

1. In paragraph 2, the author discusses how the rampant growth of cancer cells can be checked by deactivating certain motors. He further says that improving motor-driven transport can help treat diseases such as Alzheimer's, Parkinson's or ALS, also known as Lou Gehrig's disease.

Options 1 and 2 can be ruled out in light of this information.

Option 3 only talks about arresting cancerous growth.

Option 4 covers diseases in general. Therefore it is a more complete answer.

Hence, the correct answer is **option 4**.

2. The author puts this in the first paragraph –“The inside of a cell bustles with more traffic than Delhi roads, and, like all vehicles, the cell's moving parts need engines.” Therefore (a) is an analogy the author has used.

In the third paragraph, the author puts forth another analogy, “The movements that make these cellular activities possible occur along a complex network of threadlike fibers, or polymers, along which bundles of molecules travel like trams.” If bundle of molecules are travelling like trams on polymers, then polymers or threadlike fibers are akin to tram tracks. Thus, (b) is also an analogy. That gives us the answer as option 1.

In the fourth paragraph, the author says, “Each myosin molecule has a tiny head that pokes out from the chain like oars from a canoe.” Genes have not been mentioned here to be analogous to a canoe in any way. Therefore (c) can thus be eliminated.

Ratchets have not been used as an analogy to vorticellids. Rather, they have been mentioned as one of the parts of a cell helping in motion. Therefore (d) can be done away with as well.

Hence, the correct answer is **option 1**.

3. Statement (a) appears in the sixth paragraph- Some sperm use spring like engines made of actin filaments to shoot out a barb that penetrates the layers that surround an egg. Therefore (a) is true and can be eliminated.

Statement (c) appears in the second paragraph- The ability of such engines to convert chemical energy into motion is the envy of nanotechnology researchers

looking for ways to power molecule-sized devices. Therefore, (c) can be eliminated.

Statement (d) appears in the third paragraph- We wouldn't make it far in life without motor: proteins. Our muscles wouldn't contract.

The fourth paragraph states- Myosin molecules, best known for their role in muscle contraction, form chains that lie between filaments of another protein called actin. (d) can be eliminated as well.

Statement (e) appears in the fourth paragraph- The dynein motor, on the other hand, is still poorly understood. Therefore, it is true and can be done away with.

Statement (b) does not appear anywhere in the passage. In the fourth paragraph- but newly discovered similarities in the motors' ATP-processing machinery now suggest that they (Myosin and Kinesin) share a common ancestor-molecule. Therefore, they are related. Only option (b) is not representative and it is only in option 1.

Hence, the correct answer is **option 1**.

4. Statement (a) (Third Paragraph): “We wouldn't make it far in life without motor: proteins. Our muscles wouldn't contract. We couldn't grow, because the growth process requires cells to duplicate their machinery and pull the copies apart.” Therefore, (a) is valid from the passage.

Statement (b) (Second Paragraph): “Because these molecules are essential for cell division, scientists hope to shut down the rampant growth of cancer cells by deactivating certain motors.” Tuberculosis is not mentioned and therefore statement (b) is not representative. We can eliminate option 1.

Statement (c) (Last Paragraph): “Ultimately, Mahadevan and Matsudaira hope to better understand just how these particles create an effect that seems to be so much more than the sum of its parts.” The meaning is implied.

Statement (d) (Fifth Paragraph): “For example, one such engine is a spring-like stalk connecting a single-celled organism called a vorticellid to the leaf fragment it calls home. When exposed to calcium, the spring contracts, yanking the vorticellid down at speeds approaching to 3 inches (8 centimeters) per second.”

Statement (d) has not been given explicitly. Since d is not true, we can eliminate options 3 and 4 (which state that (d) is true).

That leaves us with option 2.

Hence, the correct answer is **option 2**.

5. It has been stated in the third and the fourth paragraph that Myosin, Kinesin and Actin are proteins. Hence, (a) is true. With that we can eliminate options 2 and 3.

Statement (b) also has been introduced in the first paragraph and has been explicitly mentioned in the third paragraph.

Statement (c) has not been stated in the passage. Therefore, option 4 can be eliminated. Statement (d) is partially incorrect as Ronald is not a researcher at Massachusetts Institute of Technology though Mahadevan is a researcher at MIT.

Hence, the correct answer is **option 1**.

6. In paragraph 2, the author mentions, "In recent times, governments, usually controlled by men, have "given" women the right to contraceptive use and abortion access, when their countries were perceived to have an overpopulation problem." India and China are overpopulated countries (as opposed to Australia and Mongolia) and hence are more likely to allow abortion according to this information in the passage.

Hence, the correct answer is **option 1**.

7. In paragraphs 2 and 3, the reasons for banning abortions have been given. Health and safety concerns prompted medical professionals (option 1).

Operations performed by unlicensed medical practitioners were also a concern (option 3).

Political motivators were immigrants with lots of children (option 2). The idea was to encourage natives to go for more births rather than abortions.

Options 1, 2 and 3 have been clearly mentioned in the passage as reasons for banning abortions. There is no mention of matriarchal control in this passage.

Hence, the correct answer is **option 4**.

8. A pro-life woman would not consider abortion as tolerable. Pro-life supporters believe an abortion is murder of the unborn. No reason has been cited in the passage as an exception to this.

Therefore, options 1, 2 and 3 are ruled out.

Hence, the correct answer is **option 4**.

9. In the sixth paragraph, the author mentions the view of pro-choice supporters in this regard, "They object to the notion of the home being the "women's sphere". Women's reproductive and family roles are seen as potential barriers to full equality. Motherhood is seen

as a voluntary, not a mandatory of "natural" role." True, they object to the "women's sphere" part but the author has not cited that they support "joint sphere". Therefore, option 1 can be eliminated.

The supporters also support what option 2 says. But option 2 does not answer the question as to why they object the notion of home being the 'women's sphere'.

They object because, as option 3 conveys, the sphere comes in the way of saying that both men and women are equal.

Hence, the correct answer is **option 3**.

10. Option 1 can be ruled out because the tragedies did not lead to a change in attitude. Rather, the change (in attitude) happened along with the tragedies. As the author puts in, "these tragedies combined with a change of attitude towards a woman's right to privacy lead a number of states to pass abortion-permitting legislation."

That also helps us to eliminate option 3.

All states did not scrap abortion laws. Option 4 can be done away with as well, as nothing about pro-life lobby being strengthened has been talked about in this regard. Certain states passed abortion-permitting regulation, whereas others did not.

Hence, the correct answer is **option 2**.

11. The author states in the second paragraph, "They observe that the definition and control of women's reproductive freedom has always been the province of men. Patriarchal religion, as manifest in Islamic fundamentalism, traditionalist Hindu practice, orthodox Judaism, and Roman Catholicism, has been an important historical contributory factor for this and continues to be an important presence in contemporary societies."

Option 1 therefore can be ruled out as the patriarchal religions were against the movement.

Only overpopulated countries supported abortion. Therefore, option 2 can be eliminated as well.

In the 1900's medical profession (option 3) also did not support abortion.

Hence, the correct answer is **option 4**.

12. Option 1 seems tempting. But, among the earlier writers whom the author mentions, like Abdul Fazl were Indians too. "Prior to the British, Indian historiographers were mostly Muslims..." Therefore, option 1 can be ruled out.

Again, Earlier historians could be trained as well, especially the English. Option 2, therefore can be done away with.

Option 3 is a possibility, because the earlier approach was Anglo-centric and this one by trained Indian historians gave an Indian perspective.

Option 4 is ruled out because earlier than this time, Indian history was in fact written in India.

Hence, the correct answer is **option 3**.

13. From the third paragraph, the bias were there (4 is ruled out) and it wasn't about doing further work at archeological sites (3 is ruled out). It was about digging afresh in newer areas of thought and digging deeper on establishment of recently emerged perspectives (Option 1 is ruled out).

Option 2 therefore comes close to this thought. As the author puts it, "Here Indian historians have been influenced both by their local situation and by changes of thought elsewhere."

Hence, the correct answer is **option 2**.

14. In the third paragraph, the author mentions, "But when the Raj was settled down, glamour departed from politics, and they turned to the less glorious but more solid ground of administration." Therefore it was not about change in attitude (1 eliminated). Yes, Raj settled down and administration history was solid material, but, the reason for the shift of topic was that the glamour of politics was no more.

Hence, the correct answer is **option 3**.

15. In the last paragraph the author mentions what is given in option 4 as a desirable and something which has not happened earlier for historians he has mentioned. Therefore, options 1, 2 and 3 have been the attitudes of Indian historians but not 4.

Hence, the correct answer is **option 4**.

16. Following cite the references from the passage to link historians with their respective approaches.

Statement (a) - Paragraph 3: "But when the Raj was settled down, glamour departed from politics, and they turned to the less glorious but more solid ground of administration. Not how India was conquered but how it was governed was the theme of this school of historians. It found its archpriest in H.H. Dodwell" A corresponds with F.

Statement (b) Paragraph 2: Dr. Radha's bias was mainly political. B corresponds with G.

Statement (c) Paragraph 1: "like Robert Orme in his Military Transactions, gave a straight narrative" C corresponds with E.

Statement (d) Paragraph 3: "R.C. Dutt entered the first of these currents with his Economic History of India" D corresponds with H.

Hence, the correct answer is **option 1**.

17. In the last paragraph, the author says, "Unfortunately, though, the conclusions are of more than academic interest. The conversations of classicists or of astronomers rarely affect the lives of other people. Those of economists do so, on a large scale." Because the conversation affects lives of other people and are of more than academic interest, statements (a) and (d) hold true.

In the third paragraph, the author states that economics is not just a matter of opinion as stated in statement (b). With that, options 1 and 4 can be eliminated.

Economics is not damaging (last line of last paragraph), economists and their conversations are, and therefore (d) can be ruled out and with that, option 2 is eliminated.

Hence, the correct answer is **option 3**.

18. Rhetoric can arouse feelings in an electorate, so says the author. Hence, option 1 can be ruled out.

An advertisement jingle or the dialogues or a play are prepared to attract the audience and keep the audience attentive. Therefore, both 2 and 3 can be ruled out.

An army officer's command to his subordinate will have to be obeyed whether the command was used with rhetoric or not. Hence, it will have the least element of rhetoric.

Hence, the correct answer is **option 4**.

19. In the first paragraph, the author says, "the talk is hard to follow when one has not made a habit of listening to it for a while." He/she also says, "Underneath it all (the economist's favorite phrase) conversational habits are similar."

Option 3 says the same thing; unfamiliar terms make it arcane whereas the conversational part is similar.

Options 1, 2 and 4 do not follow from the passage.

Hence, the correct answer is **option 3**.

20. Secret and covert are synonyms. We can eliminate both because to choose one would be to choose the other. Perfidy, most commonly used to mean disloyal, also means 'treacherous'. But, here there is no negative connotation. The author states in the first paragraph, "the talk is hard to follow when one has not made a habit of listening to it for a while. The culture of the conversation makes the words arcane." Here, it means 'difficult to understand'. Therefore, mysterious (baffling, puzzling, inexplicable) fits the meaning best. Hence, the correct answer is **option 1**.

21. Both options 1 and 2 use rhetoric. They both are persuasive. Plus, either one would be valid when it comes to using rhetoric to persuade.  
Option 4 is ruled out, because the author is not against rhetoric.  
Hence, the correct answer is **option 3**.
22. The passage concludes with the statement –“To teach how to live without certainty, and yet without being paralyzed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it.” The purpose, therefore, is not to reduce uncertainty; rather, it is to help us deal with uncertainty and hesitation (ambiguity).  
Option 2 reiterates this idea.  
Option 3 comes close to the idea but does not mention dealing with ambiguity.  
Options 1 and 4 can be eliminated. Although option 4 has been mentioned, it is not the purpose of philosophy.  
Hence, the correct answer is **option 2**.
23. According to the author, philosophy comes intermediate between science and theology. Hence, they are not antagonistic as stated in option 1 nor are they unrelated as mentioned in option 3.  
Philosophy does not derive from science as stated in option 4, but, as the author puts in, it is the presence of both (theology and science) that characterizes philosophy. Therefore, they are more or less complementary.  
Hence, the correct answer is **option 2**.
24. The author states, “The answer of the historian, in so far as I am capable of giving it, will appear in the course of this work.” He may be a historian, so, option 1 is eliminated. Philosopher is also ruled out as he holds a favourable view towards it (the passage is on philosophy!).  
Between options 3 and 4, the author definitely does not hold a favourable view of theology. He makes statements like, “the confident answers of theologians no longer seem as convincing as they did in former centuries.” Thus, he is surely not a theologian.  
Hence, the correct answer is **option 4**.
25. Options 1, 2 and 3 are questions that the author ponders on. The definiteness of the nature of the universe cannot be ascertained from his or her questions. Rather, they need some answers or explanation to support what he believes which has not been stated in the passage. Therefore, options 1, 2 and 3 do not hold true.  
Hence, the correct answer is **option 4**.
26. The sentence following the first blank reads as ‘humans are not to process information as quickly ... they tend not to think’ in short the model is not applicable to the way human’s reason. Hence, the word has a negative connotation. Firstly, obviously and apparently therefore do not fit. The word has to be ‘regrettably’. Apparently and obviously are also synonyms. To use one would be similar as to use the other.  
Hence, the correct answer is **option 1**.
27. Whether the word Von Neumann and Morgenstern have undertaken is scientific is questionable. We do not have any solid evidence for that. It could be systematic or analytical or quantitative. Since there is consideration of ‘a numerical value’, quantitative is a likely answer. Systematic and analytical are close but quantitative would be an appropriate choice.  
Hence, the correct answer is **option 1**.
28. Implication here refers to consequence. People may deal with a particular option without really assessing its disadvantages (option 2) or utility (option 3) or implications (option 1) or alternatives (option 4). Where usage is concerned, all of the options make sense in different ways. But the sentence continues and states, “when they do assess alternatives”. Therefore, the word here is ‘alternatives’.  
Hence, the correct answer is **option 4**.
29. The passage is about ‘firing’ employees. A dismissal (option 1) may or may not equivalent to a permanent one. Punishing and admonishing (scolding) again are not the same as firing people. This eliminates options 1, 2 and 4. The word therefore is ‘firing’.  
Hence, the correct answer is **option 3**.
30. Thwart means ‘frustrate, ruin, or stop’. Where it means ‘stop’, it may still be applicable. ‘Close’ an argument is also an option. ‘Defeat (option 3)’ can be easily eliminated. The best alternative here is ‘resolve’. But resolve fits in best with the sentence as one resolves or solves an argument.  
Hence, the correct answer is **option 1**.
31. The product was not ‘derived’ by the organization. The organization did not ‘produce’ or ‘engineer’ the “failed product. Instead, the last sentence enquires how the process ‘allowed’ such a phenomenon in the first place.  
Hence the correct answer is **option 4**.

32. Sentence A is incorrect as 'not' should precede the first occurrence of 'that' (... not that it is a bad thing but ...). Sentence B requires another 'that' (... not that it is a bad thing but that it is ...) for the sake of consistency or parallelism. Sentence C is correct logically and grammatically. Sentence D again has a missing pronoun 'that', this time it should follow 'not'. Hence, the correct answer is **option 3**.
33. A large number of anything has to be more than one or has to be plural. In sentence A, in place of 'device', it should be (a large number of) 'devices'. Article 'the' precedes only 'politicians' in sentence C. For consistency, it should precede either each one of them or none at all (as in sentence B). In sentence D, article 'a' is required. It has to precede 'large number of'. Hence, the correct answer is **option 2**.
34. Sentences B and D can be eliminated as goods are traded on the world market and not with the world market. In sentence A, article 'a' should precede 'difference of prices'. Hence, the correct answer is **option 3**.
35. The action is by the government and not of the government. That helps us to rule out sentences A and D. Also, 'hedging' is not correct in sentence A. Hedge is 'a means of protection or defense, especially against financial losses. 'Gambling' is more appropriate (reduce risk and encourage gambling) in the context of the sentence. Sentence C has a verbose segment –'reduce that risk that private ...' It should be 'reduce the/those risks...' B is the most appropriate. Hence, the correct answer is **option 2**.
36. From the options, the paragraph begins with sentence A. Sentences A, B and D talk about branded diapers and hence are related. Only option 3 gives us this sequence (ADB). A contrast to the more price sensitiveness shown in B is given in C. An example of private-label product (introduced in C) is given in D, therefore CD is a pair. F concludes it (then) and therefore, the sequence is CEF. Hence, the correct answer is **option 3**.
37. AC is a pair. Sentence A mentions discipline and C elaborates it by telling what kind of discipline. E furthers the idea of discipline given in A and C. Hence, ACE. That itself helps us to eliminate options 2, 3 and 4. Similarly, DB is a pair. Sentence D says that strategy goes far beyond best practices and B explains sentence D as in what sentence D wants to say. Hence, the correct answer is **option 1**.
38. Sentence B begins the paragraph. That is evident from the options. It is also evident because the sentence introduces the topic 'ambassadors'. At first glance, BC seems a likely pair. But, it is not so. DC is a mandatory pair. 'Ambivalence' mentioned in sentence D is exemplified in sentence C (to say what they feel... they appear to be denying...) that helps us to rule out all other options that is, 1, 2 and 4. BEA talk about what ambassadors have to be like. Sentence D introduces another idea and as discussed earlier is followed by C. Hence, the correct answer is **option 3**.
39. The question can be solved by paying attention to time (past, present and future) sequence. E begins the paragraph. Shrill alarm had been sounded (statement E). The recent revival of rains (sentence C) led to a divide between the two- centre and the state mentioned in statement E. Therefore, EC is a pair. It is followed by sentence B, as the centre now denies the earlier apprehensions. Statement D follows B as it gives the states' point of view (on the other hand). Finally statement A concludes the paragraph, "this face off will continue (future)... on either side". The sequence is ECBDA. Hence, the correct answer is **option 4**.
40. An easier way to approach this question would be to attack the options after a brief scan of the sentences. Sentence B begins the passage; it states the 'unsettled question'. Sentence E attempts to answer that question. Therefore, BE is a pair. D continues from there (one way of doing that (determining how much is the earth oblate spheroid)) and C gives reasoning for the same. A summarizes it. Sentence A begins with 'this fact was established...' and the 'this' points to the fact mentioned in sentence C. Therefore, the sequence is BEDCA. Hence, the correct answer is **option 2**.
41. Sentence H is an example of B. It is a measure which indicates a vessel of standard capacity. Here, it is a standard vessel which will take up to a litre of oil. With that association we can eliminate options 1 and 2. Sentence F is an example of A. Sheila ascertains quantity of each item that is delivered. Sentence G is an example of D as size/extent of the cricket pitch was 22 yards. Since only option 3 contains these associations.

Hence, the correct answer is **option 3**.

42. In sentence (E) Dinesh felt obliged (A) to walk out..., hence, A relates to E. With that, options 1 and 4 can be eliminated.

In sentence F, 'bound to' indicates certainty. Therefore, D relates to sentence F.

In sentence G, 'the bounds of credulity' refers to 'the limits of credulity' (B).

In sentence (H), 'bound for a career in law' means that Jyoti was 'moving towards' (C) a career in law.

Hence, the correct answer is **option 2**.

43. Prasad (mentioned in sentence E) is a good catch (a person worth trapping). Hence, Sentence E is an example of D.

Hussain (G) tries to catch (capture) the spirit in this painting. Therefore, A matches with G.

B goes with sentence H, since the person was unable to catch (H) or understand (grasp with senses or mind).

Catch in F refers to the deceiving (C) part of the deal.

Hence, the correct answer is **option 4**.

44. In sentence F, 'deal with' means 'pertains to or is concerned with'.

In sentence G, 'deals in' means 'sells'.

In sentence H, 'deal with' is used in the sense of 'attending to'.

The examples are similar (all deal with cards!) and that may lead to confusion. The key is to capture a key association: for example- if you have heard of 'dealing the cards' which means 'give out to a number of people', the C-E association is a certainty and with that all options except option 2 are eliminated.

Hence, the correct answer is **option 2**.

45. There is a clear link between A and sentence G. Change in form is denoted by the structural changes to the school building. Only option 2 has this match.

Hence, the correct answer is **option 2**.

46. Opprobrium is 'a case of shame and disgrace'. From the options, although 2 and 3 may fit the context but 1 is the most appropriate. Partisan conduct is being 'partial'. That can generate criticism and where police or the legal guardians are concerned, harsh criticism.

Stark oppressiveness (option 4) does not fit the context.

Hence, the correct answer is **option 1**.

47. Portend is 'to serve as an omen or a warning of' or 'bodes'. All the options may fit, if the meaning is not known. Bodes is the best choice because the trouble is a 'forecast' which is another way of saying 'portend'.

Evoked may come close but it is not the same as predicting.

Hence, the correct answer is **option 2**.

48. Options 2 and 4 portray extreme emotion. In case she displays that then that would give her away easily. Therefore, both 2 and 4 can be eliminated.

To prevaricate is to lie. More correctly, it means, 'to stay from or evade the truth'. Therefore, prevaricate is more about equivocating than 'lying furiously'.

Hence, the correct answer is **option 1**.

49. It is necessary to eliminate the 'extreme-ended' arguments or words. The waiting public most likely got restless rather than angry or violent. Even distressed- to say that they suffered greatly would be an exaggeration. Restless, therefore is the most appropriate word.

Hence, the correct answer is **option 3**.

50. Blatant is 'unpleasantly loud' or 'obtrusive' which is definitely not the case here. Don't confuse it with 'blatant truth'. Here, the meaning has to do with something very basic.

Guarding a building at night cannot be an ostentatious (showy) job. Nor, can it be an insidious (sinister) job.

Ostensible means 'seeming, professed'. Or, apparent-guarding the building was his obvious job.

Hence, the correct answer is **option 4**.

51. The smallest number with a remainder 4 when divided by 7 is 4.

∴ The smallest number possible as per the given condition

$$= \{[(7 \times 0 + 4) \times 4] + 1\} \times 3 + 2 = (16 + 1) \times 3 + 2 = 53$$

Consider a number,  $N = 53 + (3 \times 4 \times 7)k$  (where  $k$  is any integer)

$$\therefore N = 53 + 84k$$

∴  $N$  when divided by 84 will result in remainder 53.

Hence, **option 3**.

52. The largest possible piece of cake from the three given pieces  $[9/2, 27/4, 36/5]$  can be obtained by finding the H.C.F of the three fractions,

$$\therefore \text{H. C. F.} \left[ \frac{9}{2}, \frac{27}{4}, \frac{36}{5} \right] = \frac{\text{H. C. F. of Numerator}}{\text{L. C. M. of Denominator}} = \frac{9}{20}$$

∴ The weight of the piece of cake given to each guest  $9/20$  lbs.

$$\therefore \text{Number of Guests} = \left( \frac{9}{\frac{9}{20}} \right) + \left( \frac{27}{\frac{9}{20}} \right) + \left( \frac{36}{\frac{9}{20}} \right)$$

$$= 10 + 15 + 16 = 41$$

Hence, **option 4**.

53.  $x + y + z = 5$  ... (i)  
 $xy + yz + zx = 3$  ... (ii)

From equations (i) and (ii), we get,  
 $(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$   
 $\therefore x^2 + y^2 + z^2 = 19$  ... (iii)

When  $x^2$  is maximum,  $y^2 + z^2$  is minimum,  
 $\therefore y^2 + z^2 \geq 0$  or  $y^2 + z^2 = 0$   
 $\therefore y = z = 0$ , This is not possible as it does not satisfy equation (ii)

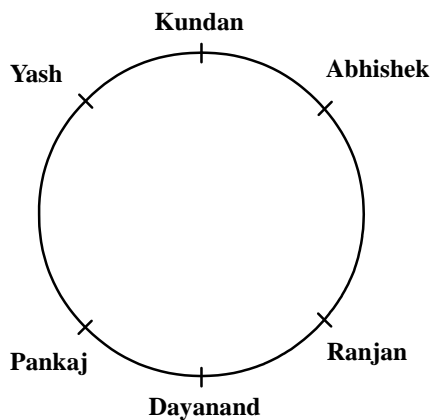
$\therefore y \neq 0$  and  $z \neq 0$   
 $\therefore y^2 + z^2$  will be minimum when  $y = z$

Substituting  $z = y$  in (i) and (ii), we get,  
 $x = 5 - 2y$  ... (iii)  
 $xy + y^2 + xy = 3$  ... (iv)

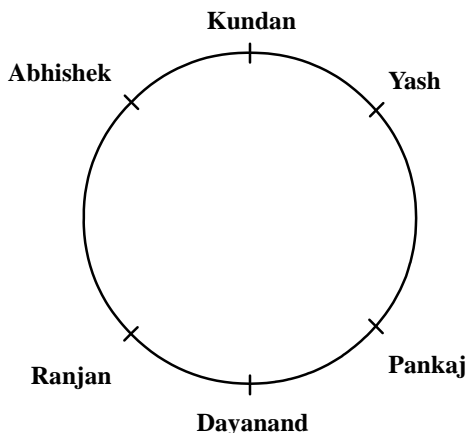
Solving (iii) and (iv) for  $x$  and  $y$ , we get,  
 $y = 3$  or  $1/3$

$\therefore$  If  $y = 3$ ;  $x = -1$  and  $z = 3$   
 $\therefore$  If  $y = 1/3$ ;  $x = 13/3$  and  $z = 1/3$   
 $\therefore$  The maximum value of  $x$  is  $13/3$ .  
Hence, **option 3**.

54. The original arrangement,



The new arrangement is as per the changes described in the question,



$\therefore$  Kundan is sitting to the left of Abhishek.  
Hence, **option 1**.

55. The rent of the car = Maxima(number of hours  $\times$  charge per hour, km travelled  $\times$  charge per km)

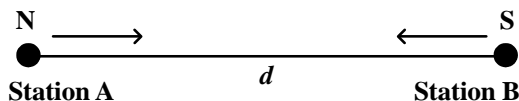
Case 1: Anand drove the car for 5 hours or less  
 $\therefore$  Rent = Maxima(300,  $30 \times 12$ ) = 360

Case 2: Anand drove the car for more than 5 hours  
 $\therefore$  Rent = Maxima(300,  $7.5 \times 30$ ) = 300

$\therefore$  Anand paid Rs. 300 as rent.  
 $\therefore$  Anand drove for 6 hours.

Hence, **option 4**.

56.



Let the speed of E be  $2x$  km/hr.

$\therefore$  Speed of N =  $4x$  km/hr and speed of S =  $x$  km/hr

According to the problem,

Time taken by N to cover AB + Time taken by S to cover BA = 1 hour

$$\therefore \frac{d}{4x} + \frac{d}{x} = 1$$

$$\therefore 5d = 4x \text{ or } d = \frac{4x}{5}$$

$\therefore$  To maintain the schedule (gap of 20 min), N doubles its speed and speed of S becomes  $y$ .

$$\therefore \frac{4x}{8x} + \frac{4x}{y} = \frac{2}{3}$$

$$\therefore \frac{1}{10} + \frac{4x}{5y} = \frac{2}{3}$$

$$\therefore \frac{4x}{5y} = \frac{17}{30}$$

$$\therefore \frac{4x}{y} = \frac{17}{6}$$

$$\therefore \frac{8x}{y} = \frac{17}{3} \text{ or } \frac{y}{8x} = \frac{3}{17} \approx \frac{1}{6}$$

$$\therefore \frac{\text{Speed of passanger train}}{\text{Speed of superfast train}} \approx \frac{1}{6}$$

Hence, **option 4**.

57.  $x^2 + 5y^2 + z^2 = 4xy + 2yz$

$$\therefore x^2 + 4y^2 + y^2 + z^2 - 4xy - 2yz = 0$$

$$\therefore (x^2 + 4y^2 - 4xy) + (y^2 - 2yz + z^2) = 0$$

$$\therefore (x - 2y)^2 + (y - z)^2 = 0 \quad \dots(i)$$

As per equation (i),

$$\therefore (x - 2y)^2 = 0 \text{ and } (y - z)^2 = 0$$

$$\therefore x = 2y \text{ and } y = z$$

Hence, **option 4**.

58.  $\therefore$  The area of  $\triangle ABE = \frac{1}{2} \times BE \times AB = 7 \text{ cm}^2$

$$\therefore BE \times AB = 14$$

$$\text{The area of the rectangle } ABCD = AB \times BC$$

$$= AB \times (BE + EC) = 4 \times (BE \times AB) = 56 \text{ cm}^2$$

Hence, **option 4**.

59. Let S be the square of the sum of the digits.

Substituting options,

$$\text{Option (1), } (3 + 2)^2 - 23 \neq 27$$

$$\text{Option (2), } (5 + 4)^2 - 54 = 27$$

Hence, **option 2**.

60. Let the Arithmetic Mean of the 10 numbers be  $x$  and  $s$  be the sum of the remaining 9 numbers.

$$\frac{s + 10a + b}{10} = x \quad \dots(i)$$

Interchanging the number  $ab$  with  $ba$ ,

$$\frac{s + 10b + a}{10} = x + 1.8 \quad \dots(ii)$$

Subtracting (i) from (ii), we get,

$$10b + a - (10a + b) = 9(b - a) = 18$$

$$b - a = 2$$

Hence, **option 2**.

61. Let  $l$ ,  $m$  and  $s$  be the longest, medium and the shortest lengths of the strings.

$$l = 3m \text{ and } s = l - 23$$

$$l + s + m = 40$$

$$l + \frac{l}{3} + l - 23 = 40$$

$$\frac{7l}{3} = 63$$

$$l = 27$$

Hence, **option 1**.

62. Factorizing the given expression,

$$(7^{3n} - 6^{3n})(7^{3n} + 6^{3n})$$

$$\text{i.e. } (7^n - 6^n)(7^{2n} + 6^{2n} + 7^n 6^n)(7^{3n} + 6^{3n}) \quad \dots(i)$$

Substitute  $n = 1$  in equation (i),

The three factors are 1, 127 and 559.

Since 559 is divisible by 13, hence 13 will also be a factor.

Hence, **option 4**.

63. Let us assume that the 10 numbers are 1 - 10.

When the first number is 1,

2<sup>nd</sup> number as 2, the last number can be chosen in 8 different ways.

2<sup>nd</sup> number as 3, the last number can be chosen in 7 different ways, and so on.

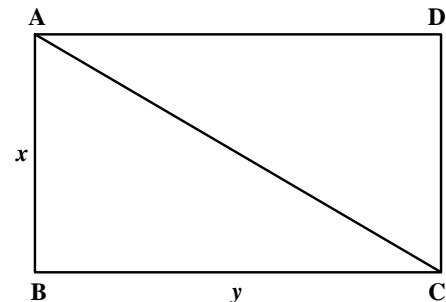
When 1 is the first number, the possible number of triplets as per the given condition =  $8 + 7 + 6 + \dots + 1 = 36$

When the first number as 2, the possible number of triplets will be  $7 + 6 + \dots + 1 = 28$

$\therefore$  The total number of triplets =  $36 + 28 + 21 + 15 + 10 + 6 + 3 + 1 = 120$

Hence, **option 4**.

64.



Let the breadth of the rectangular field be  $x$ , its length be  $y$  and the diagonal be  $d$ .

If he had moved along the edge, he would have moved through a distance =  $x + y = d + y/2$

$$d = x + y/2$$

Substituting the options, only option 3 gives the values of  $y$ ,  $x$  and  $d$  as 4, 3 and 5 which are Pythagorean triplets.

Hence, **option 3**.

65.  $A^2(x - 1) + B^2(x) = x(x - 1)$

$$A^2x - A^2 + B^2x = x^2 - x$$

$$x^2 - x - A^2x - B^2x + A^2 = 0$$

$$x^2 - x[A^2 + B^2 + 1] + A^2 = 0$$

Since it is a quadratic equation, the number of roots = 2

$$\text{Now, } b^2 - 4ac = (A^2 + B^2 + 1)^2 - 4A^2$$



$$= A^4 + B^4 + 1 + 2A^2B^2 + 2B^2 + 2A^2 - 4A^2$$

$$= A^4 + B^4 + 1 + 2A^2B^2 + 2B^2 - 2A^2$$

If  $B = 0$  and  $A = 1$ , then

$$b^2 - 4ac = 0$$

So there is only one root possible in this case.

If  $A = 0$  and  $B = 1$ , then

$$b^2 - 4ac > 0$$

There are two roots possible in this case.

Hence, **option 4**.

66. Let the money contributed by Mayank, Mirza, Little and Jagbir be  $a, b, c$  and  $d$  respectively.

$$a = \frac{1}{2}(b + c + d)$$

$$\therefore 2a = b + c + d$$

$$\therefore 2a = 60 - a$$

$$\therefore a = 60$$

$$b = \frac{1}{3}(a + c + d)$$

$$\therefore 3b = a + c + d$$

$$\therefore 3b = 60 - b$$

$$\therefore b = 15$$

$$c = \frac{1}{4}(a + b + d)$$

$$\therefore 4c = a + b + d$$

$$\therefore 4c = 60 - c$$

$$\therefore c = 12$$

Money contributed by Jagbir =  $60 - 20 - 15 - 12 = \$13$

Hence, **option 2**.

67. Taking  $m = 1$ , we have,

$$U^1 + V^1 = W^1$$

The least values of  $U$  and  $V$  are 1 and 1.

$$\therefore \text{Least value of } W = 2$$

Also, taking  $m = 2$ , we have,

$$U^2 + V^2 = W^2$$

The least values of  $U$  and  $V$  are 3 and 4 (not necessarily in that order).

$$\therefore \text{Least value of } W = 5$$

$$\therefore m \text{ is always less than } \text{Max}(U, V, W).$$

Hence, **option 3**.

- 68.

$$f(x) + f(y) = \log\left(\frac{1+x}{1-x}\right) + \log\left(\frac{1+y}{1-y}\right)$$

$$= \log\frac{(1+x)(1+y)}{(1-x)(1-y)}$$

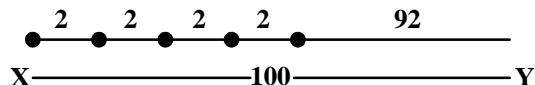
$$= \log\frac{1+xy+x+y}{1+xy-(x+y)}$$

$$= \log\frac{1+\frac{x+y}{1+xy}}{1-\frac{x+y}{1+xy}}$$

$$= f\left(\frac{x+y}{1+xy}\right)$$

Hence, **option 4**.

- 69.



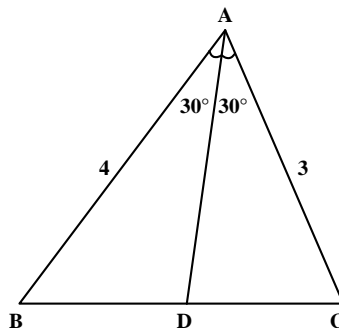
The first stone is kept at 'X' and the subsequent stones are equidistant from each other, i.e. 2 metres.

$\therefore$  The total distance covered by the man to keep all the stones at Y =  $100 + 2 \times (98 + 96 + 94 + 92)$

$$= 100 + 2 \times (380) = 860 \text{ metres}$$

Hence, **option 3**.

- 70.



In a triangle with sides  $a$  and  $b$  and the included angle  $\theta$  the area is given by

$$\text{Area}(A) = \frac{1}{2} \times a \times b \sin\theta$$

$$\text{Area of } \triangle ADC = \frac{1}{2} AD \times 3 \times \sin 30^\circ$$

$$\text{Area of } \triangle ADB = \frac{1}{2} AD \times 4 \times \sin 30^\circ$$

$$\text{Area of } \triangle ABC = \frac{1}{2} \times 3 \times 4 \times \sin 60^\circ$$

$$\frac{1}{2} AD \times 3 \times \sin 30^\circ + \frac{1}{2} AD \times 4 \times \sin 30^\circ$$

$$= \frac{1}{2} 3 \times 4 \times \sin 60^\circ$$

$$AD \left[ 3 \times \frac{1}{2} + 4 \times \frac{1}{2} \right] = 12 \times \frac{\sqrt{3}}{2}$$

$$AD \frac{7}{2} = \frac{12\sqrt{3}}{2}$$

$$\therefore AD = \frac{12\sqrt{3}}{7}$$

Hence, **option 1**.

71.  $BC^2 = AB^2 + AC^2 = 225 + 400 = 625$

$\therefore BC = 25$

Let  $BD = x$ , so  $DC = 25 - x$

In  $\triangle ABD$ ,

$BD^2 + AD^2 = AB^2$

$x^2 + AD^2 = 225 \dots (i)$

In  $\triangle ADC$ ,

$AD^2 + (25 - x)^2 = 400$

$\therefore AD^2 + 625 - 50x + x^2 = 400$

$\therefore (AD^2 + x^2) + 625 - 50x = 400 \dots (ii)$

Substituting (i) in (ii), we get,

$225 + 625 - 50x = 400$

$\therefore x = 9$

$BD = 9$  and  $DC = 16$

Calculating the inradius using the formula.

$A = r \times S$ , where  $A$  is the area,  $r$  is the radius and  $S$  is the semiperimeter.

The radius of the circle inscribed in  $\triangle ABD = 3$  m and the radius of the circle inscribed in  $\triangle ADC = 4$  m

$\therefore PQ = r$  of  $\triangle ABC = r$  of  $\triangle ADC = 7$  m

Hence, **option 1.**

72.  $2^4 = -1 \pmod{17}$

$\therefore (2^4)^{64} = [-1 \pmod{17}]^{64} = (-1)^{64} = 1$

Hence, **option 4.**

73.  $S = 2x + 5x^2 + 9x^3 + 14x^4 + 20x^5 \dots (i)$

Multiplying both sides by  $x$ ,

$xS = 2x^2 + 5x^3 + 9x^4 \dots (ii)$

Subtracting (ii) from (i),

$(1 - x)S = 2x + 3x^2 + 4x^3 \dots (iii)$

$x(1 - x)S = 2x^2 + 3x^3 + 4x^4 \dots (iv)$

Subtracting (iv) from (iii),

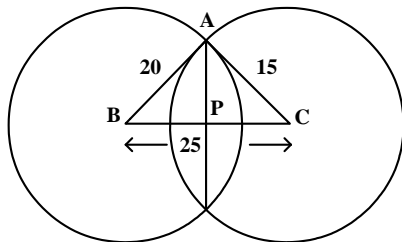
$(1 - x)^2 S = 2x + x^2 + x^3$

$(1 - x)^2 S = x + \frac{x}{1-x} \quad (x < 1)$

$S = \frac{x(2-x)}{(1-x)^3}$

Hence, **option 1.**

74.



In  $\triangle ABC$ ,

$AB^2 + AC^2 = BC^2$

$\therefore \angle BAC = 90^\circ$

Let  $BP = x$

$\therefore PC = 25 - x$

$20^2 = x^2 + AP^2 \dots (i)$

In  $\triangle APC$ ,

$225 = AP^2 + (25 - x)^2$

$225 = AP^2 + 625 + x^2 - 50x \dots (ii)$

Equating (i) and (ii), we get,

$225 = 625 + 400 - 50x$

$\therefore 50x = 800$

$\therefore x = 16$

$AP^2 = 20^2 - 16^2 = 12^2$

$\therefore AP = 12$

$\therefore$  Length of the chord  $= 2 \times AP = 24$

Hence, **option 2.**

75. Let the man has received a cheque of  $x$  rupees and  $y$  paise.

$\therefore$  The amount on cheque  $= (100x + y) \dots (i)$

The amount actually received by him  $= 100y + x$

After spending Rs. 5 and 42 paise, the remaining amount  $= (100y + x - 542) \dots (ii)$

But,  $(100y + x - 542) = 6 \times (100x + y) \dots (iii)$

Substituting the values from the given options,

$x = 6$  and  $y = 44$

Hence, **option 2.**

76. Assume the values for  $x$  and  $y$ .

Let  $x = 1.1$  and  $y = 2.1$

$\therefore L(x, y) = 6$  and  $R(x, y) = 6$

Let  $x = 1.1$  and  $y = 2.5$

$L(x, y) = 6$  and  $R(x, y) = 7$

Thus, options (1), (2) and (3) are eliminated.

Hence, **option 4.**

77. Sum of first  $n$  natural numbers  $= S(n)$

Sum given by student  $= 575$

$S(10) = \frac{10 \times 11}{2} = 55$

$S(20) = \frac{20 \times 21}{2} = 210$

$S(30) = \frac{30 \times 31}{2} = 405$

$S(40) = \frac{40 \times 41}{2} = 820$

$\therefore$  The student stopped counting somewhere between 30 and 40.

Consider  $S(35) = \frac{36 \times 35}{2} = 630$

The student stopped somewhere before 35.

$\therefore S(31) = 496, S(32) = 528, S(33) = 561$  and  $S(34) = 595$

But the student gave 575 as the sum, so the student missed the number 20.

Hence, **option 4**.

**78.** Assume that the thief had stolen  $x$  diamonds.

The 1<sup>st</sup> watchman got  $= x/2 + 2$

Diamonds left  $= x - (x/2 + 2) = x/2 - 2$

The 2<sup>nd</sup> watchman got  $= (x/2 - 2)/2 + 2 = x/4 + 1$

Diamonds left  $= (x/2 - 2) - (x/4 + 1) = x/4 - 3$

The 3<sup>rd</sup> watchman got  $= (x/4 - 3)/2 + 2 = x/8 + 1/2$

Diamonds left  $= (x/4 - 3) - (x/8 + 1/2) = x/8 - 7/2 = 1$

$\therefore x/8 = 9/2$

$\therefore x = 36$

Hence, **option 2**.

*Alternatively,*

One may proceed by substituting the options that are even.

Hence, **option 2**.

**79.** There are 8 apples available for 3 friends. So, share of apples of each person  $= 8/3$

The 1<sup>st</sup> person gives out  $5 - 8/3$  apples  $= 7/3$  apples to 3<sup>rd</sup> person

The 2<sup>nd</sup> person gives out  $3 - 8/3$  apples  $= 1/3$  apples to 3<sup>rd</sup> person

$\therefore$  3<sup>rd</sup> person will distribute Rs. 8 in the ratio 7 : 1 to 1<sup>st</sup> and 2<sup>nd</sup> person respectively and thus Rs. 7 and Rs. 1 are given to them respectively.

$\therefore$  Share of 1<sup>st</sup> friend is Rs. 7.

Hence, **option 2**.

**80.** Let  $y$  be the number of days that they went for Yoga,  $t$  be the number of days that they played Tennis and  $f$  be the number of days that they were free.

On 14 mornings they did not do anything, then they either played tennis in the evening or did nothing.

$\therefore 14 = t + f$  ... (i)

Similarly,  $24 = y + f$  ... (ii)

Also,  $22 = t + y$  ... (iii)

Adding (i) and (ii) and substituting in (iii), we get,

$2f = 16$

$\therefore f = 8$  days

$\therefore$  Total number of days Amar stayed

$= 22 + f$

$= 22 + 8 = 30$  days

Hence, **option 3**.

**81.**

$$\text{Area } (\Delta) = \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

where  $x_1 = y_1 = a, x_2 = a + 1, y_2 = a, x_3 = a$  and  $y_3 = a + 2$

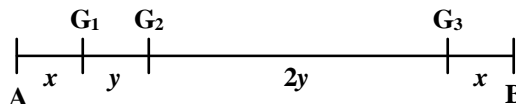
$$\text{Area } (\Delta) = \frac{1}{2} \begin{vmatrix} a & a & 1 \\ a+1 & a & 1 \\ a & a+2 & 1 \end{vmatrix}$$

$$\therefore \text{Area } (\Delta) = \frac{1}{2} \{ a[a(1) - (a+2)(1)] - a[(a+1)(1) - a(1)] + 1[(a+1)(a+2) - a^2] \}$$

$$= \frac{1}{2} \{-2a - a + 3a + 2\} = 1$$

Hence, **option 2**.

**82.** As per the description,



$AB = 20$  km

$AG_1 = BG_3$

$2G_1G_2 = G_2G_3$

Also,  $\frac{x}{30} = \frac{1}{12}$  hr

$\therefore x = 2.5$  km

$y + 2y = 20 - 2x$

$\therefore y = 5$  km

$\therefore$  Time to cover A to  $G_3 = \frac{1}{12} + \frac{15}{60} = 20$  min

$\therefore$  While coming back his speed is 60 km/hr.

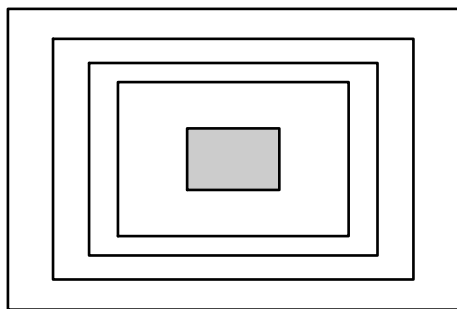
$\therefore$  Time taken to cover the distance from  $G_3$  to A (i.e. 17.5 km) = 17.5 minutes

$\therefore$  Required time = 20 + 17.5 + 1 = 38.5 minutes

$\therefore$  The doctor will have 1.5 minutes to attend the patient.

Hence, **option 3**.

83.



The movement of the mower may be considered as shown in the figure.

Total area of the plot =  $20 \times 40 = 800$  sq.m.

After 1<sup>st</sup> mowing, area left =  $(20 - 2) \times (40 - 2) = 684$  sq.m.

After 2<sup>nd</sup> mowing, area left =  $(20 - 4) \times (40 - 4) = 576$  sq.m.

After 3<sup>rd</sup> mowing, area left =  $(20 - 6) \times (40 - 6) = 476$  sq.m.

After 4<sup>th</sup> mowing, area left =  $(20 - 8) \times (40 - 8) = 384$  sq.m.

∴ But, more than half the area is mowed in the 4<sup>th</sup> round.

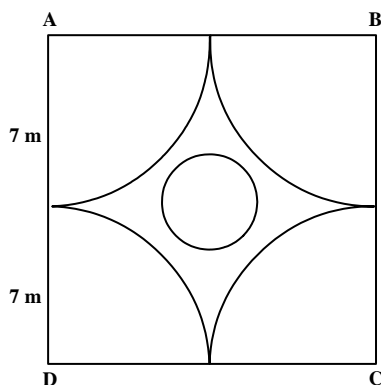
Total area mowed in the 4<sup>th</sup> round =  $476 - 384 = 92$  sq.m.

∴ Number of rounds taken to mow half of the field

$$= 3 + \left[ \frac{(476 - 400)}{92} \right] = 3 + \left( \frac{76}{92} \right) = 3.8$$

Hence, **option 2.**

84.



Side of square field = 14 m

∴ Area of square field = 196 sq.m.

Area of the circle = 20 sq.m.

$$\text{Area grazed by horses} = 4 \times \frac{90^\circ}{360^\circ} \times \pi \times 7^2$$

$$= 22 \times 7 = 154 \text{ sq.m.}$$

∴ Area capable of being grazed =  $196 - 20 = 176$  sq.m.

∴ Area left ungrazed =  $176 - 154 = 22$  sq.m.

Hence, **option 2.**

85. Numbers possible with 0, 7, 8:

Possible single-digit numbers = 2

Possible 2-digit numbers =  $2 \times 3 = 6$

Possible 3-digit numbers =  $2 \times 3 \times 3 = 18$

Possible 4-digit numbers =  $2 \times 3^3 = 54$

Possible 5-digit numbers =  $2 \times 3^4 = 162$

Possible 6-digit numbers =  $2 \times 3^5 = 486$

Total possible numbers =  $486 + 162 + 54 + 18 + 6 + 2 = 728$

Hence, **option 3.**

86. The number of ways of selecting 1 black square is 32.

∴ 8 white squares in the corresponding row and column cannot be selected.

∴ The number of ways of selecting the white square is 24.

∴ Total number of required ways =  $32 \times 24 = 768$

Hence, **option 4.**

87. Let the two unequal numbers be  $x$  and  $y$ .

$$\therefore 48(x - y) = x^2 - y^2$$

$$\therefore 48(x - y) = (x + y)(x - y)$$

$$\therefore (x + y) = 48$$

∴ Total number of coins is 48.

Hence, **option 1.**

88. Given that  $AB = BC = 2CH = 2CD = EH = FK = 2HK = 4KL = 2LM = MN$

And  $EO = FP$

Also,

$$2CD = EH$$

$$EO = FP = CD$$

$$\therefore KL = PG = \frac{CD}{2}$$

$$FP = CD; PG = \frac{CD}{2}; \angle FPG = 90^\circ$$

∴ The angle are proportionate to the sides opposite to the angles.

$$\text{In } \triangle FGP, \tan \angle FGP = FP/PG = 2/1$$

$$\therefore \angle FGO = \angle FGP = \tan^{-1} 2$$

Hence, **option 4.**

89. Area of trapezium ABCD

$$= \frac{1}{2} BC (CD + AB)$$

Also  $AB = BC = 2CD$

$$\begin{aligned}\text{Area of trapezium ABCD} &= \frac{1}{2} \times 2CD(CD + 2CD) \\ &= 3CD^2 \quad \dots (i)\end{aligned}$$

$$\text{Area of trapezium DEFG} = \frac{1}{2} EO(EF + DG)$$

$$EO = CD$$

$$EF = CD$$

$$DG = CH + HK + KL = CD + CD + \frac{CD}{2} = \frac{5}{2}CD$$

$$\text{Area of trapezium DEFG} = \frac{1}{2} \times CD \left( CD + \frac{5}{2}CD \right)$$

$$= \frac{1}{2} \times CD \left( \frac{7CD}{2} \right) = \frac{7CD^2}{4} \quad \dots (ii)$$

$$\text{Ratio of ABCD : DEFG} = 12 : 7$$

Hence, **option 3**.

90. It is given to us that  $X_0 = x$

$$\therefore X_1 = -x$$

$$X_2 = -x$$

$$X_3 = x$$

$$X_4 = x$$

There is no trend for odd or even  $X_n$ .

$\therefore$  No concrete statement can be made.

Hence, **option 4**.

91. 4 out of the 11 symmetrical alphabets need to be selected,

Also the order of alphabets needs to be accounted for (as it is a password)

$$\therefore {}^{11}P_4 = \frac{11!}{7!} = 11 \times 10 \times 9 \times 8 = 720 \times 11 = 7920$$

Hence, **option 3**.

92. Number of asymmetrical letters = 15

$$\text{Total number possible of words} = 26 \times 26 \times 26 = 17576$$

$$\text{Number of words without any symmetrical letters} = 15 \times 15 \times 15 = 3375$$

$$\text{Number of words with at least one symmetrical letter} = 17576 - 3375 = 14201$$

Hence, **option 4**.

93. 6 technicians  $\rightarrow$  10 hours to 1 job

$$\therefore 1 \text{ technician} \rightarrow 60 \text{ hours to 1 job}$$

$$\therefore \text{In 6 hrs (11 a.m. - 5 p.m.)}$$

$$6 \text{ technicians} \rightarrow \frac{3^{\text{th}}}{5} \text{ of the work}$$

In the hour after 5p.m.,

$$7 \text{ technicians} \rightarrow \frac{7^{\text{th}}}{60} \text{ of the job}$$

$$\text{Next hour 8 technicians} \rightarrow \frac{8^{\text{th}}}{60} \text{ of the job}$$

In the next hour, 9 technicians will complete

$$\rightarrow \frac{9^{\text{th}}}{60} \text{ of the job}$$

$$\therefore \text{In 3 hrs after 5 p. m.} \rightarrow \frac{24}{60}$$

$$= \frac{2^{\text{th}}}{5} \text{ of the job is complete}$$

$\therefore$  At the end of 9<sup>th</sup> hour i.e. 8:00 p.m. the work is complete.

Hence, **option 4**.

94. Consider that  $N$  extra packets of 20 samosas each are bought.

$$\begin{aligned}\therefore \text{Total cost, } C &= (200 + 20N) \times (2 - 0.1N) \\ &= 400 - 20N + 40N - 2N^2 \\ &= 400 + 20N - 2N^2\end{aligned}$$

$$\text{Maxima } (C) = 20 - 4N = 0$$

$$\therefore N = 5$$

$\therefore$  Revenue will be maximum at  $N = 5$

$$\therefore \text{Total number of samosas} = 200 + 20(5) = 300$$

Hence, **option 2**.

95. Let the work done by the large pump be 3 units

$$\therefore \text{Work done by the 3 small pumps} = 2 \times 3 = 6 \text{ units}$$

$$\therefore \text{Work done by all 4 pumps together} = 9 \text{ units}$$

$$\therefore \frac{\text{Rate of work of the large pump}}{\text{Rate of work for all 4 pumps}} = \frac{3}{9} = \frac{1}{3}$$

Rate of work is inversely proportional to time taken for completing the work.

$$\therefore \frac{\text{Time take by the larger pump}}{\text{Time taken by all 4 pumps}} = \frac{3}{1}$$

$$\therefore \frac{\text{Time taken by all 4 pumps}}{\text{Time take by the larger pump}} = \frac{1}{3}$$

Hence, **option 2**.

96.  $\therefore pqr = 1$

Case 1:

$$\text{Let } p = 2/3, q = 3/2 \text{ and } r = 1$$

Substituting the values of  $p, q, r$ , we get,

$$\begin{aligned}\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}} \\ = \frac{3}{7} + \frac{2}{7} + \frac{2}{7} = 1\end{aligned}$$

Case 2:

$$\text{Let } p = 1, q = 1 \text{ and } r = 1$$

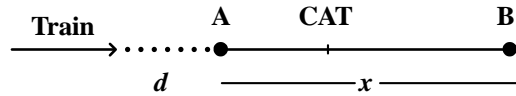
Substituting the values of  $p, q, r$ , we get,

$$\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$$

$$= \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$$

Hence, **option 3.**

97.



Let the speed of the train be  $S_t$  and the speed of the CAT be  $S_c$ .

**Case 1:**

The CAT runs towards the train.

$$\frac{d}{S_t} = \frac{3x}{8S_c}$$

$$\therefore \frac{3x}{8} \times \frac{S_t}{S_c} = d \quad \dots (i)$$

**Case 2:**

The CAT runs away from the train.

$$\frac{d+x}{S_t} = \frac{5x}{8S_c}$$

$$\therefore d = \frac{5x}{8} \times \frac{S_t}{S_c} - x \quad \dots (ii)$$

Equating (i) and (ii),

$$\frac{3x}{8} \times \frac{S_t}{S_c} = \frac{5x}{8} \times \frac{S_t}{S_c} - x$$

$$\therefore \frac{3S_t}{8S_c} = \frac{5S_t}{8S_c} - 1$$

$$\therefore S_t : S_c = 4 : 1$$

Hence, **option 1.**

98. The words MODERN, BOOK and STORES appear after  $5/2$ ,  $17/4$  and  $41/8$  seconds respectively and are put off after 1 second.

So, if all the words flashed together at  $t = 0$  seconds, then

MODERN will flash after  $(5/2 + 1) = 7/2$  seconds

BOOK will flash after  $(17/4 + 1) = 21/4$  seconds

STORES will flash after  $(41/8 + 1) = 49/8$  seconds.

So, all the words will flash together again after  $\text{LCM}(7/2, 21/4, 49/8)$  seconds.

$$\begin{aligned} \therefore \text{L. C. M.} \left( \frac{7}{2}, \frac{21}{4}, \frac{49}{8} \right) &= \frac{\text{L. C. M. of Numerators}}{\text{H. C. F. of Denominators}} \\ &= \frac{147}{2} = 73.5 \text{ seconds} \end{aligned}$$

Hence, **option 1.**

99. The sequence,

1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4

Number of oranges put in = Number of times 2 was ordered = 6

Number of oranges taken out = Number of times 4 was ordered = 4

Number of oranges at the end of the sequence

$$= 6 - 4 = 2$$

Hence, **option 1.**

100. Number of fruits put in the basket = Number of times of orders 1, 2 or 3 = 19

Number of fruits taken out = 2 fruits taken out for every order for 4 =  $2 \times 4 = 8$

Number of fruits in the basket after the sequence

$$= 19 - 8 = 11$$

Hence, **option 2.**

101.

Year	AP	GU	KA	MA	TN	UP	WB
1996 - 97	4	3	5	1	2	6	7
1997 - 98	3	4	6	1	2	5	7
1998 - 99	3	4	6	1	2	5	7
1999 - 00	3	4	6	1	2	5	7
2000 - 01	3	5	6	1	2	4	7

The table given above indicates the ranks according to the annual sales-tax revenue collections of seven states from 1996-97 to 2000-01.

WB, TN and MA have the ranks 7, 2, and 1 respectively over the five years.

AP and KA change their ranks only once, in 1997-98.

$\therefore$  There are five states for which the ranks didn't change more than once.

Hence, **option 2.**

102. From the table given in the solution of the previous question, we see that UP and GU have changed their rankings twice (in the years 1997-98 and 2000-01).

Hence, **option 2.**

103.

In 1996 - 97, the percentage share of AP

$$= \frac{3526}{29870} \times 100 = 11.80\%$$

In 2000 - 01, the percentage share of AP

$$= \frac{7202}{49639} \times 100 = 14.50\%$$

Similarly calculating for other states, we get:

	1996 - 97	2000 - 2001
<b>WB</b>	9.05	8.66
<b>UP</b>	11.63	12.84
<b>TN</b>	17.88	16.15
<b>MA</b>	24.41	24.24
<b>KA</b>	11.75	10.90
<b>GU</b>	13.48	12.69
<b>AP</b>	11.80	14.50

∴ We can see that the percentage share of sales tax revenue has increased only for AP.

Hence, **option 4**.

- 104.** Growth rate of tax revenue in MA for 1997-98

$$= \frac{7826 - 7290}{7290} \times 100$$

$$\approx \frac{500}{7300} < 10\%$$

Growth rate of tax revenue in MA for 1998-99

$$= \frac{8067 - 7826}{7826} \times 100$$

$$\approx \frac{200}{7800} < 10\%$$

Growth rate of tax revenue in MA for 1999-00

$$= \frac{10284 - 8067}{8067} \times 100$$

$$\approx \frac{2000}{8000} \approx 25\%$$

Growth rate of tax revenue in MA for 2000-01

$$= \frac{12034 - 10284}{10284} \times 100$$

$$\approx \frac{2000}{10000} \approx 20\%$$

Hence, **option 3**.

- 105.** For Karnataka the increase from the year 1998-1999 to 1999-2000 and the increase from the year 1999-2000 to 2000-2001 is the same.

$$\text{Increase from 1998-1999 to 1999-2000} = 4839 - 4265 = 574$$

$$\text{Increase from 1999-2000 to 2000-2001} = 5413 - 4839 = 574$$

Hence, **option 1**.

- 106.** From the table given in the solution of the first question of the set, it is seen that WB, TN and MA have a consistent rank.

∴ From the given options, only Tamil Nadu has been maintaining a constant rank.

Hence, **option 3**.

- 107.** The regions that produce medium quality of Crop-1 or Crop-2 are R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub> and R<sub>13</sub>

The regions that produce low quality of Crop-3 or Crop-4 are R<sub>1</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>9</sub>

Thus, only region R<sub>9</sub> produces medium quality of Crop-2 and low quality of Crop-4.

Hence, **option 2**.

- 108.** Option 1 is false because R<sub>9</sub> is a medium quality Crop-2 producing region, which does not produce high quality of Crop-3.

Option 2 is false because R<sub>3</sub> is a high quality Crop-1 producing region, which does not produce medium and low qualities of Crop-4.

Option 3 is true as there are exactly 5 regions (R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>11</sub>) and that produce Crop-3 and Crop-4 but not Crop-2.

Option 4 is false as no regions producing Crop-3 produces high quality Crop-2.

Hence, **option 3**.

- 109.** Regions R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub> produce low quality of Crop-1.

Of these, regions R<sub>10</sub> and R<sub>11</sub> also produce high quality of Crop-4 while regions R<sub>9</sub> and R<sub>11</sub> produce medium quality of Crop-3.

∴ There are 3 low quality Crop-1 producing regions that are either high quality Crop-4 producing regions or medium quality Crop-3 producing regions.

Hence, **option 3**.

- 110.** Vienna, Sofia, Tripoli, Warsaw and Lusaka lie between 10° E and 40° E.

∴ The number of cities located within 10° E and 40° E = 5

Out of these, only Lusaka is in the Southern Hemisphere.

$$\therefore \text{Required percentage} = \frac{1}{5} \times 100 = 20\%$$

Hence, **option 2**.

- 111.** 'Cities' implies that we need to refer to the 'Capitals' column while answering this question.

The number of cities whose names begin with a consonant and are in the Northern Hemisphere = 11

The number of cities whose names begin with a consonant and are in the Southern Hemisphere = 7

The number of cities whose names begin with a consonant and lie East of the meridian = 17

∴ The number of cities whose names begin with a consonant and are in the Northern Hemisphere exceed the cities whose names begin with a consonant and are in the Southern Hemisphere by 4.

Hence, **option 1**.

- 112.** There are three countries, Argentina, Australia and Ecuador, which start with a vowel and are in the Southern Hemisphere.

There are two countries, Canada and Ghana, whose capitals (Ottawa and Accra) start with a vowel.

∴ The required ratio = 3 : 2

Hence, **option 1**.

- 113.**

$$\text{Earnings per day} = \frac{\text{Total Earnings for complex work}}{\text{Number of days for complex work}}$$

Hence, we have:

Emp. No.	Earnings	Days	Approximation	Pay per day
2001147	82.98	3	< 90/3	< 30
2001148	51.53	3.33	< 60/2	< 30
2001151	171.71	5.5	< 200/5	< 40
2001155	100.47	6	< 120/6	< 20
2001159	594.43	9.67	≈ 600/10	≈ 60
2001161	83.7	8	≈ 80/8	≈ 10
2001162	472.51	1.29	> 400/2	> 200
2001165	402.25	5.27	≈ 400/5	≈ 80
2001167	576.57	21	< 600/20	< 30
2001169	288.48	8.38	≈ 300/9	≈ 33.33
2001170	812.1	10	≈ 800/10	≈ 80
2001171	1203.88	28.8	≈ 1160/29	≈ 40
2001174	1017.94	26	< 1040/26	< 40
2001177	46.56	2	< 50/2	< 25
2001180	116.4	5	< 150/5	< 30

Employees numbered 2001159, 2001162, 2001165 and 2001170 have earned more than Rs. 50 per day in complex operation.

∴ Number of employees = 4

Hence, **option 1**.

- 114.** 80% of 25 = 20

∴ Total attendance should be more than 20 and total earning should be more than 600.

There are 7 employees (2001147, 2001159, 2001170, 2001171, 2001174, 2001177 and 2001180) who have worked for more than 20 days and whose earning is more than Rs. 600.

Hence, **option 4**.

- 115.** Earnings per day in medium operations for the given options is as follows:

$$\text{Employee 2001180} \equiv \frac{1262.79}{19} = \text{Rs. } 66.5$$

$$\text{Employee 2001165} \equiv \frac{735.72}{12.07} = \text{Rs. } 61.5$$

$$\text{Employee 2001170} \equiv \frac{117.46}{8.5} = \text{Rs. } 13.8$$

$$\text{Employee 2001177} \equiv \frac{726.19}{19} = \text{Rs. } 38.2$$

Hence, **option 1**.

- 116.** There are 10 employees who are engaged in both complex and medium operations.

For employee 2001148:

$$\text{The amount earned in Medium operations} = 513.26 - 51.53 - 3 = 458.73$$

$$\frac{51.53}{3.33} < \frac{458.73}{1.67}$$

For employee 2001151:

$$\text{The amount earned in Medium operations} = 282.81 - 171.71 - 79.1 = 32$$

$$\frac{171.71}{5.5} > \frac{32}{4}$$

For employee 2001155:

$$\text{The amount earned in Medium operations} = 597.94 - 497.47 - 100.47 = 0$$

Hence, the average amount earned per day in Medium operations = 0/4.67 = 0

Hence, the average amount earned per day in Complex operations is more.

For employee 2001159:

$$\frac{594.43}{9.67} > \frac{159.64}{13.33}$$

For employee 2001162:

$$\frac{472.51}{1.29} > \frac{109.73}{9.71}$$

For employee 2001165:

$$\frac{402.25}{5.27} > \frac{735.72}{12.07}$$

For employee 2001169:

$$\frac{288.48}{8.38} > \frac{6.1}{4.25}$$

For employee 2001170:

$$\frac{812.1}{10} > \frac{117.46}{8.5}$$

For employee 2001177:

$$\frac{46.56}{2} < \frac{726.19}{19}$$

For employee 2001180:



$$\frac{116.4}{5} < \frac{1262.79}{19}$$

∴ There are 7 employees for whom per day earnings in complex operations is more than per day earnings in medium operations.

Hence, **option 4**.

**117.** Total revenue in 1999 = 3314

$$\begin{aligned} \therefore 5\% \text{ of the total revenue in 1999} &= \frac{5}{100} \times 3314 \\ &= 165.7 \end{aligned}$$

The operations of Spain, the Rest of Latin America, the Northern Sea and the Rest of the World are less than 165.7.

Hence, **option 3**.

**118.** Total revenues earned from 1999 to 2000 = 3314 + 8328 = 11642

$$5\% \text{ of } 11642 = 582.1$$

There are only three operations, Spain, the Northern Sea and Rest of the World, whose gross revenues for these two years is less than 582.1.

Hence, **option 3**.

**119.** Only North Africa and the Middle East, Argentina, the Rest of Latin America and the Far East experience a sustained increase.

∴ There are 4 regions.

Hence, **option 2**.

**120.** The average increase in income before taxes and charges from 1998 to 1999 (ignoring the loss making operations)

$$= \frac{(7 - 31) + (341 - 111) + (838 - 94) + (97 - 19) + (75 - 86)}{5}$$

$$= 1077/5 = 215.4$$

Looking at the Incomes of the various operations in 1998 and 1999, it is clear that Argentina and the Far East definitely have percentage increases of more than 400%. It is also clear that all the other operations (except North America and the Middle East) will have percentage increases less than 200%.

% Increase in North America and Middle East from 1998

$$- 9 = \frac{341 - 111}{111} \times 100 \approx 210$$

Hence, **option 3**.

**121.** Consider option 1:

Probability of Far East operations in 1998

$$= \frac{10}{63} = 0.158$$

Probability of Far East operations in 1999

$$= \frac{58}{204} = 0.284$$

Probability of Far East operations in 2000

$$= \frac{189}{311} = 0.607$$

The profitability is highest for the year 2000.

∴ Option 1 is false.

Consider option 2:

$$\text{Probability of Northern Sea operations in 1998} = \frac{24}{52}$$

$$= 0.462$$

$$\text{Probability of Northern Sea operations in 1999} = \frac{54}{65}$$

$$= 0.831$$

Profitability is increased from 1998 to 1999.

∴ Option 2 is true.

Consider option 3

$$\text{Probability of Argentina operations in 1998} = \frac{61}{187}$$

$$= 0.326$$

$$\text{Probability of Argentina operations in 1999} = \frac{500}{1168}$$

$$= 0.428$$

Profitability has increased from 1998 to 1999.

∴ Option 3 is false.

Hence, **option 2**.

**122.**

Operations	Profitability in 2000
North Africa and Middle East	$\frac{356}{530} < \frac{400}{500} = 0.8$
Spain	$\frac{225}{43} < \frac{225}{45} = 5$
Rest of Latin America	$\frac{169}{252} < \frac{250}{250} = 1$
Far East	$\frac{189}{311} < \frac{210}{300} = 0.7$

The profitability for the given options are as given in the above table.

Spain has the best profitability.

Hence, **option 2**.

123.

Operations	Ration of Revenue to Expense 2000
Spain	$\frac{394}{43} > \frac{360}{45} = 8$
North Africa and Middle East	$\frac{1290}{530} > \frac{1200}{600} = 2$
Argentina	$\frac{5539}{2840} > 1$
Rest of Latin America	$\frac{482}{252} > \frac{390}{260} = \frac{3}{2}$
Far East	$\frac{603}{311} > 1$
Rest of the World	$\frac{20}{33} < 1$

Efficiency for all operations in 2000 is shown in the above table.

Efficiency is the least for the Rest of the World.

Hence, **option 4**.

124. Option 1 is true as Spain has the best efficiency in 2000.

Consider option 2:

$$\text{Efficiency of Far East operations in 1999} = \frac{301}{204} \approx 1.5$$

$$\text{Efficiency of Far East operations in 2000} = \frac{603}{311} \approx 2$$

Efficiency has improved from 1999 to 2000.

∴ Option 2 is true.

Consider option 3:

$$\text{Efficiency of Northern Sea operations in 1998} = \frac{78}{52}$$

$$= 1.5$$

$$\text{Efficiency of Northern Sea operations in 1999} = \frac{140}{65}$$

$$= 2.2$$

Efficiency has improved from 1998 to 1999.

∴ Option 3 is true.

Consider option 4:

Option 4 is false as in the year 1998, the operations in the Rest of the World was the least efficient.

Hence, **option 4**.

125. The highest ratio of the percentages will be the highest average price because the multiplying factor is common for all.

$$\therefore \text{Average price} = \frac{\text{Value in million Euro}}{\text{Volume in million tons}}$$

Country	Average Comparison
USA	$\frac{17}{15} = 1.133$
Switzerland	$\frac{20}{11} = 1.818$
Turkey	$\frac{16}{15} = 1.06$
India	$\frac{20}{26} < 1$

∴ Switzerland has the highest average price.

Hence, **option 2**.

126. Distribution value of Turkey = 16% of 5760 million Euro

Distribution quantity of Turkey = 15% of 1.05 million tons

$$\begin{aligned} \therefore \text{Average Price} &= \frac{\frac{16}{100} \times 5760 \times 10^6}{\frac{15}{100} \times 1.05 \times 10^6 \times 10^3} \\ &= \frac{16 \times 5760}{15 \times 1.05 \times 10^3} = 5.85 \text{ Euro/kg} \end{aligned}$$

Hence, **option 2**.

127. The cost of transporting one unit from refinery BD to depot AE is Rs. 0 and the cost of transporting one unit from depot AE to district AAB is also Rs. 0.

∴ The minimum cost of transporting one unit from any refinery to any district is Rs. 0.

Hence, **option 1**.

128. Number of ways = Six refineries × Seven depots × Nine districts

$$= 6 \times 7 \times 9$$

$$= 378$$

Hence, **option 4**.

129. The highest cost of transportation from a refinery to the depot = Rs. 1,157.70 (BE to AE)

Cost of transportation from AE to AAF takes up the highest charge of Rs. 1,035.30

$$\therefore \text{The maximum cost} = 1157.7 + 1035.3 = \text{Rs. } 2,193$$

Hence, **option 2**.

130. The transportation cost from refinery BD to depot AE is Rs. 0.

The transportation cost from depot AE to district AAB is also Rs. 0.

∴ The minimum cost of transportation from BD to any district is Rs. 0.

Hence, **option 2**.

131. The transportation cost from depot AD to district AAG = 0

The transportation cost from refinery BC to depot AD = Rs. 50.1

∴ Minimum cost of transportation from any refinery to district AAG = Rs. 50.1

Hence, **option 4**.

132. The cost will be minimum when the transportation from BE to AAA is through AD.

∴ The cost of transportation =  $650.4 + 159 = \text{Rs. } 809.4$

Hence, **option 4**.

133. From statement A alone, it is not clear whether Korea too scored in the last 5 minutes or not.

From statement B alone, it is not clear whether India scored in the last 5 minutes or not.

Using both the statements, there are two cases possible:

Case 1:

	Before the last 5 minutes	In the last 5 minutes	Final Score
India	0	3	3
Korea	2	1	3

In this case, the match ended in a draw.

Case 2:

	Before the last 5 minutes	In the last 5 minutes	Final Score
India	1	3	4
Korea	3	0	3

In this case, India wins the match.

∴ Even after combining both the statements, we cannot say whether India won the match or not.

Hence, **option 4**.

134. Consider statement A:

Let  $x$  be the total number of students present in the class.

$$\therefore (x + 12) - (x + 4) = 8$$

∴ If  $(x + 12)$  is divisible by 8, then  $(x + 4)$  too is divisible by 8.

Statement A alone is sufficient to answer the question.

From statement B alone, we cannot conclude anything.

Hence, **option 1**.

135. Consider statement A:

$$(x + y) \frac{(x + y)}{xy} = 4$$

$$\therefore (x + y)^2 = 4xy$$

$$\therefore x^2 + y^2 + 2xy - 4xy = 0$$

$$\therefore (x - y)^2 = 0$$

$$\therefore x = y$$

∴ Statement A alone is sufficient.

Consider statement B:

$$(x - 50)^2 = (y - 50)^2$$

$$\therefore \text{Either } (x - 50) = (y - 50) \text{ or } (x - 50) = -(y - 50)$$

∴ Either  $x = y$  or  $x + y = 100$ , which gives infinite values for  $x$  and  $y$ .

∴ Statement B alone is not sufficient.

Hence, **option 1**.

136. Let  $100x$  be the wholesale cost of the dress.

$$\therefore \text{List price of the dress} = 120x$$

Consider statement A:

$$\text{Selling Price} = 0.9 \times \text{List Price} = 0.9 \times 120x = 108x$$

Now, Selling Price – Cost Price = Profit

$$\therefore (108x) - (100x) = 10$$

$$\therefore x = 10/8$$

$$\therefore \text{Wholesale Cost} = 100x = \text{Rs. } 125$$

∴ Statement A alone is sufficient.

Consider statement B:

This gives the selling price of the dress but it is not mentioned whether any discount is provided on the list price or not.

∴ Statement B alone is not sufficient.

Hence, **option 1**.

137. Consider statement A:

This statement alone does not give sufficient information as we do not know how much above/below 500 these students scored.

For example, it is possible that one student scored 800, one scored 750, the third scored 450, while the last scored 200.

$$\text{Then, average} = (800 + 750 + 450 + 200)/4 = 550 \neq 500$$

Consider statement B:

Using this statement alone, we cannot say whether 500 is the average score of GMAT. The previous example can be used here as well.

Combining both statements together:

Even now, we cannot determine the average. (Again, the above example can be used.)

Hence, **option 4**.

138.  $|x - 2| < 1$

**Consider statement A:**

$$|x| > 1$$

$$x < -1 \text{ or } x > 1$$

For  $x = 1.5$ ,  $|x - 2| < 1$  is true.

For  $x = 4$ ,  $|x - 2| < 1$  is false.

∴ Statement A alone is not sufficient.

**Consider statement B:**

$$|x - 1| < 2$$

$$-2 < x - 1 < 2$$

$$-1 < x < 3$$

For  $-1 < x < 1$ ,  $|x - 2| < 1$  is false.

For  $1 < x < 3$ ,  $|x - 2| < 1$  is true.

∴ Statement B alone is not sufficient.

**Consider both the statements:**

We have,  $1 < x < 3$

For this range,  $|x - 2| < 1$  is true.

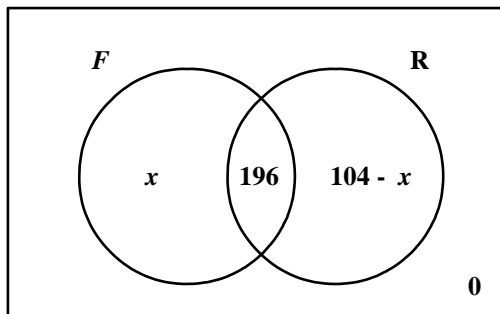
∴ Both the statements combined together are sufficient to answer the question.

Hence, **option 3**.

139. Let  $F$  represent the set of members speaking French and  $R$  represent the set of members speaking Russian.

Also, let  $x$  represent the number of members speaking *only* French.

**Consider statement A:**



Here, total number of members = 300

∴ Number of members who speak only Russian

$$= 300 - 196 - x = 104 - x$$

However, we cannot find the value of  $x$ .

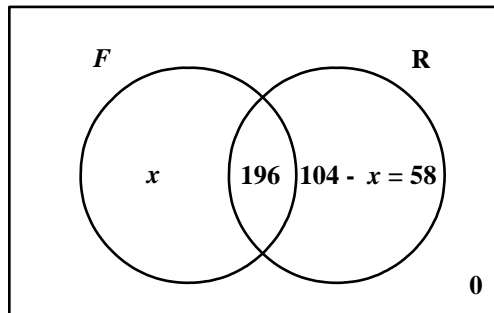
∴ Statement A alone is not sufficient.

**Consider statement B:**

We are given that the number of members speaking Russian = 58

∴ Statement B alone is not sufficient.

**Consider both statements together:**



We have,  $104 - x = 58$

∴ Number of members speaking only French,

$$x = 104 - 58 = 46$$

∴ The question can be answered using both statements together.

Hence, **option 3**.

140. **Consider statement A:**

Jagdish : (Punit + Girish) = 2 : 9

$$\therefore \text{Jagdish's share} = \frac{2}{11} \times \text{Total} = 18.18\% \text{ of the total}$$

However, we don't know the percentage distribution between Punit and Girish.

∴ Statement A alone is not sufficient.

**Consider statement B:**

Punit : (Jagdish + Girish) = 3 : 11

$$\therefore \text{Punit's share} = \frac{3}{14} \times \text{Total} = 21.4\% \text{ of the total}$$

However, we do not know the percentage distribution between Jagdish and Girish.

∴ Statement B alone is not sufficient.

**Consider both statements together:**

Jagdish = 18.18% of the total amount

Punit = 21.4% of the total amount

Girish =  $100 - 18.18 - 21.4 = 60.42\%$  of the total amount

∴ Jagdish received the minimum amount.

Hence, **option 3**.

141. The movement can be tabulated as below:

Distance	Direction	Speed	Time till next Signal
10	N	20	30 min.
10	W	40	15 min.
20	N	40	30 min.
40	E	100	24 min.
10	N	40	15 min.
Stop			

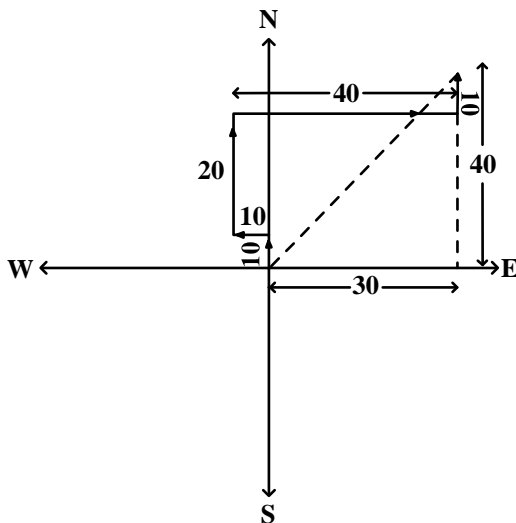
$$\text{Distance} = 20 \times \frac{1}{2} + 40 \times \frac{1}{4} + 40 \times \frac{1}{2} + 100 \times \frac{2}{5} + 40 \times \frac{1}{4}$$

$$= 10 + 10 + 20 + 40 + 10$$

$$= 90 \text{ km}$$

Hence, **option 1**.

142. The map of his movements is as shown below:



∴ The net displacement with respect to the starting point.

$$= \sqrt{40^2 + 30^2} = 50 \text{ km towards North - East}$$

Hence, **option 2**.

143. Since only the direction of the man has changed, the total distance covered by him will still remain the same.

$$\therefore \text{Total distance} = 90 \text{ km}$$

Hence, **option 1**.

144. If instead of North, the man headed for South, the map given in the solution of the second question in the set will get inverted and flipped.

∴ He will end up south-west of his starting position, instead of north-east.

∴ He ends up at 30 km West and 40 km South of his starting point.

Hence, **option 4**.

145. Non-clearance of the mandatory medical test is the reason for not getting the offer of employment.

Hence, **option 4**.

146. Inefficient labour forces, fall in product price, and entry of similar foreign goods at lower rates are the possible reasons for incurring losses by DESCO.

Hence, **option 1**.

147. Sunil purchased a new shirt on Friday and he got the letter of promotion one day before.

∴ Sunil got his letter of promotion on Thursday.

Hence, **option 3**.

148. From statement (I), we get,

$$B > A, B > D, C > A \text{ and } C > D \quad \dots (i)$$

From statement (III), we get,

$$B > C > A \quad \dots (ii)$$

From statement (IV), we get,

$$E > B \quad \dots (iii)$$

From (i), (ii) and (iii), we get,

$$E > B > C > A, D$$

∴ E is the heaviest.

Hence, **option 1**.

149. A causes B or C, but not both.

In either case, D occurs.

F can occur only if B occurs, while E can occur only if C occurs. Since only one of B and C can occur, hence only one of F and E can occur.

Hence, **option 4**.

150. Consider option 1:

E occurs only if C occurs,

∴ E cannot occur because of a cause not mentioned.

Consider option 2:

E occurs only if C occurs and F occurs only if B occurs,

∴ E and F both cannot occur as a result of a cause not mentioned.

Consider option 4:

J occurs only if E or F occurs,

∴ J also cannot occur as a result of a cause not mentioned.

Consider option 3:

It is given that A causes B or C but not both,

∴ Either B or C can occur by a cause not mentioned.

Hence, **option 3**.