

1. Statement 1 in the given paragraph is a fact since it can be verified whether a “high preponderance” of innovative people have “some sort of disability”. This eliminates options 1 and 2.

Statements 2 and 3 are questions since they try to elicit the reader’s opinion about the effect of a physical disability.

Statement 4 is a reason that provides the explanation for the question put forth in the previous statement.

Statement 5 is a proposition since it expresses the author’s opinion on compensating for a disability. This eliminates option 5.

Statement 6 is a reason since it provides a justification for the findings of the research study mentioned in the beginning of the statement.

Statement 7 too, is an extension of the same explanation and hence, can be termed as a reason. This eliminates option 4.

Thus, option 3 alone presents the most suitable choice with 1-Fact, 2 – Question, 4 – Reason, 6 - Reason.

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

2. Statement 1 generalizes about “the chronic neglect of school education” based on a particular incident (the death of twenty two children as a consequence of food poisoning).

Statements 2 and 3 follow the same trend and generalize about the “commitment to universal primary education” and the “absence of strong normative procedures for the provision of infrastructure” on the basis of the aforementioned incident.

Therefore, all three statements are inductive inferences. This vindicates option 4 and eliminates the other options.

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

3. The first word “MBA” refers to a course and can be classified as a noun.

The word “it” is a pronoun that refers to MBA.

The third word “helps” refers to an action and can hence be termed as a verb. This eliminates options 1 and 2.

The word “important” acts an adjective that describes the need for an MBA qualification. This eliminates option 4.

The word “how” describes the action of dealing with many of the important organizational and career issues, making it an adverb.

The word “tackle” implies the action of dealing with issues and hence, can be classified as a verb. This eliminates option 3.

“And” is a conjunction that joins two or more clauses. This vindicates option 5.

Hence, the correct answer is **option 5**.

4. The paragraph talks about how the floods in Uttarakhand led to widespread devastation across the state. However, the media attention remained focused on the Char Dhams.

Option 1 can be eliminated since the paragraph talks about how flash floods led to mountain sides, villages and towns being swept away besides the Char Dhams alone.

Option 2 might seem suitable but loses out to option 3 which seems more in tune with the author’s opinion about the focus of the media.

Option 4 presents a rather extreme stance about the media coverage which is not supported by the passage. Option 5 implies that the author expects the media to reach out to affected people which is not hinted at in the paragraph.

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

5. Option 2 can be eliminated due to the presence of “nevertheless” which hints towards a contradiction where none exists.

The presence of the definite article “the” before the underlined part eliminates options 3 and 4 which begin with the proper noun “Bihar”.

Option 5 can be eliminated since it uses the comparative form of the adjective “old” rather than the superlative form which ought to be used since Patna is not being compared to any other city.

Therefore, option 1 alone is a grammatically correct.

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

6. The paragraph is on the concept of electroweak symmetry and the role of the Higgs doublet in it. Statement 1 makes for a suitable introduction since it introduces the concept of “electroweak symmetry” in the context of Particle Physics. This eliminates options 3 and 5.

Statement 1 is followed by statement 3 which tells us why a Higgs doublet is introduced with regard to the electroweak model mentioned in statement 1. Eliminate options 2 and 4.

Statement 4 follows statement 3 by introducing the concept of Supersymmetry(SUSY) which is referred to in its abbreviated form in the rest of the sentences.

Statement 5 follows statement 4 by linking SUSY with the electroweak model and introducing the concept of two chiral superfields.

The relative pronoun “they” in statement 2 refers to the same chiral superfields, lending an apt conclusion to the paragraph.

Thus, the correct sequence is 1, 3, 4, 5, 2.

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

7. Statement 1 introduces the topic of discussion, which pertains to Shakespeare not writing his plays for publication and how they came to light post his death. “These quartos” in statement 3 needs reference and does not make for a good introductory statement. This eliminates options 3 and 4.

“Some...” in statement 2 refers to the “quartos” in statement 3. Hence, it cannot follow statement 1. This eliminates options 1 and 2.

Thus, the correct order of statements is 1,4,5,3,2.

Hence, the correct answer is **option 5**.

8. One may infer through examination of the statement that the defense went on to prove what the prosecution rejected by indicating that the said incident did take place. The prosecution is not likely to reject an incident as “undesirable”, “pointless” or “inevitable”.

“Cavalierly” meaning 'haughty; disdainful' describes the manner of rejection of the prosecution.

In comparison to “factual”, “apocryphal” meaning 'of questionable authenticity' fits appropriately with respect to the prosecution in the second blank.

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

9. The first blank with “absence” preceding it, needs a word with a negative connotation while the second blank, which must be used in combination with “honesty” must be positive in connotation.

“Retribution” referring to 'punishment or vengeance' would be necessary in overcoming the nation's wrongs and thus, binding up the “nation's wound”. “Camaraderie” meaning 'a spirit of familiarity and trust existing between friends' is nearly synonymous with “honesty” and would amount to redundancy. This eliminates option 1.

“Religion” does not fit in the context logically. Eliminate options 2 and 3.

Option 4 is ruled out as “love” has a positive connotation.

“Recrimination” meaning 'wrongdoing' and “insight” fit in logically and contextually.

Hence, the correct answer is **option 5**.

10. The crux of the paragraph is explained in the second last line - “One is therefore...includes bosons and fermions”. Hence, the correct answer must take both aspects into consideration. This points to option 2.

Option 1 is ruled out as it only focuses on “bosonic particles”.

Options 3 and 5 contradict what the paragraph conveys.

Option 4 simply goes on to repeat what has already been stated in the passage.

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

11. “Exact” does not make for a favourable adjective as far as describing the “planning techniques” is concerned. This eliminates options 1, 2 and 5.

Between options 3 and 4, the nouns “improvement” and “reduction” make for a better fit with the “firms' notions” and “incidents of mistakes”. “Increase in firms' notions” does not make sense logically.

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

12. The plural verb “have” makes for the most grammatically correct fit for the first blank from the options given. This eliminates options 3 and 5.

Integration of “mindfulness” cannot be “for” the “treatment of a host of emotional and behavioral disorders.” This does not make sense logically. Eliminate option 4.

The verb in the last blank must attribute to the subject “number” and not “practitioners”. Thus, the correct verb to use is “has”.

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

13. The “subsumption relation” refers to a definite entity. Hence, it must take the definite article “the”. This eliminates options 1, 3 and 4.

A demonstrative pronoun is required to attribute to the forms of “hierarchies of classes, class definitions and the subsumption relation”. Thus, the correct pronoun to use would be “these”. Eliminate option 2 with “such”.

Hence, the correct answer is **option 5**.

14. According to the main paragraph, “the hope for hope that an altered state of being may result keeps the cycle of desire going”. The aspect of desire has been given prime importance in the main paragraph. The main paragraph also discusses the factors that influence desire. Therefore, objects that are likely to fulfill desire will appeal more to people and will sell more.

Although option 1 addresses the idea presented, it has no bearings with the main paragraph.

The tendencies of boys has nothing to do with the idea or the main paragraph. Eliminate option 2.

Option 3 contradicts the presented idea.

“Do-it-yourself kits” have not been mentioned in both, the idea presented and the main paragraph.

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

15. The main paragraph highlights the influence of social context and culture in determining individual choices. Neither the paragraph, nor the idea mention anything about “anti-social behavior”. Eliminate options 1, 2 and 3.

Option 5 is focused more on the individual and does not give the necessary importance to the social aspect of consumption.

Option 4 with “socially visible consumption” concurs with the main paragraph and also the aspect of “consumer identity construction” mentioned in the presented idea.

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

16. The presented idea implies that consumers often generate their own constructions of fashion by negotiating with the dominant norms of their social context.

The aspect of gender has not come forth neither in the idea, nor in the main paragraph. This eliminates options 1 and 3 as they focus on “females” and “feminists”.

Option 2 takes a very extreme stance with “resist all dominant norms”. While the idea states that consumers often resist dominant norms, it does not say that they resist all of them.

“Attractiveness” once again is not an aspect that has been addressed in the idea or the passage. Eliminate option 5.

Option 4 establishes the required liaison between the idea and the main paragraph by representing how consumers interact with their context.

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

17. The given statement “The relations between probability and experience are still in need of clarification” hints that while probability and experience are linked, their precise relationship requires further elucidation.

Option 1 can be eliminated because of the word “always” which indicates a precise relationship between experience and probability.

Option 2 can be eliminated due to similar reasons, as it indicates that probability is entirely dependent on history.

Option 3 distinguishes probability from experience by calling one “real” and the other “mathematical”; no such comparison has been made in the passage.

Option 5 can be eliminated since the implications of the future on probability are not suggested in the passage.

Option 4 alone holds since it does not dispute the link between “probability” and “experience” and is vindicated from the lines - “The second task is to elucidate the relations between ... decidability of probability statements”.

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

18. The author's theory aims to come up with “a satisfactory, consistent definition of probability” while clarifying the “relations between probability and experience”. The two tasks he mentions in the passage - “to provide new foundations for the calculus of probability” and “to elucidate the relation between probability and experience” are both essential in accomplishing the goals of the author's theory. In no manner, does the author indicate a precedence of one task over the other. Therefore, option 5 is the most suitable choice.

Hence, the correct answer is **option 5**.

19. Option 1 implies that no subject borrows from the theory of probability other than Physics, which is not supported by the passage.

Options 2 and 3 can be eliminated since the passage does not so much deal with ‘inaccurate application’ as much as it deals with the absence of an exact definition of probability and the relation between probability and experience.

Option 4 can be inferred from the lines “physicists make much use of ... mean by ‘probability’.”

Option 5 can be eliminated since there is no mention of “physical objects” in the passage at all.

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

20. In the passage, the author says that he believes that “that government is best which governs not at all” and he goes on to say that an army would be subject to the same objections, many of which would be “weighty” and would “deserve to prevail”. This supports option 5 since the author implies that an army is “not required”. Option 1 is thus, contradictory to the content of the passage.

Option 2 can be eliminated since the army's ability to make mistakes is not discussed in the passage.

Options 3 and 4 can be eliminated since the author does not indicate any reasons which would lead us to believe that an army is “necessary” or a “must”.

Hence, the correct answer is **option 5**.

21. In the passage, the author implies that only a conscientious government can be considerate of the interests of minorities and in all other cases, what can

be termed as right or wrong is decided by the majority. This can be inferred from the rhetorical question posed in the passage - "Can there not be a government in which the majorities do not virtually decide right and wrong but conscience?" This vindicates option 4 as the right choice.

Option 1 can be eliminated since the author implies that fairness is a result of possessing a conscience.

Option 2 can be eliminated because the passage suggests that what is deemed to be "right" is often dependent on the opinion of the majority.

Option 3 can be eliminated since the author mentions how laws are not sufficient to inspire men to be righteous and just.

Option 5 does not find any support in the passage.

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

22. Throughout the passage, the author reiterates the importance of self-governance. Option 1 reflects the same and can be inferred from the line - "Must the citizen, ever for a moment or in the least degree resign his conscience to the legislator?"

Option 2 cannot be inferred since the author does not mention business houses or their functioning in the passage.

Option 3 seems correct but is not as suitable as option 1. Though the author elucidates through the passage how governments and armies are not required, his prime belief is contained in option 1.

Option 4 can be eliminated since the concept of nations has not been mentioned in the passage.

Option 5 is contradictory to the author's opinion that a rule of majority is not always in the right.

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

23. Option 4 is stated verbatim in the passage - "no doubt, the fact that most beer is bought by individuals...as a raw material by firms, which could be expected to be more rational than individuals..."

Option 1 contradicts what is stated in the passage.

Options 2 and 3 are extreme in their propositions, as they state that firms are always rational and more so than individuals.

Option 5 cannot be inferred from the passage. The passage discusses behavior with respect to the psychophysical goods such as beer and not all goods.

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

24. Rutherford's example is given in the passage to disprove the common assumption made with regard to molecules being perceived as little hard elastic balls. In the same vein, the author goes on to disprove the assumptions made with regard to psychophysical goods such as beer. The quality of the product is equated with its advertising spends, which is an aspect

that the author challenges. According to the author, these are not suitable parameters of comparison and hence, a case of apples being compared to oranges.

Options 1 and 3 contradict the information given in the passage.

Beer is not compared to little hard elastic balls, but the assumptions associated with beer and molecules are compared with each other. Eliminate option 4.

Option 5 cannot be inferred from the passage.

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

25. Psychophysical goods refer to objects that share physical and psychological qualities. Beer is a good that shares similar physical qualities in most instances, irrespective of brands. None of the examples given share similar physical and psychological qualities as they are quite distinct from each other with multiple variants and forms.

Hence, the correct answer is **option 5**.

26. The prime concern of the author pertains to achievement of scientific and moral ends through the pursuit of work. Remuneration, according to the author, refers to a means to achieve the same. He attaches importance to values. Betting in a casino, according to his perspective, would amount to acquisition of money and has no moral merit associated with it.

Setting up a factory in a rural area and studying in a business school may contribute to the greater good. Eliminate options 1 and 3.

An analogous relationship cannot be established between the author's perspective and the advertising of toothpaste or working for an investment bank. Eliminate options 2 and 5.

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

27. The author discusses remuneration through the course of the passage and evaluates it on the basis of work and effort. Hence, option 1 makes for the most appropriate title.

Options 2 and 5 are outlandish in nature.

The author does not attach a worship based value with work. Eliminate option 3.

The passage does not discuss the search for God. Eliminate option 4.

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

28. The author is extremely critical of mankind's "exclusive devotion to trade and commerce...", which are means of economic growth but not those which will lead to scientific and moral ends. He attaches a lot of value to individual righteousness. This eliminates options 1 and 5.

Options 3 and 4 have not been mentioned as mankind's primary goals.

Option 2 concurs with the author's perspective.

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

29. The probability of winning in the international competition is very less (5%). So the students selected for it should have a greater chance of scoring cent percent.

Option (1) is eliminated because 4 & 11 score cent percent just once.

In option (2), the combined number of times cent percent is scored is $15 + 12 + 20 = 47$

In option (3), the combined number of times cent percent is scored is $7 + 10 + 6 = 23$

In option (4), 2 of the members score cent percent less number of times. Combined cent percent is $2 + 20 + 5 = 27$

In option (5), the combined number of times cent percent is scored is $7 + 8 + 1 = 16$

Hence, **option 2**.

30. The probability of winning in the district level competition is high (95%). So Ms. Banerjee needs to select students who have high averages. The number of times the students score cent percent is not important. Students 4 & 11 have high an average of 70 and they score cent percent just once. So option (1) is eliminated as it has student 14 who has scored cent percent 20 times. Similarly, option (3) is also eliminated. In options (2) and (4), we select option (4) as the correct option because both students 1 & 13 have the same average but student 13 scores cent percent just twice.

Hence, **option 4**.

31. A student selected for international competition cannot be selected for national competition. So, students 2, 8 and 14 cannot be a part of national team. The probability of winning in the national competition is 10%. So, here the stress should be on the number of times cent percent is scored. Also, the students with higher averages are preferred.

Option (1) has students having high averages but lesser cent percent scores.

Option (2) has students having lower average scores like 60.

Option (3) has all the students having an average score of 60.

Option (4) has students having higher averages of 65 and 70. Also, their combined cent percent scores is very high, $8 + 10 + 7 = 25$.

Hence **option 4**.

32. According to the information provided, the issues of interpretation arise from the fact that anthropologists

cannot dissociate the influence of their training from their projection of colonial/ post-colonial trajectories.

Therefore, it would be very difficult to evaluate the work of an anthropologist without evaluating their professional training and vice-versa. This is analogous to the conclusion drawn from Heisenberg's uncertainty principle which indicates that one cannot evaluate speed without determining the position and vice-versa. This vindicates option 1. Options 2, 4 and 5 are beyond the scope of the analogy put forth in the question. Option 4 puts forth the conclusion drawn from the passage but is not analogous to it.

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

33. The claim made by parents and business leaders is that it is lamentable that "there are no carrots/sticks used to motivate teachers". The option that disproves this claim is option 1 because if teachers are self-motivated, the provision of merit pay would not help in motivating them in any manner.

Option 2 supports the claim made by the parents instead of disproving it by indicating that financial incentives would work in motivating teachers. Eliminate option 2.

Option 3 disputes the yardstick used for assessing the performance of the teachers but does not pertain specifically to the claim made by parents and business leaders.

Options 4 and 5 do not bear any effect on the mentioned claim.

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

34. Risk of those who drank 2 to 4 cups of coffee was about half of those who drank almost no coffee.

Therefore, the graph would be a straight line from 2 to 4, and it is falling to half its value from 2 to 4.

Therefore, it will look closest to an L shaped curve.

Hence, **option 5**.

35. Denote the runners by the first letter of their name. According to the given conditions, the runners based on their ranks are:

i) $F > A$, ii) $D > B, D > E$, iii) $C > I$, iv) $A > G$

Girish finishes after Ashok. But Ashok finishes after Faneesh. So, the BEST position Girish can finish is third.

Hence, **option 3**.

36. Sales of the company if it launches the new drug = $0.5(100) + 0.5(20) = 50 + 10 = \text{Rs. } 60$ crores

Cost of launching the new drug = Rs. 50 crores

Therefore, profit that the company can expect to earn = $60 - 50 = \text{Rs. } 10$ crores.

Hence, **option 2**.

37. Sales if the product is successful = $0.8(100) = 80$ crores
 Sales if the product is unsuccessful = $0.2(20) = 4$ crores
 \therefore Total expected sales = $80 + 4 = \text{Rs. } 84$ crores
 Cost of launching the product = Rs. 50 crores
 Cost of test marketing = Rs. 10 crores
 \therefore Expected profit of the company if the product is launched after favorable marketing conditions
 = $84 - 60 = \text{Rs. } 24$ crores.
 Hence, **option 5**.
38. Probability of product failure if the test marketing results were favourable = $(0.7)(0.2) = 0.14$
 Probability of product failure if the test marketing results were unfavorable = $(0.3)(0.7) = 0.21$
 Probability of product failure if it was test marketed
 = $0.14 + 0.21 = 0.35$
 Hence, **option 2**.
39. Sales if the product is marketed unfavorable = $0.3(100) + 0.7(20) = \text{Rs. } 44$ crores
 Cost of launching the drug = Rs. 50 crores
 Cost of test marketing the drug = Rs. 10 crores
 Therefore, profit that the company can expect to earn if the product is marketed unfavorable = $44 - 50 - 10 = \text{Rs. } -16$ crores
 Hence, **option 4**.
40. In order to arrive at the correct answer for this question, one must read it very carefully.
 The passage mentions that, "some customers bought two types of products and some bought only one". This implies that "run-of-the-mill" and "maxi-max" were in demand as well. Thus, Ram **must not** only produce the "quickie-quick".
 All of the other options, indicate courses of action that Ram must undertake.
 Hence, the correct answer is **option 1**.
41. Rocket Singh realized that customers were upset with "run-of-the-mill" and "maxi-max". Hence, the decision he takes must take this into consideration.
 "Launching one more product" is uncalled for at this stage. Eliminate option 1.
 The customers have not been mentioned as being upset with "quickie-quick". Eliminate option 2.
 Launching a campaign on social media to increase awareness does not address the customers' mindset. Eliminate option 3.
 Option 4 is unprofessional in nature.
 Option 5 will bring the required insight to the scenario.
 Hence, the correct answer is **option 5**.
42. The affected managers in this scenario are those in the production, finance and marketing departments.
 From the information given in the caselet, one may infer that their rights were certainly not violated in any manner. This eliminates options 1, 2 and 4.
 Option 5 is not only far fetched but also erroneous. Going to the U.S. for further education is completely uncalled for.
 Creating a forum for discussion will bring everyone's ideas to the table and facilitate resolution of the mentioned issues.
 Hence, the correct answer is **option 3**.
43. Options 1, 2 and 5 while possible in real life, do not have data to support them in the passage.
 Option 5 has two issues: it refers only to that report, and the response may not be objective / neutral since it is critical of Samsung.
 Option 3 is the best option since the three reports highlight different parts of the same picture leading us to the conclusion that newspapers may report selectively.
 Hence, the correct answer is **option 3**.
44. Report 1 is focused on the US, while option 2 focuses on Japan, eliminating it.
 Options 3 and 4 bypass the crux of the question.
 Option 1 creates the possibility that the sales of iPhone could have come from iPhone 4 (note that report 1 discusses the sales of the iPhone in general and report 3 discusses iPhone 5 in particular).
 Hence, the correct answer is **option 1**.
45. This question asks for another reason for the same data as the previous question.
 Report 1 presents sales data, while report 3 presents data on customer satisfaction.
 Only option 4 satisfactorily answers the question asked. All of the other options address other concerns.
 Hence, the correct answer is **option 4**.
46. The reader makes the clear point that data on Samsung is ambiguous, since the company does not release data on phones sold. This makes option 5 correct.
 There is no justification for options 1 to 4 in report 2.
 Hence, the correct answer is **option 5**.
47. The consultants have been mentioned as giving old solutions to new problems and the clients have complained about the same. Hence, the first course of action would be making it compulsory for them to be versatile in their work methods as mentioned in statement 4. Secondly, in-order for them to perform better, their work load needs to be reduced and new as well as competent support staff should be hired to help the consultants stay adept with the latest

developments in the industry. This could be followed by devoting more time towards the finding of solutions and spending less time on client interactions. Given that hiring new people has been mentioned as a challenge, that would be one of the last courses of action to embark.

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

48. From what is mentioned in the caselet, the old consultants seem to have entered into a comfort zone as far as their work is concerned. The fact that them working across industries and domains was not mentioned earlier added to their discomfort in the said scenario. Given that the job requires them to mend their ways, the problem calls for a platform where they can raise their concerns openly. Only option 5 puts forth a viable solution for all the stakeholders involved i.e. the company, the old consultants as well as the younger consultants.

Options 1 and 2 are extreme and can very well be avoided.

Option 3 is unfair to the younger consultants.

Option 4 is passive in nature.

Hence, the correct answer is **option 5**.

49. Statement 1 as a course of action is out of question, given that Ajay has been mentioned as being concerned about the well-being of his company. Eliminate options 1, 3 and 4.

The only difference between options 2 and 5 is that option 2 gives benchmarking the performance of the company with the best in the industry priority, while option 5 does not. Given that Ajay wants to set the situation straight within the next five years, statement 3 should be one of his first priorities.

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

50. Rajinder has been mentioned as being on good terms with Balwant. This relationship is responsible for his emotional response to the possibility of Bigmart opening in Bhatinda.

Given that the passage gives no details on Rajinder's relationship with his boss and colleagues, we do not know if they will be the right people to approach. Eliminate options 2 and 5.

Option 3 is extremely passive in nature.

Although option 1 seems tempting, the association he shares with Balwant makes option 4 the most appropriate choice.

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

51. Options 1, 2, 4 and 5 do not take any concrete action to address the issue at hand.

Option 3 addresses the issue at hand.

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

52. The passage mentions that 10 percent of the population comprised of small traders and 30 percent farmers. Therefore, we can infer that retailers made for the smallest proportion of the population followed by farmers and consumers which would include most of the population. Therefore, the entities in ascending order would be – retailers, farmers and consumers.

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

53. Since it is an A.P.,

$$\text{Therefore, } 17 - x = 3x + y^2 - 30 - 3x + y^2 + 2$$

$$\text{Or, } x + 2y^2 = 45 \quad \dots(i)$$

$$\text{Again, } 17 - x = 3x - y^2 - 2 - 17$$

$$\text{Or, } 4x - 2y^2 = 36 \quad \dots(ii)$$

Solving equations (i) and (ii),

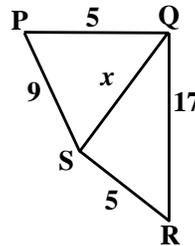
we get $x = 13$.

$$\begin{aligned} \text{Sum of the A.P.} &= x + 17 + 3x - y^2 - 2 + 3x + y^2 - 30 \\ &= 7x - 15 = 7(13) - 15 = 76 \end{aligned}$$

Out of the given options, 76 is only divisible by 2.

Hence, **option 1**.

54. Let $QS = x$, we get the following figure



In any triangle, the sum of any two sides must be greater than the third side. Similarly, the difference between any two sides must be smaller than the third side. Hence,

In $\triangle QRS$,

$$x + 5 > 17$$

$$\Rightarrow x > 12 \quad \dots(i)$$

In $\triangle PQS$,

$$x < 9 + 5$$

$$\Rightarrow x < 14 \quad \dots(ii)$$

Combining (i) and (ii), we get

$$12 < x < 14$$

Hence, **option 2**.

$$55. \frac{1}{S} = \frac{\tau + \rho * \omega}{\alpha \omega} = \frac{\tau}{\alpha \omega} + \frac{\rho}{\alpha} = \frac{K_1}{\omega} + K_2$$

Where K_1 and K_2 are constants

$\Rightarrow 1/S$ decreases when ω increases.

$\Rightarrow S$ increases when ω increases.

Hence, **option 1**.

56. Total exams given = x

Score of previous exams = y

$$\frac{y + 97}{x} = 90 \quad \frac{y + 70}{x} = 87$$

$$\frac{y}{x} + \frac{97}{x} = 90 \quad \frac{y}{x} + \frac{70}{x} = 87$$

$$\frac{y}{x} = 90 - \frac{97}{x} \quad \frac{y}{x} = 87 - \frac{70}{x}$$

$$\therefore 90 - \frac{97}{x} = 87 - \frac{70}{x}$$

$$3 = \frac{-70}{x} + \frac{97}{x} = \frac{27}{x}$$

$$\therefore x = 9$$

Hence, **option 4**.

57. $ax^3 + bx^2 + cx + d$ intersects x axis at 1 & -1

$$\therefore a + b + c + d = 0$$

$$-a + b - c + d = 0$$

$$\therefore 2(b + d) = 0$$

$$\therefore b + d = 0$$

$ax^3 + bx^2 + cx + d$ intersects y axis at 2

$$0 + d = 2$$

$$\therefore d = 2$$

From (1) & (2), $b = -2$

Hence, **option 1**.

58. $|X + 7| + |X - 8| = 16$

For $X \geq 8$, $|X + 7| = X + 7$ and $|X - 8| = X - 8$

$$\therefore |X + 7| + |X - 8| = X + 7 + X - 8 = 2X - 1$$

$$2X - 1 = 16$$

$$\therefore X = \frac{17}{2}$$

For $-7 \leq x < 8$,

$$\therefore |X + 7| = X + 7 \text{ \& } |X - 8| = 8 - X$$

$$\therefore |X + 7| + |X - 8| = X + 7 + 8 - X = 15 \neq \text{RHS}$$

$0 \leq x < 8$ is not possible.

$$-7 \leq x < 0$$

$$\therefore |X + 7| = 7 + X \text{ \& } |X - 8| = -X + 8$$

$$16 = |X + 7| + |X - 8| = 7 + X - X + 8 = 15$$

$\therefore -7 \leq x < 0$ is not possible.

$$\text{Now, } x < -8 \quad |X + 7| = -7 - X \quad |X - 8| = -X + 8$$

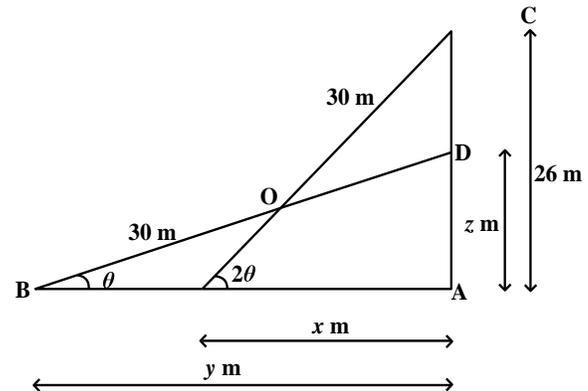
$$\therefore |X + 7| + |X - 8| = -7 - X - X + 8 = 1 - 2X = 16$$

$$\Rightarrow 2X = -15 \Rightarrow X = -7.5$$

$$\therefore -7.5 + 8.5 = 1$$

Hence, **option 2**.

59. The following figure represents the length and the position of the ladder,



By Pythagoras Theorem,

$$x = \sqrt{30^2 - 26^2} = \sqrt{224} \approx 15 \text{ m}$$

$$\therefore \cos 2\theta = \frac{15}{30} = \frac{1}{2}$$

$$\Rightarrow 2\theta = 60^\circ \Rightarrow \theta = 30^\circ$$

$$\cos 30^\circ = \frac{y}{30}$$

$$\Rightarrow \frac{\sqrt{3}}{2} = \frac{y}{30}$$

$$\Rightarrow y = 15\sqrt{3} \text{ m}$$

The approximate distance between A and B can be given as,

$$y - x = 15\sqrt{3} - 15 = 10.98 \text{ m}$$

Hence, **option 5**

60. Let the smallest number be 'X'

	Amitabh	Sashi
Step 1:	2X	2X + 50
Step 2:	4X + 100	4X + 150
Step 3:	8X + 300	8X + 350
Step 4:	16X + 700	16X + 750
Step 5:	32X + 1500	32X + 1550

Amitabh has to win and X is the least possible number in the range 1 - 999 \therefore step 4 has to be the last step.

$$\Rightarrow 16X + 750 > 1000$$

The least possible value of $X = 16$

Sum of the digit = 1 + 6 = 7

Hence, **option 3**.

61. Considering Statement I:

x	y	$x+y$	$x-y$
5	2	7	3

Since this is the only possible solution, statement I is sufficient.

Considering Statement II:

x	y	$x+y$	$x-y$
5	3	8	2
6	4	10	2

Since no unique solution is possible, statement II is not sufficient.

Hence, **option 1**.

62. Option 1: If we take statements I and II, we have 2 medians of a right angled triangle, without knowing which angle is a right angle.

Option 2: If we take statements I and III, we have 1 median of a right angled triangle, and B is the right angle.

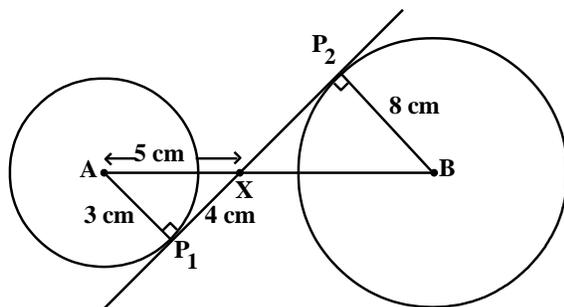
Option 3: If we take only statements II and III, we have 1 medians of a right angled triangle, and B is the right angle.

Option 4: If we only know that B is a right angle, we cannot determine the length of AC.

Option 5: If we have all 3 statements, then we have 2 medians of a right angled triangle, and we know B is the right angle. Hence, we can find AC.

Hence, **option 5**.

63. Let A, B be the centre of the two circles with radius 3cm, 8cm respectively.



$AX = 5\text{cm}$, $AP_1 = 3\text{cm}$

Using Pythagoras theorem, $P_1X = 4\text{cm}$

Now $\Delta AP_1X \approx \Delta BP_2X$

$\Rightarrow \frac{AP_1}{BP_2} = \frac{P_1X}{P_2X}$

$\Rightarrow \frac{3}{8} = \frac{4}{P_2X}$

$P_2X = 10.66$

$P_1P_2 = P_1X + P_2X = 14.66$

Hence, **option 3**.

64. $10 = 5 \times 2$

$10^{29} = 5^{29} \times 2^{29}$

\therefore Number of divisors = $(29 + 1)(29 + 1) = 30 \times 30$

We need to find all the divisors of K such that 10^{29}

$= K \times 10^{23}$

$K = 10^6 = 5^6 \times 2^6$

\therefore Number of divisors = $(6 + 1)(6 + 1) = 7 \times 7$

The probability that a randomly chosen positive divisor of 10^{29} is an integer multiple of 10^{23}

$$= \frac{7 \times 7}{30 \times 30} = \frac{a^2}{b^2}$$

$\therefore a = 7$ and $b = 30$

$\therefore b - a = 30 - 7 = 23$

Hence, **option 4**.

65. Points P and Q have the same Y coordinate but their X coordinates differ by 6 units (Since the diameter = 6 units)

We have two possible cases:

Case 1:

$$y = a^x = 2a^{(x+6)}$$

$$a = (1/2)^{\left(\frac{1}{6}\right)}$$

Case 2:

$$y = 2a^x = a^{(x+6)}$$

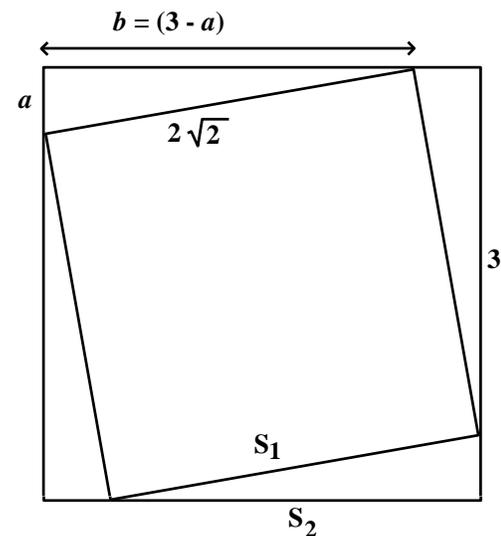
$$a = (2)^{\left(\frac{1}{6}\right)}$$

But it is given that $a < 1$

\therefore Case 2 can be discarded

Hence, **option 1**.

66.



$$a^2 + (3 - a)^2 = 8$$

$$2a^2 - 6a + 1 = 0$$

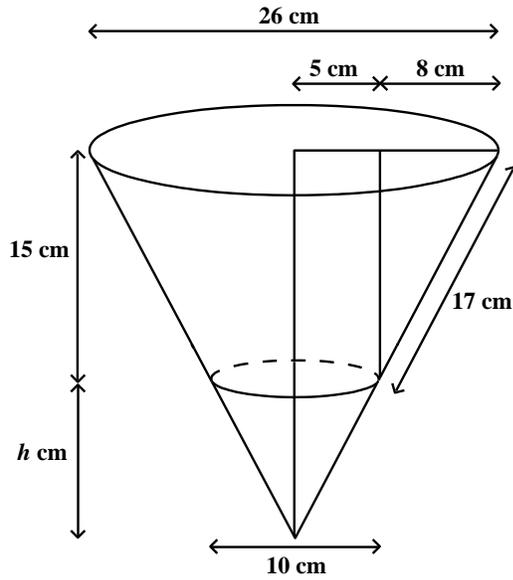
$$a = \frac{3}{2} \pm \frac{\sqrt{7}}{2}$$

$$\Rightarrow a = 0.18, b = (3 - a) = 2.82$$

$$\therefore b/a = 15.66$$

Hence **option 4**.

67.



Applying the concept of similarity,

$$\frac{10}{26} = \frac{h}{h + 15}$$

$$\Rightarrow h = 9.375 \text{ cm}$$

Volume of water that overflows can be given as,

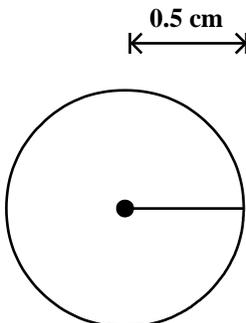
$$\frac{1}{3}\pi[(13^2 \times (15 + 9.375)) - (5^2 \times 9.375)]$$

$$\Rightarrow \frac{1}{3}\pi[(13^2 \times 24.375) - (5^2 \times 9.375)]$$

$$\Rightarrow \frac{1}{3}\pi[4119.375 - 234.375]$$

$$\Rightarrow 1295 \pi \text{ cm}^3$$

Since the radius of the hole is 5 mm i.e. 0.5 cm,



The volume of water flowing in 1 minute,

$$(0.5^2 \times 1000)\pi \text{ cm}^3$$

Hence, the required time can be given as,

$$\frac{1295\pi}{0.5^2 \times 1000\pi} = 5.18 \text{ min}$$

Hence, **option 4**.

68.

	Red	Blue
Bag 1	X_1	Y_1
Bag 2	X_2	Y_2

$$(X_1 + Y_1) + (X_2 + Y_2) = 18 \quad \dots (i)$$

Selecting a marble from the first bag and then from the second bag can be done in $(X_1 + Y_1) \times (X_2 + Y_2)$ ways.

Selecting a red marble from the first bag and then a red marble from the second bag can be done in $(X_1) \times (X_2)$ ways.

\therefore Probability of selecting red marbles from both the bags = $(X_1) \times (X_2) / (X_1 + Y_1) \times (X_2 + Y_2) = 5/16$

$$\text{Let } (X_1 + Y_1) \times (X_2 + Y_2) = 16a \quad \dots (ii)$$

$$\therefore (X_1) \times (X_2) = 5a \quad \dots (iii)$$

Considering (i) and (ii), $a = 2$ or 5

Case i: $a = 2$

$$(X_1 + Y_1) \times (X_2 + Y_2) = 32 \quad \dots (iv)$$

\therefore From (i) and (iv),

$$(X_1 + Y_1) = 2 \text{ and } (X_2 + Y_2) = 16$$

$$\therefore X_1 = Y_1 = 1 \Rightarrow X_2 = 10 \quad (\because (X_1) \times (X_2) = 10)$$

$$\therefore Y_2 = 6$$

$$\text{Probability of both marbles being blue} = (1 \times 6) / 32 = 3/16$$

Case ii: $a = 5$

$$(X_1 + Y_1) \times (X_2 + Y_2) = 80 \quad \dots (v)$$

\therefore From (i) and (v),

$$(X_1 + Y_1) = 8 \text{ and } (X_2 + Y_2) = 10$$

$$\therefore X_1 = X_2 = 5 \quad (\because (X_1) \times (X_2) = 25)$$

$$Y_1 = 3 \text{ and } Y_2 = 5$$

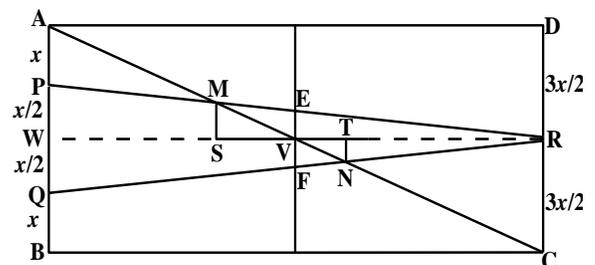
$$\therefore Y_2 = 6$$

$$\text{Probability of both marbles being blue} = (5 \times 3) / 80 = 3/16$$

Hence, **option 3**.

69. Let the breadth be $3x$ and the breadth be y .

$$3xy = 90 \Rightarrow xy = 30$$



V is midpoint of WR. $PW \parallel EV \Rightarrow EV = PW/2$

Similarly, $FV = WQ/2$

$$\therefore EF = PQ/2 = x/2$$

$\Delta MPA \sim \Delta MEV$

Height of ΔMPA with respect to AP: Height (h_1) of ΔMEV with respect to EV = AP : EV = $x : x/4 = 4 : 1$

Let height of $\Delta MPA = 4k$ and height (h_1) of $\Delta MEV = k$

$$\therefore 4k + k = 5k = y/2$$

$$\therefore k = y/10$$

$$\therefore \text{Height } (h_1) \text{ of } \Delta MEV = y/10$$

$$A(\Delta MEV) = \frac{1}{2} \times EV \times h_1 = \frac{1}{2} \times \frac{x}{4} \times \frac{y}{10} = \frac{30}{80} = 0.375$$

Similarly, $\Delta VFN \sim \Delta CRN$

Height (h_2) of ΔVFN with respect to VF : Height of ΔCRN with respect to CR = VF : CR = $x/4 : 3x/2 = 1 : 6$

Let height (h_2) of $\Delta VFN = m$ and height of $\Delta CRN = 6m$

$$\therefore m + 6m = 7m = y/2$$

$$\therefore m = y/14$$

$$\therefore \text{Height } (h_2) \text{ of } \Delta VFN = y/14$$

$$A(\Delta VFN) = \frac{1}{2} \times FV \times h_2 = \frac{1}{2} \times \frac{x}{4} \times \frac{y}{14} = \frac{30}{112} \approx 0.27$$

$$A(\square PQFE) = \frac{1}{2} \times (PQ + EF) \times \frac{y}{2}$$

$$= \frac{1}{2} \times \left(x + \frac{x}{2}\right) \times \frac{y}{2} = \frac{3xy}{8} = \frac{90}{8} = 11.25 \text{ sq. units}$$

$$A(\square PQMN) = A(\square PQFE) - A(\Delta MEV) + A(\Delta VFN)$$

$$= 11.25 - 0.375 + 0.27 \approx 11.145$$

Hence, **option 4**.

70. Solving by options,

By option(1), we get,

$$297_B = 11^2 \times 2 + 11 \times 9 + 7 = 348$$

$$792_B = 11^2 \times 7 + 11 \times 9 + 2 = 948$$

Since 348, is not a factor of 948, option(1) is eliminated.

By option(2), we get,

$$297_B = 12^2 \times 2 + 12 \times 9 + 7 = 403$$

$$792_B = 12^2 \times 7 + 12 \times 9 + 2 = 1118$$

Since 403, is not a factor of 1118, option(2) is eliminated.

By option(3), we get,

$$297_B = 15^2 \times 2 + 15 \times 9 + 7 = 592$$

$$792_B = 15^2 \times 7 + 15 \times 9 + 2 = 1712$$

Since 592, is not a factor of 1712, option(3) is eliminated.

By option(4), we get,

$$297_B = 17^2 \times 2 + 17 \times 9 + 7 = 738$$

$$792_B = 17^2 \times 7 + 17 \times 9 + 2 = 2178$$

Since 738, is not a factor of 2178, option(4) is eliminated.

By option(5), we get,

$$297_B = 19^2 \times 2 + 19 \times 9 + 7 = 900$$

$$792_B = 19^2 \times 7 + 19 \times 9 + 2 = 2700$$

Since 900, is a factor of 2700,

Hence, **option 5**.

71. Let the number of students scoring 6, 8 and 20 be x, y and z respectively.

$$\text{So, } 6x + 8y + 20z = 504$$

$$x + 2z = y$$

$$\text{or, } 14y + 8z = 504$$

$$\text{or, } 7y + 4z = 252$$

By hit and trial we get $y = 32$ and $z = 7$

Therefore, $x = 18$

Therefore, total number of students = $32 + 7 + 18 = 57$

Hence, **option 5**.

$$72. \sum_{n=1}^{13} \frac{1}{n} = \frac{x}{13!}$$

$$\therefore x = \frac{13!}{1} + \frac{13!}{2} + \frac{13!}{3} + \dots + \frac{13!}{11} + \frac{13!}{12} + \frac{13!}{13}$$

All the terms in x are divisible by 11 except $13!/11$

$$\frac{13!}{11} = 1.2.3.4 \dots 10.12.13$$

According to Wilson theorem,

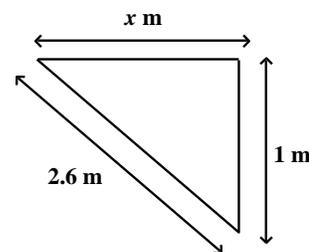
$$\text{rem} \left(\frac{(p-1)!}{p} \right) = -1$$

$$\frac{13!}{11} = 1.2.3.4 \dots 10.12.13 = 10!(12)(13)$$

$$\therefore \text{rem} \left(\frac{13!}{11} \right) = \frac{10!(12)(13)}{11} = (-1).1.2 = -2 = 9$$

Hence, **option 4**.

73. Since the elevation increases by 1 m for every 2.6 m,

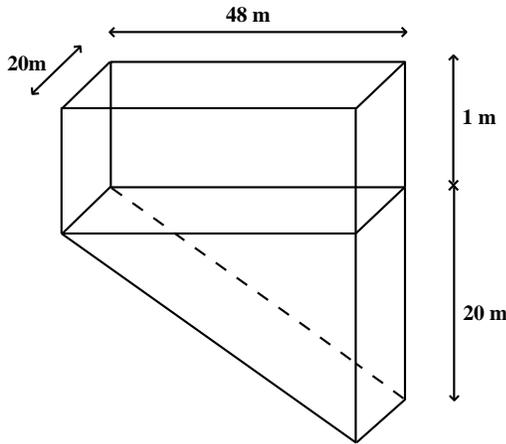


$$x = \sqrt{2.6^2 - 1} = \sqrt{6.76 - 1} = \sqrt{5.76} = 2.4 \text{ m}$$

$$\text{Since } \frac{48}{2.4} = 20,$$

The height of the deeper end of the pool is 20 m.

This can be represented as follows,



The total volume of water in the pool,

$$\left(\frac{1}{2} \times 48 \times 20\right) \times 20 + (48 \times 20 \times 1)$$

$$\Rightarrow 48 \times 20 \times 11$$

$$\Rightarrow 10560 \text{ m}^3$$

Hence, **option 4**.

$$74. \sum_{i=2}^{100} \frac{1}{\log_i 100!} = \sum_{i=2}^{100} \log_{100!} i = \log_{100!} 2 + \log_{100!} 3 + \log_{100!} 4 + \dots + \log_{100!} 100$$

$$= \log_{100!} 100! = 1$$

Hence, **option 3**.

75. Observe that Scandinavia and Western Europe have all their democratic score points as 20. SO, they should be the last two regions in ascending order. However, Scandinavia has no difference between rich and poor. So, it should be the last region and Western Europe should be second last.

Only option 4 satisfies this condition.

Hence, **option 4**.

76. The greatest disparity of democratic participation between rich and poor is obtained from the graph with the steepest slope and having some point as close as possible to full democracy and another point as close as possible to full authoritarianism. This condition is satisfied for C and E Europe where the slope of the line is the steepest and the difference between the maximum and minimum points is around 18.

Hence, **option 2**.

77. The maximum GDP of Africa and South America has the same value.

Hence, **option 5**.

78. Observe that the required percentage is to be found for all years from 2004 to 2008.

The percentage increase in the number of Indians going abroad and the percentage increase in the number of domestic tourists for each year from 2004 to 2008 is as shown below:

Year	Indians going abroad	% increase	Domestic Tourists	% increase
2003	5.35		309.04	
2004	6.21	16.07	366.27	18.52
2005	7.18	15.62	392.01	7.03
2006	8.34	16.16	462.32	17.94
2007	9.78	17.27	526.56	13.90
2008	10.87	11.15	563.03	6.93

Thus, the percentage increase in the number of Indians going abroad is greater than the percentage increase in the number of domestic tourists in 2005, 2007 and 2008.

Hence, **option 3**.

79. The rupee is cheapest with respect to the dollar when the numerical value of rupees corresponding to 1 dollar is the highest
i.e. If $1 \text{ US } \$ = X \text{ INR}$, then the rupee is cheapest when X takes its largest numerical value.
The value of the rupee with respect to the dollar for the given years is:

Year	Dollar	Rupee	
2001	3198	150830	47.16
2002	3103	150640	48.55
2007	10729	443600	41.35
2010	14193	648890	45.72
2011	16564	775910	46.84

Thus, the rupee is cheapest in 2002.

Hence, **option 2**.

80. The value of R for each year is as shown below:

Year	Tourist Arrivals	Foreign Earnings	R
1997	2.37	2889	1218.99
1998	2.36	2948	1249.15
1999	2.48	3009	1213.31
2000	2.65	3460	1305.66
2001	2.54	3198	1259.06
2002	2.38	3103	1303.78
2003	2.73	4463	1634.80
2004	3.46	6170	1783.24
2005	3.92	7493	1911.48
2006	4.45	8634	1940.22
2007	5.08	10729	2112.01
2008	5.28	11832	2240.91
2009	5.17	11136	2153.97
2010	5.78	14193	2455.54
2011	6.29	16564	2633.39
Total			26415.49

When a pie-chart is made using the values of R , the value for 2011 forms the largest sector. Also, the total value of R is 26415.49.

Observe that the value of R in 2011 is approximately 10% of the total. So, the angle that it subtends at the centre is 10% of 360 i.e. 36 degrees.

Hence, **option 3**.

81. It is observed from the bar-graphs that India has the second-highest spending on military as percentage of GDP in the period 2000-2010.
Hence, **option 3**.
82. Among the options given, it can be seen that Malaysia in 2008-09 has witnessed the maximum year-on-year decline in "industry as percentage of GDP".
Hence, **option 4**.
83. It can be seen that India has shown the maximum increase in the "services, value added as percentage of GDP" from 2000 to 2010".
Hence, **option 2**.