JMET 2010 - SET A - Solution Key

SECTION - 1 (Verbal Communication)

1. Option 1 is eliminated as the passage does not only focus exclusively on the evolution of early philosophy.
   Option 2 with 'theory' digresses from the main ideas of the passage.
   Option 4 has no mention of philosophy and broadly states 'knowledge'.
   The entire focus of the passage is the evolution of philosophical thought.
   Hence, the correct answer is option 3.

2. Options 1, 3 and 4 are mentioned in the passage.
   Option 1 – "What precisely is the relation between our knowledge and the raw material furnished by our sense perceptions? An almost boundless chaos of philosophical opinions corresponds to these questions".
   Option 3 – "Plato ascribed a higher reality to ideas than to empirically experienceable things".
   Option 4 – "Science seems to be at war with itself. When it most wants to be objective it finds itself plunged into subjectivity against its will". Therefore subjectivity is a part of science.
   Option 2 cannot be deduced from the passage.
   Hence, the correct answer is option 2.

3. The word, "parenthetically" is used in the passage means 'a qualifying or amplifying word, phrase or sentence written within brackets and inserted within written matter'.
   Only option 2 fits the definition.
   Hence, the correct answer is option 2.

4. The last line of the passage states, "Naive realism if true, is false: therefore it is false". If you accept naive realism to be true then it leads you to physics. However, if you accept the laws of physics to be true then those very laws prove naive realism to be false. This is best explained in option 2.
   Options 1 and 4 are eliminated as they are not addressed in the last line of the passage.
   Option 3 is eliminated as it does not convey the same idea as the last line of the passage.
   Hence, the correct answer is option 2.

5. The word "incorruptible", meaning 'that cannot be bribed', has been incorrectly spelt as "incorruptable".
   Hence, the correct answer is option 3.

6. "Eruct" means 'to belch forth (as gas from the stomach), or to emit violently (as matter from a volcano)'. Therefore, the word that is closest in meaning to eruct is "belch", which means 'to

eject gas spasmodically and noisily from the stomach through the mouth, or to emit violently'.
Hence, the correct answer is option 2.

7. "Cometary" is a related form of comet.
Hence, the correct answer is option 3.

8. Options 2 and 4 are incorrect as the author explicitly states that he does not believe that "man is born to trouble".
Option 3 is incorrect because it is beyond the scope of the passage.
The entire passage revolves around the theme of 'man being unhappy because he chooses to be'. Option 1 best captures that essence.
Hence, the correct answer is option 1.

9. The word "fatalistically" as used in the passage means 'the acceptance of all things and events as inevitable; submission to fate'.
"Pre-ordained" best fits the description.
Hence, the correct answer is option 3.

10. Option 1 is incorrect because it states that 'prosperity has vanished'. The passage states that prosperity is present but not helpful. The meaning changes entirely.
Option 3 is broad and encompasses the entire passage rather than limiting to the quoted text.
Option 4 is incorrect presentation of data.
Option 2 is the meaning of the quoted text as presented in the passage.
Hence, the correct answer is option 2.

11. 'Biology' is the science of life or living matter in all its forms and phenomena, especially with reference to origin, growth, reproduction, structure, and behaviour. It includes the study of cells.
Similarly, 'agriculture' is the science or occupation concerned with cultivating land, raising crops, and livestock.
Hence, the correct answer is option 1.

12. 'Angular' means pertaining to angles, which are studied in geometry.
'Hibernal' means of or pertaining to winter.
Hence, the correct answer is option 3.

13. AMBIGUOUS (A number of relationships can be derived from the pair Power: Politics, making it difficult to narrow down and select a single option).

14. The sentence reads, "From that memorable night, I dismissed my apprehensions, with them vanished the disorders, of which they (apprehensions) had been the cause".
Therefore, the apprehensions may have been the cause of the disorders; alternately, the

disorders may have been the consequence of the apprehensions.
Option 1 is eliminated as the cause-effect relationship is reversed.
Option 2 changes the meaning completely by stating that the disorders were dismissed from the apprehensions.
Option 3 also changes the meaning completely with 'apprehensions dismissed the disorders'.
Option 4 is concise and closest in meaning to the given sentence. It mentions that the apprehensions and the consequent disorders disappeared from that night onwards.
Hence, the correct answer is option 4.

15. Option 2 is mentioned in the line "but the fishy similarities of trout and lungfishes are genuine evolutionary marks of common ancestry."
Option 3 is mentioned in the line, "In genealogical terms, closeness is defined by position in a sequence of branching – what Darwin called propinquity".
Option 4 is mentioned in the line, "dogs and seals are genealogically close as members of the order Carnivora".
Option 1 is contrary to the data presented in the passage.
Hence, the correct answer is option 1.

16. Definition of a cladist is a person who advocates classification by pure genealogy (branching order or propinquity), with no attention what so ever to traditional concepts of similarity in function or biological role.
Hence, the correct answer is option 3.

17. The whole passage mentions propinquity being different from functionality.
As a result, genealogical propinquity does not follow from functional similarity.
The other options are not best deduced from the passage.
'No such thing' in option 1 and 'all' in option 3 render them inadequate.
Option 2 is contrary to the data presented in the passage.
Hence, the correct answer is option 4.

18. Statement 1 can be structured as either 4123 or 1423. In both cases, the sentence unnecessarily uses the present continuous tense.
Statement 3 can be structured as 213…4 where 4 is the erroneous part and doesn't connect with the rest of the sentence
Statement 4 can either be 241…3 or 213…4. In both cases is the erroneous part is '3'.
In statement 2, the right sequence, without any grammatical errors, is 2413.
Hence, the correct answer is option 2.

19. 'Nescience' means 'ignorance'.
The word opposite in meaning is 'awareness'.
Hence, the correct answer is option 1.

20. ‘Preconize’ means ‘to proclaim or commend publicly’.
‘Announce’ is a synonym, ‘predict’ and ‘negate’ are not opposite in meaning to ‘preconize’.
‘Conceal’ which the opposite of ‘proclaiming something publicly’ is the appropriate choice.
Hence, the correct answer is option 3.

21. Option 3 has been indicated in paragraph five of the passage: “There are all kinds of parallel cultural and value shifts….the new emphasis on renewed family life”
Option 2 has been mentioned in paragraph one.
Option 4 has been mentioned in paragraph four.
Option 1 has not been stated in the passage, nor can be implied.
Hence, the correct answer is option 1.

22. The passage makes a strong case of working from home. The entire case has been made with the background of the emergence of the third wave economy. The mention of third wave industries, two powerful economic curves about to intersect, and the mention of how things are fundamentally about to change in the last two paragraphs make a strong case for option 3.
Options 1 and 2 are narrow. They touch upon parts of the passage without encompassing the entire passage.
Option 4 comes tantalizingly close to the right answer except for the last two paragraphs of the passage.
Hence, the correct answer is option 3.

23. The rise in transportation has been associated with rise in costs and waste of non-renewable fuel, waste of human creativity and time, crowding etc. This data as well as the passage implies that community wastes a lot of time and resources which could have otherwise been utilized effectively- in effect commuting is the least productive aspect. This is stated in option 2.
However, least productive aspect has not been connected with transport costs. The passage merely states that increased transport costs compel companies to pay higher wages to their employees. Eliminate option 1.
Reduced telecommunications costs and renewed emphasis on family life have been mentioned independently of each other. The cause-effect relationship is missing. Eliminate option 3.
Similarly, physical production in factories, information design and symbols have been mentioned independently in the passage. Eliminate option 4.
Hence, the correct answer is option 2.

24. The entire passage makes a case for working from home and provides various reasons for it.
‘Increased energy costs’ have been mentioned in paragraph one, ‘decreased telecommunications costs’ have been mentioned in paragraph two, and ‘regional decentralization’ has been mentioned in paragraph four.
‘Increasing levels of social diversity’ has not been mentioned in the passage.
Hence, the correct answer is option 3.

25. The question requires identification of the correct indirect speech.
Option 4 has a redundancy error with the use of 'as' and 'because'.
Option 3 changes the communication to past tense and thereby changes the meaning of the sentence. The person who is supposed to visit has not completed 'his visiting' as mentioned in option 3.
Option 2 changes the meaning of the original sentence by asking 'whether'. It should also use 'was' instead of 'is' in the first part and 'had seen' instead of 'is' in the latter part of the sentence.
Option 1 communicates the ideas presented in the main sentence without changing the meaning or inserting any ambiguity.
Hence, the correct answer is option 1.

26. Options 1 and 3 are eliminated as the sentence incorrectly focuses on Russell rather than the relationship.
Option 2 is eliminated because the term, "reciprocal relationship" changes the meaning of the entire sentence.
Option 4 is correct because the emphasis of the sentence is on the relationship which Russell identified to be reciprocal.
Hence, the correct answer is option 4.

27. Options 2 and 3 are eliminated as they unnecessarily introduce the continuous tense 'hating'.
Option 4 is eliminated as it gives an abrupt end to the sentence with 'perhaps'.
Option 1 has no errors. The use of pronoun 'whom' in the sentence is appropriate.
Hence, the correct answer is option 1.

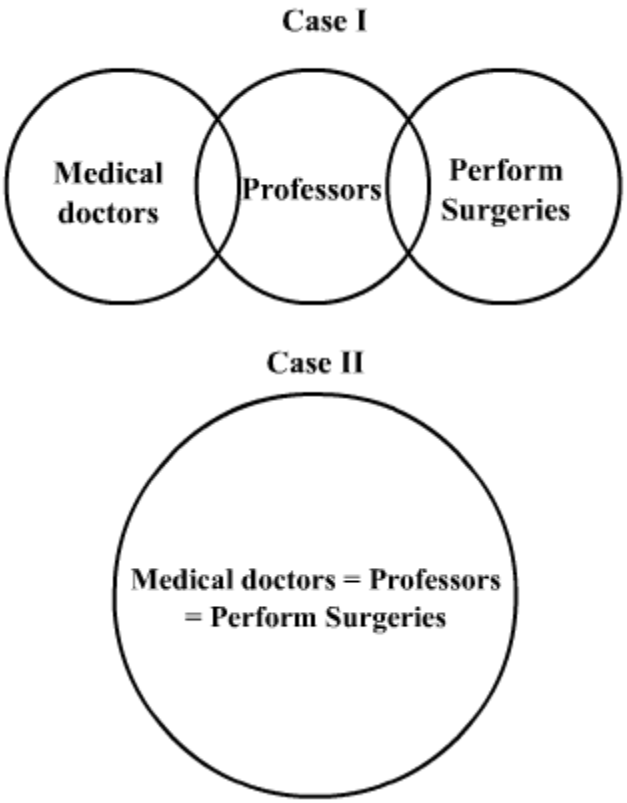
28. Options 1, 2 and 3 are incorrect due to punctuation errors which completely change the meaning of the sentence. The extensive use of commas is not required.
In option 4, "Indeed" is used to mean 'truly, actually' to emphasize the point. This fits in as it adds to the main sentence.
Hence, the correct answer is option 4.

29. 'Pertinacity' means, 'the quality of being persistent or stubborn'.
Out of the four options the best choice is 'stubbornness'.
Hence, the correct answer is option 4.

30. The sentence is completed with 'humour' in the first blank and with 'amusing' in the second blank.
The sentence structure does not indicate or hint at an abrupt change in thought or tone, or the need to bring in contrasting ideas within the two blanks. This eliminates options 1 and 2.
Option 4 is also eliminated as anguish (suffering) and droll (humorous) are contradictory ideas.
Hence, the correct answer is option 3.

SECTION - 2 (Logical Reasoning)

31.



All the three conclusions are valid in case 1 but not in case 2.

Hence, none of the conclusions can be said to be definite.

Hence, the correct answer is option 4.

32. The first given statement is: A group of four has at least two female members.∴ There are three possibilities.

1. The group has two Female and two Male members (F F M M)
2. The group has three Female and one Male Member (F F F M)
3. The group has all four Female members (F F F F)

The second given statement is: Three of the group members are college students.

Consider conclusion I: Two female group members are college students.

It is not necessary as in case 1 there can be one female member and two male members of the group who are college students.

∴ Conclusion I is not valid.

Consider conclusion II: There are at most two male members.

As can be seen from the three cases, there can at most be two male members in the group.

∴ Conclusion II is valid.

Consider conclusion III: There is at least one female college student.

As can be seen from the given cases, there has to be at least one female member in the group who is a college student.

∴ Conclusion II and III are valid.

Hence, option 2.

33. The question is camouflaged as a conclusion but essentially asks about the assumption made to present the data given.

There is a difference between 'only' and 'all'. 'Only' implies that no one else, apart from the university students, is familiar with the campus. This, however, does not imply that all of them are familiar, which is the required. Hence, option 1 is a probable but not a definite assumption.

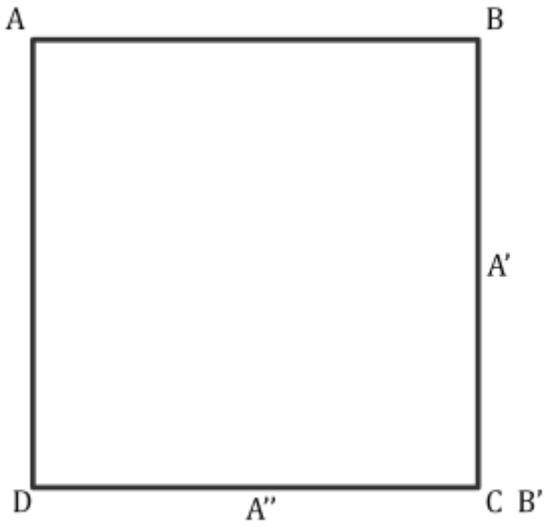
Option 2, with the words 'may be' is also a probable but not a definite assumption.

Option 3 with 'some students' is a possible but not a definite assumption.

The main statement states that since he is a student of this university, he should be familiar with the university campus. To make this statement, the speaker needs to assume that all students of this university should be familiar with the university campus.

Hence, the correct answer is option 4.

34. Refer the diagram,



Here, A, B, C and D represent the starting positions of Ahmad, Burman, Chhaya and Deepak respectively such that AB = BC = CD = DA = a.

B' is the final position of Burman and A' or A'' are the two possible final positions of Ahmad such that B'A' = B'A'' = $a/2$

Now, the distance walked by Ahmed is either $3a/2$ or $5a/2$.

Consider option 1: Ahmed has walked a distance of ***only*** '$3a/2$'.

The word ***only*** has made this statement '***must be false***'.

Hence, option 1.

35. The essence of the paragraph is "right to freedom of expression".

Statement (ii) introduces the idea.

"It is subject to …" in statement (i) refers to "right to freedom of expression" stated in (ii).

Statements (iii) and (iv) follow with statement (iii) quoting articles 19(3) and 20(1) and statement (iv) following with "among others" of defamation, public order… quoting article 19(1)(2).

The sequence is (ii)-(i)-(iii)-(iv)

Hence, the correct answer is option 1.

36. Statements (i) and (iii) are a pair. Both mention financial results of the railways for the fiscal year 2006-07.

Statement (ii) follows (iii) adding with "Another significant development".

Statement (iv) provides a smooth finish to the entire paragraph by forecasting the contribution in 2008-09.

"Central exchequer" in statement (iii) connects with "the exchequer" in statement (iv).

The sequence is (i)-(iii)-(ii)-(iv)

Hence, the correct answer is option 4.

37. Statement (ii) introduces the scene with "Olga".

"…at her" in statement (i) connects with Olga in statement (ii).

"He could not find.." in statement (iii) connects with the preceding statement (iv) with "old man"

The sequence is (ii)-(i)-(iv)-(iii).

Hence, the correct answer is option 3.

38. The question stem asks us to pick an option that makes the three statements consistent.

Statement (i), "among other things" states illegal production, poor policing and corruption and destruction of environment.

Statement (ii), "among other things" states illegality, poor environmental performance and displacement of communities and traditional subsistence base.

Statement (iii) states mining laws protect interests of the disadvantaged.

Statement (iii) has data contrary to statements (i) and (ii).

Option 1 with 'Only' makes it the most suitable answer.

Options 2 and 3 are silent about the other two statements which may render the 3 statements inconsistent.

Option 4 is contradictory to what is expected in the question stem.

Hence, the correct answer is option 1.

39. The given statement is " Raja will go for lunch if Ravi agrees to stay back."

Statement (i): If Ravi did not agree to stay back then Raja will not go for lunch.

∴ This statement is not definitely true but is possible.

∴ This statement might be true.

Statement (ii): If Raja has had his lunch it is not necessary that Ravi must have stayed back but it is possible.

∴ This statement might be true.

Statement (iii): Since Ravi stayed back Raja might have had his lunch.

Since Ravi stayed back it is not necessary Raja might have had his lunch but is possible and hence might be true.

Statement (iv):

It is possible that Ravi will stay back for Raja to have lunch.

∴ All the four options might be true.

Hence, option 1.

40. Option 1 strengthens the argument presented in the main statement. If trade deficits are a sign of national strength and profits, a sign of corporate strength then there is clear justification in assuming that nations do not compete with each in the way corporations do.
Option also 2 strengthens the argument. If increase in human development index improves national standing while an increase in market share increases corporate standing, then it is clear that nations and corporations do not compete in the same way.
Option 3 does not even mention nations and corporations.
If nations go to war to capture territory, while corporations go to war against each other to capture market share then it stands to reason that nations and corporations are competing in the same way. Thus, option 4 weakens the argument presented in the main statement.
Hence, the correct answer is option 4.

41. Option 2 loses out the clear connect provided in option 1. If men live in nuclear families, it is not a clear sign of friendliness towards one another when elephants have been compared to be moving in herds.
Option 3 with 'men capturing others' territories' and option 4 with 'men of one race dominating over another' weaken, rather than strengthen the argument.
If cats are loyal to their children while men are loyal to their communities, then this statement conclusively strengthens the argument that civilization has taught us to be friendlier towards one another.
Hence, the correct answer is option 1.

42. **Note : We have assumed that the Rita given in the conditions is not correct and it should be Geeta.**
It is given that Kamini has a daughter-in-law named Fullara and two sons-in-law, one being Eeshwaran.
∴ We get that Kamini has 2 daughters and one of her sons-in-law is Eeshwaran and her daughter-in-law is Fullara.
∴ She has a son who is married.
It is given that Bandana is Devesh's sister, Manohar is married to Geeta and Harihar's brother is Devesh.
∴ Geeta and Bandana are the two sisters and Devesh and Harihar are their brothers.

∴ Geeta is married to Eeshwaran

Geeta is married to Manohar

Harihar is married to Fullara

And Devesh is unmarried (As we know there are 4 persons in the third generation and the total number of people in the family is thirteen)

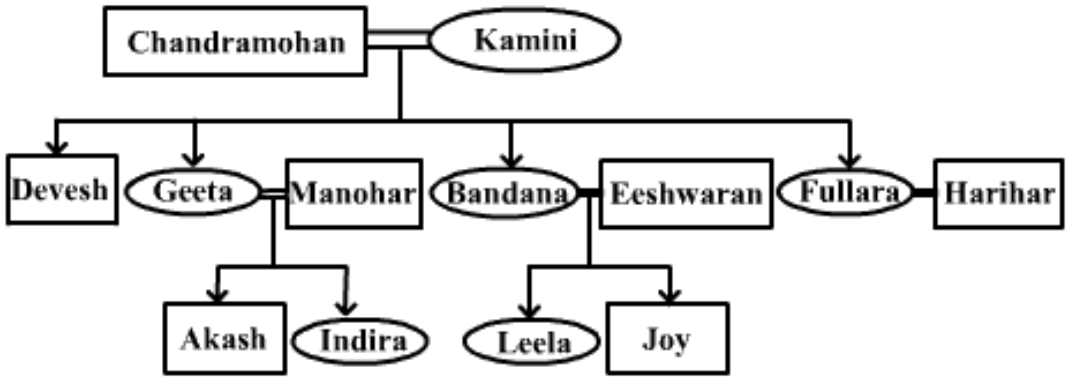
We know that Manohar and Geeta have a daughter Indira and a son.

∴ Bandana and Eeshwaran also have a daughter and a son.

Joy has two cousins Akash and Indira.

∴ Akash is the son of Geeta and Manohar.

∴ Leela is the daughter of Bandana and Eeshwaran and Joy is their son.



∴ Akash is Geeta's son.

Hence, option 1.

43. From the diagram drawn in the solution of the first question of the set we get that Leela is the niece of Harihar.

    Hence, option 3.

44. Referring the diagram drawn in the solution to the first question of the set we get that,

    From the options given only Devesh and Geeta are brother and sister.

    Hence, option 2.

45. From the given options only option 2 i.e. Joy is Geeta's child is false as he is Bandana's child.

    Hence, option 2.

46. Consider statement (i):

Fullara is Harihar's wife is true.

Consider statement (ii):

Akash is Geeta and Manohar's son.

∴ This statement is false.

Consider statement (iii):

Bandana is Leela's mother is true.

∴ Only statements (i) and (iii) are true and (ii) is false.

Hence, option 2.

47. From the information given in the common data, we can make the following table:

Friends' Name	Month	City	Brides' Name
A		A	xJ, xB
D			
M		C	xG, xV
P	D	xB, xK	
R		D	xJ, xB
S	S		J
	F	K	
	A	xA	H
	F, N	C, K	G, I

Here, friends' names are represented as:

A = Abhishek, D = Deepak, M = Mridul, P = Pritam, R = Ranjan and S = Salil

Months are represented as:

F = February, A = April, J = July, S = September, N = November and D = December

Brides' names are represented as:

G = Geetika, J = Jasmine, H = Hema, B = Brinda, I = Ipsita and V = Veena

The Last three rows represent the additional data. A sign of 'x' before a letter represents negation. For example, in the second last line 'xA' means 'not Ahmedabad'.

Now, the combination of 'February and Kolkata' can only fit with Deepak. Also, from the last row 'November and Chennai' combination will fit with Mridul. Since Geetika is not the bride of Mridul, Ipsita is the bride of Mridul and Geetika is the bride of Deepak.

The remaining combination of 'April and Hema' will fit with Ranjan.

The remaining cells of the table can be filled by elimination. The final table is as given below:

Friends' Name	Month	City	Brides' Name
A	J	A	V
D	F	K	G
M	N	C	I
P	D	M	B
R	A	D	H
S	S	B	J

From the table, we get,

Deepak's wedding took place in Kolkata.

Hence, option 3.

48. From the table given in the solution of the first question of the set, we get,

In Mumbai, the wedding took place in the month of December.

Hence, option 4.

49. From the table given in the solution of the first question of the set, we get,

Ipsita's wedding took place in Chennai

Hence, option 4.

50. From the table given in the solution of the first question of the set, we get,

Hema's husband is Ranjan.

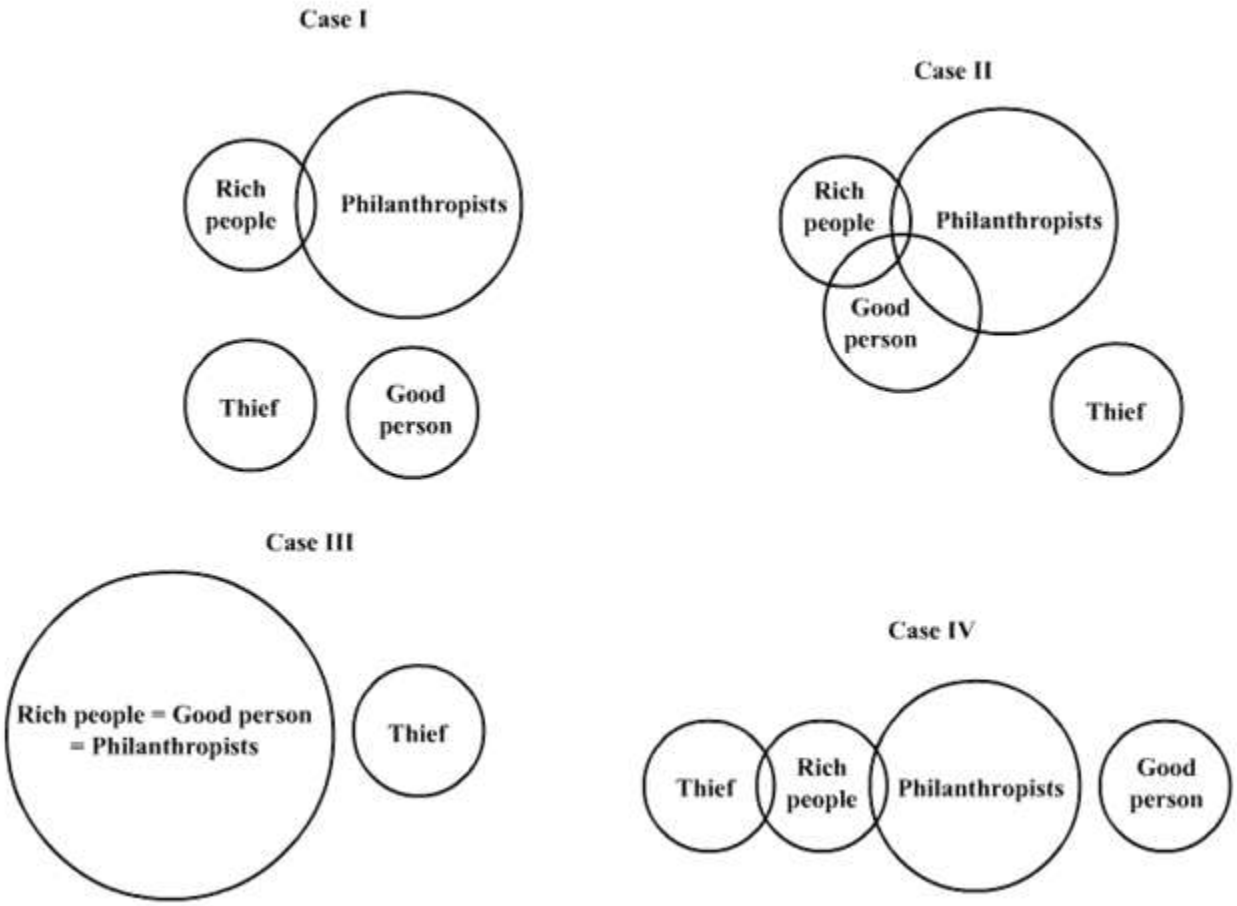
Hence, option 3.

51. From the table given in the solution of the first question of the set, we get,

Salil's wedding was held in Bengaluru

Hence, option 1.

52.



Option 1 is strongly supported from the three statements and is true in all cases. As No thief is a philanthropist, those good people who are philanthropists will never be thieves.

Option 2 is strongly supported from the three statements and is true in all cases. As no good person is a thief, those rich persons who are good will never be thieves.

Option 4 is strongly supported from the three statements and is true in all cases. As no thief is a philanthropist, those rich people who are thieves will never be philanthropists.

Option 3 is not strongly supported by the three statements. Option 3 is true is case III but not true in cases I, II and IV.

Hence, the correct answer is option 3.

53. If P: Milk is kept in front of a child.

Q: Child cries

R: Child is hungry

S: Child is unhappy

Statement (i) can be written as $P \rightarrow Q$

Statement (ii) can be written as $R \rightarrow Q$

Statement (iii) can be written as $S \rightarrow R$

Consider option 1: When hungry, a child likes milk.

Nothing is mentioned about the child liking milk in the given statements.

$\therefore$ The statement in option 1 cannot be logically deduced from the given statements.

Consider option 2: A child crying means he/she is unhappy.

This statement can be written as $Q \rightarrow R$

$\therefore$ This statement cannot be logically deduced from the given statements.

Consider option 3: A happy child does not cry.

This statement can be written as $\sim S \rightarrow \sim Q$

This statement also cannot be logically deduced from the given statements.

Consider option 4: An unhappy child usually cries.

This statement can be written as $S \rightarrow Q$

$\therefore$ This statement can be logically deduced from statement (ii) and (iii).

Hence, option 4.

54. If A: There is fire

B: The fire alarm goes off

C: Sprinkler starts

D: An automatic alarm is set off in the fire department

Then the given statements can be represented as:

Statement (i): $A \rightarrow B$

Statement (ii): $\sim C \rightarrow \sim B$ which also implies $B \rightarrow C$

Statement (iii): $C \rightarrow D$

Consider option 1: If an automatic alarm is set off at the fire department, that means there must be a fire.

This statement can be written as : $D \rightarrow A$

$\therefore$ This statement cannot be logically deduced from the given statements.

Consider option 2: If the sprinklers do not start, the automatic alarm at the fire department is not set off.

This statement can be written as: $\sim C \rightarrow \sim D$

$\therefore$ It cannot be logically deduced from the given statements.

Consider option 3: Whenever there is a fire, an automatic alarm is set off in the fire department.

This statement can also be written as: $A \rightarrow D$

This can be logically deduced from the given three statements.

Consider option 4: If there is no fire, no automatic alarm is set off in the fire department.

This statement can also be written as: $\sim A \rightarrow \sim D$

This cannot be logically deduced from the given statements.

Hence, option 3.

55. If W: Doing well in CAT

X: Doing well in JMET

Y: Getting admission in IITs or IISc.

Z: Getting admission in IIMs

Then the given statements can be written as:

Statement (i): $W \rightarrow X$

Statement (ii): $X \rightarrow Y$

Statement (iii): $\sim W \rightarrow \sim Z$ which also implies $Z \rightarrow W$

Consider option 1: Doing poorly in CAT implies doing poorly in JMET.

This statement can be written as: $\sim W \rightarrow \sim X$

$\therefore$ This statement cannot be logically deduced from the given statements.

Consider option 2: Good CAT result ensures that one gets an admission into the IIMs

This statement can be written as: $W \rightarrow Z$

$\therefore$ This statement also cannot be logically deduced from the given statements.

Consider option 3: Admissions to the IITs or IISc may mean that one has done well in CAT.

This statement can be written as: $Y \rightarrow W$

This statement also cannot be logically deduced from the given statements.

Consider option 4: Anyone getting admissions in one of the IIMs is guaranteed to get admission in one of the IITs or IISc.

This statement can be written as: Z → Y

∴ This statement can be logically deduced from the given statements.

Hence, option 4.

56. Refer the table for the given data:

		Question Number			
		1	2	3	4
Students	1	B	C	B	A
	2	D	B	B	A
	3	B	C	D	A
	4	D	C	C	B

Now, we have to take different cases and check for the validity. For example, if we assume that student 1 has first two questions right and last two questions wrong, then last two questions of student 2 is also wrong (which are similar to student 1) and hence questions 1 and 2 of students 2 should be right. This will result in contradiction for the right answer of question 1 between student 1 and 2. Therefore, we can discard this case.

Similarly, by trial and error, we take different cases and discard the invalid cases.

The final valid table is as given below:

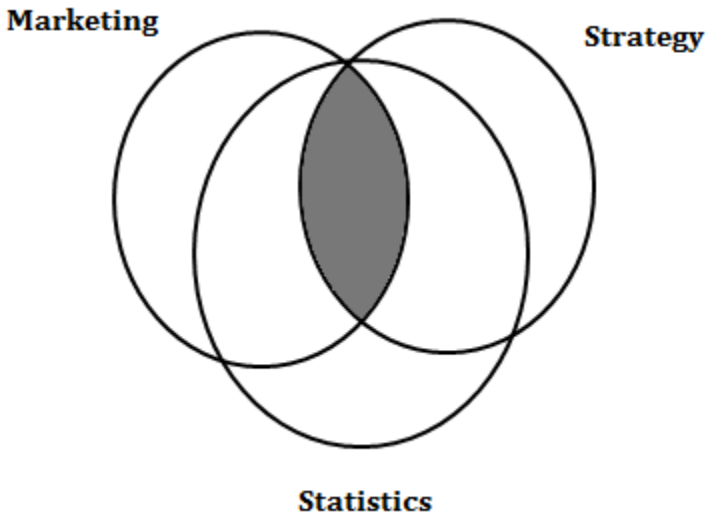
		Question Number			
		1	2	3	4
Students	1	~~B~~	C	~~B~~	A
	2	D	~~B~~	~~B~~	A
	3	~~B~~	C	~~D~~	A
	4	D	C	~~C~~	~~B~~
Right Answers		D	C	A	A
Answers of new student		~~C~~	C	A	A

We can see that the new student will have 3 correct answers.

Hence, option 3.

57. Any student who is taking a course in Marketing as well as Strategy is also enrolled in Statistics course.

This statement can be represented in the form of Venn diagram as shown below:



Consider option 1:

As can be seen from the diagram there can be students who have enrolled in Statistics course and one of Marketing and Strategy.

∴ It is not necessary that any student who is not taking Marketing or not taking Strategy must also not be taking Statistics.

∴ This statement is not true.

Consider option 2:

There can be students who have enrolled only is Statistics course.

∴ It is not necessary that any student who is taking neither Marketing nor Strategy is also not taking is also not taking Statistics.

Consider option 3:

As can be seen from the diagram, any student who is not taking Statistics is either not taking Marketing or not taking Strategy or both.

∴ Option 3 must be true.

Consider option 4:

Any student who is not taking Statistics can take one of Marketing and Strategy.

∴ It is not necessary that any student who is not taking Statistics is taking neither Marketing nor Strategy.

Hence, option 3.

58. The question is camouflaged as a conclusion but essentially asks about the assumption made to present the data given.

Statement I provides the sufficient condition and establishes the underlying relationship amongst the three elements in the main data- local self government, villages having better roads and effective governance.

Statement II is not required to be assumed to establish the relationship.

Statement III, with the word 'only' makes local self government as a necessary condition (and not necessarily a sufficient condition) whereas the main data simply requires a sufficient condition.

Hence, the correct answer is option 2.

59. Given, CLOSE is coded as DNRWJ

Here, the alphabetical position difference between C and D is 1, between L and N is 2, between O and R is 3 and so on.

By the same logic, the code of APART will be BRDVY.

Hence, option 1.

60. The main statement presents how government intervention did not really benefit companies with high import orientation. The assumption requires to establish 'relationship of need'.

Statement I is not an assumption because of the term, "do not need".

Statement II may or may not be an assumption made to make the main data.

Statement IV is not an assumption. The main statement is totally silent on exports.

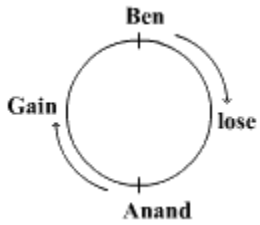
Statement III is an assumption as high import companies are affected by the government policies- it establishes the relationship of need.

Considering that none of the answer options have statements II and III as the correct answer option, the answer moves in favour of only statement III.

Hence, the correct answer is option 2.

SECTION - 3 (Quantitative Ability)

61. Let Anand and Ben be standing at the positions shown.



The runners gain or lose unit energy per unit distance travelled.

Energy gained by Anand when he completes each full circle of length $2\pi r$ is

$\pi r - \pi r = 0$

Similarly, energy gained by Ben = $-\pi r + \pi r = 0$

$\therefore$ Difference in energy levels of Anand and Ben after completing each round of distance $2\pi r$ is 0.

$\therefore$ Difference in energy levels of Anand and Ben after travelling a distance of $2\pi nr = 0$

Hence, option 1.

62. Assuming that the runners gain or lose unit energy per unit distance travelled, the maximum possible difference in their energies will be when Anand has gained πr units of energy and Ben has lost πr units of energy.

$\therefore$ The maximum difference = $(E + \pi r) - (E - \pi r) = 2\pi r$

Hence, option 3.

63. When Anand reached Ben's position, he has gained πrk units of energy.

When Ben reaches Anand's position, he has lost πrk units of energy.

$\therefore$ Difference = $(E + \pi rk) - (E - \pi rk) = 2\pi rk$

Hence, option 1.

64. Let N = 3

$\therefore$ The polygon is an equilateral triangle.

Its internal angle is 60°.

Let N = 4, then the internal angle is 90°

Let N = 5, then the internal angle is 108°

Let N = 6, then the internal angle is 120°

We can easily see that as N increases, the curve followed by the interior angles in not linear.

∴ Options (2) and (3) are eliminated.

We can also see that with increase in N, the rate at which the interior angles increase decreases.

Option 1 shows this relationship clearly.

Hence, option 1.

65. Let l, b and h be the length, breadth and height of the room.

∴ $lbh = 900$

As $h = 10$,

$lb = 90$ sq. ft.

∴ The area of the ceiling = 90 sq. ft.

Rakesh paints at 0.5 sq. ft. per minute.

He takes 15 hours and 40 minutes = 940 minutes to paint the four walls and the ceiling.

∴ The area of the ceiling and walls = 940 × 0.5 = 470 sq. ft.

∴ Area of wall = 470 – 90 = 380 sq. ft.

Time taken to paint the walls = 380 × 2 = 760 min = 12 hours and 40 minutes.

Hence, option 1.

66. The LCM of 6, 7, 8, 9 and 10 is 2520.

The largest possible 4-digit multiple of 2520 is 7560.

As x leaves remainders of 4, 5, 6, 7 and 8 when divided by 6, 7, 8, 9 and 10 respectively,

$x = 7558$

∴ Sum of digits of x is 25.

Hence, option 1.

67. Roots of equation $2ax^2 + 2ax + 1 = 0$ are real and distinct

∴ $\Delta > 0$

∴ $4a^2 - 8a > 0$

∴ $2a(a - 2) > 0$

∴ $a > 0$ and $a > 2$ or $a < 0$ and $a < 2$

But a can take values between 1 and 4 (inclusive) only.

$\therefore a > 2$

$\therefore a = 3, 4$

So, a can take 2 values.

Hence, option 4.

68.

Total cost $= 100x - 30x^2 + \frac{1}{3}x^3$

$\therefore$ The average cost per tyre $= 100 - 30x + \frac{x^2}{3}$

Let average cost per tyre = p

For p to be minimum,

$\frac{dp}{dx} = 0$

$\therefore -30 + \frac{2x}{3} = 0$

$\therefore \frac{2x}{3} = 30$

$\therefore x = 45$

Hence, option 4.

69. Numbers divisible by 5 have either 0 or 5 in their unit's place.

Case i:

5 is in the unit's place.

The digits in the hundred's place can be selected from 1, 3 and 4 in 3 ways.

The ten's place can be selected from 0 and the remaining two digits in 3 ways.

$\therefore$ Total such numbers = 1 × 3 × 3 = 9

Case ii:

0 is in the unit's place.

The digits in the hundred's and ten's place can be selected from 1, 3, 4 and 5 in 4 × 3 = 12 ways.

$\therefore$ Total number of ways = 9 + 12 = 21

Hence, option 2.

70. Father runs at a speed of 1 km for every 8 minutes.

$\therefore$ Speed of father $= \frac{1 \times 60}{8} = 7.5 \frac{\text{km}}{\text{hr}}$

Son runs at a speed of 1 km every 12 minutes.

$\therefore$ Speed of son $= \frac{1 \times 60}{12} = 5 \frac{\text{km}}{\text{hr}}$

Son in 1000 m ahead of the father.

Let the time taken for the father to overtake the son be t.

$\therefore 5t + 1 = 7.5t$

$\therefore 2.5t = 1$

$\therefore t = \frac{1}{2.5} \text{hr}$

So the distance covered by son in time t

$= 5t$

$= \frac{5}{2.5} = 2 \text{ km} = 2000 \text{ m}$

Hence, option 2.

71. The following data is given in the question

	Machine 1	**Machine 2**
A	2 hrs	4 hrs
B	3 hrs	1 hr
Total Time	6 hrs	8 hrs

Also, we know that at least 8 units of A and B together should be produced.

Also, per unit profit of A = Rs. 5

Per unit profit of B = Rs. 7

Let the number of units of Product A manufactured on any given day be X and number units of product B manufactured be Y.

The total amount of profit by manufacturing of two products on any given day = $5X + 7Y$

We have to maximize profit = $5X + 7Y$

Also, it is given that total time available from machine 1 in one working day = 6 hours

$\therefore 2X + 3Y \leq 6$

Also, it is given that total time available from machine 2 in one working day = 8 hours

$\therefore 4X + Y \leq 8$

As given in the question at least 8 units of A and B together should be produced in a given day.

$\therefore X + Y \geq 8$

As X and Y represent the quantity of products A and B produced in a day, respectively, therefore, X and Y will be non negative integers.

$\therefore$ The LPP problem is:

Max profit = $5X + 7Y$

$2X + 3Y \leq 6$

$4X + Y \leq 8$

$X + Y \geq 8$

$X, Y \geq 0$ and are integers.

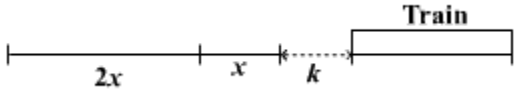
Hence, option 1.

72. When the constraints $2X + 3Y \leq 6$, $4X + Y \leq 8$ and $X + Y \geq 8$ are plotted on the positive X and Y axis (since X, Y are positive integers) then we can observe that there is no region common to all the three inequalities.

$\therefore$ The LPP will have no feasible solution.

Hence, option 3.

73.



Let the length of the tunnel be $3x$.

$\therefore$ The man is at a distance of x km inside the tunnel.

Let the train be k km away from the tunnel.

Let the speed of the man be y km /hr.

$\therefore$ As per conditions,

$$\frac{x}{y} = \frac{k}{30}$$

$\therefore 30x = ky$ ...(i)

Also, $$\frac{2x}{y} = \frac{k + 3x}{30}$$

$\therefore 60x = ky + 3xy$ ... (ii)

Subtracting (i) from (ii)

$\therefore 30x = 3xy$

$\therefore y = 10$

$\therefore$ Speed of the man is 10 kmph.

Hence, option 4.

74. Let the price of mango be x.

If the price of mango was Rs. 4 less, I would have got two more mangoes for the same amount of money

$\therefore 4x = 6(x - 4)$

$\therefore 4x = 6x - 24$

$\therefore 2x = 24$

$\therefore x = 12$

Hence, option 4.

75. Here $x^3 - 6x^2 + 11x - 6 = 0$

$\therefore (x - 1)(x^2 - 5x + 6)=0$

$\therefore (x - 1)(x - 3)\ (x - 2)=0$

$x = 1, 2, 3$

Roots of the equations $x^3 - px^2 + qx - r = 0$ are $a + b$, $b + c$ and $c + a$

$\therefore$ Its roots will be $1 + 2 = 3$, $2 + 3 = 5$ and $1 + 3 = 4$

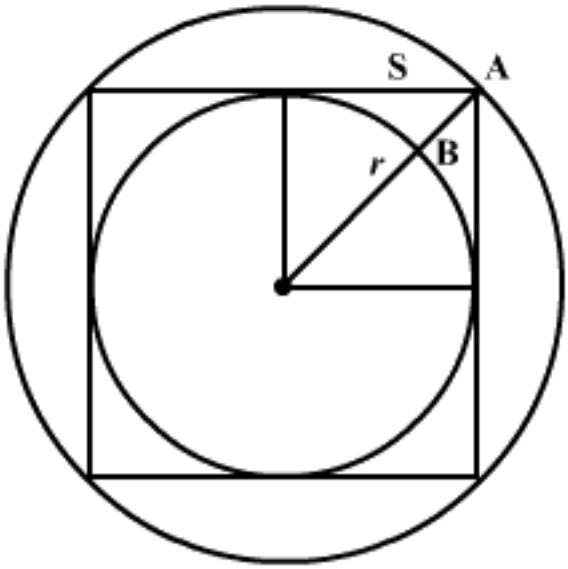
So the equation will be $(x - 3)(x - 4)(x - 5) = 0$

$\therefore r = 3 \times 4 \times 5$

$= 60$

Hence, option 3.

76. Let the radius of circle A be r.



Diagonal of the square S, will be same as diameter of the circle A i.e. $2r$

Let the length of each side of square S be x

$\therefore x^2 + x^2 = (2r)^2$

$\therefore 2x^2 = 4r^2$

$\therefore x = \sqrt{2}r$

From the figure it is evident that the length of the diameter of the circle will be equal to the length of the side of the square

$\therefore$ Radius of circle $B = \dfrac{\sqrt{2r}}{2} = \dfrac{r}{\sqrt{2}}$

$\therefore$ Ratio of areas of circle A *to* $B = \dfrac{r^2}{\left(r/\sqrt{2}\right)^2}$

$= \dfrac{r^2}{\left(r/\sqrt{2}\right)^2} = \dfrac{2}{1}$

Hence, option 2.

77. Minimum number of points required to form a straight line is 2.

So we will get maximum number of lines when no three points are collinear, or we use only two of the six points in any line.

$\therefore$ Total number of ways of selecting 2 of 6 points on the plane

$= {}^6C_2 = 15$

Hence, option 4.

78. Let A denote the surface area of the square wall, h denote the thickness of the wall and Δt denote the difference of temperatures maintained across two sides of the wall.

If f denotes the heat flow,

$$f \propto \frac{A \times \Delta t}{h}$$

or $f = k \frac{A \times \Delta t}{h}$, where k is the constant of proportionality

Sides of new wall are 1.5 times the previous wall.

$\therefore A' = (1.5)^2 A$

$= 2.25 A$

New thickness is 80% more than the original thickness

$\therefore h' = 1.8 h$

As the heat flow is to remain the same,

$$k \times \frac{A \times \Delta t}{h} = k \times \frac{2.25A \times \Delta t'}{1.8h}$$

$$\therefore \Delta t = \frac{2.25}{1.8} \times \Delta t'$$

$$\therefore \frac{\Delta t'}{\Delta t} = \frac{1.8}{2.25} = 0.8$$

$$\therefore \frac{\Delta t' - \Delta t}{\Delta t} \times 100$$

$$= \frac{0.8 - 1}{1} \times 100$$

$= -20\%$

$\therefore$ The temperature difference should decrease by 20% to have same heat flow.

Hence option 2.

79. The sum of weights of all 9 coins = 9.

$\therefore$ Sum of weights of each row, column or a diagonal = 9/3 = 3.

By trial and error, the arrangements that we get are:

0.8	1.8	0.4
0.6	1	1.4
1.6	0.2	1.2

1.6	0.6	0.8
0.2	1	1.8
1.2	1.4	0.4

1.2	0.2	1.6
1.4	1	0.6
0.4	1.8	0.8

0.4	1.4	1.2
1.8	1	0.2
0.8	0.6	1.6

1.6	0.2	1.2
0.6	1	1.4
0.8	1.8	0.4

1.2	1.4	0.4
0.2	1	1.8
1.6	0.6	0.8

0.4	1.8	0.8
1.4	1	0.6
1.2	0.2	1.6

0.8	0.6	1.6
1.8	1	0.2
0.4	1.4	1.2

Hence, option 3.

80. By trial and error, the arrangements that we get are:

0.4	1.8	0.8
1.2	0.2	1.6
1.4	1	0.6

1.4	1.2	0.4
1	0.2	1.8
0.6	1.6	0.8

0.6	1	1.4
1.6	0.2	1.2
0.8	1.8	0.4

0.8	1.6	0.6
1.8	0.2	1
0.4	1.2	1.4

1.4	1	0.6
1.2	0.2	1.6
0.4	1.8	0.8

0.6	1.6	0.8
1	0.2	1.8
1.4	1.2	0.4

0.8	1.8	0.4
1.6	0.2	1.2
0.6	1	1.4

0.4	1.2	1.4
1.8	0.2	1
0.8	1.6	0.6

Hence, option 2.

81. Cone left for the mother after the child consumes = 12.5% = 1/8

Now, the change in the volume of the coin is proportional to the cube of change in radius.

Thus the radius of the cone that is left = $r(1/8)^{1/3} = r/2$

If the radius of the base and height of the cone left be r_1 and h_1, then

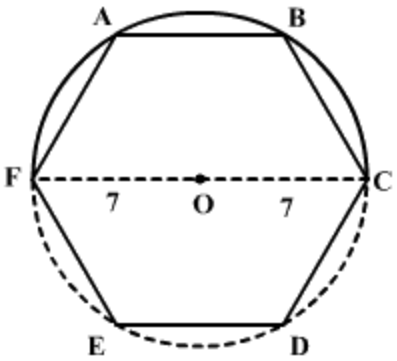
$8 \times \pi \times r_1^2 \times h_1 = \pi \times r^2 \times h$

$\therefore 8 \times (r/2)^2 \times h_1 = r^2 \times 8$

$\therefore h_1 = 4$

Hence, option 4.

82.



AB = BC = AF

We can easily see that the given trapezoid is half of a regular hexagon inscribed in the circle.

Area of hexagon ABCDEF $= 6 \times \frac{\sqrt{3}}{4} \times (\text{side})^2$

But side = radius of the circle = 14/2 = 7 cm

$\therefore$ Area of trapezoid $= \left(6 \times \frac{\sqrt{3}}{4} \times 7^2\right) \times \frac{1}{2}$

$$= \frac{49 \times 3}{2} \times \frac{\sqrt{3}}{2}$$

$$= \frac{147\sqrt{3}}{4} \text{ cm}^2$$

Hence, option 3.

83. Let Mr. Haque's total salary be Rs. 100 in 2007.

$\therefore$ His salary in 2008 = 0.9 × 100 = Rs. 90

His family's food expenditure in 2007 = Rs. 40

His family's food expenditure in 2008 = 40 × 1.05 = Rs. 42

$\therefore$ Percentage expenditure on food in 2008 $= \frac{42}{90} \times 100 \approx 47\%$

Hence, option 3.

84. Speed on road 1 is 50 km/hr.

So the time taken to travel from A to B on road 1 = 50/50 = 1 hour.

Total number of vehicles on road 2 while coming from B to A = 3 + 1 = 4

$\therefore$ The speed of vehicle on road 2 = 80/4 = 20 km/hr

So time taken on road 2 = 50/20 = 2.5 hr.

∴ Average speed for the entire journey

$$= \frac{\text{Total distance travelled}}{\text{Total time taken}} = \frac{100}{1 + 2.5} \approx 29 \text{ km/hr}$$

Hence, option 2.

85. We know that the ball picked up was black.

There are 6 + 3 + 5 = 14 black balls in all.

∴ Probability that the black ball was from the second box

= (Number of ways in which one black ball can be picked from the second box)/(Total number of ways in which a black ball can be picked)

$$\frac{{}^{3}C_{1}}{{}^{14}C_{1}} = \frac{3}{14}$$

Hence, option 1.

86.

$$\text{TC} = \frac{C \times D}{Q} + \frac{Q \times K}{2}$$

where C, D and K are constants.

∴ TC is a function of Q.

$$\therefore f(Q) = \frac{CD}{Q} + \frac{QK}{2}$$

$$\therefore f'(Q) = -\frac{CD}{Q^2} + \frac{K}{2}$$

$$\text{when } f'(Q) = 0, Q = \sqrt{\frac{2CD}{K}}$$

$$f''(Q) = \frac{CD}{Q^3} > 0, \text{as } C, D \text{ and } Q \text{ are all positive.}$$

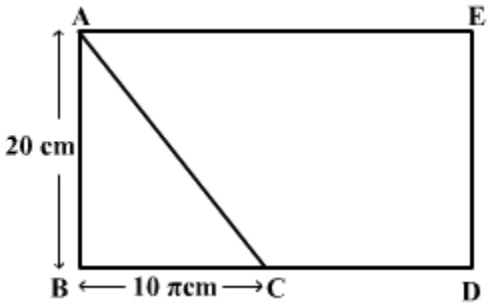
$$\therefore f(Q) \text{has a minimum at } \sqrt{\frac{2CD}{K}}$$

$$f\left(\sqrt{\frac{2CD}{K}}\right) = \frac{CD}{\sqrt{\frac{2CD}{K}}} + \frac{K}{2}\sqrt{\frac{2CD}{K}}$$

$= \sqrt{2CDK} = \sqrt{2 \times C \times D \times K}$

Hence, option 3.

87. If we think of the cylinder as a folded sheet of paper, then on opening the cylinder the ant is at position A and the sugar grain is kept at C as shown in the following figure.



AB = height of the cylinder = 20 cm

BC = 0.5 × the circumference of the base of the cylinder = 10π cm

∴ AC is the shortest distance that the ant has to travel.

∴ AC $= \sqrt{20^2 + (10\pi)^2} \approx 37.25$ cm

Hence, option 3.

88. Volume of square pyramid

$= \frac{1}{3} \times$ base area × height

Original base = 10 cm

Original Height = 20 cm

New height = 22 cm

New base = b

As volume remains constant,

$\frac{1}{3} \times 10 \times 10 \times 20 = \frac{1}{3} \times b \times b \times 22$

∴ $2000 = 22b^2$

∴ $b^2 = 90.90$

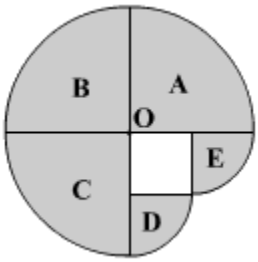
∴ $b \approx 9.5$

∴ Percentage change in side of base

$= \frac{10 - 9.5}{10} \times 100 = 5\%$

Hence, option 3.

89.



Let O be the point where the goat is tethered.

Then the area in which the goat can graze is the shaded region.

A, B and C are the quadrants of the circle of radius 20 meters, while D and E are quadrants of a circle of radius 10 meters.

∴ The total area in which the goat can graze

$= \frac{3}{4}\pi(20)^2 + \frac{2}{4}\pi(10)^2$

$= 300\pi + 50\pi$

$= 350\pi$

$= 3.5 \times 100\pi$

Hence, option 2.

90. Here $f(1) = 1$

$f(n) = n + f(n-1)$

$\therefore f(2) = 2 + f(1) = 2 + 1 = 3$

$f(3) = 3 + f(2) = 3 + 3 = 6$

$f(4) = 4 + f(3) = 4 + 6 = 10$ ...

Thus it can be observed that

$$f(n) = \sum_{i=1}^{n} i$$

$$\therefore f(100) = \frac{100 \times 101}{2} = 5050$$

Hence, option 4.

SECTION - 4 (Data Interpretation)

91. During the time-periods 1999 - 2000, 2000 – 2001, 2001 – 2002, 2003 – 2004 and 2006 – 2007 all the three variables (Production, Exports and Profits) show an increasing trend whereas during the time period 2002 – 2003, they show a decreasing trend.
Thus, there are 6 instances in all, where all the variables show a similar trend.

Hence, option 3.

92. Percentage of growth of profits for the required years is given below:

$$2000 = \frac{13-10}{10} \times 100 = 30\%$$

$$2002 = \frac{17-15}{15} \times 100 = 13.33\%$$

$$2004 = \frac{17-15}{15} \times 100 = 13.33\%$$

$$2005 = \frac{19-17}{17} \times 100 = 11.76\%$$

Hence, option 1.

93. Consider option 1:
The exports increase continuously from 2005 to 2007 while the profits decrease from 2005 to 2006 and increase from 2006 to 2007.
Thus, they do not show similar patterns.

Consider option 2:
The profits increase continuously while the exports first increase and then decrease.
Thus, they do not show similar patterns.

Consider option 3:
The profits and exports both decrease from 2002 to 2003 and increase from 2003 to 2004.
Thus, they show similar patterns.

Consider option 4:
Profits and exports show contradictory trends i.e. when profits increase, the exports decrease and vice versa.
Thus, they do not show similar patterns.

Hence, option 3.

94. Domestic Sales = Production – Exports

Using this formula, calculate the domestic sales for the required years as shown below.

Year	Domestic Sales
1999	112 – 23 = 89
2000	145 – 36 = 109
2001	156 – 37 = 119
2004	167 – 80 = 87
2005	189 – 60 = 129
2006	164 – 85 = 79
2007	185 – 90 = 95

Positive change (in terms of millions of rupees) for 2000 = 109 – 89 = Rs. 20

Positive change (in terms of millions of rupees) for 2001 = 119 – 109 =Rs. 10

Positive change (in terms of millions of rupees) for 2005 = 129 – 87 = Rs. 42

Positive change (in terms of millions of rupees) for 2007 = 95 – 79 = Rs. 16

Thus, the minimum positive change is for the year 2001.

Hence, option 2.

95. For store H,

Percentage of Revenue of store H from accessories = 15%

∴ The percentage of revenue from garments = 85%

Average price of the accessories = Rs. 300

Let the total revenue of the store be x.

∴ Revenue from accessories = $0.15x$

And, revenue from garments = $0.85x$

Number of accessories sold $= \frac{0.15x}{300}$

By the condition given in the question,

Number of garments sold $= \frac{0.15x}{300}$

$\therefore$ Average price of garments $= \dfrac{0.85x}{\dfrac{0.15x}{300}} = 1700$

$\therefore$ The average price of garments is Rs. 1,700.

Hence, option 4.

96. Let the revenue of the store B be b and that of store F be f.

The revenue of store B from accessories = $0.28b$

The revenue of store F from accessories = $0.22f$

Average price of accessories in store B = 370

Average price of accessories in store F = 100

$\therefore$ Number of accessories bought in store B $= \dfrac{0.28b}{370}$

$\therefore$ Number of accessories bought in store F $= \dfrac{0.22f}{100}$

By the condition given in the question,

$\dfrac{0.28b}{370} = \dfrac{0.22f}{100}$

$\therefore \dfrac{b}{f} = \dfrac{0.22}{0.28} \times \dfrac{370}{100} \approx 2.9$

The value closest to it is 3.33

Hence, option 4.

97. Let the revenue for stores E and L be x each.

For store E,

Revenue earned by accessories = $0.42x$

Average price of accessories = 125

Number of accessories sold $= \dfrac{0.42x}{125}$

For store L,

Revenue earned by accessories = $0.7x$

Average price of accessories = 450

Number of accessories sold $= \dfrac{0.7x}{450}$

$\dfrac{\text{Number of accessories sold by store L}}{\text{Number of accessories sold by store E}}$

$$= \frac{\frac{0.7x}{450}}{\frac{0.42x}{125}}$$

≈ 0.46

The value closest to it is 0.57

Hence, option 2.

98. Calculate the country wide consumption (urban + rural) as shown below.

Food Items	Urban		Rural		Total (Urban + Rural)	
	1988	2002	1988	2002	1988	2002
Rice	5.65	4.85	7.35	6.79	13	11.64
Wheat	4.57	4.03	4.8	4.05	9.37	8.08
Other Cereals	0.83	0.56	2.59	1.38	3.42	1.94
Total Cereals	11.05	9.44	14.74	12.22	25.79	21.66
Pulses	1.06	0.86	0.97	0.77	2.03	1.63
Dairy	4.52	5.25	3.34	3.94	7.86	9.19
Edible Oils	0.56	0.69	0.35	0.51	0.91	1.2
Meat/fish/eggs	2.01	2.49	0.91	1.5	2.92	3.99
Vegetables/fruit	11.46	13.44	6.99	9.48	18.45	22.92
Sugar/spices	1.63	1.46	1.53	1.34	3.16	2.8
Total					86.91	

Refer to the column 'Rural'

The percentage increase in the per capita consumption for the required food items from 1988 to 2002 is as follows:

$$\text{Edible oils} = \frac{0.51 - 0.35}{0.35} \times 100 = 45.71\%$$

$$\text{Meat/fish/eggs} = \frac{1.5 - 0.91}{0.91} \times 100 = 64.84\%$$

$$\text{Vegetables/fruit} = \frac{9.48 - 6.99}{6.99} \times 100 = 35.62\%$$

$$\text{Dairy} = \frac{3.94 - 3.34}{3.34} \times 100 = 17.96\%$$

Thus, meat/fish/eggs shows the maximum percentage increase.

Hence, option 2.

99. Refer to column '1988' under 'Total (Urban + Rural)'

As can be directly observed, "Total Cereals" has the maximum share (25.79) in the total consumption for that year.

Hence, option 2.

100. With reference to the table,

Percentage decline in per capita consumption for the required products from 1988 to 2002 is as follows:

$$\text{Rice} = \frac{11.64 - 13}{13} \times 100 = -10.46\%$$

$$\text{Wheat} = \frac{8.08 - 9.37}{9.37} \times 100 = -13.76\%$$

$$\text{Pulses} = \frac{1.63 - 2.03}{2.03} \times 100 = -19.70\%$$

$$\text{Other Cereals} = \frac{1.94 - 3.42}{3.42} \times 100 = -43.27\%$$

Thus, "Other Cereals" show the maximum percentage decline.

Hence, option 4.

101. On observing the last column of the table, 'Total (Urban + Rural)', observe that 4 food items: Dairy, Edible Oils, Meat/fish/eggs and Vegetable/fruit show an increase in their per capita consumption from 1988 to 2002. The rest show a decrease.

Hence, option 2.

102. Total number of non-DLP students = (Total number of RDTP students) + (Total number of REP students)

∴ Total number of non-DLP students = (38 + 42) + (50 + 20) = 150

Number of non-DLP students with work experience of 1 to 5 years = (20 + 15) + (30 + 12) = 77

$$\text{Hence, the required percentage} = \frac{77}{150} \times 100 = 51.33\% \text{ (aproximately)}$$

Hence, option 3.

103. The total number of on-campus male students is 38 + 50 = 88

Out of this group, the number of students who have work experience of more than 5 years is 8

+ 20 = 28

Hence, the required ratio $= \frac{28}{88} = \frac{7}{22}$

Hence, option 3.

104. The total number of inexperienced students is 20 + 25 = 45

The number of female inexperienced students in the regular program is 20 + 0 = 20

Hence, the required fraction is $\frac{20}{45} = \frac{4}{9}$

Hence, option 4.

105. Experienced male students in the regular program = (20 + 8) + (30 + 20) = 78

Experience male students in the DLP program = 50

Total number of students = 148 + 102 = 250

% of experienced male students in the regular program $= \frac{78}{250} \times 100 = 31.2\%$

% of experienced male students in the DLP $= \frac{50}{250} \times 100 = 20\%$

Hence, the percentage difference between the two = 31.2 – 20 = 11.2%

Hence, option 1.

106. Considering that most questions ask for maximum of minimum values, it is easier to work by calculating the total exports by region and by category. These values are shown in the table below.

	World	NA	S & CA	Europe	CIS	Africa	Middle East	Asia
Iron & Steel	474.2	26.9	19.3	228.2	45.4	9.4	4.5	140.4
Chemicals	1483.2	199.3	29.9	883.3	27.4	13.0	43.1	287.0
Office & Telecom Equipment	1515.2	204.0	6.5	402.7	2.0	2.4	16.6	880.9
Automotive Products	1182.9	219.9	21.2	654.5	7.5	5.3	9.8	264.6
Textiles	238.3	16.9	3.4	92.7	2.0	2.2	7.0	114.0
Clothing	356.5	21.0	12.5	122.4	3.0	11.4	5.3	181.0

Total	5250.3	688.0	92.8	2383.8	87.3	43.7	86.3	1867.9

Note that the sum of exports for a category across all regions is approximately equal to the value of exports for that category under the "World" category.

Though the market share for various products is to be found, it is not necessary to calculate the actual market share. Note that the denominator in each case is the same i.e. the total manufacturing exports (5250.3)
Thus, the product with maximum worldwide exports has the maximum market share.
Thus, the Office and Telecom Equipment category with worldwide exports of 1515.2 has maximum market share.

Hence, option 2.

107. The required values are as shown below:

$$\text{For Europe,} \frac{\text{Iron and Steel + Automotive}}{\text{Total Exports}} = \frac{882.7}{2383.8} = \text{some value between 0.3 and 0.4}$$

$$\text{For Asia,} \frac{\text{Iron and Steel + Automotive}}{\text{Total Exports}} = \frac{405}{1867.9} = \text{some value between 0.2 and 0.3}$$

$$\text{For S \& CA,} \frac{\text{Iron and Steel + Automotive}}{\text{Total Exports}} = \frac{40.5}{92.8} = \text{some value between 0.4 and 0.5}$$

$$\text{For NA,} \frac{\text{Iron and Steel + Automotive}}{\text{Total Exports}} = \frac{246.8}{688} = \text{some value between 0.3 and 0.4}$$

Hence, South and Central America has the maximum share of exports of Iron and steel and automotive products.

Hence, option 3.

108. Total exports of Textile and Clothing = 238.3 + 356.5 = 594.8

Exports of Textiles and Clothing from Asia = 114 + 181 = 295

$$\text{Hence, the required percentage} \approx \frac{295}{595} \times 100 \approx 49.5\%$$

Hence, option 1.

109. The required ratio for the various regions is given below

For S & CA, $\frac{\text{Chemicals}}{\text{Textiles}} = \frac{29.9}{3.4} \approx 9$

For Europe, $\frac{\text{Chemicals}}{\text{Textiles}} = \frac{883.3}{92.7} \approx 9.5$

For North America, $\frac{\text{Chemicals}}{\text{Textiles}} = \frac{199.3}{16.9} \approx 12$

For CIS, $\frac{\text{Chemicals}}{\text{Textiles}} = \frac{27.4}{2} = 13.7$

Hence, option 4.

110. Europe and Asia are the largest and second largest exporter respectively

Total exports for Europe = 2383.8

Total exports for Asia = 1867.9

Difference between the two = 2383.8 – 1867.9 = 515.9

Hence, the required percentage $\approx \frac{516}{1868} \times 100 \approx 27.6\%$

Note that while the question does mention the exports as a percentage of the total world exports, it is not necessary to calculate this percentage. This is because the denominator i.e. total worldwide exports are the same throughout and get cancelled out.

Hence, option 3.

111. In the year 2008, the father's income increases by 40% while the mother's income increases by 30%

Also, the cost of education doubles in 2008.

All these details can be tabulated as shown below.

Income	2007	2008
Mother's Income	Rs. 2,40,000 (30%)	Rs. 3,12,000 (Increase of 30%)
Father's Income	Rs. 3,20,000 (40%)	Rs. 4,48,000 (Increase of 40%)
Rent from property	Rs. 1,60,000 (20%)	Rs. 1,60,000
Mutual fund and Fixed deposit	Rs. 80,000 (10%)	Rs. 80,000
Total	Rs. 8,00,000	Rs. 10,00,000

Expenditure	2007	2008
Education	Rs. 2,00,000 (25%)	Rs. 4,00,000 (Double)
Medical Expenses	Rs. 80,000 (10%)	Rs. 80,000

Clothing	Rs. 80,000 (10%)	Rs. 80,000
Grocery and Food	Rs. 2,40,000 (30%)	Rs. 2,40,000
Bills	Rs. 64,000 (8%)	Rs. 64,000
Miscellaneous	Rs. 96,000 (12%)	Rs. 96,000
Savings	Rs. 40,000 (5%)	Rs. 40,000
Total	Rs. 8,00,000	Rs. 10,00,000

It is given that the relative contribution of different sources of income remains the same across all heads of expenditure.
Thus, if the father's gets 40% of the total income, he contributes 40% to medical expenses as well.

$\therefore$ Father's income spent on medical expenses in 2007 $= \frac{40}{100} \times 80{,}000 = \text{Rs. } 32{,}000$

Hence, option 1.

112. From the table,

In 2008, amount spent on education = Rs. 4,00,000

Total income = Rs. 10,00,000

$\therefore$ Percentage spent on education $= \frac{400000}{1000000} \times 100 = 40\%$

Hence, option 4.

113. From the table, Savings (2008) = Rs. 40,000.

Hence, option 2.

114. Total amount spent on clothing and medical expenses during 2007 and 2008 = (80000 + 80000 + 80000 + 80000) =Rs. 3,20,000.

Hence, option 1.

115. In 2008, total income = Rs. 10,00,000

Bills and miscellaneous expenses together 64000 + 96000 = Rs. 1,60,000

Hence, the required percentage $= \frac{160000}{1000000} \times 100 = 16\%$

Hence, option 3.

116. If the absolute change in the yearly closing stock price from 2004 to 2005 and from 2005 to 2006 is to be similar, the graph of the yearly closing stock price has to be linear from 2004 to 2006.

Simple observation of the line graph indicates that this linearity between 2004 and 2006 is shown only by SBI (among the given options). The graphs for Axis, HDFC and Kotak are non-linear in the given period.

Hence, option 4.

117. Rather than calculating actual values, this problem is better solved by observation and elimination of answer options.

Axis : The stock price in 2006 is just below 500 i.e. definitely greater than 400. Hence the stock price in 2007 should be greater than 1200. However, the value for 2007 is shown below 1000. Hence, Axis does not satisfy the condition.

BOB : The value in 2006 is approximately 250. Hence, the value in 2007 should be close to 750, but is shown below 500 in the given figure. Hence, BOB also does not satisfy the given condition.

SBI : The value in 2006 is more than 1000 while the value in 2007 is shown to be less than 3000. Thus, SBI definitely does not satisfy the given condition.

Kotak : The value in 2006 is close to 450 while the value in 2007 is close to 1300. Hence, it best satisfies the given condition.

Hence, option 4.

118. Consider Statement I:

By simple observation, the graph for HDFC is nearly linear from 2003 to 2005. Thus, the absolute change from 2003 to 2004 is approximately equal to the absolute change from 2004 to 2005. However, the base value i.e. the stock price of HDFC in 2003 and 2004 is different. Hence, the PIICSP for the two years cannot be equal.

Hence, statement I cannot be true.

Consider Statement II:

$$\text{PIISCP of HDFC from 2003 to 2005} = \frac{700 - 375}{375} \times 100 = \frac{325 \times 100}{375} \approx 80\%$$

$$\text{PIISCP of ICICI from 2004 to 2005} = \frac{600 - 375}{375} \times 100 = \frac{225 \times 100}{375} = 60\%$$

Hence, the required relationship is not obtained.

Hence, statement II is not true.

Consider Statement III:

$$\text{PIISCP of ICICI from 2004 to 2007} = \frac{1250 - 375}{375} \times 100 = \frac{875 \times 100}{375} \approx 233\%$$

$$\text{PIISCP of Kotak from 2006 to 2007} = \frac{1275 - 380}{380} \times 100 = \frac{895 \times 100}{380} \approx 235\%$$

Hence, the PIICSP of ICICI in the required period is approximately equal to the PIICSP of Kotak in the required period.

Hence, statement III is true.

However, none of the options mentions “III only” or “None of these” due to which there is no correct option.

119. Consider HDFC

Since the share price of HDFC changes from 375 in 2003 to 700 in 2005, an investment of 750 in 2003 becomes

$$\frac{700 \times 750}{375} = 1400 \text{ in } 2005$$

Consider Kotak

Since the share price of Kotak changes from approximately 375 in 2003 to 250 in 2005, an investment of 750 in 2003 becomes

$$\frac{250 \times 750}{375} = 500 \text{ in } 2005$$

The remaining Rs. 1,250 is invested in Axis.

Since the share price of Axis changes from approximately 150 in 2003 to 300 in 2005, an investment of 1250 in 2003 becomes

$$\frac{1250 \times 300}{150} = 2500 \text{ in } 2005$$

Thus, the total amount received in 2 years is approximately 1400 + 500 + 2500 = Rs. 4,400

Hence, the profit made in two years is 4400 – 2750 = Rs. 1,650

Hence, the return on investment in 2 years $= \frac{1650 \times 100}{2750} = 60\%$ (approximately)

Hence, the simple average annual percentage return obtained = 60/2 = 30% (approximately)

This lies between 25% and 50%.

Hence, option 3.

120. Here, check each period for the given condition.

By simple observation, it is clear that during the period 2004 to 2006, the share price of BOB was almost constant. Also, this was the only bank whose share price was constant during this period.
Hence, the given condition is satisfied only for the period 2004 to 2006.

Hence, option 4.