing series viz. $a/(1 - r)$. Comparing the two formulae, we get $a = -p$ and $r = p$. f(k) is the k^{th} term of this series given by $ar^{(k-1)}$. Hence $f(k) = -p \times p^{(k-1)}$

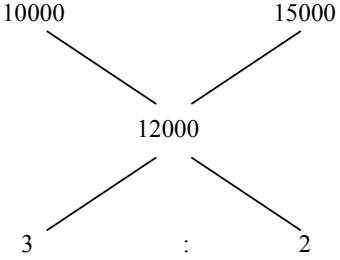
72. a There are 116 players in all. If we have to choose 1 winner, there have to be 115 losers in all. And since 1 match gives 1 loser, there has to be 115 matches to be played in all in the tournament.

73. c $n^3 - n = n(n^2 - 1) = (n - 1)n(n + 1)$ = product of three consecutive numbers. So at least one number is even, and one number is a multiple of 3. So the product is divisible by 6. Students please note that can also be done by the method of simulation i.e choosing any value of n and verifying the answer choices. However you need to be careful in choosing the values. You may choose such a value that the answer is divisible by 12 and hence also by 6.
Alternatively, you may choose to eliminate answer choices by using the above rule. If a number is divisible by 12, it also has to be divisible by 6. Since both of them cannot be the answer you can eliminate option (a). Also if a number is not divisible by 6, it will not be divisible by 12 either and hence you can eliminate option (d) as well.

74. b $(1 - d^3) / (1 - d) = (1 - d)(1 + d + d^2)/(1 - d) = (1 + d + d^2)$ If $d > 1$, then $d^2 > 1$ and $(1 + d + d^2) > 3$. Hence (b) is the right answer.

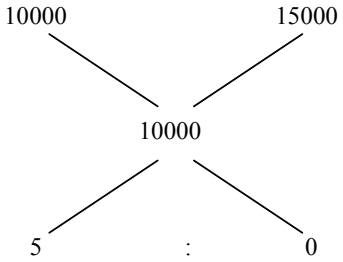
75. c Let Gopal have Rs. 400. The price of an orange is then Rs. 8 and that of a mango is Rs.10. If he keeps 10% of the money for taxi fare, he is left with Rs.360. Now if he buys 20 mongoes i.e. if he spends 200 Rs., he is left with Rs.160, in which he can buy 20 oranges.

76. c Since average cost per piece = 1200000/100 = Rs.12000, if we alligate we get



Hence, he shpuld stock 60 TV's and 40 VCR's.

77. b If 20 more items are stocked, the average cost per piece would now be 1200000/120 = Rs.10000. Now if we alligate we get



Hence, the ratio VCR's and TV's is 0.

78. a For maximising profits, we have figured out that he should stock 60 TV's and 40 VCR's. Now per TV he is making a profit of (12200 – 10000) = Rs.2200 and per VCR he is making a profit of (18300 – 15000) = 3300. So his profit will be (2200 x 60) + (3300 x 40) = 264000 i.e. 2.64 lakhs.

79 to 81:

Since Ghosh babu distributed his property equally among his 4 daughters, each one of them should get 25% of the property. The eldest daughter got 20% of the total property and Rs.25000 in cash. So, Rs.25000 should constitute 5% of the total property. Hence the total property is worth Rs.5 lakhs. This the answer to Q80.

Now, the total cash given by him = Rs.25000 (eldest daughter) + Rs.50000 (second daughter) + Rs.150000 (i.e. Rs.75000 each to his third and fourth daughters) = Rs.225000. So, out of his total property of Rs.500000, Rs.225000 is cash, so the gold and silver should be worth Rs.275000. This is the answer to Q79.

If Ghosh Babu has equal number of gold and silver bars, the value of 1 gold bar and 1 silver bar is Rs.5000 (i.e. Rs.4000 + Rs.1000) and the total worth of gold and silver bars is Rs.275000. Hence there has to be 275000/5000 = 55 gold and silver bars each. This is the answer to Q81.

Students please note that this set of questions can intelligently by solved by looking at the answer choices. Since we know that the combined value of 1 gold and 1 silver bar should be Rs.5000, so the answer to Q79 when divided by 5000 should give the answer to Q81. The only pair of answer choices that satisfies this is Rs.275000 and 55. Hence answers to Q79 and Q81 can be obtained without much effort. Remember the golden rule : whenever you have questions in a set, read all the questions first before you go on to solve them.

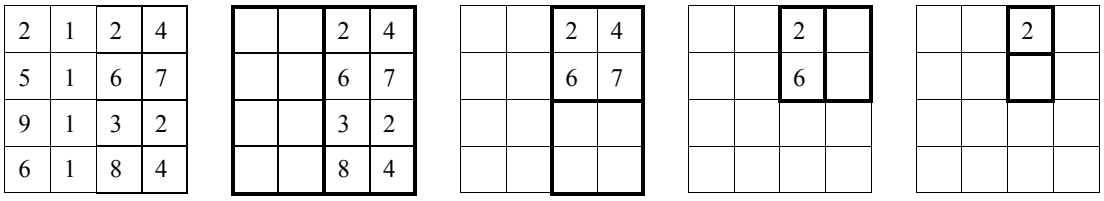
79. b

80. a

81. d

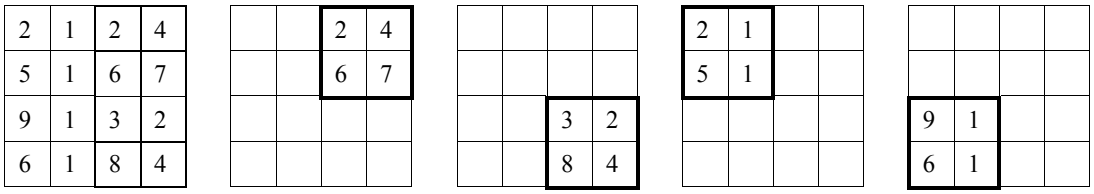
82 to 84. :

82. c



Since you choose to retain right and then left in your next move, the cells that would hence be retained contain 2,6,3,8. (look at the second grid) Hence the to reduce your gain to minimum, your friend has to retain 2 at the end. So his strategy has to be retain upper and retain upper.

83. b If both of you select the moves intelligently, you would both go for maximising your earnings.
In your first move you have to select either left or right and your friend has to then select either upper or lower. Hence the possibilities could be :



You Move	Your Friend Moves	Integers left for your 2nd move	Minimum gain ensured
(Retain Right)	(Retain Upper)	2, 4, 6, 7	4 (after you move retain right)
	(Retain Lower)	3, 2, 8, 4	3 (after you move retain left)
(Retain Left)	(Retain Upper)	2, 1, 5, 1	2 (after you move retain left)
	(Retain Lower)	9, 1, 6, 1	6 (after you move retain left)

So, if you move (retain right) you ensure a minimum gain of Rs.3 and if you move (retain left) you ensure a minimum gain of Rs.2. Hence if both of you play intelligently, you would first move retain right and ensure a minimum win of Rs.3, irrespective of what your friend moves.

84. a If your first move is (retain right) then the grid will look the same as in Q82. Your friend may hence choose either (retain upper), which will leave you to choose from 2,4,6,7 or he may choose (retain lower), which will leave you to choose from 3,2,8,4. In case he takes the former move, you can then move (retain right) and hence force a minimum gain of 4. But in case he chooses the latter move, you can then move (retain move) and force a minimum gain of 3. In either case you can force a minimum gain of Rs.3

85. d If the roots are reciprocal of each other their product = 1. But product of roots in our equation = 6/a. Therefore 6/a = 1 $\therefore a = 6$.

86. d It can be seen that by travelling 12 km more at original speed, the car reaches 9 minutes earlier. So, in order to reach 45 minutes earlier, it has to travel a distance of 60 km more. So the distance between points A & B = (18 + 60) = 78 kms. Hence the answer is (d).

87. a If there are 120 units of the work to be done, A would finish $1/6^{th}$ of it in 1 day i.e. 20 units, B will finish 1/8 of it in 1 day i.e. 15 units and C will finish $1/15^{th}$ of it in 1 day i.e.8 units. So, the amount of work done by A, B and C are in ratio 20 : 15 : 8. This should be ratio in which the total earning should be divided into. So, A, B and C would get Rs.44, Rs.33 and Rs.17.60 respectively.

88. c To completely cross each other the trains have to effectively travel a distance equal to the sum of their lengths. They cover this distance at a effective speed of (60 + 50) = 110 kmph in 5 sec. Hence the sum of the lengths = 110 x (5/3600) = 0.152.78 km or 152.78 m. For the passenger sitting in the faster train to cross the slower train completely, he should have moved through a distance equal to the length of the slower train. Also since the trains are moving in the same direction, effective speed = (60 – 50) = 10 kmph. Since the distance equal to the length of the slower train is covered in 18 secs., the length of the slower train = 10 x (18/3600) = 0.05 km or 50 m. Thus the length of the faster train is (152.78 – 50) = 102.78 m.

89. d If we are to take out the first elements of each set we find them as : 1, 2, 4, 7, 11, 16…..
This series is neither an AP nor a GP, but the difference between the terms viz.1, 2, 3, 4, 5 ….. is in AP with a=1 and d=1. Hence to find the 50^{th} term of the original series we have to add the sum of 49 terms of the second series to the first term of the original series. Since the difference series is the natural number series, the sum of first 49 terms = (49 x 50)/2 = 1225. Hence the 50^{th} term of the original series = (1225 + 1) = 1226. This will be the first element of the set S_{50}, which will have 50 elements ie. The last element will be 1275. So, the sum of the elements in this set is given as : n(a + l)/2 = 50x(1226 + 1275)/2 = 62525.

90. a The side of every inner square will be $1/\sqrt{2}$ times the side of the outer square. Hence the area of every inner square will be ½ the area of the outer square. The area of the outermost square = 64 sq. cm. So the area of the 2nd square woluld be 32 sq.cm., the 3rd square would be 16 sq.cm. and so on. Hence the sum of all these areas would be :
64 + 32 + 16 + 8 + 4 + ……. This forms a GP with a = 64 and r = ½. It is also a infinitely diminishing series. Hence the sum of all terms = a/(1 – r) = 64/(1 – ½) = 128 sq. cm.

91 to 94 :

91. a FORWARD 25, BACKWARD 10 would effectively mean a FORWARD 15 i.e. n_2-n_1 = 15, (if M – n_1> 25) and n_2 = M – 10 (if M – n_1 < 25). The only option that satisfies this is option (a). So if M = 10 and n_1 = 0., then M – n_1 < 25 and so n_2 = 10 – 10 = 0. Hence, n_1=n_2

92. a BACKWARD, 5; FORWARD, 5 would effectively mean n_1 = n_2 (in case $n_1 \geq 5$) or n_2 = 5 (in case n_1<5). The only option that satisfies this is (a).

93. b FORWARD, 10 ; FORWARD, 10 would effectively mean a FORWARD 20 i.e. n_2-n_1 = 20, (if M – n_1 $\geq$ 20) .or n_2 = M (if M – n_1 < 20). The option that satisfies this condition is (b), as if M>20 and n_1=1, then M – n_1 > 20, and hence n_2-n_1 = 20.

94. c FORWARD, 5; BACKWARD, 4, would effectively mean a FORWARD 1 i.e. n_2-n_1 = 1 (if M – n_1 $\geq$ 5) or n_2 = M – 4 (if M – n_1< 5). The option that satisfies this condition is (c).

95 to 96 :

95. b Let us work by the rule of elimination. Option (a) cannot be true as there are many routes that satisfy the given condition. Option (c) is also not true as we can have a route starting from D (eg. DEBDCBAC). The route need not necessarily end at E, which is apparent from the eg. Given. Hence the correction option is (b).

96. d City A is connected by 2 roads, B by 4 roads, C by 3 roads, D by 3 roads and E by 2 roads. For a city to be starting city for such a route, it has to be connected by odd number of roads. Hence the required answer is 2 viz. C and D.

97. c $(x + y + z)^2 = x^2 + y^2 + z^2 + 2\,(xy + yz + xz) = x^2 + y^2 + z^2 + 2 \times 0 = x^2 + y^2 + z^2$.

98. d Let ‘p’ people be born everyday. Since February 29 comes once in 4 years. In 20th century there were 25 leap years, hence number of people born on 29th February = 25p. Total number of people born in the century = (25 x 366 x p) + (75 x 365 x p) = 36525p. Therefore percentage of people born on 29th February = 25/36525 x 100 = 0.0684.
HINT : Students please note that this could well be solved by taking 1 set of leap year as well. In other words, in a 4 year period number of people born = (3x365xp) + 366p = 1461p and number of people born on 29th February in this 4 year period = p. Hence required percentage = 1/1461 x 100 = 0.0684. Thus the period has no significance in this problem.

99. c Options (b) and (d) can be eliminated as the difference in the number of books here is 1. i.e.12,13 and 5,6 respectively. That leaves us with options (a) and (c). Among these we can quickly verify by multiplying only the last digits. Eg. For option (a) the last digit of the total cost should be (5x7) + (8x9) + (7x3) = 5 + 2 + 1 = 8. Which is not we are looking for as our total cost is Rs.620 (with last digit = 0). But option (c) does satisfy this as (5x7) + (0x9) + (5x3) = 5 + 0 + 5 = 0 (as last digit).

100. d Since the total cost is a multiple of 10, the addition of the cost of each type of card should also be a multiple of 10. Now if he buys 5 cards at Rs.5, hill totally pay Rs.25. Since to total cost of Rs.2 card will always be a multiple of 10 (irrespective of whether he buys 5 or 10), the only way total cost can be a multiple of 10 is if the cost of Rs.4.50 cards and that of Rs.3.50 card ends in 5 (eg. 35, 45 etc.). But this will never be possible as either both of them have to bought 10 in number or 1 of them has to be 5 and the other one 10. In the first case we will have their cost as 35+45 = 70 and in the latter case we will have 50 paise at the end. This means that the only way in which the total cost could be multiple of 10 is if we buy 10 each of Rs.2 and Rs.5 and 5 each of Rs..3.50 and Rs.4.50. This will make the total cost = 50+20+17.50+22.50 = 110 rs. Hence he gave 11 notes to the shopkeeper.

101 to 104 :

101. d The answer cannot be determined as the data for only five states is given and we don't know the excise duty rates for other states.

102. d We have been given the total value in the graph, but nothing is mentioned about the amount of liquor manufactured by states other than TN..

103. c Since Excise duty is levied on the total value of liquor produced by the 5 distillaries, this will be in the same order as the order of the amount of the liquor produced by them (as the excise duty rate remains constant). Hence the correct order is DCEBA.

104. b The simple average annual growth for the 5 distilleries in TN is as shown :

Distillary	Calculation	Rate
A	(12.89 – 6.41)/(6.41 x 2)	50.54%
B	(12.07 – 3.15)/(3.15 x 2)	141.58%
C	(11.92 – 1.64)/(1.64 x 2)	313.41%
D	(5.79 – 1.05)/(1.05 x 2)	225.71%
E	(4.21 – 2.45)/(2.45 x 2)	35.91%

So the distillery with highest growth rate is C and with lowest growth rate is E. So had the amount of liquor manufactured by E grown by 313.41% in the 2 year period ie. Grown by 616.82% overall its supply in 1998 would be (2.45 x 616.82 /100) = 15.11 liters.

105 – 107 : The best way to solve these types of questions is the method of assumptions. For eg. The 3 statements are :
Saira has a ball.
Mumtaz does not have the ball.
Zeenat does not have the pen.
Let us assume that statement (I) is true. So other 2 are false. In other words it implies that both. Saira and Mumtaz have the ball. This is not possible.
Let us now assume that statement (II) is true. Which means that Statements (I) and (III) are false. Hence, Saira and Mumtaz does not have the ball but even Zeenat does not have the ball as she has the pen. So even this is contradctory.
Hence the only possibility exists is Statement (III) is true and (I) and (II) are false. This implies that Mumtaz has the ball, Zeenat has the pencil and Saira has the pen.

105. b

106. b The equations can be expressed as :
$J < T$
$J + T = A + D$
$A + T < D + J$
Comparing (i) and (iii), we can see that $D > A$.
If we rearrange the statement (ii) we get : $(T – J) < (D – A)$. In other words the difference between J and T is less than that between D and A. Using this relationship and using the statement (ii) we can say that the right order is $D > T > J > A$. Hence the answer is (b).

107. b This can best be done by the method of elimination. As Bhanu's total was less than Akila's, Bhanu cannot be the winner. As Ela's and Divya's marks are the same, none of them could be winners. The winner could hence be either Bhanu or Charulata. Now, Akhila got 13 in Coherence. Even if she gets 19 in all of the remaining (as no one got 20 in any 1 head), her total would only be 89. But the winner's total is 90. So Charulata is the winner.

108 – 110:

108. a $(100.5 + 67 + 141 + 143.9 + 65)/5 = 103.48$

109. a The key here is figuring out that the only performance which is less than the 1985 performance is the 1988 performance. Hence the percentage corresponding to 1988 should be less than 100. Thus we see that (c) cannot be the answer. Also (b) cannot be the answer as it shows two of the years having less than 100%. Between options (a) and (d), the correct answer is (a), This is so because the difference beween the 1985 and 1988 performance is only 2 units on 67 units. Hence percentage wise it has to be 97% and not 68%.

110. b The highest percentage decline over the previous year is seen for the year 1988, as in this year the performance almost halved. In other year you won't find this happening.

111 – 116:

111. c The estimated total expenditure = 52.1+267.5+196.4+209.5 = 725.5 lakhs.
If it has to be kept within 700 lakhs, the expenditures have to be cut by 25.5 laks. In other words, in each year the expenditure on administration will be cut by (25.5/4) = 6.375 lakhs.
Hence, percentage cut for 1989 would be = (6.375/15) × 100 = 42.5%.

112. b The estimated costs of material and labour for different years are :
1988 = 2.1
1989 = 95+70+15+25+25 = 230
1990 = 80+45+12+18+20 = 175
1991 = 75+60+16+21+18 = 190
The proportion of these expenditures till 1990 = (2.1 + 230 + 175) / (2.1 + 230 + 175 + 190) = 0.6817. This will hence also be the fraction of the total length of the line.

113. b Total material cost for all years = (95+80+75+70+45+60+15+12+16+25+18+21) = 532
Total labour cost for all years = (2.1+25+20+18) = 65.1
Hence ratio = 532 : 65.1 = 8 : 1 (approximately)

114. b In the given table we can see that the costs that can be taken under the head "Materials" are : Cement, steel, Bricks and Other building materials.
The estimated cost of of these heads in 1990 = 80 + 45 + 12 + 18 = 155
The estimated cost of these heads in 1991 = 75 + 60 + 16 + 21 = 172
Since the cost of material rises by 5%, ot would rise by 0.05X (155 + 172) = Rs.16.35 lakhs.

115. b It is said that till 1990, amount spent = Rs.725.5 lakhs
Expenditure for 1991 remains as estimated = 209.5 lakhs.
Hence the increase in expenditure will be 209.5 on 725.5 = 28.87%.

116. a Total estimate = Rs. 725.5 lakh;
Estimate of contingencies = (1 + 15 + 4.2 + 5) = Rs.25.2 lakh.
Now as the estimate of contingencies is doubled, it increases by Rs.25.2 lakhs.
And hence the percentage increase in the total estimate is (25.2/725.5) × 100 = 3.47%

Q117-121:

117. c From table 3 it can be seen that the highest percentage of sales to stock is 74% for the Region 4 and colour Brown.

118. b From Table 4 it can be seen that in region 1, the maximum percentage of saris were sold of Brown colour viz.22% and hence this is the most popular colour in this region.

119. d This can be answered from the fifth table. It can be seen that Region 1 has sold the maximum percentage of magenta saris out of its total magenta saris sold (viz.44%)

120. b This can be answered from the fourth table. It can be seen that Region 6 has sold the least percentage of green saris out of its total sale (viz.14%)

121. a This can be answered from the fifth table. It can be seen that the percentage of blue saris sold is maximum for Region 2 viz. (33%)

122-125:

122. a

Year	Consumption of chemical fertilizers	Gross cropped area	Ratio
84-85	(3.68+1.21+0.62) = 5.51	173.1	0.0318
85-86	(4.07+1.32+0.67) = 6.60	177	0.0372
86-87	(4.22+1.44+0.73) = 6.39	172.6	0.0370
87-88	(5.20+1.73+0.78) = 7.71	180.4	0.0427

Hence the ratio is lowest for 84-85.

123. a I can be seen that in the year 88-89, area cropped shows a decline for 3 of the crops viz.wheat, jowar and bajra. This is the maximum number of crops for any year.

124. d The amount area brought under irrigation for Major and Medium in 86-87 = (24 – 23.2) = 0.8
The amount area brought under irrigation for Minor in 86-87 = (34.2 – 32.77) = 1.43
Hence total area brought under irrigation in 86-87 = 0.8+1.43 = 2.23 million hectares

125. d It can be seen that only in the year 1987-88, the area under minor irrigated area has decreased (from 34.2 to 34). Hence it is obvious that this area should have been transferred to major and medium irrigated areas.

126. c Psychoanalysis has been referred to a curative system for mental healing.

127. c Behaviorism bid for approval by reducing adjustment to a program of conditioning while psychoanalysis analysed mental factors.

128. b The passage states that psychoanalysis created for itself a considerable following among those content with traditional methods and attitudes.

129. c Create a belief in the theory and facts will create themselves.

130. c Psychoanalysts believe that practice is entirely a derivative of theory.

131. d Freudian psychoanalysis was neglected by academic psychology because orthodox psychology largely ignored dreams, lapses and neuroses.

132. b The mission of psychoanalysis has been described as humanistic and one that was the most novel and releasing of the curative systems that mark the history of mental healing.

133. d The psychoanalytical movement became popular due to its exploration of intimate problems of human relations.

134. d Computers produce by accident sequences of words that e recognize as poetry.

135. c Both can be organized to solve problems and both have a similar mose of communication.

136. d The comparison between the two depends upon what the two can do.

137. d The author says that there is no sharp break of continuity between what is human and what is mechanical.

138. b The author implies that computers are not yet capable of producing poetry.

139. b The mode of communication is very similar in both.

140. b The author states that in future due to mechanization there would be many unemployed people.

141. c Socialism at present does not think of the possibility of unemployment in the wake of mechanization.

142. c A revolt against the conception of a worker as a commodity led to the labour movement.

143. d The main purpose of competitive enterprise is to realize a profit.

144. c In the given context we should think of limiting the amount of leisure to that which can be profitably used.

145. b In the given activities the external compulsion is minimum and the they have an element of pleasure and initiative.

146. d There are forms of work like that of an artist or a scientist where external compulsion is reduced to the minimum and which can thus be hardly differentiated from occupation.

147. d Occupation absorbs time and energy so long as we choose to give them.

148. c Work implies necessity and contributes to one's subsistence in particular while an occupation is an en in itself.

149. c The articulate minority refers to the educated and intelligent class.

150. c The passage states that democracy gives more minorities more scope to have their own way than any other system.

151. c We have come to appreciate the virtues of democracy through experience.

152. d The author states that the lesson about the scope offered by democracy to minorities could have been derived by an analysis of the concept of democracy.

153. b The author seems to talk about the virtues of democracy.

154. d Democracies of the world are closer to being ruled by an intelligent, educated minorities.

155. d The author thinks it is the duty of science to study the means by which we can adapt ourselves to the new world.

156. a The examples of these scientists have been given to show that scientists have always been associated with war.

157. b The author says that it is the labour of scientists that has led to all these dangers so scientists have to work to save mankind from this madness.

158. b Till now the scientists felt loyalty to their own state was paramount. But now the loyalty to human race should replace it.

159. c The example has been used to prove how scientists felt that loyalty to their states, to whatever ends it led to, was paramount.

160. d The passage states that scientists have always been associated with war and always have been respected.

161. c The passage states that it is part of the duty of men of science to see that important knowledge is widely disseminated and is not falsified in the interests of this or that propaganda.

162. c Only an adequate progress in human sciences can overcome evils that have resulted from the knowledge of physical world.

163. c Science is in its very nature a liberator, a liberator of bondage to physical nature and, in time to come a liberator from the weight of destructive passion.

164. c The whole argument is based on the fact that we are planning our development with a purpose in mind. If development cannot be planned, the argument is weakened.

165. c The statement that our economic development is inspired by social justice implies both the assumptions.

166. a The argument suggests that our economic development will lead to better standard of living and it will in turn bring social justice.

167. c The reasons given for taking interest in hydro electric projects are that oil prices are increasing and that renewable sources should be tapped.

168. a If it is costlier than such projects will not help in the face of rising oil prices.

169. b The statement suggests that without music, dance or art one cannot be fully alive, hence there can be no civilization.

170. c If art has no relation with civilization the whole argument is nullified.

171. b The statement considers being vibrantly alive as being a necessary condition for being civilized.

172. c If two parties limit the choice of the voters, we cannot have a true democracy.

173. a If politics were also played like any other game then two parties would be enough to play that game.

174. c The author states that democracy would be possible with just two parties if it were a game like cricket, thus assuming that cricket is played by two parties, or teams.