Answer Key XAT 2008

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

Solutions XAT 2008

SECTION A : VERBAL AND LOGICAL ABILITY

1. E The passage primarily talks about the importance of moods and emotions in marketing. In the process it also draws a clear distinction between moods and emotions and how these are related to each other, but in itself (B) is not an adequate summary of the passage.

2. D Consumption of material items for impressing others-
Refer to the fourth paragraph where it is stated that "Consumers as socially involved individuals.....by the prevailing social climate".

3. C When moods are synchronous with thoughts and actions - Refer to sixth line, second paragraph of the passage.

4. B First is implication, second is proposition - The first statement can be derived from the passage and the second statement is given in the last sentence of the passage.

5. C 1, 2, 4 - Only option 3 is incorrect as it is contradicted in the first paragraph of the passage.

6. C Refer to the lines starting with "When consumers are in a good mood....." in para 2 and the line starting with "An elated mood .....business....." in para 4. Here it is clear that moods when they are positive provide energy otherwise not.

7. A 4213 Source given below
All propositions are of equal value.
- 6.41 The sense [Sinn] of the world must lie outside the world. In the world everything is as it is, and everything happens as it does happen: **in** it no value exists—and if it did exist it would have no value. If there is any value that does have value, it must lie outside the whole sphere of what happens and is the case. For all that happens and is the case is accidental. What makes it non-accidental cannot lie **within** the world, since if it did it would itself be accidental. It must lie outside the world.
6.42 So too it is impossible for there to be any propositions of ethics.
Propositions can express nothing that is higher.
6.421 It is clear that ethics cannot be put into words.
Ethics is transcendental.
(Ethics and aesthetics are one.)
http://shell.cas.usf.edu/~alevine/tlp/100s.htm

8. E 2143 Source given below
6.432 **How** things are in the world is a matter of complete indifference for what is higher. God does not reveal himself **in** the world.
- 6.4321 The facts all contribute only to setting the problem, not to its solution.
- 6.44 It is not **how** things are in the world that is mystical, but that it exists.
- 6.45 To view the world <u>sub specie aeterni</u> is to view it as a whole—a limited whole.
Feeling the world as a limited whole—it is this that is mystical.
6.5 When the answer cannot be put into words, neither can the question be put into words.
The riddle does not exist.
http://shell.cas.usf.edu/~alevine/tlp/100s.htm

9. C 2341 Source given below
The structures of propositions stand in internal relations to one another.
5.21 In order to give prominence to these internal relations we can adopt the following mode of expression: we can represent a proposition as the result of an operation that produces it out of other propositions (which are the bases of the operation).
5.22 An operation is the expression of a relation between the structures of its result and of its bases.
5.23 The operation is what has to be done to the one proposition in order to make the other out of it.
5.231 And that will, of course, depend on their formal properties, on the internal similarity of their forms.
http://en.wikipedia.org/wiki/User_talk:DrL ontology

10. C An epigram is a concise, clever, often paradoxical statement. An epigraph is an inscription , as on a statue / building or a motto / quotation. An epitaph is an inscription on a tombstone. So, it is likely that a clever statement becomes a quotation / an inscription but people are unlikely to engrave it on tombstones.

11. A "prostate" is a gland in men whereas "prostrate" means to lay flat on the ground facing downwards. There is only one option with the word "prostate" which is option (A).

12. E "ordinance" is a rule/decree whereas "ordnance" is another term for weapons.

13. C 'Sinus' is one of the hollow cavities in the skull connecting with the nasal cavities whereas 'Sinusitis' is the condition of inflammation of the sinus. 'Mucous' is an adjective used for tissues/membranes (that secretes mucus); 'mucus' is the viscous, slimy mixture secreted by the nasal gland.

14. D "I never speak the truth" is a logically contradictory statement because -
case (a) if it is true then it means that the person never speaks the truth so he should be lying, but we started with the premise that he is speaking the truth this time.
case (b) if it is false then it means that the person always speaks the truth but we have established the statement as being false already.

15. E A scholarly treatise - It is evident by seeing the pattern of the passage.

16. B The transcendent is the core of the individuation process - Refer to the first sentence of the first paragraph of the passage.

17. E The two separate images of the transcendent function as enunciated in the passage are: the narrow transcendent function and the expansive transcendent function. The comparison is thus of opposites. None of the words in the options (A), (B), (C) & (D) are opposites of each other. Thus option (E) is the correct answer.

18. B The other key Jungian structure that emerges from the expansive transcendent function is the 'archetype'. All options except option (B) are similar in meaning to archetype. Hence option (B) is the correct answer.

19. B It rejects the argument of the author that CEOs of big organisations should not be paid more salary as compared to the small ones.

20. A Except for (A) the rest of the options do not strengthen the speaker's argument. Options (B), (C) and (E) all give reasons as to why CEOs in big organizations should be paid more. Option (A) would add a further reason, one related to education, that would strengthen the speaker's argument that CEOs of small organizations should be paid more.

21. C* The argument in the given question is that Hindi should be made the official language of India. The speaker gives better utilization of the taxpayers' money as a reason and benefit of doing the same. Option (A) in fact strengthens the argument as it presents a point in support for doing away with multiple languages. Option (B) doesn't affect the argument as the passage only talks of people learning to read and write while the option talks of the difficulty in speaking. More importantly, being the most difficult language doesn't counter the given argument as the speaker clearly states that people should learn the language at the earliest (irrespective of the difficulty level). Options (D) and (E) are unrelated to the given argument and hence do not affect it in any way. Option (C) is the only option that comes close to being an answer as it talks of catering to the interests of multilingual people who have the maximum share in the taxes. However, the option incorrectly assumes that these multilingual people would not know Hindi and require the documents to be printed in many languages. Nevertheless, option (C) is the best choice out of the given options.

22. D The initial argument is discussing the relation between India and Hindi and then later it shifts to the relation between UN and India and therefore the final conclusion focusses on the inter relationship between UN and Hindi as an official language. Hence the point above extends the speaker's point of view.

23. E All the other options are out of context keeping in mind the premise of the given paragraph.

24. D The paragraph given provides statistical data which proves that not too many children pass by that intersection.

25. B As the opening line of the paragraph suggests that history can produce decisive transformation with respect to the image of science.

26. E The extract states that different perspectives of looking at history can change people's perceptions about science. Option (E) is the only option that makes a similar statement. Thus (E) is the correct answer.

27. E Option (A) is explicitly stated in the passage and thus cannot be a deduction. Option (B) states that increase in production of existing products enhances core competence, whereas it is the other way round. Similarly option (C) is incorrect because it is modernization that would lead to an enhancement of core competence. Option (D) cannot be concluded from the passage. Thus option (E) is the correct answer.

28. A The extract begins by mentioning "the author" and function goes on to elaborate what the author says about the Blue Ocean strategy. Thus, the extract seems to be part of a review of an article or book on the Blue Ocean strategy.

29. C Refer to the first para which says in part , this trend.....reified India into a monolithic entity. The word 'monolithic' points towards being devoid of diversity.

30. C "Reify" means to make something more concrete or real. The 'construct' the author refers to is the abstract notion that was made more concrete when it was developed into a monolithic identity of India.

31. D The last few lines of the third para state that 'ethic-ization' means judging acts as good/bad.

32. E All four sentences can be found in the passage. Hence all of them are true and (E) is the correct answer.

33. C The third para clearly states that the base meaning of the term 'karma' is 'action'.

34. D The first paragraph clearly states that modern day scholars have tended to study the various disciplines of Hinduism in isolation. Option (D) directly contradicts this. Thus (D) is the correct answer.

35. D To make the concept of 'karma' equally valid across different space-time combinations , it is mandatory that in the next life one is aware of the previous life's actions.

36. C It is the main idea of the passage which is continued throughout the passage.

37. B Options (A) & (C) are not mentioned in the passage. Option (D) is not supported by the passage. Only option (B) conforms to Mayo's perspective as mentioned in the passage.

38. D The author uses the example of Snell's law to illustrate the main idea of the passage.

SECTION B: ANALYTICAL REASONING & DECISION MAKING

For questions 39 to 42: According to the information given in the question, the following table can be drawn.

	Monday		Tuesday		Wednesday		Friday		Saturday	
	M	A	M	A	M	A	M	A	M	A
Conduct-Quiz	√				√		√		X	X
Evaluate Quiz		√	√					√		√
Lecture				√		√			X	X
Work on Consultancy Project									√	

Subscriptions M and A stand for morning and afternoon. Now, referring the above table, answers for the given questions are as follows.

39. A Refer the conduct quiz and lecture rows.

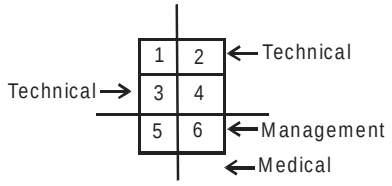
40. E Refer the Tuesday column.

41. E

42. D She must deliver lecture on Tuesday, otherwise the condition that "she lectures in the afternoon on exactly two consecutive calendar days" will not be satisfied.

For questions 43 to 46: State 3 contains technical institute and state 6 contains a management institute. State 6 cannot contain a technical institute and also states 1, 4 and 5 cannot contain a technical institute as they share the common boundary. Therefore, state 2 contains a technical institute.

From the given information and above conclusions the following diagram can be drawn.



43. E 44. C 45. D 46. D

For questions 47 to 50: From the given mother data, we have

H ← J
G G
J or O
K = Week 1 or 2
Week 3 = O
Week 3 = Product that is advertised twice.

47. B J should come after H so, (A) and (E) are eliminated.
G cannot be with M, so (C) is also eliminated.
(D) cannot be the correct choice as K is not present in the first 2 weeks. So option (B) is correct.

48. C The two possible cases can be
Week 1 = H, K
Week 2 = L, J
Week 3 = O, G
Week 4 = L, M
Or
Week 1 = H, L
Week 2 = K, J
Week 3 = O, G
Week 4 = L, M
So option (C) is correct.

49. B One possible case can be as follows.
Week 1 = H, K
Week 2 = G, J
Week 3 = O, L
Week 4 = K, M
So L can occupy any place.

50. A G and H as well as H and J can never be together, so (B) and (C) are eliminated.
K and O cannot be together other wise K cannot be in the first two weeks, hence (E) is eliminated.
H and O cannot be together other wise J would have to come before H, hence (D) is eliminated.
Hence M and O can be together.

51. C Option (A), (D) and (E) are eliminated as all the words are not in alphabetical order.
(B) is out because in order to get the second word 2 operations have been performed at the same time.
Hence, option (C) is correct.

52. D Such a letter will be Y as three words can start with Y and the next three can start with Z.
So option (D) is correct.

53. E Considering only one operation to have happened the third word can be Elicit.

54. C Clean clearn learn
Clean cleabn clearn learn
Clean cleabn cleadn clearn learn
Clean cleabn cleadn cleafn clearn learn
So option (C) is correct.

55. D Except first word each word is formed by different option used for preceding word. Hence, among four words after first word addition of letter can happen for maximum of two times. Therefore, fifth word of sentence can have maximum of 7 litres.

56. B For question 56, we can have the following arrangements

R	G	Y	R	G
1	3	5	7	9
G	R	G	Y	R
2	4	6	8	10

We can easily see that for stores 2, 4, 6, 8 and 10, lights used to decorate are green, red, green, yellow and red respectively.
Hence, option (B) is the correct choice

57. E

R	G	Y	G	R
1	3	5	7	9
Y	R	G	R	G
2	4	6	8	10

58. A See the arrangements for questions 56 and 57.

59. D

R	G	Y	R	G
1	3	5	7	9
Y	R	G	Y	R
2	4	6	8	10

For questions 60 and 61: Since the number in Set C has to be a multiple of the two numbers on the left as well on the right hand side of it, so we are looking for a three digit number of the form
ABC = DE × F = GH × I
Now let's consider the last digits ,viz. 'C', 'E', 'F', 'H' and 'I'
All these 5 digits are different. Now if 'C' is odd, none of the other digits can be even. This means all 5 are odd, so one of the digits should be 5. Now if 5 gets multiplied by any odd number, another 5 gets produced, which is not allowed. This means 'C' can't be odd. Now if 'C' is even, atleast two more digits are even ⇒ atleast 3 evens are there. We have {2, 4, 6, 8} as the set of evens to choose from. Now if 6 is there it can't be anyone amongst 'E', 'F', 'H', 'I'.
So lets assume '6' is not there.
So 'C' could be any one amongst '2', '4', '8'.
Case 1: C = 2, with 4 we have a 3 to get a 2 and with 8, we have 9 to get 2.
The set which is left is {1, 5, 6, 7}
(a) AB2 = D3 × 4 = G9 × 8 (b) AB2 = D3 × 4 = G8 × 9
(c) AB2 = D4 × 3 = G9 × 8 (d) AB2 = D4 × 3 = G8 × 9
We can have the following values of D3 × 4
{52, 212, 252, 292}. All of them are invalid.
we can have the following values of D4 × 3
{42, 162, 192, 222}. All of them are invalid.

Case 2: C = 4 , with 2 we have a 7 to get a 4 and with 8, we have 3 to get 4.

The set which is left is {1, 5, 6, 9)
(a) AB4 = D2 × 7 = G8 × 3
(b) AB4 = D2 × 7 = G3 × 8
(c) AB4 = D7 × 2 = G8 × 3
(d) AB4 = D7 × 2 = G3 × 8
We can have the following values of D2 × 7
{84 , 364 ,434, 644 }. All of them are invalid.
We can have the following values of D7 × 2
{34, 114 ,134, 194 }. All of them are invalid.

Case 3: C = 8 , with 2 we have a 9 to get a 8 and with 4, we have 7 to get 8.
The set which is left is {1, 3, 5, 6)
(a) AB8 = D2 × 9 = G4 × 7 (b) AB8 = D2 × 9 = G7 × 4
(c) AB8 = D9 × 2 = G7 × 4 (d) AB8 = D9 × 2 = G4 × 7
We can have the following values of D2 × 9
{108, 288, 468, 558}. All of them are invalid.
we can have the following values of D9 × 2
{38, 78, 118, 138}. All of them are invalid.

Case 4: C = 6, with 2 we have 3 and 8, with 4 we have 9, with 8 we have 2 and 7.
4 Permutations of a) AB6 = D2 × 3 = G8 × 7 {1, 4, 5, 9}
4 Permutations of b) AB6 = D2 × 3 = G4 × 9 {1, 5, 7, 8}
4 Permutations of c) AB6 = D2 × 8 = G4 × 9 {1, 3, 5, 7}
4 Permutations of d) AB6 = D8 × 7 = G4 × 9 {1, 2, 3, 5}

For a) we have the following values of D2 × 3 {36,126, 156, 276} and the following values of D3 × 2 {26, 86, 106, 186}
All are invalid.

For b) we have the following values of D2 × 3 {36, 156, 216, 246} and the following values of D3 × 2 {26, 106, 146, 166}
All are invalid.

For c) we have the following values of D2 × 8 {96, 256, 416, 576} and the following values of D8 × 2 {36, 76, 116, 156}
All are invalid except 156
D = 7 and G = 3
78 × 2 = 39 × 4 = 156

60. D Minimum re-arrangement required is 3.

61. A The pair of digits occupying A and E is 2 and 4.

62. **Incorrect Question.**

63. C Options (A) and (B) cannot be the right choice as Mukherji cannot be the accountant as it is given that the accountant looks after Mukherji's and Chatterji's account. Options (D) and (E) are not possible as Chatterji cannot be accountant or lawyer (Read the last statement of the question). Hence, (C) is the correct answer

64. A Since Seema is a conscientious female entrepreneur, she should realize that one of the basic premises behind her forming her company was to provide equal opportunity to female employees. Hence she cannot step back from that aim. At the same time she has to run her business profitably. Hence she should look at placing female employees in jobs where they can perform productively without the company's interests being compromised. For jobs requiring overtime and travel she could then look at perhaps hiring more male employees.

65. B As a recruitment manager one should focus on Mayank's strengths and not necessarily his weaknesses. If Mayank has strengths in an area where there is a vacancy then he should be hired for that position. His lack of communication skills is a drawback which can be rectified through proper training on the job so long as it is not directly affecting his productivity too much. Hence the recruitment manager should give more priority to his qualities and not be governed by his drawbacks which may not be strictly relevant for the position he can join.

66. B Since Saundarya Cosmetics has to maximize long-term profits, it has to look at moving beyond the 'rich' segment it has serviced so long. It has to look at catering to the middle class and poor segments which aspire to its products. Also sales in the rich segment are stagnating. Therefore the company should target products of different quality (and hence by implication price) to these other segments. Option (A) is ruled out because by selling high quality products at low prices, the company will lose money in the long run. Option (C) also implies selling the same products previously targeted at the rich (under different brand names) to the poor and middle classes. This would also potentially lead to losses through higher cost of productions and the need to maintain lower prices. Continuing to target only the rich would not maximize long-term profits as sales in this segment is clearly stagnating. Targeting only the middle-class would also be putting all eggs in one basket and hence not desirable. Thus option (B) is the correct answer as the company would be customizing its offering for targeting the different segments.

67. A The company has sold its software to more than a million of customers. The bug poses a significant threat to these customers. Hence if the problem is left unattended the company will face even greater loss of credibility and bad word-of-mouth if it keeps quiet and the customers discover the bug. Hence in order to keep its reputation with its customers and show its commitment to them the company should own up and fix the bug for all software copies sold even if it involves expenses for it. (B), (C) and (D) talk about keeping silent about the problem and hence can be ruled out. (E) is also not correct. Taking off a product that has sold more than a million copies is also an extreme step which will show up the company in a poor light.

Questions from 68 to 70 cannot be answered as data given is inconclusive.

71. B The important cause behind this entire incident was definitely the fact that while Mr Thakur took the bold initiative of negotiating wage contracts directly with supervisors working in day shift, he was inconsistent in doing the same with supervisors working in night shift. He took the trouble to negotiate with day supervisors personally but failed to follow the same process for night supervisors which led to Ram Lal feeling aggrieved, resulting in the incident.

72. E Since the immediate cause of the problem was the inability of night supervisors to deal directly with Mr Thakur, if Thakur had created a process for night supervisors to meet him then the unpleasant incident with Ram Lal and its effect on the organization could have been avoided. Hence 2 comes first in terms of impact on organization. 3 would be next in terms of positive impact if Thakur had generally followed a policy of allowing employees to see him without an appointment. The problem with Ram Lal was aggravated by his repeated inability to see Thakur. Delegating the task of negotiating wage contracts with night shift employees to the Personnel Deptt. would have been next most effective though it would have been overall inconsistent with Thakur's policy. Postponing the decision of wage revision of night shift supervisors would have been least effective. Since contracts had been already made out for day supervisors this would have only added fuel to the problem. Hence the sequence 2-3-1-4 is the right one.

73. B Option (A) is incorrect because his objective was definitely not to create a channel wherein employees could bargain on their wages. Option (C) is not correct as there is no mention in the passage that the supervisors were planning collective action against the management. Similarly, neither option (D) nor option (E) are borned out by the statements mentioned in the passage.

74. B The reason(s) for Ram let's "grievance" have been mentioned as both his inability to meet the President & the unfairness of his wage contract. Thus, option (B) is the correct answer. Option (C) states the immediate cause of his outburst in the President's office.

75. C Obviously the Personnel Department would be disgruntled with Mr.Thakur's initiative because he had deliberately aggravated the problem by keeping it out of the picture. Since. Thakur was unilaterally negotiating contracts without keeping the company in the picture about the financial implications of his contracts the Finance Deptt would also be disturbed about it. Lastly, since the problem involved factory supervisors, the production department would also be annoyed. If consulted it would have been able to advise Thakur about day and night shift workers and how they were likely to react to his manner of dealing with them.

76. D The fact that Mr Thakur hit Ram Lal back when he tried to assault him shows that he clearly became emotionally unstable under pressure and did not deal with the problem in a manner befitting a mature, senior executive.

SECTION C: DATA INTERPRETATION AND QUANTITATIVE ABILITY

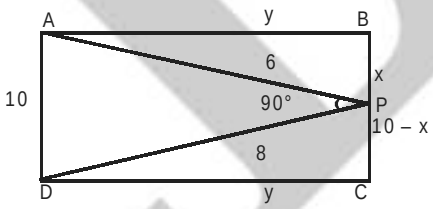
77. E By removing 2, 1, 3 and 5, we get the largest result as 9876. Therefore the largest omitted digit is 5.
Option (E) is the correct choice.

78. D It can be easily seen from the graphs that stock X is more volatile than mutual fund Y.
$\therefore$ Option (D) is the correct choice.

79. C Let us denote number of girls who opted for system, operations and HR electives by G(S), G(O) and G(HR) respectively.
Similarly, number of boys who opted for system, operations and HR electives be B(S), B(O) and B(HR) respectively.
According to the question, we get
G(O) + B(S) = 37 ...(i)
G(O) + B(O) = 22 ...(ii)
G(S) + G(O) = 20 ...(iii)
G(S) + B(S) + B(O) = 37 ...(iv)
G(HR) + B(HR) = 25 ...(v)
On solving the above equations, we get
G(O) = 14, G(S) = 6, B(O) = 8 and B(S) = 23.
Hence, the total number of students in the second year are 14 + 6 + 8 + 23 + 25 = 76.
(We have added 25 as number of students who opted for HR electives are 25.)

80. C Let the total number of girls in the second year be x and the number of girls who opted for the elective be 25 – y, where y is the number of boys in the second year who opted for HR elective.
According to the question, we have
$x = 20 + (25 - y)$
$\Rightarrow x + y = 45$ ...(i)
Also, $\frac{20}{100} \times x = 25 - y$
$\Rightarrow x + 5y = 125$ ...(ii)
On solving (i) and (ii), we get y = 20
$\therefore$ Number of boys who opted for HR elective = 20
$\Rightarrow$ Total number of boys in the second year
= B(S) + B(O) + B(HR) = 23 + 8 + 20 = 51.

81. D According to the question, we have



$AP = \sqrt{10^2 - 8^2} = 6$
Now, let AB = y = DC
$y^2 + x^2 = 6^2$ … (i)
$(10 - x)^2 + y^2 = 8^2$ … (ii)
Solving (i) and (ii) we get BP = x = 3.6
Hence, (D) is the correct option.

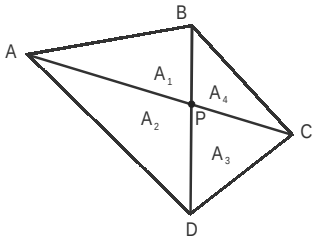
82. E Let x be the average marks and n be the number of tests. Then,

$$\frac{83 - x}{n} = 2 \quad \ldots(i)$$

$$\frac{75 - (x + 2)}{n + 1} = 1 \quad \ldots(ii)$$

Solving (i) and (ii), we get
x = 61 and n = 11
If Rajiv gets 51 in Reasoning, his average will be 63.
Hence (E) is the correct option.

83. E Let A_1 and A_3 be x as both are equal.



We know, $A_1 A_3 = A_2 A_4$
$\Rightarrow x \times x = 27 \times 12 \Rightarrow x = 18$
$\therefore$ Option (E) is the correct choice.

84. B F (4, 3) is the number of ways of distributing 4 toys among 3 children A, B, C (say). Consider child A. A can get either 0 or 1 or 2 toys.

The 4 toys can be distributed among A, B and C in 6 ways, as shown below.

A	B	C
2	2	0
2	1	1
2	0	2
1	1	2
1	2	1
0	2	2

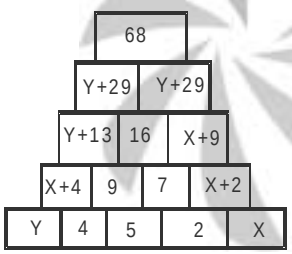
85. B Let runs scored by Ram and Shyam be 6x and 7x respectively. Let runs scored through byes and wides be B and W respectively.
According to the question, we have
$6x + 7x = 26W$
$\Rightarrow 13x = 26W$ ...(i)
$W + 8 = B$ ...(ii)
$13x + W + B = 232$ ...(iii)
From (i), (ii) and (iii), we get
$x = 16$
$\therefore$ Runs scored by Ram $= 6 \times 16 = 96$.

86. E None of the conclusion can be derived.
Hence option (E) is the correct choice.

87. E Given that
$A + B + C = 118$ ...(i)
$B + C + D = 156$ ...(ii)
$C + D + A = 166$ ...(iii)
$D + A + B = 178$ ...(iv)
Adding all the four equations, we get
$3 (A + B + C + D) = 618$
$\Rightarrow A + B + C + D = 206$ ...(v)
Subtracting (i) from (v), we get
$D = 88$
Similarly, $A = 50$, $B = 40$ and $C = 28$.
$\therefore$ None of the conclusions can be derived.
Hence, option (E) is the correct choice.

88. A For sets X and Y, a function from X to Y is a set of ordered pairs F of members of there sets such that for every x in X there is a unique y in Y for which the pairs (x, y) is in F. Only F_2 and F_3 satisfy this. Hence, option (A) is the correct choice.

89. B According to the condition given in the question, we can draw the following frame of cells as follows.



Now for first two rows from the top
$2Y + 58 = 68 \Rightarrow y = 5$
Now for second and third row from top
$34 = X + 25 \Rightarrow X = 9$
Therefore, $X - Y = 4$.
Hence, option (B) is the correct choice.

90. C $A_0 = 1$ and $A_n = pn + (-1)^n . A_{n-1}$
$\Rightarrow A_1 = 1.p + (-1)^1 . A_{1-1} = p - A_0 = p - 1$
$A_2 = 2.p + (-1)^2 . A_{2-1} = 2p + (p - 1) = 3p - 1$
$A_3 = 3.p + (-1)^3 . A_{3-1} = 3p - (3p - 1) = 1$
$A_4 = 4p + (-1)^4 . A_2 = 4p + 1$
$A_5 = 5p + (-1)^5 . A_4 = 5p - (4p + 1) = p - 1$
$A_6 = 6p + (-1)^6 . A_5 = 6p + (p - 1) = 7p - 1$
$A_7 = 7p + (-1)^7 . A_6 = 7p - (7p - 1) = 1$
$A_8 = 8p + (-1)^8 . A_7 = 8p + 1 = 8p + 1$
... ...
Each term of the above sequence is either 1 or $xp - 1$ (where x is an odd number) or $yp + 1$ (where y is an even number).
If $A_n = yp + 1$

$p = \frac{1000 - 1}{y} = \frac{999}{y}$

$\Rightarrow$ p, cannot be an integer.
If $A_n = xp - 1 = 1000$,

$\Rightarrow p = \frac{1000 + 1}{x} = \frac{1001}{x}$

As $1001 = 7 \times 11 \times 13$, except for $(p - 1)$, all the terms of the type $xp - 1$ are of the form $x = 4a + 3$ (where a is a non-negative integer)
So the values correspond to $(p - 1)$, $(7p - 1)$, $(11p - 1)$, $(91p - 1)$ and $(143p - 1)$.
Hence, there are 5 integral values of p.

91. B The given equation is $(1 - p) x^2 + 4x + p = 0$
It's discriminant $16 - 4 (1 - p) p$ or $16 - 4p (1 - p)$ is positive as $0 < p < 1$.

Also sum of roots $\left(\frac{-4}{(1-p)}\right)$ and product of roots $\left(\frac{p}{1-p}\right)$ are negative and positive in sign respectively. Therefore, roots of the given equation are real and negative.
Hence, (B) is the correct choice.

92. B Given $x > 0$.

$$\frac{\left(x+\frac{1}{x}\right)^6 - \left(x^6+\frac{1}{x^6}\right) - 2}{\left(x+\frac{1}{x}\right)^3 + \left(x^3+\frac{1}{x^3}\right)} = \frac{2^6 - 2 - 2}{2^3 + 2} = 6$$

Since $x + \frac{1}{x}$ has a minimum value of 2 for $x > 0$.
Hence, (B) is the correct choice.

93. C The given equation is
$y^2 - 2y \cos x + 1 = 0$ ... (i)
For real solution of y,

$4\cos^2 x \geq 4$

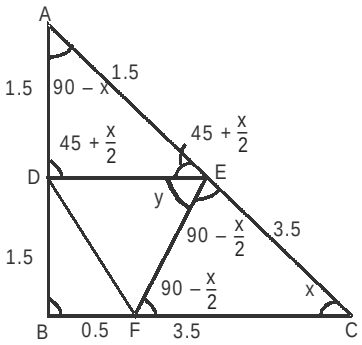
$4(\cos^2 x - 1) \geq 0$

as $-1 \leq \cos x \leq 1$, only possible value of cosx for which

$4(\cos^2 x - 1) \geq 0$ are 1 and –1.

Hence, the number of possible real solutions are 2.
$\therefore$ Option (C) is the correct choice.

94. C As per the data given in the question, we have



Let $\angle DEF = y$.

Now, $\angle AED + y + \angle FEC = 180°$

$\Rightarrow 45° + \frac{x}{2} + y + 90° - \frac{x}{2} = 180°$ …(i)

$\Rightarrow y = 45°$

Hence, (C) is the correct choice.

95. E $3f(x+2) + 4f\left(\frac{1}{x+2}\right) = 4x$

Putting x = z – 2, we get

$3f(z) + 4f\left(\frac{1}{z}\right) = 4z - 8$ …(i)

Now replacing z with $\frac{1}{z}$ in the above equation, we get

$3f\left(\frac{1}{z}\right) + 4f(z) = \frac{4}{z} - 8$ …(ii)

From (i) and (ii),

$f(z) = \frac{1}{7}\left\{\frac{16}{z} - 8 - 12z\right\}$

$f(x+2) = \frac{1}{7}\left\{\frac{16}{(x+2)} - 8 - 12(x+2)\right\}$

$f(4) = \frac{1}{7}\left\{\frac{16}{4} - 8 - 12\times 4\right\} = -\frac{52}{7}$.

Hence, option (E) is the right choice.

96. C Train left at A hr B min or we can say after (60A + B) min and reaches at (B hr C min) $\Rightarrow$ (60 B + C) min.
Total time of journey.
(60B + C) – (60A + B) = 60C + A.

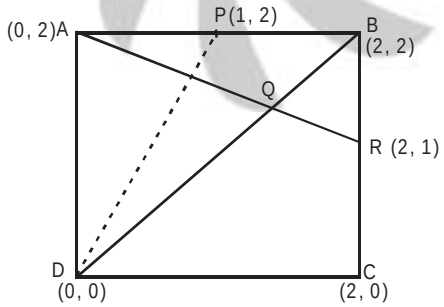
$\Rightarrow 59(B - C) = 61A \Rightarrow A = (B - C)\frac{59}{61}$.

For A = 0, (A, B, C) < 24.
Hence, only one value of A satisfies it as the journey is completed on the same day.
Hence, (C) is the correct choice.

97. B The maximum value of any term of the sequence can be 1 and that happens for the range of values inside the greatest integer function from $\frac{1}{3} + \frac{66}{99}$ to $\frac{1}{3} + \frac{98}{99}$.

For all the other values, the output is 0.
So 1 occurs 98 – 66 + 1 = 33 times in the given series.
Thus, the required sum is 33.
Option (B) is the right choice.

98. B



Equation of the line AR is given by:

$(y - 2) = -\frac{1}{2}(x - 0) \Rightarrow 2y + x = 4$

Slope of the line $DP = \frac{(2-0)}{(1-0)} = 2$

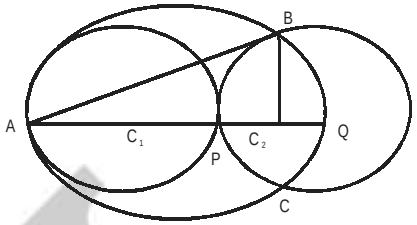
Slope of the line $AR = -\frac{1}{2}$

Coordinates of the point R = (2, 1)

Hence, $PR = \sqrt{(1-2)^2 + (2-1)^2} = \sqrt{2}$ units

Hence, option (B) is the correct choice.

99. C



Δ ABQ and Δ ABC_2 are similar

$\Rightarrow \frac{AB}{AQ} = \frac{AC_2}{AB} \Rightarrow AB = \sqrt{3^2 + 1^2} = \sqrt{10}$

Let $C_2Q = x$

$\Rightarrow \frac{\sqrt{10}}{3x} = \frac{3}{\sqrt{10}} \Rightarrow 3(3 + x) = 10 \Rightarrow x = \frac{1}{3}$

Hence, diameter of bigger circle is $\left(3 \times \frac{1}{3}\right) = \frac{10}{3}$

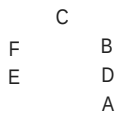
or radius = $\frac{5}{3}$ unit .

Hence, option (C) is correct.

100. Incorrect Question.

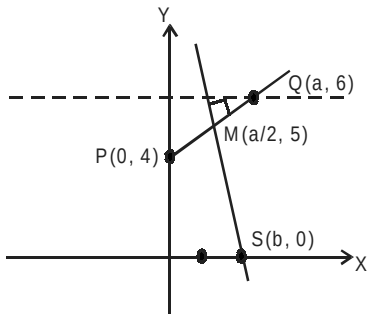
101. D Using statement I, we can have sides as 60 cm, x cm and (80 – x)cm. One of the angles is 60°. Using the cosine law, we can find out the value of x and hence the shortest side. Using statement II, we know all the angles and one side and hence all sides are known using sine law.
So option (D) is the correct choice.

102. A



From statement I, we have
E + B < D + A
Also, we know from the main data that
E + B > E + D
Hence, E + D < D + A
$\Rightarrow$ E < A
So A is not the smallest integer.
From statement II, we cannot deduce whether or not A is the smallest integer.
Hence, option (A) is the right choice.

103. C



The co-ordinates of the point M are $\left(\frac{a+0}{2}, \frac{6+4}{2}\right)$ or $\left(\frac{a}{2}, 5\right)$

Slope of the straight line PQ is $\frac{6-4}{a-0} = \frac{2}{a}$

$\Rightarrow$ Slope of the straight line MS = $-\frac{a}{2}$

$\Rightarrow$ Equation of the straight line MS is $\frac{y-5}{x-\frac{a}{2}} = -\frac{a}{2}$

$\Rightarrow y + \frac{a}{2}x = 5 + \frac{a^2}{4}$

As point S(b, 0) lies on it, we must have;

$0 + \frac{a}{2} \times (b) = 5 + \frac{a^2}{4} \Rightarrow b = \left(\frac{10}{a} + \frac{a}{2}\right)$

For a = 2, –2, 10 and –10; b is an integer.
Hence, (C) is the correct option.

104. E Units ordered = Units sold + Ending inventory – Beginning inventory
= 3150 + 2880 – 2520 = 3510
Total sales of Television = 900 + 1800 + 6300 + 1050 + 2100 + 7350 + 1200 + 2400 + 8400 = Rs.31,500

Sales price per unit of Television $= \frac{31500}{3150} = Rs.10$

Cost price per unit of television $= \frac{10}{1.25} = Rs.8$

Total value of order placed = 3510 × 8 = Rs.28,080.

105. D Adding all the sales value, column wise
= 40500 + 47700 + 44100 = 132300
Now 14% of 132, 300 = 18522.
Hence, (D) is the correct option.

106. C For Bistupur and Kadma, Ipod sale value = 22050
And Television sales value = 7200
Now $10\% \times 22050 + 20\% \times 7200 = 3645$
Hence, (C) is the correct option.

107. E Given that
Units ordered = Units sold + Ending Inventory – Beginning Inventory
7560 = units sold + 6120 – 5760
or units sold = 7200
I pods sold (in rupees thousand) = 100800

Therefore, unit sales price $= \frac{100800}{7200} = 14$

Hence, (E) is the correct option.

108. B In a month of February, 1050 units of Television and 2400 units of IPods were sold in all three areas

Selling price per unit of Television $= \frac{10500}{1050} = Rs.10$

Price of IPod per unit $= \frac{33600}{2400} = Rs.14$

This Price per unit is from a month of January.
Number of units of Television sold in the month of January

$= \frac{9000}{10} = 900$

and number of units of IPods sold in the month of January

$= \frac{31500}{14} = 2250$

Number of units ordered = Units sold + Ending Inventory – Beginning Inventory
For Television, units ordered = 900 + 840 – 720 = 1020
For Ipod, units ordered = 2250 + 1920 – 1800 = 2370

109. C Given equations are
B + C + D + E = 4A
C + F = 3A
C + D + E = 2F
F = 2D
E + F = 2C + 1
Also, A is a prime number between 12 and 20.
Therefore, A can be 13 or 17.
Assuming A = 17, we have
C + F = 51
23 + 28 = 51
or 23 + 2(14) = 51
C = 23, D = 14, F = 28, A = 17
E = 2C + 1 – F = 56 + 1 – 28 = 29.

110. E

111. A When A = 13, equation does not satisfy the given conditions.

112. A Profit = Sales – Cost . It can be easily seen that for the month 1, the difference between sales and cost is maximum.
Hence, (A) is the correct option.

113. B Graph clearly suggests that in the month of 4, maximum sales growth is witnessed as from 3 to 4 line is the most steepest.

114. A Average sales

$= \frac{2200+1725+1625+2250+1600+1850+2100+1475+1700+1650}{10}$

$= \frac{18175}{10} \approx 1818$

Average costs

$= \frac{1800+1650+1300+1950+1700+1800+1850+1400+1600+1700}{10}$

$= \frac{16750}{10} = 1675$

As only option (A) has sales value in 1800, it would be most appropriate option.

115. E $A_2 = 3A_1 - 2A_0 = 7$
$A_3 = 4A_2 - 3A_1 = 19$
$A_4 = 5 \times 19 - 4 \times 7 = 67$
$A_5 = 6 \times 67 - 5 \times 19 = 307$
Clearly, $(t + 1) A_{t-1} > tA_{t-2}$
Hence, non of the conclusions are true.
So option (E) is the correct choice.

116. A Taking b = 2, we have ac = 1 and a + c = 4

$\Rightarrow$ a can be $2 + 3^{\frac{1}{2}}$ and c can be $2 - 3^{\frac{1}{2}}$ which satisfies the condition. If we chose a = 2.5, the condition is not satisfied.
Hence, (A) is the correct option.

Question from 117 to 120 cannot be answered as the data given is inconclusive.