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	b	**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**	d	**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		
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' a claim is the correct idiomatic usage.

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

4. b A scarcity of goods is usually accompanied by or causes a rise in prices. So (d) does not follow logically. (*glut* means an excessive supply of something). *Destitution* (poverty) cannot be applied to inanimate objects. So (c) is also eliminated. *Accompaniment* means something incidental or added for ornament, symmetry, etc. This does not fit the context of the sentence. So (a) is also eliminated. *Concomitant* as a noun is used to mean "a phenomenon that naturally accompanies or follows something." This makes (b) the correct option.

5. b The correct usage is - disturbances 'blow over' (which means to fade away without serious consequences).

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 subjects. So the verb is going to agree with the noun or pronoun used before the preposition. The subject is "state" which is singular in number, so the verb must be "was".

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 Here "marginal performance" has to be emphasized. The sentence in option (c) does that most convincingly. In option (b), using "of" after the possessive makes the sentence awkward. Option (a) and (d) talk about the marginal nature of performance as additional information rather than foregrounding it.

22. c The constructions in (a) and (d) are wordy and awkward. The use of the concessive clause in (c) (Although we know that some things are dear) clearly communicates why we can still enjoy festivals.

23. c Choice (c) uses the simplest and most concise words. 'Conceptual grasp' is incomplete and needs to be followed by a preposition and an object.

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. d The sentence in (a) features a comma splice error. A comma has been used to connect two independent clauses. (b) and (c) feature awkward sentence constructions. In sentence (d) the simple present tense is used to talk about a future event/ schedule.

30. a "Looking back' is the correct idiomatic usage. It means "remembering" or "reflecting" something.

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.

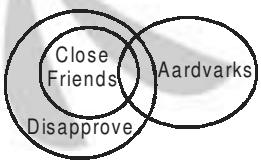
37. d In all other pairs the first word is used to measure the second.

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.

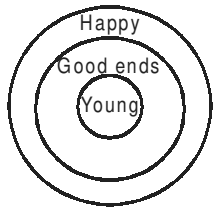
39. b All others pairs have words that are opposites of each other. "Amoral" means not caring about right or wrong; neither moral nor immoral.

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.

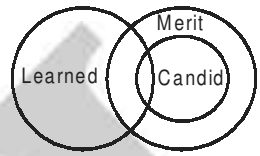
41. c



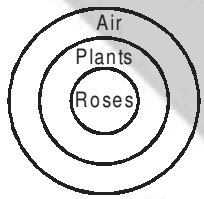
42. c



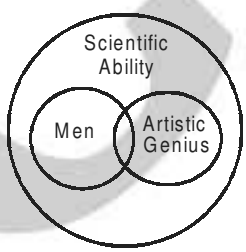
43. d



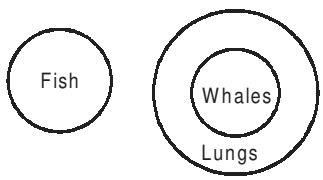
44. a



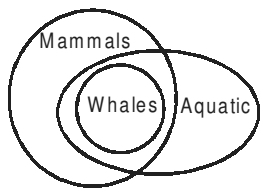
45. b



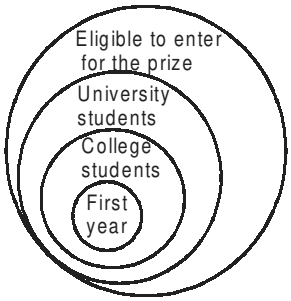
46. c



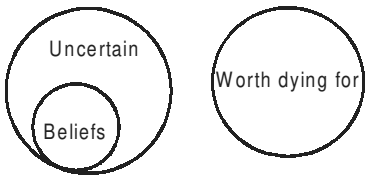
47. d



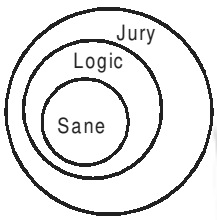
48. c



49. d



50. b



51. b From the question we can figure out that P lies between 2371 and 2379.
Using statement I: P = 2372 or 2376
Using statement II: P = 2376
Hence, statement II alone is sufficient to get a unique value of R.

52. c As 43 is neither a multiple of 5 nor 6, either statement alone is not sufficient to answer the question.
Using both statements together: Let the number of children older than 5 years be 'a' and that of 5 years or younger be 'b'.
As per the given information, 5a + 6b = 43.
As a and b are non-negative integer, only possible value: a = 5 and b = 3.

53. c None of the statements alone is sufficient to answer the question.
Using both statements together: Let the distance and average speed between Calcutta and Madras be 'x' km and 'y' kmph respectively.

$$\text{Average speed} = \frac{\text{Total Dstance}}{\text{Total Time}}$$

$$= \frac{1.3x}{\left(\frac{x}{y} + \frac{0.3x}{2y}\right)} = \frac{1.3}{\left(\frac{1}{y} + \frac{0.3}{2y}\right)} = 40 \text{ kmph}$$

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 statements to answer the question.

54. c As none of the statement gives information about all three – x, y and z, they alone are not sufficient to answer the question.
Using both statements together: x, y and z are three consecutive odd integers.
Therefore, x + z is not divisible by 4.

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 statement I we can find that the stopping time was $\left(1^2 + 2^2 + 3^2 + 4^2 + \cdots + 10^2\right)$ minutes
But this statement alone is not sufficient to answer the question.
From statement II, average speed between stopovers can be determined but 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 statements together.

58. b $$\left[\frac{\left(x^{-1} - y^{-1}\right)}{\left(x^{-2} - y^{-2}\right)}\right] = \frac{\left(\frac{1}{x} - \frac{1}{y}\right)}{\left(\frac{1}{x^2} - \frac{1}{y^2}\right)}$$

$$= \frac{\left(\frac{1}{x} - \frac{1}{y}\right)}{\left[\left(\frac{1}{x} - \frac{1}{y}\right)\left(\frac{1}{x} + \frac{1}{y}\right)\right]} = \frac{1}{\left(\frac{1}{x} + \frac{1}{y}\right)}$$

For above expression to be > 1, $\left(\frac{1}{x} + \frac{1}{y}\right)$ has to be less than 1.
For this both 'x' and 'y' have to be greater than 2. Statement I doesn't give any information about this, but statement II clearly specifies this. Hence, only statement II is required to answer the given question.

For questions 59 and 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 pick-up 1 or 2 match sticks and force upon A to pick-up the last one. For this to happen the number of match sticks initially must be of form 3k + 1.

59. a The smallest number greater than 5 of the form 3k + 1 is 7.

60. d The largest number less than 50 of the form 3k + 1 is 49.

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 $\text{Rem}\left[\frac{2^{60}}{5}\right] = \text{Rem}\left[\frac{\left(2^4\right)^{15}}{5}\right]$

$= \text{Rem}\left[\frac{1^{15}}{5}\right] = 1.$

63. c Repeated square root of positive integer y

$$= \left(\left(\left(y^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\cdots\infty} = (y)^{\frac{1}{2^\infty}} = y^0 = 1.$$

64. c $\frac{1}{(1\times2)} + \frac{1}{(2\times3)} + \frac{1}{(3\times4)} + ---+ \frac{1}{(100\times101)}$

$= \left(1-\frac{1}{2}\right)+\left(\frac{1}{2}-\frac{1}{3}\right)+\left(\frac{1}{3}-\frac{1}{4}\right)$

$+ --- + \left(\frac{1}{99} - \frac{1}{100}\right)+\left(\frac{1}{100} - \frac{1}{101}\right) = 1-\frac{1}{101} = \frac{100}{101}.$

65. a $\frac{1}{(1-x)} + \frac{1}{(1+x)} + \frac{2}{\left(1+x^2\right)} + \frac{4}{\left(1+x^4\right)}$

$= \frac{2}{\left(1-x^2\right)} + \frac{2}{\left(1+x^2\right)} + \frac{4}{\left(1+x^4\right)} = \frac{4}{\left(1-x^4\right)} + \frac{4}{\left(1+x^4\right)}$

$= \frac{8}{\left(1-x^8\right)}.$

66. a When x = 0, $a^x b^{(1-x)} = b$

When x = 1, $a^x b^{(1-x)} = a$

Only option (a) always satisfies the given constraints.

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 can be in either of the boxes (1,2), (2,3), (3,4), (4,5) or (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,
Percentage of defective stockpile = 3.

70. b $x \times x = 1.5x - x^2$ and $y \times y = 1.5y - y^2$.
For $x \times x < y \times y$ 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, $x \times x$ must be greater than 0.5 and $y \times y$ must be less than 0.5.
This condition can never be true.

71. a The summation of all terms $= \frac{p}{(p-1)} = \frac{-p}{(1-p)}$,

comparing this expression with sum $\left(\frac{a}{1-r}\right)$ of an infinite geometric progression with first term as 'a' and common ratio as r, $a = -p$ and $r = p$. $f(k)$ is the k^{th} term of geometric progression.
Hence, $f(k) = -p \times p^{(k-1)} = p(-p)^{k-1}$

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 $n^3 - n = n(n^2 - 1) = (n-1)n(n+1)$
Above expression is the product of three consecutive numbers. So at least one number is even and one number is a multiple of 3. So the product is always divisible by 6.

74. b $\left(\frac{1-d^3}{1-d}\right) = \frac{(1-d)(1+d+d^2)}{(1-d)} = (1+d+d^2)$

If $d > 1$, then $d^2 > 1$ and $(1 + d + d^2) > 3$.
Hence, (b) is the correct option.

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

76. c Let the number of TVs and VCRs bought be t and v respectively. Therefore,

$t + v \le 100$ … (i)

$10000t + 15000v \le 1200000 \Rightarrow 2t + 3v \le 240$ … (ii)

Profit = 2000t + 2500v,
to maximize profit we have to maximize v.
From (i) and (ii),

$2(100 - v) + 3v \le 240$

$v \le 40$ and $t \le 60$

For maximum profit: t = 60 and v = 40.

77. b Let the number of TVs and VCRs bought be t and v respectively. Therefore,

$t + v \le 120$ … (i)

$10000t + 15000v \le 1200000 \Rightarrow 2t + 3v \le 240$ … (ii)

Profit = 2000t + 2500v,
to maximize profit we have to maximize v.
From (i) and (ii),

$2(120 - v) + 3v \le 240$

$v \le 0$ and $t \le 120$

For maximum profit: t = 120 and v = 0.
Required ratio = 0.

78. a Let the number of TVs and VCRs bought be t and v respectively. Therefore,

$t + v \le 100$ … (i)

$10000t + 15000v \le 1200000 \Rightarrow 2t + 3v \le 240$ … (ii)

Profit = 2200t + 3300v,
to maximize profit we have to maximize v.
From (i) and (ii),

$2(100 - v) + 3v \le 240$

$v \le 40$ and $t \le 60$

For maximum profit: t = 60 and v = 40.
Required profit = 2200 × 60 + 3300 × 40
= Rs.2.64 lakhs.

For questions 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.
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.

79. b

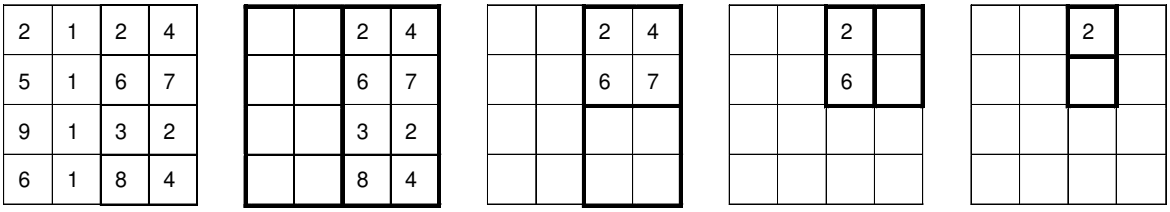
80. a

81. d 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, number of gold and silver bars would be equal

i.e. $\frac{275000}{5000} = 55$.

For question 82 to 84:

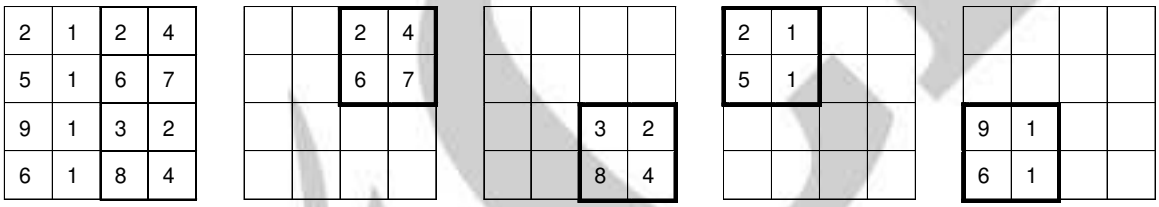
82. c



Initial Board	After your move (Retain right)	After your friends move (Retain upper)	After your move (Retain left)	After your friends move (Retain upper)

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, 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.

Product of roots of the equation $= \frac{6}{a}$

Since $\frac{6}{a} = 1$

$\Rightarrow a = 6.$

86. d It can be seen that by travelling 12 km (30 –18) 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 at original speed.
So the distance between points A & B = (18 + 60) = 78 kms.
Hence, the answer is (d).

87. a Ratio of working efficiently of A, B and C $= \frac{1}{6} : \frac{1}{8} : \frac{1}{15}$ or 20 : 15 : 8
Total earnings would be divided among A, B and C in ratio 20 : 15 : 8.
Earnings of A, B and C (in Rs.) will be 44, 33 and 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 $= 110 \times \left(\frac{5}{3600}\right)$
= 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.
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 $= 10 \times \left(\frac{18}{3600}\right) = 0.05$ km or 50 m.

Thus the length of the faster train is (152.78 – 50) = 102.78 m.

89. d First elements of each set = 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 both first term and common difference as 1.
Hence, to find the 50th 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.

The sum of first 49 terms $= \frac{(49 \times 50)}{2} = 1225.$

Therefore, the 50th term of the original series
= (1225 + 1) = 1226.
This will be the first element of the set S_{50}, which will have 50 elements.
The last element of S_{50} will be = 1226 + 49 = 1275 .
So the sum of the elements in this set

$= \frac{50 \times (1226 + 1275)}{2} = 62525.$

90. a The side of every inner square will be $\frac{1}{\sqrt{2}}$ times the side of the immediate outer square.
Hence, the area of every inner square will be half of the area of the immediate outer square.
The area of the outermost square = 64 sq. cm.
So the area of the 2nd square would be 32 sq.cm., the 3rd square would be 16 sq.cm. and so on.
Hence, the sum of all these areas
= 64 + 32 + 16 + 8 + 4 + …

$= \frac{64}{(1 - \frac{1}{2})} = 128$ sq. cm.

91. a FORWARD 25, BACKWARD 10 would effectively mean 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 satisfies 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 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 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. b 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 given example.
Hence, the correct 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 i.e. C and D are the stating cities.

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

$$= \frac{25}{36525} \times 100 = 0.0684.$$

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 in 20th century number of people born = (3 x 365 x p) + 366p = 1461p and number of people born on 29th February in this 4 year period = p.

Hence, required percentage $= \frac{1}{1461} \times 100 = 0.0684$.
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 is 1. i.e.12,13 and 5,6 respectively.
Among option (a) and (c) 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.
Hence, option (c) is correct choice.

100. d As total cost is an integral multiple of 10, number of cards bought by Rahul of Rs.3.50 and that of Rs.4.50 must be equal i.e. 5 or 10.
If Rahul bought 5 cards of Rs.3.50 and 5 cards of Rs.4.50,
total cost of all cards = 2 × 10 + 3.50 × 5 + 4.50 × 5 + 5 + 10 = Rs. 110.
If Rahul bought 10 cards of Rs.3.50 and 10 cards of Rs.4.50,
total cost of all cards = 2 × 5 + 3.50 × 5 + 450 × 10 + 5 × 5 = Rs. 115. (not possible)

$\therefore$ Required number of notes $= \frac{110}{10} = 11$.

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 Tamil Nadu.

103. c Since Excise duty is levied on the total value of liquor produced by the 5 distilleries, 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 Average simple annual growth rate of five distilleries is as follows:

$$A = \frac{1}{2}\left(\frac{12.89 - 6.41}{6.41}\right) \times 100 = 50.54\%$$

$$B = \frac{1}{2}\left(\frac{12.07 - 3.15}{3.15}\right) \times 100 = 141.58\%$$

$$C = \frac{1}{2}\left(\frac{11.92 - 1.64}{1.64}\right) \times 100 = 313.41\%$$

$$D = \frac{1}{2}\left(\frac{5.79 - 1.05}{1.05}\right) \times 100 = 225.71\%$$

$$E = \frac{1}{2}\left(\frac{4.21 - 2.45}{2.45}\right) \times 100 = 35.91\%$$

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 i.e. Grown by 616.82% overall, its supply in 1998 would be

$$2.45 \times \frac{616.82}{100} = 15.11 \text{ liters.}$$

105. b If statement (I) is true, the other 2 should be false. In other words it implies that both Saira and Mumtaz have the ball. This is not possible.
If statement (II) is true, then statements (I) and (III) are false, then Saira and Mumtaz does not have the ball and even Zeenat does not have the ball as she has the pen. This is contradictory.
Hence, the only possibility that 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.

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 statement (ii), we can say that the right order is $D > T > J > A$. Hence, the answer is (b).

107. b 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. a Required average

$$= \frac{(100.5 + 67 + 141 + 143.9 + 65)}{5} = \text{Rs.}103.48 \text{ crore}$$

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 between 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.

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.
Cut in expenditure every year

$= \left(\frac{25.5}{4}\right) = 6.375$ lakhs.

Hence, percentage cut for 1989

$= \left(\frac{6.375}{15}\right) \times 100 = 42.5\%$.

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

Required proportion $= \frac{2.1+230+175}{2.1+230+175+190} = 0.682$

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 $\approx$ 8 : 1

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 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%, or would rise by 0.05X (155 + 172) = Rs.16.35 lakhs.

115. b Till 1990, actual amount spent = Rs.725.5 lakhs
Expenditure for 1991 as estimated = 209.5 lakhs.

Required percentage increase $= \frac{209.5}{725.5} \times 100$

= 28.89%

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 $\left(\frac{25.2}{725.5}\right) \times 100 = 3.47\%$.

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. a

Year	Consumption of chemical fertilizers	Gross cropped area	Ratio
84-85	(3.68+1.21+0.62) = 5.51	173.1	0.032
85-86	(4.07+1.32+0.67) = 6.60	177	0.037
86-87	(4.22+1.44+0.73) = 6.39	172.6	0.037
87-88	(5.20+1.73+0.78) = 7.71	180.4	0.043

Hence the ratio is lowest for 84-85.

123. a It can be seen that in 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 the 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 humans recognize as poetry.

135. c Both can be organized to solve problems and both have a similar mode 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 they have an element of pleasure and require 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 end 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 talks about the virtues of democracy.

154. d Democracies of the world are closer to being ruled by 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 the 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 hydroelectric power is costlier, then 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.