

C2C MENTORS

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VARC



1.

Answer: D

Explanation: In the fourth paragraph, it is mentioned that "they suggest that at around the same time as the rings came into being an old set of moons orbiting Saturn destroyed themselves, and from their remains emerged not only the rings.....". From this, we can infer that the rings were formed from the moons. Also, from the third paragraph, it can be inferred that Saturn's rings consist of comet dust. Hence, option D is the correct answer.

2.

Answer: A

Explanation: In the last paragraph, it is given that about 100m years ago, Thethys and Dione were not there. From the last line of the passage we can conclude that Thethys and Dione are less than 100 million years old. Option B can be concluded. In the third paragraph, it is mentioned "The lighter the rings are, the faster this will happen". Option C can be concluded. From the fourth paragraph, option D can be concluded. Sufficient information has not been provided from which we can conclude that none of Saturn's moons ever had suitable conditions for life to evolve. Hence, option A is the correct answer.

3.

Answer: B

Explanation: The phrase explains how clothes would darken over time if left hanging and facing smokestack. The phrase refers to the darkening of the Saturn's rings under the influence of comet dust. Hence, option B is the correct answer.

4.

Answer: B

Explanation: Referring to the first paragraph and first few lines of the second paragraph, it was believed that the celestial bodies had been existing from the beginning. However, the data provided by Cassini gave an insight that the rings and moons of Saturn are newly created. Thus, it challenged the earlier held notion. Hence, option B is the correct answer.

5.

Answer: C

Explanation: Refer to the lines from the passage - "The suggestion that rings and moons are new is," "One reason for thinking Saturn's rings are young is that they are bright.", "Cassini's measurements of the density of comet-dust near Saturn suggests the rings are no older than the first dinosaurs, nor younger than the last of them." Throughout the passage, the author has emphasized on the fact that the rings and the moons of Saturn are recent phenomena. Option C is the most relevant in this context. Option A is not the primary objective of the passage otherwise the author would not have detailed the timeline of the formation of the moons and the rings of Saturn. Option B is factually wrong as per the information given in the passage. Option D is out of context. Hence, option C is the correct answer.

6.

Answer: C

Explanation: The author has criticized the No Child Left Behind Act of 2001. So, it should be against what the author has supported in the passage. We know that the author has been critical of metric fixation. Therefore, the No Child Left Behind Act of 2001 must have the features of metric fixation. Option C cannot be a feature of the No Child Left Behind Act of 2001 as it mentions the subjective evaluation of students based on their participation in the class which is against the theory of metric fixation. Hence, option C is the correct answer

7.

Answer: B

Explanation: In the second paragraph, the author discusses that one of the major drawbacks of metric fixation is the rise in unethical behaviour in order to maximize the metrics. The author, further, goes on to give the examples of the police officer and the surgeon to substantiate his claims. Therefore, option B is the correct answer. Option A does not mention

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that the influence would be unethical and harmful in nature. Option C is the underlying message of the author but, he does not explicitly provide the examples of the police officer and the surgeon to prove this. Option D is too broad and has no specifics about the unethical behaviour which could be encouraged by metric fixation.

8.

Answer: B

Explanation: From the second paragraph, we can say that metric fixation encourages professionals to maximize the metrics in ways that are at odds with the larger purpose of the organization. Option A is a consequence of metric fixation. From the third paragraph, we can infer that metric fixation leads to goal displacement. The author has stated short-termism as a consequence of metric fixation in the penultimate paragraph. Option B as a consequence of metric fixation has not been discussed in the paragraph. Hence, option B is the correct answer.

9.

Answer: D

Explanation: In the passage, the author has discussed the ill-effects of metric fixation. He has discussed gaming of the metrics-based performance system in detail. By providing more real-life illustrations of the same, the author would not have added any value to the main argument. Options A, B and C are relevant to the discussion and will surely add weight to the main idea of the passage. Hence, option D is the correct answer.

10.

Answer: B

Explanation: The author has criticized the method of metric fixation in the passage. He has stated that metric fixation will lead professionals to adhere to practices that are at odds with the larger purpose of the organization. He has also explained that metric fixation will lead to goal displacement. In this light, option B is the most relevant. Option A is incorrect because it is against the author's view. Option C is narrow as it focuses on short-termism only which is one of the ill-effects of metric fixation as mentioned in the passage. Option D does not state that the author is criticizing the metric fixation method to measure the performance. Hence, option B is the correct answer.

11.

Answer: B

Explanation: In the last line of the passage, the author mentions about the availability of information which should be the first step towards solving the service delivery in the Indian education system. In the penultimate paragraph, the author says that the key is to hire those teachers who want to teach. In other words, the author supports the recruitment of motivated teachers. In the first paragraph, the author states that technology can facilitate better service delivery in Indian education. The author has nowhere talked about the elimination of government involvement. He wants that the autonomy and accountability of the teachers should be increased. Hence, option B is the correct answer.

12. Answer: D

Explanation: The author has explained the phrase "Band Aids on a Corpse" by stating that "e-governance can be just as bad as any other governance when the real issue is people and their motivation." From this, we can infer that the solution was not intended to tackle the real cause of the problem which was the motivation of the people. If people are not motivated, forcing them to come on time will act only as a specious way to deal with the issue. Hence, option D is the correct answer.

13.

Answer: A

Explanation: In the third paragraph, the author has given the example of a school where the villagers forced the teachers to come to school, but the teacher instead of teaching indulged in various other non-productive activities. Further, the author also mentions that as long as the system empowers providers over citizens, technology is irrelevant. So, the author wants to convey that commitment and motivation are the primary requirements in systems which involve face-to-face interaction between service providers and clients. Therefore, using technology to monitor in such scenarios will be ineffective. Hence, option A is the correct answer.

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14.

Answer: A

Explanation: The author has explained in the passage that without increasing the autonomy and accountability of the person involved in a job, monitoring systems will be ineffective in improving the services. So, the author has advocated for making the persons more responsible and give them more independence. Option A is the most relevant in this context. Option B is narrow in the sense that the passage does not only focus on the case of nurses. Option C is irrelevant as the author does not criticize the involvement of government. Option D is incorrect because the author is not trying to find a solution, but he has proposed a solution to deal with the problem. Hence, option A is the correct answer.

15.

Answer: C

Explanation: The author has argued in the passage and proposed some ways to increase productivity and to make the systems more effective. Option C which states "Empowerment of service providers leads to increased complacency and rigged performance results." will undermine the author's main argument because if empowerment of the service providers leads to rigged performance results, the whole purpose will be defeated. Option A supports the passage's main idea. Option B is irrelevant. Option D does not talk about the effect of implementing absolute surveillance on the performance of service providers. Hence, option C is the correct answer.

16.

Answer:

A Explanation: Throughout the passage, the author has contemplated the reasons why the white-lipped variety of grove snails are found only in Ireland and the Pyrenees. This is also evident from the last line of the first paragraph, the first line of the second paragraph and the first line of the fourth paragraph. The author has not discussed the reasons why the snails were wiped out from the other parts of the world. Option B is incorrect. The author has focused neither on migration nor on the evolution of the snails. Option C and D are irrelevant. Hence, option A is the correct answer.

17.

Answer: D

Explanation: In the fourth paragraph, the author states that the appearance of grove snails and the arrival of humans in Ireland coincided. Further, the author proves his point by mentioning about the evidence that humans routinely ate these types of snails before the advent of agriculture. From this, we can infer that people who came to colonize Ireland must have brought snails with them as edibles. Option D is the most relevant in this context. Options B and C are out of context. Option A might be factually true, but it cannot be concluded from the given sentence. Hence, option D is the correct answer.

18.

Answer: B

Explanation: In the second paragraph, the author mentions convergent evolution in which two populations evolve the same trait by coincidence. In that case, if the traits are similar by mere coincidence, the genetic structure must be different as they are part of two distinct populations. However, in the study, it was found that the two groups of snails have genetic similarities and thus, it cannot be a case of convergent evolution. Option B states the same. Hence, option B is the correct answer.

19.

Answer: D

Explanation: In the second paragraph, the author mentions convergent evolution in which two populations evolve the same trait by coincidence. In that case, if the traits are similar by mere coincidence, the genetic structure must be different as they are part of two distinct populations. However, in the study, it was found that the two groups of snails have genetic similarities and thus, it cannot be a case of convergent evolution. Thus, the author refutes the claim that convergent evolution can explain the similarity in characteristics. Therefore, option C supports the passage's explanation of sea travel/trade while option D rejects. Hence, option D is the correct answer.

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20.

Answer: C

Explanation: Throughout the passage, the author has argued that each field of study has become so vast that diversity in knowledge and skills is required to sail through. Meritocracy is not enough to bring the required variety. This is the main idea presented by the author. Option A is distorted because the author is not concerned about the negative consequences of his proposition and how to deal with them. Option B is too narrow in its scope as it focuses on random decision trees which is not the main idea. Option C addresses the primary concerns which the author has and thus, weakens the main idea of the passage. Option D is irrelevant as the author has no problem with the assessment tests. Hence, option C is the correct answer.

21.

Answer: C

Explanation: Just before giving the example of neuroscience, the author has mentioned that each of these domains possesses such depth and breadth, that no test can exist. From this we can infer that the purpose behind mentioning neuroscience as an example by the author is to show that each field is so complex now that a meaningful assessment of merit is impossible. Option C is the most relevant in this case. Hence, option C is the correct answer

22. Answer: A

Explanation: Option B is the main idea that the author wants to express through the passage. So, it is one of the main reasons why the author criticizes meritocracy. Option C is also one of the reasons as conveyed by the author through the example of neuroscientists in the second paragraph. The author mentions in the second paragraph "each of these domains possesses such depth and breadth, that no test can exist." From this, we can infer option D to be a valid reason. Option A : The idea/term of 'ideal team' is not mentioned in the passage. Best team implies a team which gives the best possible outcome, however an ideal team can be understood as the model/perfect team. In order to critique ideal team, one needs to introduce such an idea. Hence, Option A is not a reason why the author criticizes meritocracy. Hence, option A is the correct answer.

23. Answer: B

Explanation: In the last two lines of the third paragraph, it has been given that forest is cognitively boosted by training the trees on the hardest cases. So, if a large number of decision trees in the ensemble were trained on data derived from easy cases, the forest will not get a cognitive boost and thus weaken the efficacy of a random decision forest. Hence, option B is the correct answer.

24.

Answer: D

Explanation: According to the author's main idea, the problem should be tackled by a diverse group of members from different fields. On the basis of this, we can eliminate options A and C because, in these options, the expert team consists of only nutritionists. Out of options B and D, option D is better because it mentions a team of members who have performed well in their respective field. In option B, the members are selected on the parameter of meritocracy, which is not concurrent with the author's viewpoint. Hence, option D is the correct answer.

25. Answer: 4213

Explanation: 4 should be the opening sentence since it states that new institutions recognize ways in which workers can contribute to the economy. The other 3 sentences provide examples and elaborate on the same and hence, sentence 4, which introduces the topic of discussion, should be the opening sentence.

2 talks about the period of industrial revolution. 1 talks about the smart world.

Chronologically, 1 should follow 2. Moreover, 2 talks about an example that conformed to

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the point mentioned in sentence 4. On the other hand, 1 talks about an inadequacy. Therefore, 2 should have preceded 1. 3 should be the last sentence of the paragraph. Sentences 4213 form a coherent paragraph and hence, 4213 is the correct answer.

26. Answer: B

Explanation: The main points of the passage are that the relation between sports participation and deviation have not been established and that there is not sufficient evidence to prove the relationship. Option A is distorted because it states that the relationship is already established. Option B mentions all the relevant points. Option C does not talk about the relationship and hence, ruled out. Option D distorts what is given in the paragraph by saying that latter researchers have "proved" there is no consistent relationship. Thus, it can be eliminated. Hence, option B is the correct answer.

27.

Answer:2314

Explanation: 1 states that 'self management is 'thus' defined as the individual's ability to manage...'. Therefore, some details about self management should have been provided before sentence 1. Sentence 2 states that people with dementia prefer to have 'control' in their lives. Sentence 3 states what 'having control means'. Therefore, sentences 2 and 3 form a mandatory pair. Sentence 1 should follow sentence 3 since sentence 3 states that 'having control means to perform self management activities' and sentence 1 defined self management activities. Sentence 4 should be the last sentence since it states what self management support is. Self management support can be defined only after defining what self management is. Sentences 2314 form a coherent paragraph. Therefore, 2314 is the correct answer.

28.

Answer: C

Explanation: Let us note down the important points: The Japanese government recommends regulating GM organisms in which foreign genes are introduced, not those in which the endogenous genes have been edited. The step has drawn mixed reactions since there are some risks involved in gene editing. Option A shifts the focus on exempting microbes. The central theme of the passage is that endogenous gene editing is not totally risk free. Therefore, we can eliminate option A. Option B states that categorizing GM products advances science but defies laws. No such comparison has been made in the paragraph. The legality of the issue has not been discussed and hence, we can eliminate option B. Option D fails to capture the fact that endogenous gene editing is not devoid of risks. Only option C captures the fact that exempting endogenous gene editing is not desirable due to the risks involved. Therefore, option C is the right answer.

29.

Answer:3

Explanation: On reading the sentences, we can infer that the paragraph talks about the development of songs in birds. 1 should be the opening sentence since it introduces the topic of discussion, the development of songs in birds. 1 provides a proper introduction to the paragraph by stating that much has been discovered about the development of songs in birds. 4 should be the sentence that follows 1 since it states that the development of songs in birds follow a template process. 5 explains the mechanism in which the song is developed. Therefore, sentence 5 should follow sentence 4. 2 should be the last sentence since it states that some species restrict themselves to one song while other species have more than one song. Sentences 1452 form a coherent paragraph. Sentence 3 talks about the sounds of birds while the other sentences are about how a species develops a song. Therefore, sentence 3 is the one out of context and hence, 3 is the right answer.

30.

Answer:3241

Explanation: 3 should be the opening sentence since it introduces the concept of phoenixing. Sentence 2 logically continues sentence 1 by stating that companies in many countries engage in such activities (Phoenixing). Sentence 2 should be followed by sentence 4 since it moves to a specific instance (Australian minister's discovery) from general statements. Sentence 1 should follow sentence 4 since it states that it was 'his' taxpayers (Australian Minister's taxpayers or Australian citizens) who had to foot the bill. Sentences 3241 form a coherent paragraph. Therefore, 3241 is the correct answer.



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31.

Answer:3

Explanation: The use of the word "such apps" in 4 indicates that 4 must be preceded by a line that mentions a type of app. We find this in 5 and 2. So the pairs could be 5-4 or 2-4. If we see the sentences 5 and 1 they introduce the topic under discussion and provide context for the details provided in 2 and 4. Hence, 1 and 5 should come at the start of the paragraph and 2-4 should be the end of the paragraph. Between 5 and 1, 5 provides a better opening line as it introduces the main topic of discussion. Hence, the order of the paragraph should be 5-1-2-4. Sentence 3 which talks of "guilty conscience" is out of context with the rest of the paragraph.

32.

Answer:3

Explanation: If we read all the sentences together, we see that the author is arguing for India preparing itself in advance for future natural disasters. Sentence 4, which introduces the broader context makes for a good opening line. Sentences 1 and 2 together make the main point that the author is trying make through the paragraph - that India should prepare itself for future natural disasters. Sentence 5 emphasizes the main point by adding that natural disasters will occur in the future and thus makes for a good concluding line. Sentence 3, that talks about extreme temperatures does not lead off to any of the other sentences nor does it add to any of the other sentences. Hence, it is the odd one. Additional Explanation: 1-2 is a block, both are talking about things that authorities should do 45 are rhetorical opinions of the author on the weather. 3 is a fact. We use facts to draw reasonable conclusions. This standalone fact cannot be used to draw any conclusion. The style of the author's writing in 4 and 5 are more opinionated than factual. So 3 is a misfit. Moreover, we cannot make a connection between 1-4, 1 says we need contingencies for natural disaster(suggestive) whereas, 4 says whether is changing(rhetorical).

33.

Answer:3241

Explanation: After reading all the sentences, we know that the paragraph is about the businessmen who, instead of tackling the root causes, focus on superficial solutions. Statement 3 is the opening sentence as it introduces the topic by comparing businessmen with a dieter who is ready to do everything except eating less. Statement 2 mentions the examples of some of the specious solutions mentioned in statement 3. Statement 4 provides the reason why businessmen are hesitant to execute the genuine solutions which will bring real change. Statement 4 mentions the alternative taken by businessmen. The word 'rather' in statement 1 connects it with statement 4. Thus, the correct order is 3 - 2 - 4 - 1. Hence, 3241 is the correct answer.

34.

Answer: D

Explanation: In the given paragraph, the author has discussed about Bad Samaritan laws and whether it is enforceable by law. While answering the question, the author puts forward three points which she deems necessary for the implementation of Bad Samaritan law. Only after crossing the three obstacles mentioned by the author, the law should be enacted. Option D is the most relevant in this context. Option A is about implementing the law without any conditions, which is not what the author wants to convey. Option B does not mention anything about the three obstacles. Option C is stated with a firmness which is not the tone of the author. The author says that the law may be enacted, not must be enacted. Hence, option D is the correct answer

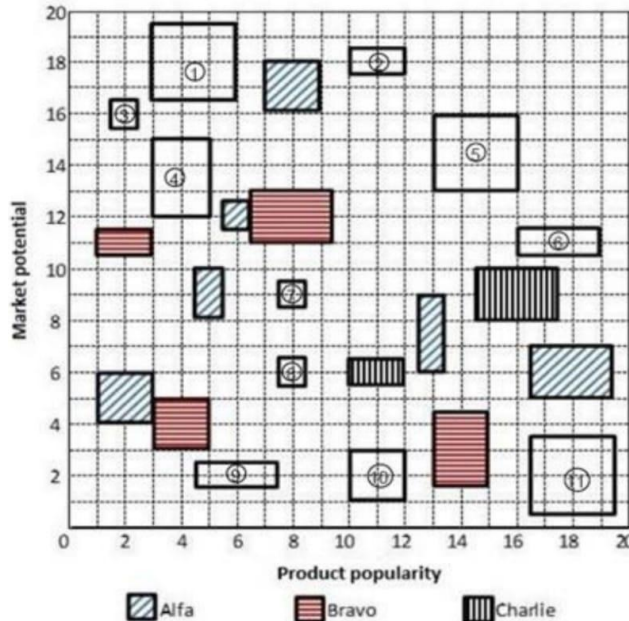
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DILR



Question35:



From the given information we can find which product belong to which company. In the given Figure the products (number) would belong to the following companies

Alfa	Bravo	Charlie
2, 3, 4, 7/8	1, 6, 10	5, 8/7, 9, 11

Question 35:

So, also the entire graph can be divided into four equal parts with the bottom left part having Products in the No hope category, the bottom right part with products in the Blockbuster Category, the top left part with products in the Doubtful category and the top right part with Products in the promising category.

The areas of all the products in the different categories are

No-hope – $4 + 4 + 3 + 2 + 1 + 1 = 15$

Blockbuster – $2 + 4 + 3 + 6 + 6 + 6 + 9 = 36$

Doubtful – $2 + 1 + 6 + 6 + 1 + 9 + 4 = 29$

Promising – $2 + 9 + 3 = 14$

As the areas is proportional to the revenue the corresponding product, products under

Blockbuster category had the highest revenue.

Ans : Blockbuster

Question 36: The number of products of Bravo in the different categories are

No-hope (bottom left) – 1

Doubtful (top left) – 3

Promising (top right) – 1

Blockbuster (bottom right) – 2

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The correct sequence is 1, 3, 1, 2

Ans : 1, 3, 1, 2

Question 37:

Revenue of Bravo from No-hope products – 4

Revenue of Charlie from No-hope products – 4.

The statements is true.

Alfa's revenue from Blockbuster products

Charlie revenue from Promising products – 9

The statement is true

Total revenue from No-hope products – 15

Total revenue from Doubtful products – 29

The statement is true

Bravo's revenue from Blockbuster products – $6 + 4 = 10$

Alfa's revenue from Doubtful products – $6 + 4 + 1 + 1 = 12$

The statement is not true

Ans: Bravo's revenue from Blockbuster products was

Greater than Alfa's revenue from Doubtful products

Question 38: The total revenue of Bravo is 4 (No. hope) + 10 (Blockbuster) + 17 (Doubtful) + 3 (Promising) = 34 Crore.

Ans : 34 .

Solution 39 to 42

Question 39:

Let the total market size be 100 units. The sales of Azra, Bysi, Cxqi and dipq would be 40, 25, 15 and 20 units respectively.

The revenue would be as follows

Azra = $40 \times 15,000 = 6.0$ lac

Bysi = $25 \times 20,000 = 5.0$ lac

Cxgi = $15 \times 30,000 = 4.5$ lac

Dipq = $20 \times 25,000 = 5.0$ lac

The brand with the highest revenue is Azra.

Ans : Azra

Question 40:

The profits for the different brands, assuming revenue as in the previous question would be

Azra $-6.0 \text{ lac} \times \frac{10}{100} = 60,000$

Bysi $-5.0 \text{ lac} \times \frac{30}{100} = 1,50,000$

Cxgi $-4.5 \text{ lac} \times \frac{40}{100} = 1,80,000$

Dipq $-5.0 \text{ lac} \times \frac{30}{100} = 1,50,000$

The profit is the highest for Cxqi

Ans : Cxqi

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Question 41:

The new market share, selling prices and profitability for the different brands are

Brand	Market share	Selling price	Profitability
Azra	35	15,000	10
Bysi	20	20,000	30
Cxqi	30	18,000	20
Dipq	15	25,000	30

Now the total sales is 140 units.(Increase of 40%) The profits are as follows

$$\begin{aligned} \text{Azra} &= 35 \times 15,000 \times \frac{10}{100} = 52,500 \\ \text{Bysi} &= 20 \times 20,000 \times \frac{30}{100} = 1,20,000 \\ \text{Cxqi} &= 30 \times 18,000 \times \frac{20}{100} = 1,08,000 \\ \text{Dipq} &= 15 \times 25,000 \times \frac{30}{100} = 1,12,500 \end{aligned}$$

The profit is the highest for Bysi

Ans : Bysi

Question 42:

The profits increased for Azra (60,000 – 52,500) for Bysi (1,20,000 – 1,20,000) and Dipq (1,12,500 – 1,12,500)

Ans : Azra, Bysi, Dipq

Solution 43 to 46

From the given information,

Balaram is the third person to enter room 101.

Erina was allotted either room 102 or 103.

Three persons entered the room before Fatima. It means Fatima and Akil entered into room 101.

Ganeshan entered room 102 with only one other person. Thus, only Erina entered room 103.

Chitra was the last person to enter the room. Thus, Chitra entered room 102 with Ganeshan.

Divya, who was the second person to enter room 101 From the above information we get the

Arrangement as follows.

101	102	103
Akil	Ganeshan	Erina
Divya	Chitra	
Balaram		
Fatima		

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Question 43:

Divya entered room 101.

Ans : Definitely room 101

Question 44:

No one entered into the room 102 before Ganeshan.

Ans : No one

Question 45:

Erina entered room at 07:45am as in room 101- Divya and Balaram entered before Fatima and Ganeshan entered the room before Chitra, thus Divya, Balaram and Ganeshan entered room Before Chitra and Fatima in any order.

Ans : 7:45 am

Question 46:

From the information, Ganeshan entered room at 7:10 am, Divya entered room at 7:15 am and Balaram

Entered room at 7:25 am.

Ans : 7:25 am

Solution 47 to 50

The base exchange rates of currencies A, B and C with respect to L is in the ratio 100 : 120 : 1.

The given information can be tabulated as follows

The outlet received 88,000 units of L by selling A and the ratio of amounts of L used to by A and B are in the ratio 5 : 3 and from the sales of A and B are in the ratio 5 : 9.

This set is best solved by looking at the choices for the question which asked for the base exchange rate of currency C. From that we have only two possible value for the base exchange rates for A, B and C 100,120 and 1 or 200, 240 and 2.

Assuming L to be 100 for A.

$$\text{Units sold of A} = \frac{88,000}{110} = 800$$

As the net addition is 800, the units of A bought is 1600 Amount of L used in buying 1600 units

$$\text{Is } 1600 \times 0.95 \times 100 = 152000$$

As the amount used to buy A and B are in the ratio 5 : 3, the amount used to buy B is $\frac{152000}{5} \times 3 = 91,200$

$$\text{Number of units of B bought} = \frac{91,200}{114} = 800$$

As the net addition of B is zero, number of units of B sold = 800.

$$\text{The amount received} = 800 \times 132 = 105600$$

$$\text{The amount received from selling A} = 88,000$$

As 88,000 : 105600 is not in the ratio 5 : 9 as given in the data the base exchange rate for A is

Not 100 and has to be 200.

$$\text{Units sold for A} = \frac{88000}{220} = 400$$

As net addition is 800, the units of A bought is 1200.

$$\text{Amount of L used in buying 1200 units of A} = 1200 \times 0.95 \times 2000 = 228000.$$

As the amount used to buy A and B are in the ratio 5 : 3, quantity of L used to buy B is $\frac{228000}{5} \times 3 = 136800$

Number of units of B bought

As the net addition in B is zero, the number of units of B sold = 600.

$$\text{The amount received from selling B} = 600 \times 264 = 158400$$

$$\text{The amount received from selling A} = 88,000$$

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The required ratio $\frac{88,000}{158,400} = 5/9$

Question 47: Number of units of currency A bought $400 + 800 = 1200$

Question 48: As the net addition in the number of units of C is 3,000 and the buying and selling rates are in the ratio 0.95 and 1.1, assuming x units are sold $0.95(x + 3000) = 1.1(x)$

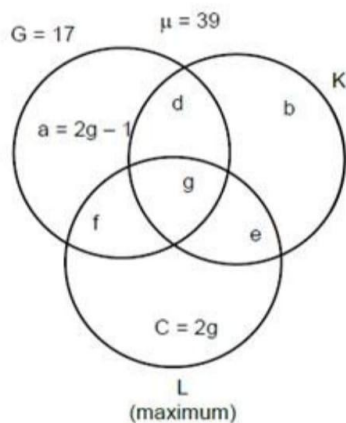
$$0.15x = 2850$$

$$X = 19000$$

Question 49: The base exchange rate of currency B with respect to L is 240.

Question 50: The buying exchange rate of currency C with respect to L on that day was 1.90.

Solution 51 to 54 : The given data can be represented as follows.



$$f + g + d = 10 \text{ (given)}$$

$$g + e = b \text{ (given)}$$

$$\text{Since } f + g + d = 10,$$

$$g = 7 = 2g - 1$$

$$\text{Therefore, } 2g = 8$$

$$\therefore f = 4$$

$$\text{Thus, } g = 4, c = 8, a = 7 \text{ and } f + d = 6 \quad b + e = 39 - (G + c) = 14$$

$$\text{therefore } g + 2e = 14$$

Hence, $e = 5$ and $b = 9$ Since, L is maximum we get the following cases.

$$\text{Case (i) } G = 17 \quad K = 20 \quad L = 21 \quad d = 2 \quad f = 4$$

$$\text{Case (ii) } G = 17 \quad K = 19 \quad L = 22 \quad d = 1 \quad f = 5$$

$$\text{Case (iii) } G = 17 \quad K = 18 \quad L = 23 \quad d = 0 \quad f = 6$$

Question 51: G and L but not K $f = 4$. Ans : 4

Question 52: The given condition is possible in case (ii). Hence, the number of students enrolled in L = 22. Ans : 22

question 53: From $g = 4$, one person moves to f, one person to d and two persons to e. Then the value of G and $K = d + g = 2$.

Ans : 2

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Question 54: From the above G and L = f = 6. Ans : 6

Solution 55 to 58

Let a, b, c and d be the weights of parameters F, R, P and I respectively.

Given, (i) $30a + 20b + 20c + 40d > 40a + 30b + 20c + 20d$

(ii) $40a + 30b + 20c + 20d > 40a + 20b + 20c + 30d$

(iii) $50a + 50b + 40c + 50d > 50a + 50b + 50c + 40d$

From (i), $2d > a + b$ From

(ii), $b > d$ From

(iii), $d > c \Rightarrow b > d > c$ a, b, c and d are 0.1, 0.2, 0.3 and 0.4 in any order. d cannot be 0.1 or 0.2. (\therefore $2d$ cannot be greater than $a + b$) d can be 0.3 or 0.4, but given $b > d \Rightarrow b = 0.4, d = 0.3$

$2(0.3) > 0.4 + a < 0.2 \Rightarrow a = 0.1, c = 0.2$

	F(0.1)	R(0.3)	P(0.2)	I(0.4)	
A - One	5	15	10	16	46
Best Ed	4	6	4	8	22
Cosmopolitan	4	6	4	12	26
Dominance	2	6	8	12	28
Education Aid	5	15	8	20	48
Fancy	5	15	8	16	42
Global	3	0	4	8	15
High Q	3	6	4	16	29

Question 55 Weight of faculty parameter is 0.1.

Ans : 0.1

Question 56 : Three colleges received AAA rating.

Ans : 3

Question 57 Height overall score among the eight colleges is 48.

Ans : 48

Question 58 No college has score between 31 and 40 (both inclusive).

Ans : 0

Solution 59 to 62 :

Given 'peacock is designated as the national bird of India' is coded as ' 5688999 35 1135556678 56 458 13666689 1334 79 13366' 9 is the code for o and c from the words peacock and of.

F is coded as 7 from the word of. I is coded as either 3 or 6 from the word India, but from the word 'is' and 'designated' code for 'I' is 3. S is coded as 5 from the word is. A is coded as 6 from the word 'as'. N is coded as 6 from the word national.

Thus D is coded as 1 from the word India. E is coded as 5 from the word designated. T is coded as 8 from the word 'the' and 'National'. Thus H is coded as 4 from the word 'the'. G is coded as 7.

L is coded as 1 from the word 'National'. P and K are coded as 8 from the word 'peacock'. B and R are coded as 3 and 4 many order from the word 'bird'.

We get the codes as follows] . B and R is coded as 3 or 4.

C2C MENTORS

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Code	Letter
1	D, L
2	
3	I
4	H
5	S, E
6	A, N
7	F, G
8	T, P, K
9	O, C

Question 59 L is coded as '1'.

Ans : 1

Question 60 Either 3 or 4 is the code for B.

Ans : 3 or 4

Question 61 The code for 8 and 9 is identified.

Ans : 2

Question 62 S, U, V cannot be coded with same digit.

Ans : S, U, V

Solution 63 to 66 Number of young visitors = 2 x number of middle age visitors Number of middle age visitors = 2 x number of old visitors Total number of tickets sold = total number of visitors = 140 Hence, the number of young visitors = 80, the number of middle age visitors = 40 and the number of old visitors = 20 The given data can be tabulated as follows.

	Old = 20	Middle Age = 40	Young = 80	Total = 140
Platinum			Platinum/2	
Gold	a			
Economy	a		38	55
Total				

Question 63: Since half of the platinum tickets were purchased by young visitors, the remaining half were purchased by old and middle age visitors. Since these two are equal, half of total number of platinum tickets should be an even number. Among the given values, this is possible only for 32 and 36. In case of 36, Old- Platinum = 9. In that case $2a = 11$. But this is not possible. Hence, the total number of platinum tickets sold can only be 32.

Ans : 32

C2C MENTORS

CAT 2018 SLOT 2



Question 64: Let Old – platinum = Middle aged – Economy = x We get $x + 2a = 20$ and $a + x + 38 = 55$ By solving these two equations we get $x = 3$.

Ans : 3

Question 65: If the number of Old visitors buying Gold tickets was strictly greater than the number of Young visitors buying Gold tickets, then the number of Middle-aged visitors buying Gold tickets was The maximum possible value of Young - gold = $x - 1$ Then young – platinum = $80 - (38 + x - 1) = 43 - x$ Hence, Old – platinum + Middle age – Platinum = $43 - x$ Total old + Middle age = 60 (Old – platinum + Middle age – platinum) + (Old – gold + Middle age – gold) + (Old – economy + Middle age – economy) = 60 Hence, Old – gold + Middle age – gold = x Thus, Middle age – gold = 0

Ans : Zero

Question 66: Since Old – Economy + Middle age – economy = 17, these two can never be equal. Hence, the statement that “The numbers of Old and Middle-aged visitors buying Economy tickets were equal” is false.

Ans : “The numbers of Old and Middle-aged visitors buying Economy tickets were equal”

CAT2CET MENTORS

67.

Answer 48

Let the efficiency of type A pipe be 'a' and the efficiency of type B be 'b'.

In the first case, 10 type A and 45 type B pipes fill the tank in 30 mins.

So, the capacity of the tank = $\frac{1}{2} (10a + 45b)$(i)

In the second case, 8 type A and 18 type B pipes fill the tank in 1 hour.

So, the capacity of the tank = $(8a + 18b)$(ii)

Equating (i) and (ii), we get

$$10a + 45b = 16a + 36b$$

$$\Rightarrow 6a = 9b$$

From (ii), capacity of the tank = $(8a + 18b) = (8a + 12a) = 20a$

In the third case, 7 type A and 27 type B pipes fill the tank.

Net efficiency = $(7a + 27b) = (7a + 18a) = 25a$

Time taken = $20a/25a$ hour = 48 minutes.

Hence, 48 is the correct answer.

68.

Answer 20

The minimum value of the function will occur when the expressions inside the function are equal.

So, $5x = 52 - 2x^2$ or,

$$2x^2 + 5x - 52 = 0$$

On solving, we get $x = 4$ or $-13/2$

But, it is given that x is a positive number. So, $x = 4$

And the minimum value = $5 \cdot 4 = 20$

Hence, 20 is the correct answer.

69.

Answer D

Car 3 meets car 1 at Q, which is 200 km from A.

Therefore, at the time of their meeting, car 1 must have travelled 200 km and car 3 must have travelled 100 km.

As the time is the same, ratio of speed of car 1 to speed of car 3 = 2 : 1.

Car 3 meets car 2 at P, which is 100 km from A.

Therefore, at the time of their meeting, car 2 must have travelled 100 km and car 3 must have travelled 200 km.

As the time is the same, ratio of speed of car 2 to speed of car 3 = 1 : 2.

Speed of car 1 : speed of car 3 = 2 : 1

And speed of car 2 : speed of car 3 = 1 : 2

So, speed of car 1 : speed of car 2 : speed of car 3 = 4 : 1 : 2

Hence, option D is the correct answer.

70.

Answer 8

We can see that at $n = 2$, $n^3 - 11n^2 + 32n - 28 = 0$ i.e. $(n-2)$ is a factor of $n^3 - 11n^2 + 32n - 28$

$$\frac{n^3 - 11n^2 + 32n - 28}{n - 2} = n^2 - 9n + 14$$

We can further factorize $n^2 - 9n + 14$ as $(n-2)(n-7)$.

$$n^3 - 11n^2 + 32n - 28 = (n - 2)^2(n - 7)$$

$$\Rightarrow n^3 - 11n^2 + 32n - 28 > 0$$

$$\Rightarrow (n - 2)^2(n - 7) > 0$$

Therefore, we can say that $n-7 > 0$

Hence, $n_{\min} = 8$

71.

Answer A

Let the score of Amal and Bimal be $11k$ and $14k$

Let the scores be increased by x

So, after increment, Amal's score = $11k + x$ and Bimal's score = $14k + x$

According to the question,

$$\frac{11k + x}{14k + x} = \frac{47}{56}$$

On solving, we get $x = (42/9)k$

Ratio of Bimal's new score to his original score

$$= \frac{14k + x}{14k}$$

$$= \frac{14k + \frac{42k}{9}}{14k}$$

$$= \frac{168k}{14 \cdot 9k}$$

$$= \frac{4}{3}$$

72.

Answer 6

Let 'ab' be the two digit number. Where $b \neq 0$.

We will get number 'ba' after interchanging its digit.

It is given that $10a + b > 3 \cdot (10b + a)$

$$7a > 29b$$

If $b = 1$, then $a = \{5, 6, 7, 8, 9\}$

If $b = 2$, then $a = \{9\}$

If $b = 3$, then no value of 'a' is possible. Hence, we can say that there are a total of 6 such numbers.

73.

Answer 7

$P = \{1, 2, 3, 4\}$ and $Q = \{2, 3, 5, 6\}$

$P \Delta Q = \{1, 4, 5, 6\}$

$R = \{1, 3, 7, 8, 9\}$ and $S = \{2, 4, 9, 10\}$

$R \Delta S = \{1, 2, 3, 4, 7, 8, 10\}$

$(P \Delta Q) \Delta (R \Delta S) = \{2, 3, 5, 6, 7, 8, 10\}$

Thus, there are 7 elements in $(P \Delta Q) \Delta (R \Delta S)$.

hence, 7 is the correct answer.

74.

Answer B

We can see that area of parallelogram ABCD = 2 * Area of triangle ACD

$48 = 2 * \text{Area of triangle ACD}$

Area of triangle ACD = 24

$(1/2) * CD * DA * \sin ADC = 24$

$AD * \sin ADC = 6$

We know that

$\sin \theta \leq 1$, Hence, we can say that $AD \geq 6$

$s \geq 6$

75.

Answer C

Let the volume of the first and the second solution be 100 and 300.

When they are mixed, quantity of ethanol in the mixture

$= (20 + 300S)$

Let this solution be mixed with equal volume i.e. 400 of third solution in which the strength of ethanol is 20%.

So, the quantity of ethanol in the final solution

$= (20 + 300S + 80) = (300S + 100)$

It is given that, 31.25% of 800 = $(300S + 100)$

or, $300S + 100 = 250$

or $S = 1/2 = 50\%$

Hence, 50 is the correct answer.

76.

Answer 1098

In a tournament, there are 43 junior level and 51 senior level participants.

Let 'n' be the number of girls on junior level. It is given that the number of girl versus girl matches in junior level is 153.

$nC_2 = 153$

$n(n-1)/2 = 153$

$n(n-1) = 306$

$n^2 - n - 306 = 0$

$(n+17)(n-18) = 0$

$n = 18$ (rejecting $n = -17$)

Therefore, number of boys on junior level = $43 - 18 = 25$.

Let 'm' be the number of boys on senior level. It is given that the number of boy versus boy matches in senior level is 276.

$mC_2 = 276$

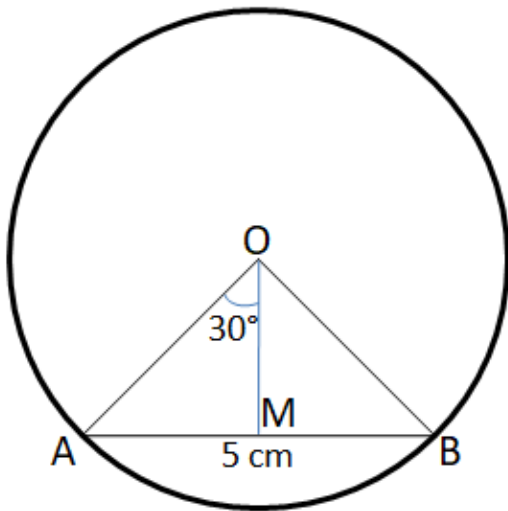
$m = 24$

Therefore, number of girls on senior level = $51 - 24 = 27$.

Hence, the number of matches a boy plays against a girl = $18 * 25 + 24 * 27 = 1098$

77.

Answer A



We are given that $AB = 5$ cm and

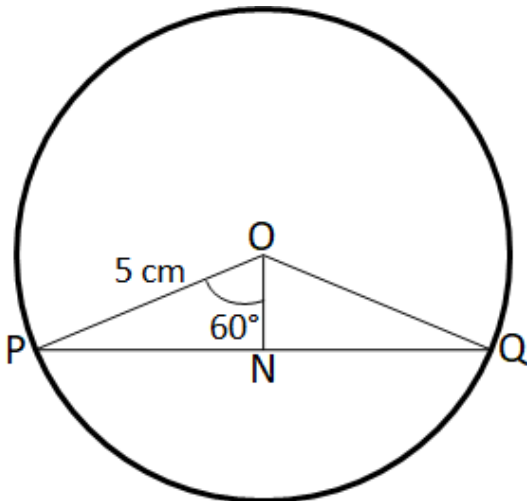
$\angle AOB = 60^\circ$

Let us draw OM such that $OM \perp AB$.

In right angle triangle AMO,

$$\sin 30^\circ = \frac{AM}{AO}$$

$AO = 2 \cdot AM = 2 \cdot 2.5 = 5$ cm. Therefore, we can say that the radius of the circle = 5 cm.



In right angle triangle PNO,

$$\sin 60^\circ = \frac{PN}{PO}$$

$$\Rightarrow PN = \frac{\sqrt{3}}{2} \cdot PO = \frac{5\sqrt{3}}{2}$$

Therefore, $PQ = 2 \cdot PN = 5\sqrt{3}$ cm

78.

Answer C

Let 'x' be the average of all 52 positive integers a_1, a_2, \dots, a_{52} .

$$a_1 + a_2 + a_3 + \dots + a_{52} = 52x \dots (1)$$

Therefore, average of $a_2, a_3, \dots, a_{52} = x+1$

$$a_2 + a_3 + a_4 + \dots + a_{52} = 51(x+1) \dots (2)$$

From equation (1) and (2), we can say that

$$a_1 + 51(x+1) = 52x$$

$$a_1 = x - 51.$$

We have to find out the largest possible value of a_1 . a_1 will be maximum when 'x' is maximum.

$(x+1)$ is the average of terms a_2, a_3, \dots, a_{52} . We know that $a_2 < a_3 < \dots < a_{52}$ and $a_{52} = 100$.

Therefore, $(x+1)$ will be maximum when each term is maximum possible. If $a_{52} = 100$, then $a_{51} = 99, a_{50} = 98$ ends so on.

$$a_2 = 100 + (51-1)*(-1) = 50.$$

$$\text{Hence, } a_2 + a_3 + a_4 + \dots + a_{52} = 50 + 51 + \dots + 99 + 100 = 51(x+1)$$

$$\Rightarrow \frac{51 * (50 + 100)}{2} = 51(x+1)$$

$$\Rightarrow x = 74$$

Therefore, the largest possible value of $a_1 = x - 51 = 74 - 51 = 23$.

79.

Answer 80707

$$S = 7 \times 11 + 11 \times 15 + 15 \times 19 + \dots + 95 \times 99$$

Nth term of the series can be written as $T_n = (4n+3) * (4n+7)$

Last term, $(4n+3) = 95$ i.e. $n = 23$

$$\sum_{n=1}^{n=23} (4n+3) * (4n+7)$$

$$\Rightarrow \sum_{n=1}^{n=23} 16n^2 + 40n + 21$$

$$\Rightarrow 16 * \frac{23 * 24 * 47}{6} + 40 * \frac{23 * 24}{2} + 21 * 23$$

$$\Rightarrow 80707$$

80.

Answer 10

It is given that $N^N = 2^{160}$

We can rewrite the equation as $N^N = (2^5)^{160/5} = 32^{32}$

$$\Rightarrow N = 32$$

$$N^2 + 2^N = 32^2 + 2^{32} = 2^{10} + 2^{32} = 2^{10} * (1 + 2^{22})$$

Hence, we can say that $N^2 + 2^N$ can be divided by 2^{10}

Therefore, $x_{max} = 10$

81.

Answer C

Let 't' pm be the time when the tank is emptied everyday. Let 'a' and 'b' be the liters/hr filled by pump A and pump B respectively.

On Monday, A alone completed filling the tank at 8 pm. Therefore, we can say that pump A worked for (8 - t) hours. Hence, the volume of the tank = $a \cdot (8 - t)$ liters.

Similarly, on Tuesday, B alone completed filling the tank at 6 pm. Therefore, we can say that pump B worked for (6 - t) hours. Hence, the volume of the tank = $b \cdot (6 - t)$ liters.

On Wednesday, A alone worked till 5 pm, and then B worked alone from 5 pm to 7 pm, to fill the tank. Therefore, we can say that pump A worked for (5 - t) hours and pump B worked for 2 hours. Hence, the volume of the tank = $a \cdot (5 - t) + 2b$ liters.

We can say that $a \cdot (8 - t) = b \cdot (6 - t) = a \cdot (5 - t) + 2b$

$$a \cdot (8 - t) = a \cdot (5 - t) + 2b$$

$$3a = 2b \quad \dots (1)$$

$$a \cdot (8 - t) = b \cdot (6 - t)$$

Using equation (1), we can say that

$$a \cdot (8 - t) = \frac{3a}{2} \cdot (6 - t)$$

$$t = 2$$

Therefore, we can say that the tank gets emptied at 2 pm daily. We can see that A takes 6 hours and pump B takes 4 hours alone.

Hence, working together both can fill the tank in $= \frac{6 \cdot 4}{6+4} = 2.4$ hours or 2 hours and 24 minutes.

The pumps started filling the tank at 2:00 pm. Hence, the tank will be filled by 4:24 pm.

82.

Answer 105

Given that the arithmetic mean of x, y and z is 80.

$$\Rightarrow \frac{x + y + z}{3} = 80$$

$$\Rightarrow x + y + z = 240 \quad \dots (1)$$

$$\text{Also, } \frac{x + y + z + v + u}{5} = 75$$

$$\Rightarrow \frac{x + y + z + v + u}{5} = 75$$

$$\Rightarrow x + y + z + v + u = 375$$

Substituting values from equation (1),

$$\Rightarrow v + u = 135$$

It is given that $u = (x+y)/2$ and $v = (y+z)/2$.

$$\Rightarrow (x + y)/2 + (y + z)/2 = 135$$

$$\Rightarrow x + 2y + z = 270$$

$$\Rightarrow y = 30 \quad (\text{Since } x + y + z = 240)$$

Therefore, we can say that $x + z = 240 - y = 210$. We are also given that $x \geq z$,

Hence, $x_{\min} = 210/2 = 105$.

83.

Answer 5

Time taken to cover the first 50 km at 100 km/hr = $\frac{1}{2}$ hr.

Time taken to cover the second 50 km at 50 km/hr = 1 hr.

Time taken to cover the last 50 km at 25 km/hr = 2 hr.

When car 2 starts, car 1 has already covered 20 km.

So, time taken by car 1 to reach B after car 1 starts = total time - time required to travel first 20 km

= 3 hr 30 min - 12 min = 3 hr 18 min

Distance travelled by car 2 = $(50 + 50 + 45) = 145$ km

Distance from B = $(150 - 145)$ km = 5 km

Hence, 5 is the correct answer.

84.

Answer D

Let 'a' and 'b' are those two numbers.

$$a^2 + b^2 = 97$$

$$a^2 + b^2 - 2ab = 97 - 2ab$$

$$(a-b)^2 = 97 - 2ab$$

We know that

$$(a-b)^2 \geq 0$$

$$97 - 2ab \geq 0$$

$$ab \leq 48.5$$

Hence, $ab = 64$. Therefore, option D is the correct answer.

85.

Answer A

Let 'a' and 'b' be the length of sides of the rectangle. ($a > b$)

Area of the rectangle = $a \cdot b$

Perimeter of the rectangle = $2 \cdot (a+b)$

$$\frac{a \cdot b}{(2 \cdot (a+b))^2} = \frac{1}{25}$$

$$25ab = 4(a+b)^2$$

$$25ab = 4(a+b)^2$$

$$4a^2 - 17ab + 4b^2 = 0$$

$$= 0$$

$$(4a-b)(a-4b) = 0$$

$$a = 4b$$

$$a = 4b \text{ or } b/4$$

We initially assumed that $a > b$, therefore $a \neq b/4$

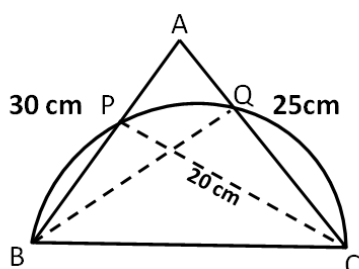
Hence, $a = 4b$

$$b : a = 1 : 4$$

86.

Answer 24.

Let us draw the diagram according to the available information.



We can see that triangle BPC and BQC are inscribed inside a semicircle. Hence, we can say that

$$\angle BPC = \angle BQC = 90^\circ$$

Therefore, we can say that $BQ \perp AC$ and $CP \perp AB$.

In triangle ABC,

$$\text{Area of triangle} = \left(\frac{1}{2}\right) \times \text{Base} \times \text{Height} = \left(\frac{1}{2}\right) \times AB \times CP = \left(\frac{1}{2}\right) \times AC \times BQ$$

$$\Rightarrow BQ = \frac{AB \times CP}{AC} = \frac{30 \times 20}{25} = 24 \text{ cm.}$$

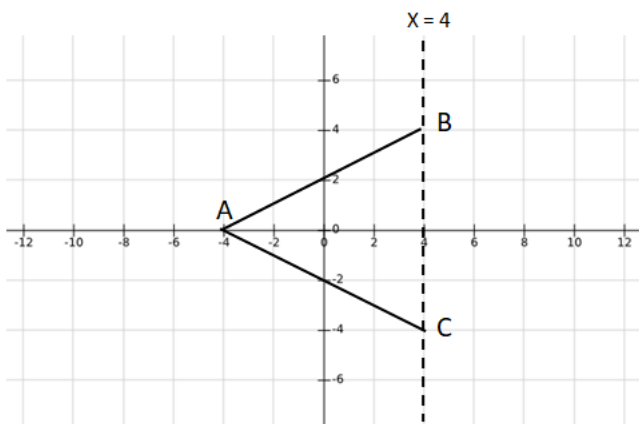
87.

Answer B

We know that area of the triangle = 32 sq. units, $BC = 8$ units

Therefore, the height of the perpendicular drawn from point A to BC = $2 \times 32 / 8 = 8$ units.

Let us draw a possible diagram of the given triangle.



We can see that if A coincide with $(-4, 0)$ then the distance between A and $(0, 0) = 4$ units.

If we move the triangle up or down keeping the base BC on $x = 4$, then point A will move away from origin as vertical distance will come into factor whereas horizontal distance will remain as 4 units.

Hence, we can say that minimum distance between A and origin $(0, 0) = 4$ units.

88.

Answer C

$$\text{Area of the semicircle with AB as a diameter} = \frac{1}{2} \times \pi \times \left(\frac{AB^2}{4}\right)$$

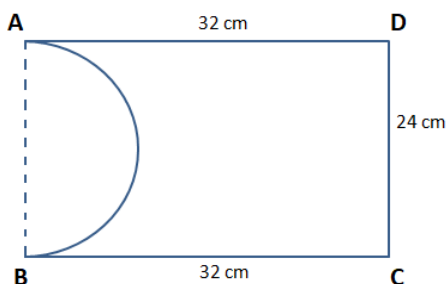
$$\frac{1}{2} \times \pi \times \left(\frac{AB^2}{4}\right) = 72 \times \pi$$

$$AB = 24 \text{ cm}$$

Given that area of the rectangle ABCD = 768 sq.cm

$$AB \times BC = 768$$

$$BC = 32 \text{ cm}$$



We can see that the perimeter of the remaining shape = AD + DC + BC + Arc(AB)
 $32+24+32+\pi*24/2$
 $=88+12\pi$

89.

Answer A

If we carefully observe set A, then we find that

$$6^{2n} - 35n - 1$$

is divisible by 35. So, set A contains multiples of 35. However, not all the multiples of 35 are there in set A, for different values of

n.

For

n = 1, the value is 0, for

n = 2, the value is 1225 which is the 35th multiple of 35.

If we observe set B, it consists of all the multiples of 35 including 0.

So, we can say that every member of set A will be in B while every member of set B will not necessarily be in set A.

Hence, option A is the correct answer.

90.

Answer D

$$4^n > 17^{19}$$

$$\Rightarrow 16^{n/2} > 17^{19}$$

Therefore, we can say that $n/2 > 19$

$n > 38$

Hence, option D is the correct answer.

91.

Answer B

$$\text{Final quantity of alcohol in the mixture} = \frac{700}{700 + 175} * \left(\frac{90}{100}\right)^2 * [700 + 175] = 567 \text{ ml}$$

Therefore, final quantity of water in the mixture = $875 - 567 = 308 \text{ ml}$

$$\text{Hence, we can say that the percentage of water in the mixture} = \frac{308}{875} \times 100 = 35.2 \%$$

92.

Answer 36

Let $f(x) = 2x^2 - ax + 2$. We can see that $f(x)$ is a quadratic function.

For, $f(x) > 0$, Discriminant (D) < 0

$$\Rightarrow (-a)^2 - 4 * 2 * 2 < 0$$

$$\Rightarrow (a-4)(a+4) < 0$$

$$\Rightarrow a \in (-4, 4)$$

Therefore, integer values that 'a' can take = $\{-3, -2, -1, 0, 1, 2, 3\}$

Let $g(x) = x^2 - bx + 8$. We can see that $g(x)$ is also a quadratic function.

For, $g(x) \geq 0$, Discriminant (D) ≤ 0

$$\Rightarrow (-b)^2 - 4 * 8 * 1 < 0$$

$$\Rightarrow (b - \sqrt{32})(b + \sqrt{32}) < 0$$

Therefore, integer values that 'b' can take = $\{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

We have to find out the largest possible value of $2a - 6b$. The largest possible value will occur when 'a' is maximum and 'b' is minimum.

$$a_{max} = 3, b_{min} = -5$$

Therefore, the largest possible value of $2a - 6b = 2*3 - 6*(-5) = 36$.

93.

Answer A

$$\text{We know that } \frac{1}{\log_a b} = \frac{\log_x a}{\log_x b}$$

$$\text{Therefore, we can say that } \frac{1}{\log_2 100} = \frac{\log_{10} 2}{\log_{10} 100}$$

$$\Rightarrow \frac{1}{\log_2 100} = \frac{1}{\log_4 100} + \frac{1}{\log_5 100} - \frac{1}{\log_{10} 100} + \frac{1}{\log_{20} 100} - \frac{1}{\log_{25} 100} + \frac{1}{\log_{50} 100}$$
$$\Rightarrow \frac{\log_{10} 2}{\log_{10} 100} = \frac{\log_{10} 4}{\log_{10} 100} + \frac{\log_{10} 5}{\log_{10} 100} - \frac{\log_{10} 10}{\log_{10} 100} + \frac{\log_{10} 20}{\log_{10} 100} - \frac{\log_{10} 25}{\log_{10} 100} + \frac{\log_{10} 50}{\log_{10} 100}$$

$$\text{We know that } \log_{10} 100 = 2$$

$$\Rightarrow \frac{1}{2} * [\log_{10} 2 - \log_{10} 4 + \log_{10} 5 - \log_{10} 10 + \log_{10} 20 - \log_{10} 25 + \log_{10} 50]$$

$$\Rightarrow \frac{1}{2} * [\log_{10} \frac{2 * 5 * 20 * 50}{4 * 10 * 25}]$$

$$\Rightarrow \frac{1}{2} * [\log_{10} 10]$$

$$\Rightarrow \frac{1}{2}$$

94.

Answer A

$$\text{Given that, } p^3 = q^4 = r^5 = s^6$$

$$p^3 = s^6$$

$$p = s^{\frac{6}{3}} = s^2 \quad \dots(1)$$

$$\text{Similarly, } q = s^{\frac{6}{4}} = s^{\frac{3}{2}} \quad \dots(2)$$

$$\text{Similarly, } r = s^{\frac{6}{5}} \quad \dots(3)$$

$$\Rightarrow \log_s(pqr)$$

By substituting value of p, q, and r from equation (1), (2) and (3)

$$\Rightarrow \log_s(s^2 * s^{\frac{3}{2}} * s^{\frac{6}{5}})$$

$$\Rightarrow \log_s(s^{\frac{47}{10}})$$

$$\Rightarrow \frac{47}{10}$$

Hence, option A is the correct answer.

95.

Answer B

It is given that in drum 1, A and B are in the ratio 18 : 7.

Let us assume that in drum 2, A and B are in the ratio $x : 1$.

It is given that drums 1 and 2 are mixed in the ratio 3 : 4 and in this final mixture, A and B are in the ratio 13 : 7.

By equating concentration of A

$$\Rightarrow \frac{3 * \frac{18}{18+7} + 4 * \frac{x}{x+1}}{3+4} = \frac{13}{13+7}$$

$$\Rightarrow \frac{54}{25} + \frac{4x}{x+1} = \frac{91}{20}$$

$$\Rightarrow \frac{4x}{x+1} = \frac{239}{100}$$

$$\Rightarrow x = \frac{239}{161}$$

Therefore, we can say that in drum 2, A and B are in the ratio $\frac{239}{161} : 1$ or 239 : 161.

96.

Answer C

Let 'R' and 'G' be the amount of work that Ramesh and Ganesh can complete in a day.

It is given that they can together complete a work in 16 days. Hence, total amount of work = $16(R+G)$... (1)

For first 7 days both of them worked together. From 8th day, Ramesh worked at 70% of his original efficiency whereas Ganesh worked at his original efficiency. It took them 17 days to finish the same work. i.e. Ramesh worked at 70% of his original efficiency for 10 days.

\Rightarrow

$$\Rightarrow 16(R+G) = 7(R+G) + 10(0.7R+G)$$

\Rightarrow

$$\Rightarrow 16(R+G) = 14R + 17G$$

\Rightarrow

$$\Rightarrow R = 0.5G \text{ ... (2)}$$

Total amount of work left when Ramesh got sick = $16(R+G) - 7(R+G) = 9(R+G) = 9(0.5G+G) = 13.5G$

Therefore, time taken by Ganesh to complete the remaining work = 13.5

97.

Answer 4000

Amount of interest paid by Ishan to Gopal if the borrowed amount is Rs. $(X+Y) = \frac{10}{100} * (X+Y) = 0.1(X+Y)$

Gopal also borrowed Rs. X from Ankit at 8% per annum. Therefore, he has to return Ankit Rs. $0.08X$ as the interest amount on borrowed sum.

Hence, the interest retained by gopal = $0.1(X+Y) - 0.08X = 0.02X + 0.1Y$... (1)

It is given that the net interest retained by Gopal is the same as that accrued to Ankit.

Therefore, $0.08X = 0.02X + 0.1Y$

$$X = 5/3 Y$$

Amount of interest paid by Ishan to Gopal if the borrowed amount is Rs. $(X+2Y) = \frac{10}{100} * (X+2Y) = 0.1X+0.2Y$

In this case the amount of interest retained by Gopal = $0.1X+0.2Y - 0.08X = 0.02X + 0.2Y$... (3)

It is given that the interest retained by Gopal increased by Rs. 150 in the second case.

$$(0.02X + 0.2Y) - (0.02X + 0.1Y) = 150$$

$$Y = \text{Rs. } 1500$$

By substituting value of Y in equation (2), we can say that $X = \text{Rs. } 2500$

Therefore, $(X+Y) = \text{Rs. } 4000$.

98.

Answer B

Let 'a', 'b' and 'c' be the concentration of salt in solutions A, B and C respectively.

It is given that three salt solutions A, B, C are mixed in the proportion 1 : 2 : 3, then the resulting solution has strength 20%.

$$\frac{a + 2b + 3c}{1 + 2 + 3} = 20$$

$$a + 2b + 3c = 120 \dots (1)$$

If instead the proportion is 3 : 2 : 1, then the resulting solution has strength 30%.

$$\frac{3a + 2b + c}{1 + 2 + 3} = 30$$

$$3a + 2b + c = 180 \dots (2)$$

From equation (1) and (2), we can say that

$$b + 2c = 45$$

$$b = 45 - 2c$$

Also, on subtracting (1) from (2), we get

$$a - c = 30$$

$$a = 30 + c$$

In solution D, B and C are mixed in the ratio 2 : 7

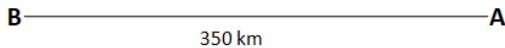
$$\frac{2b + 7c}{9} = \frac{90 - 4c + 7c}{9} = \frac{90 + 3c}{9}$$

So, the concentration of salt in D

Hence, option B is the correct answer.

99.

Answer 50



Let 'a' and 'b' be the speed (in km/hr) of cars starting from both A and B respectively.

If they both move in east direction, then B will catch A if and only if $b > a$.

Relative speed of both the cars when they move in east direction = $(b - a)$ km/hr

It takes them 7 hours to meet. i.e. they travel 350 km in 7 hours with a relative speed of $(b - a)$ km/hr.

Hence, $(b - a) = 350/7 = 50$ km/hr.

100.

Answer 24

It is given that $t_1 + t_2 + \dots + t_n = 2n^2 + 9n + 13$, for every positive integer $n \geq 2$.

We can say that $t_1 + t_2 + \dots + t_k = 2k^2 + 9k + 13 \dots (1)$

Replacing k by $(k-1)$ we can say that

$$t_1 + t_2 + \dots + t_{k-1} = 2(k-1)^2 + 9(k-1) + 13 \dots (2)$$

On subtracting equation (2) from equation (1)

$$\Rightarrow t_k = 2k^2 + 9k + 13 - 2(k-1)^2 - 9(k-1) - 13$$

$$\Rightarrow 103 = 4k + 7$$

$$\Rightarrow k = 24$$

