

Answers

Verbal Ability	LRDI	Quantitative Aptitude
1.D	35.1200	67.48
2.A	36.B	68.20
3.B	37.240	69.D
4.B	38.D	70.8
5.C	39.D	71.A
6.C	40.3	72.6
7.B	41.0	73.7
8.B	42.D	74.B
9.D	43.D	75.C
10.B	44.3	76.1098
11.B	45.48	77.A
12.D	46.A	78.C
13.A	47.4	79.80707
14.A	48.C	80.10
15.C	49.2	81.C
16.A	50.A	82.105
17.D	51.A	83.5
18.B	52.A	84.D
19.D	53.B	85.A
20.C	54.C	86.24

21.C	55.B	87.B
22.A	56.A	88.C
23.B	57.B	89.A
24.D	58.C	90.D
25.4213	59.A	91.B
26.B	60.D	92.36
27.2314	61.A	93.A
28.C	62.A	94.A
29.3	63.C	95.B
30.3241	64.C	96.C
31.3	65.A	97.4000
32.3	66.A	98.B
33.3241		99.50
34.D		100.24

Explanations

VARC

1.D

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.A

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.B

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.B

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.C

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.C

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.B

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 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.B

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.D

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.B

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.B

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.D

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.A

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.

14.A

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. C

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.A

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.D

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.B

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.D

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.

20.C

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.C

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.A

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.B

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.D

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.

25.4213

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 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.B

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 is can be eliminated.

Hence, option B is the correct answer.

27.2314

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.C

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.

29.3

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.

30.3241

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.

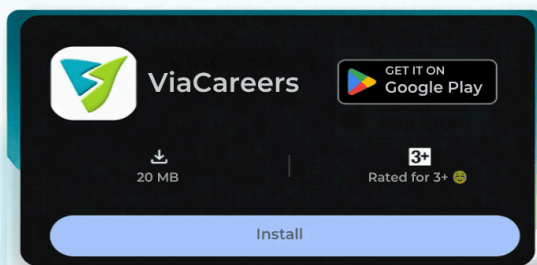
31.3

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. 3

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.



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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).

33.3241

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.D

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.

LRDI

35.1200

It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100a', '120a' and 'a' in that order. It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates. Therefore, we can say that the buying exchange rates are 95a, 114a, 0.95a. It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates. Therefore, we can say that the selling exchange rates are 110a, 132a, 1.1a. We know about the opening and closing units in stock for each currency. Let us draw the

table accordingly.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500			3300
B	114a	120a	132a	4800			4800
C	0.95a	a	1.1a	48000			51000

Let 'p', 'q' and 'r' be the number of units of currency A, B and C bought by the outlet on that day.

Then, we can say that the outlet sold 'p - 800', 'q' and 'r-3000' units of currency A, B and C respectively.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500	p	p - 800	3300
B	114a	120a	132a	4800	q	q	4800
C	0.95a	a	1.1a	48000	r	r - 3000	51000

It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

$$\Rightarrow 0.95a * r = 1.1a * (r - 3000)$$

$$\Rightarrow 0.15r = 3300$$

$$\Rightarrow r = 22000$$

It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3.

$$\Rightarrow \frac{p * 95a}{q * 114a} = \frac{5}{3}$$

$$\Rightarrow p = 2q$$

Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9.

$$\Rightarrow \frac{(p - 800) * 110a}{q * 132a} = \frac{5}{9}$$

$$\Rightarrow \frac{(2q - 800) * 110a}{q * 132a} = \frac{5}{9}$$

$$\Rightarrow q = 600$$

$$\text{Therefore, } p = 2q = 2 * 600 = 1200.$$

It is given that the outlet received 88000 units of L by selling A during the day.

$$\Rightarrow (p - 800) * 110a = 88000$$

$$\Rightarrow (1200 - 800) * 110a = 88000$$

$$\Rightarrow 44000a = 88000$$

$$\Rightarrow a = 2$$

We can fill the entire table and answer all the questions.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the currency outlet bought 1200 units of A.

It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100a', '120a' and 'a' in that order. It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates. Therefore, we can say that the

buying exchange rates are 95a, 114a, 0.95a.



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It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates. Therefore, we can say that the selling exchange rates are 110a, 132a, 1.1a. We know about the opening and closing units in stock for each currency. Let us draw the table accordingly.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500			3300
B	114a	120a	132a	4800			4800
C	0.95a	a	1.1a	48000			51000

Let 'p', 'q' and 'r' be the number of units of currency A, B and C bought by the outlet on that day.

Then, we can say that the outlet sold 'p - 800', 'q' and 'r-3000' units of currency A, B and C respectively.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500	p	p - 800	3300
B	114a	120a	132a	4800	q	q	4800
C	0.95a	a	1.1a	48000	r	r - 3000	51000

It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling A.

$$\Rightarrow 0.95a \cdot r = 1.1a \cdot (r - 3000)$$

$$\Rightarrow 0.15r = 3300$$

$$\Rightarrow r = 22000$$

It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3.

$$\Rightarrow \frac{p \cdot 95a}{q \cdot 114a} = \frac{5}{3}$$

$$\Rightarrow p = 2q$$

Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9.

$$\Rightarrow \frac{(p - 800) \cdot 110a}{q \cdot 132a} = \frac{5}{9}$$

$$\Rightarrow \frac{(2q - 800) \cdot 110a}{q \cdot 132a} = \frac{5}{9}$$

$$\Rightarrow q = 600$$

$$\text{Therefore, } p = 2q = 2 \cdot 600 = 1200.$$

It is given that the outlet received 88000 units of L by selling A during the day.

$$\Rightarrow (p - 800) \cdot 110a = 88000$$

$$\Rightarrow (1200 - 800) \cdot 110a = 88000$$

$$\Rightarrow 44000a = 88000$$

$$\Rightarrow a = 2$$

We can fill the entire table and answer all the questions.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the currency outlet sold 19000 units of currency C. Hence, option B is the

correct answer.

37.240

It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100a', '120a' and 'a' in that order. It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.

Therefore, we can say that the buying exchange rates are 95a, 114a, 0.95a.

It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.

Therefore, we can say that the selling exchange rates are 110a, 132a, 1.1a. We know about the opening and closing units in stock for each currency. Let us draw the table accordingly.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500			3300
B	114a	120a	132a	4800			4800
C	0.95a	a	1.1a	48000			51000

Let 'p', 'q' and 'r' be the number of units of currency A, B and C bought by the outlet on that day.

Then, we can say that the outlet sold 'p - 800', 'q' and 'r-3000' units of currency A, B and C respectively.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500	p	p - 800	3300
B	114a	120a	132a	4800	q	q	4800
C	0.95a	a	1.1a	48000	r	r - 3000	51000



It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

$$\Rightarrow 0.95a \cdot r = 1.1a \cdot (r - 3000)$$

$$\Rightarrow 0.15r = 3300$$

$$\Rightarrow r = 22000$$

It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3.

$$\Rightarrow \frac{p \cdot 95a}{q \cdot 114a} = \frac{5}{3}$$

$$\Rightarrow p = 2q$$

Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9.

$$\Rightarrow \frac{(p - 800) \cdot 110a}{q \cdot 132a} = \frac{5}{9}$$

$$\Rightarrow \frac{(2q - 800) \cdot 110a}{q \cdot 132a} = \frac{5}{9}$$

$$\Rightarrow q = 600$$

Therefore, $p = 2q = 2 \cdot 600 = 1200$.

It is given that the outlet received 88000 units of L by selling A during the day.

$$\Rightarrow (p - 800) \cdot 110a = 88000$$



$$\Rightarrow (1200-800)*110a = 88000$$

$$\Rightarrow 44000a = 88000$$

We can fill the entire table and answer all the questions.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the base exchange rate of currency B with respect to currency L was 240.

38.D

It is given that the base exchange rates of A, B and C with respect to L are in the ratio 100:120:1. Let us assume that base exchange rates are '100a', '120a' and 'a' in that order. It is given that the buying exchange rates of each of A, B, and C with respect to L are 5% below the corresponding base exchange rates.

Therefore, we can say that the buying exchange rates are 95a, 114a, 0.95a. It is given that the selling exchange rates of each of A, B, and C with respect to L are 10% above their corresponding base exchange rates.

Therefore, we can say that the selling exchange rates are 110a, 132a, 1.1a. We know about the opening and closing units in stock for each currency. Let us draw the table accordingly.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500			3300
B	114a	120a	132a	4800			4800
C	0.95a	a	1.1a	48000			51000

Let 'p', 'q' and 'r' be the number of units of currency A, B and C bought by the outlet on that day.

Then, we can say that the outlet sold 'p - 800', 'q' and 'r-3000' units of currency A, B and C respectively.

				No. of units			
Currency	Buying rate	Base rate	Selling rate	Opening stock	Buy	Sell	Closing stock
A	95a	100a	110a	2500	p	p - 800	3300
B	114a	120a	132a	4800	q	q	4800
C	0.95a	a	1.1a	48000	r	r - 3000	51000

It is given that the amount of L used by the outlet to buy C equals the amount of L it received by selling C.

$$\Rightarrow 0.95a * r = 1.1a * (r - 3000)$$

$$\Rightarrow 0.15r = 3300$$

$$\Rightarrow r = 22000$$

It is also given that the amounts of L used by the outlet to buy A and B are in the ratio 5:3.

$$\Rightarrow \frac{p * 95a}{q * 114a} = \frac{5}{3}$$

$$\Rightarrow p = 2q$$

Also, the amounts of L the outlet received from the sales of A and B are in the ratio 5:9.

$$\Rightarrow \frac{(p - 800) * 110a}{q * 132a} = \frac{5}{9}$$

$$\Rightarrow \frac{(2q - 800) * 110a}{q * 132a} = \frac{5}{9}$$

$$\Rightarrow q = 600$$

Therefore, $p = 2q = 2 * 600 = 1200$.

It is given that the outlet received 88000 units of L by selling A during the day.

$$= (p - 800) * 110a = 88000$$

$$= (1200 - 800) * 110a = 88000$$

$$= 44000a = 88000$$

$$= a = 2$$

We can fill the entire table and answer all the questions.

Currency	Buying rate	Base rate	Selling rate	No. of units			
				Opening stock	Buy	Sell	Closing stock
A	190	200	220	2500	1200	400	3300
B	228	240	264	4800	600	600	4800
C	1.9	2	2.2	48000	22000	19000	51000

From the table we can see that the buying exchange rate of currency C with respect to

currency L was 1.9.

Hence, we can say that option D is the correct answer.

39.D

Let 'x' be the the number of Old visitors. Then, the number of middle-aged visitors = $2x$.

Also, the number of Young visitors = $2 \times 2x = 4x$

$$= x + 2x + 4x = 140$$

$$= x = 20$$



It is given that total of 55 Economy tickets were sold out.

It is given that Young visitors half the total number of Platinum tickets that were sold.

Let 'Y' be the number of Platinum tickets bought by the Young visitors.

Then, the number of Platinum tickets sold = $2Y$.

Consequently, we can say that the number of Gold tickets sold = $140 - 55 - 2Y = 85 - 2Y$.

	Platinum	Gold	Economy	Total
Old				20
Middle-aged				40
Young	Y		38	80
Total	2Y	85-2Y	55	140

Let us assume that 'Z' is the number of Economy tickets bought by the Old visitors. It is

given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	$20 - 2Z$	Z	Z	20
Middle-aged	$(Y+2Z) - 20$	$43 - (Y+Z)$	$17 - Z$	40
Young	Y	$42 - Y$	38	80
Total	$2Y$	$85-2Y$	55	140

It is given that the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged visitors buying Platinum tickets.

$$20 - 2Z = (Y+2Z) - 20$$

$$Y + 4Z = 40$$

$$2Y + 8Z = 80$$

$$2Y = 80 - 8Z$$

We can see that Z can take only integer values. Therefore, we can say that the total number of Platinum tickets sold will be a multiple of 8. Hence, option D is the correct answer.

40.3

Let 'x' be the number of Old visitors. Then, the number of middle-aged visitors = $2x$.

Also, the number of Young visitors = $2 \times 2x = 4x$

$$= x + 2x + 4x = 140$$

$$= x = 20$$

It is given that total of 55 Economy tickets were sold out.

It is given that Young visitors half the total number of Platinum tickets that were sold.

Let 'Y' be the number of Platinum tickets bought by the Young visitors.

Then, the number of Platinum tickets sold = $2Y$.

Consequently, we can say that the number of Gold tickets sold = $140 - 55 - 2Y = 85 - 2Y$.

	Platinum	Gold	Economy	Total
Old				20
Middle-aged				40
Young	Y		38	80
Total	2Y	85-2Y	55	140

Let us assume that 'Z' is the number of Economy tickets bought by the Old visitors. It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	$20 - 2Z$	Z	Z	20
Middle-aged	$(Y+2Z) - 20$	$43 - (Y+Z)$	$17 - Z$	40
Young	Y	$42 - Y$	38	80
Total	2Y	85-2Y	55	140

It is given that the number of Old visitors buying Platinum tickets was equal to the number of Middle-aged

visitors buying Economy tickets.

$$20 - 2Z = 17 - Z$$

$$= Z = 3$$

Therefore, we can say that the number of Old visitors buying Gold tickets = 3

41.0

Let 'x' be the the number of Old visitors. Then, the number of middle-aged visitors = $2x$.

Also, the number of Young visitors = $2 \times 2x = 4x$

$$= x + 2x + 4x = 140$$

$$= x = 20$$

It is given that total of 55 Economy tickets were sold out.

It is given that Young visitors half the total number of Platinum tickets that were sold.

Let 'Y' be the number of Platinum tickets bought by the Young visitors.

Then, the number of Platinum tickets sold = $2Y$.

Consequently, we can say that the number of Gold tickets sold = $140 - 55 - 2Y = 85 - 2Y$.

	Platinum	Gold	Economy	Total
Old				20
Middle-aged				40
Young	Y		38	80
Total	2Y	85-2Y	55	140

Let us assume that 'Z' is the number of Economy tickets bought by the Old visitors. It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors.

	Platinum	Gold	Economy	Total
Old	$20 - 2Z$	Z	Z	20
Middle-aged	$(Y + 2Z) - 20$	$43 - (Y + Z)$	$17 - Z$	40
Young	Y	$42 - Y$	38	80
Total	2Y	85-2Y	55	140

It is given that the number of Old visitors buying Gold tickets was strictly greater than

the number of Young visitors buying Gold tickets.



$$Z > 42 - Y$$

$$= Z + Y > 42 \dots (1)$$

The number of Middle-aged visitors buying Gold tickets = $43 - (Y+Z)$

Since $(Y+Z) > 42$, then We can say that $(Y+Z) = 43$.

Hence, the number of Middle-aged visitors buying Gold tickets = $43 - 43 = 0$

42.D

Let 'x' be the the number of Old visitors. Then, the number of middle-aged visitors = $2x$.

Also, the number of Young visitors = $2 \times 2x = 4x$

$$= x + 2x + 4x = 140$$

$$= x = 20$$

It is given that total of 55 Economy tickets were sold out.

It is given that Young visitors half the total number of Platinum tickets that were sold.

Let 'Y' be the number of Platinum tickets bought by the Young visitors. Then, the number of Platinum tickets sold = $2Y$.

Consequently, we can say that the number of Gold tickets sold = $140 - 55 - 2Y = 85 - 2Y$.

	Platinum	Gold	Economy	Total
Old				20
Middle-aged				40
Young	Y		38	80
Total	2Y	85-2Y	55	140

Let us assume that 'Z' is the number of Economy tickets bought by the Old visitors. It is given that the number of Gold tickets bought by Old visitors was equal to the number of Economy tickets bought by Old visitors

	Platinum	Gold	Economy	Total
Old	20 - 2Z	Z	Z	20
Middle-aged	(Y+2Z) - 20	43 - (Y+Z)	17 - Z	40
Young	Y	42 - Y	38	80
Total	2Y	85-2Y	55	140

Let us check with the help of options

Option (A): The numbers of Gold and Platinum tickets bought by Young visitors were equal.

$$Y = 42 - Y$$

$= Y = 21$. Hence, this statement can be true.

Option (B): The numbers of Middle-aged and Young visitors buying Gold tickets were equal

$$43 - (Y+Z) = 42 - Y$$

$= Z = 1$. Hence, this statement can be true.

Option (C): The numbers of Old and Middle-aged visitors buying Platinum tickets were equal

$$20 - 2Z = (Y+2Z) - 20$$

$Y+4Z = 40$. Hence, this statement can be true.

Option (D): The numbers of Old and Middle-aged visitors buying Economy tickets were equal

$$Z = 17 - Z$$

$= Z = 8.5$. This is not possible as Z has to be an integer. Hence, we can say that this statement is false.

Explanation [43 - 46]:

It is given that: High Q > Best Ed > Cosmopolitan and Education Aid > A-one

We can say that High Q > Cosmopolitan

We can see that both High Q and Cosmopolitan got same points in reputation (R) and placement quality (P).

High Q received more points in infrastructure (I) than Cosmopolitan whereas Cosmopolitan received more points in faculty Quality (F) than High Q.

Hence, we can say that Infrastructure's weight should be greater than Faculty quality. i.e. $I > F$

Similarly, We can see that both Best Ed and Cosmopolitan got same points in faculty Quality (F) and placement quality (P). Best Ed received more points in reputation (R) than Cosmopolitan whereas Cosmopolitan received more points in infrastructure (I) than Best Ed.

Hence, we can say that reputation's weight should be greater than infrastructure. i.e. $R > I$

Similarly, We can see that both Education Aid and A-one got same points in faculty Quality (F) and reputation

(R). Education Aid received more points in infrastructure (I) than A-one whereas A-one received more points in placement quality (P) than Education Aid.

Hence, we can say that reputation's weight should be greater than infrastructure. i.e. $I > P$

So basically there are two possible cases: $R > I > P > F$ or $R > I > F > P$

43.D

Case 1: Order of weights assigned = $R > I > P > F$

$R = 0.4, I = 0.3, P = 0.2, F = 0.1$

In this case overall score received by Best Ed = $0.1 \times 40 + 0.4 \times 30 + 0.2 \times 20 + 0.3 \times 20 = 26$

In this case overall score received by High Q = $0.1 \times 30 + 0.4 \times 20 + 0.2 \times 20 + 0.3 \times 40 = 27$

We can see that High Q's overall score is higher than Best Ed. Hence, this is a possible case.

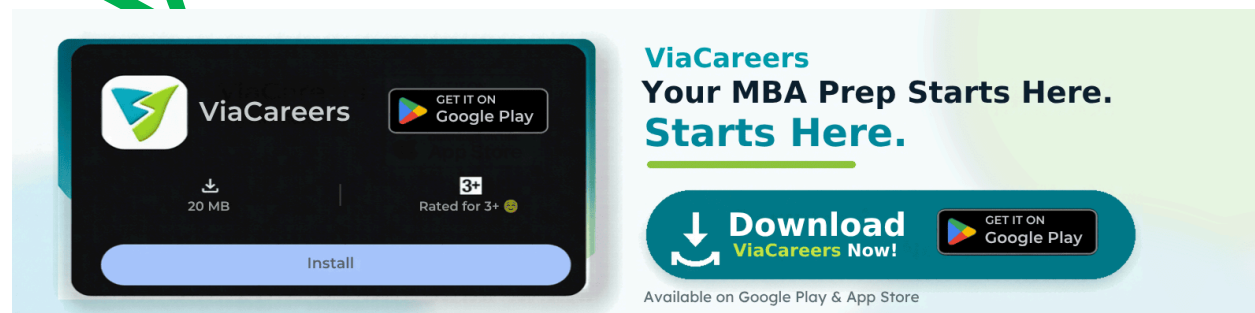
Case 2: Order of weights assigned = $R > I > F > P$

$R = 0.4, I = 0.3, P = 0.1, F = 0.2$

In this case overall score received by Best Ed = $0.2 \times 40 + 0.4 \times 30 + 0.1 \times 20 + 0.3 \times 20 = 28$

In this case overall score received by High Q = $0.2 \times 30 + 0.4 \times 20 + 0.1 \times 20 + 0.3 \times 40 = 28$

We can see that High Q's overall score is not greater than the overall score received Best Ed. Hence, this case is not possible.



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Now that we know the weight of each parameter, we can calculate the overall score and

accreditation received by each college.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

We can see that weight of the faculty quality parameter = 0.1. Hence, option D is the correct answer.

44.3

Case 1: Order of weights assigned = $R > I > P > F$

$R = 0.4, I = 0.3, P = 0.2, F = 0.1$

In this case overall score received by Best Ed = $0.1 \times 40 + 0.4 \times 30 + 0.2 \times 20 + 0.3 \times 20 = 26$

In this case overall score received by High Q = $0.1 \times 30 + 0.4 \times 20 + 0.2 \times 20 + 0.3 \times 40 = 27$

We can see that High Q's overall score is higher than Best Ed. Hence, this is a possible case.

Case 2: Order of weights assigned = $R > I > F > P$

$R = 0.4, I = 0.3, P = 0.1, F = 0.2$

In this case overall score received by Best Ed = $0.2 \times 40 + 0.4 \times 30 + 0.1 \times 20 + 0.3 \times 20 = 28$

In this case overall score received by High Q = $0.2 \times 30 + 0.4 \times 20 + 0.1 \times 20 + 0.3 \times 40 = 28$

We can see that High Q's overall score is not greater than the overall score received Best Ed. Hence, this case is not possible.

Now that we know the weight of each parameter, we can calculate the overall score and

accreditation received by each college.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

From the table, we can see that three received the accreditation of AAA.

45.48

Case 1: Order of weights assigned = $R > I > P > F$

$R = 0.4, I = 0.3, P = 0.2, F = 0.1$

In this case overall score received by Best Ed = $0.1 \times 40 + 0.4 \times 30 + 0.2 \times 20 + 0.3 \times 20 = 26$

In this case overall score received by High Q = $0.1 \times 30 + 0.4 \times 20 + 0.2 \times 20 + 0.3 \times 40 = 27$

We can see that High Q's overall score is higher than Best Ed. Hence, this is a possible case.

Case 2: Order of weights assigned = $R > I > F > P$

$R = 0.4, I = 0.3, P = 0.1, F = 0.2$

In this case overall score received by Best Ed = $0.2 \times 40 + 0.4 \times 30 + 0.1 \times 20 + 0.3 \times 20 = 28$

In this case overall score received by High Q = $0.2 \times 30 + 0.4 \times 20 + 0.1 \times 20 + 0.3 \times 40 = 28$

We can see that High Q's overall score is not greater than the overall score received Best Ed. Hence, this case is not possible.

Now that we know the weight of each parameter, we can calculate the overall score and

accreditation received by each college.

	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

From the table we can see that Education Aid scored the highest overall score = 48.



46.A

Case 1: Order of weights assigned = $R > I > P > F$

$$R = 0.4, I = 0.3, P = 0.2, F = 0.1$$

In this case overall score received by Best Ed = $0.1 \times 40 + 0.4 \times 30 + 0.2 \times 20 + 0.3 \times 20 = 26$

In this case overall score received by High Q = $0.1 \times 30 + 0.4 \times 20 + 0.2 \times 20 + 0.3 \times 40 = 27$

We can see that High Q's overall score is higher than Best Ed. Hence, this is a possible case.

Case 2: Order of weights assigned = $R > I > F > P$

$$R = 0.4, I = 0.3, P = 0.1, F = 0.2$$

In this case overall score received by Best Ed = $0.2 \times 40 + 0.4 \times 30 + 0.1 \times 20 + 0.3 \times 20 = 28$

In this case overall score received by High Q = $0.2 \times 30 + 0.4 \times 20 + 0.1 \times 20 + 0.3 \times 40 = 28$

We can see that High Q's overall score is not greater than the overall score received Best Ed. Hence, this case is not possible.

Now that we know the weight of each parameter, we can calculate the overall score and accreditation received by each college.

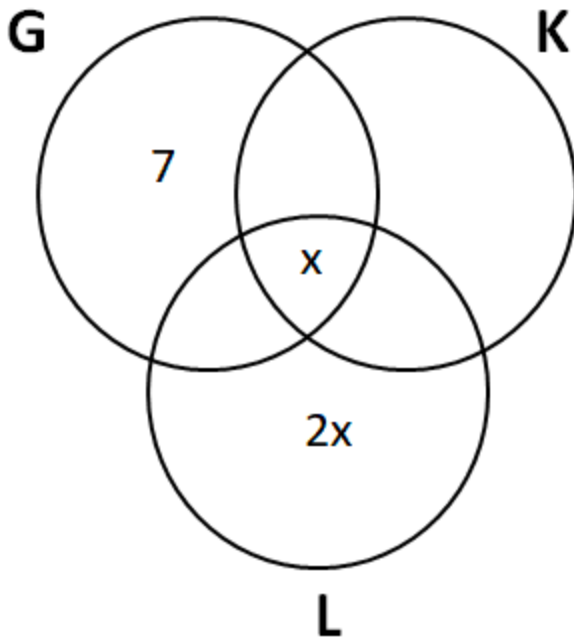
	F (0.1)	R (0.4)	P (0.2)	I (0.3)	Overall score	Accreditation
A-one	50	50	50	40	47	AAA
Best Ed	40	30	20	20	26	BBA
Cosmopolitan	40	20	20	30	25	BBA
Dominance	20	20	40	30	27	BBA
Education Aid	50	50	40	50	48	AAA
Fancy	50	50	40	40	45	AAA
Global	30	0	20	20	13	Junk
High Q	30	20	20	40	27	BBA

From the table we can see that none of the mentioned college received an overall scores between 31 and 40, both inclusive. Hence, option A is the correct answer.

47.4

Let 'x' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = $2x$

It is given that there are a total of 17 students enrolled in G. Also, ten students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = $17 - 10 = 7$



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = $7+1$

$$= 2x = 8$$

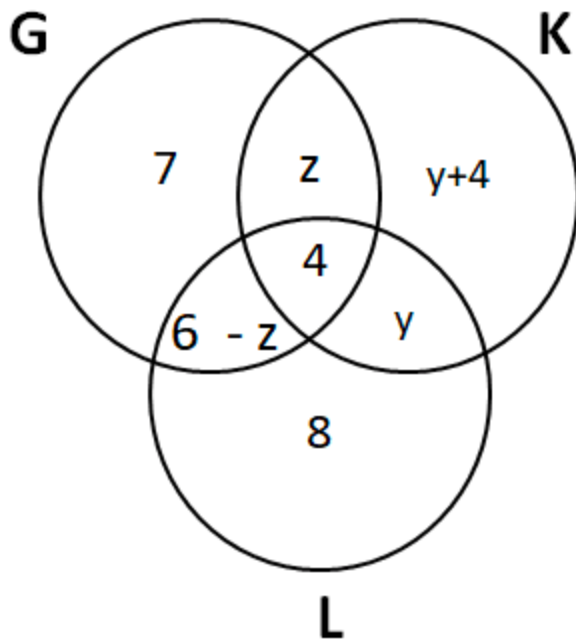
$$= x = 4$$

Let us assume that 'y' students are enrolled in K and L but not G. Then, the number of students enrolled only in

$$K = y + 4$$

Let us assume that 'z' be the the number of students enrolled in G and K but not L. Then, the number of

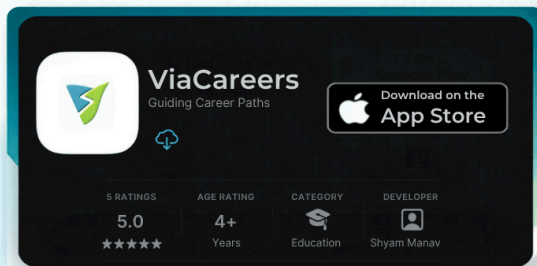
$$\text{students enrolled G and L bot not K} = 10 - 4 - z = 6 - z$$



It is given that a total of 39 students in the sports.

$$7 + z + 4 + 6 - z + 8 + y + y + 4 = 39$$

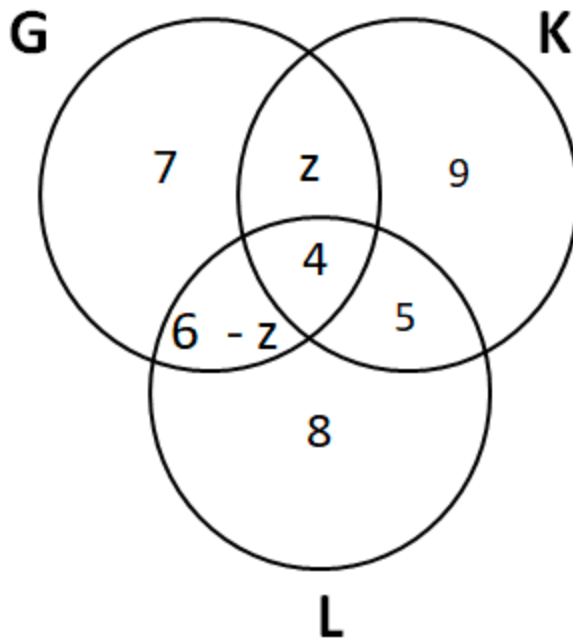
$$y = 5$$



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Number of students enrolled in G = 17

Number of students enrolled in K = $9 + 4 + 5 + z = 18 + z$

Number of students enrolled in L = $6 - z + 4 + 5 + 8 = 23 - z$

It is given that the maximum student enrollment is in L.

$$= 23 - z > 18 + z$$

$$= 2z < 5$$

$$= z < 2.5$$

Therefore, we can say that z can take three values = $\{0, 1, 2\}$

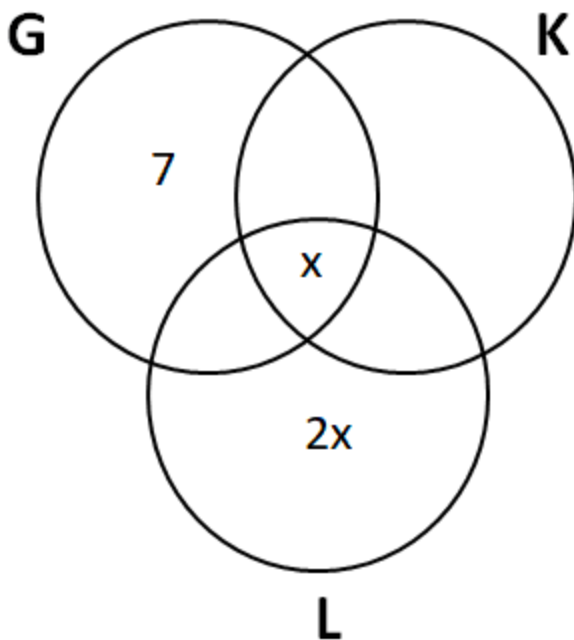
The number of students enrolled in both G and L but not in K = $6 - z$. This number will be minimum when 'z' is maximum. $z_{\{max\}} = 2$

Therefore, the minimum number of students enrolled in both G and L but not in K = $6 - 2 = 4$

48.C

Let 'x' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = $2x$

It is given that there are a total of 17 students enrolled in G. Also, ten students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = $17 - 10 = 7$



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the

number of students enrolled only in L = $7+1$

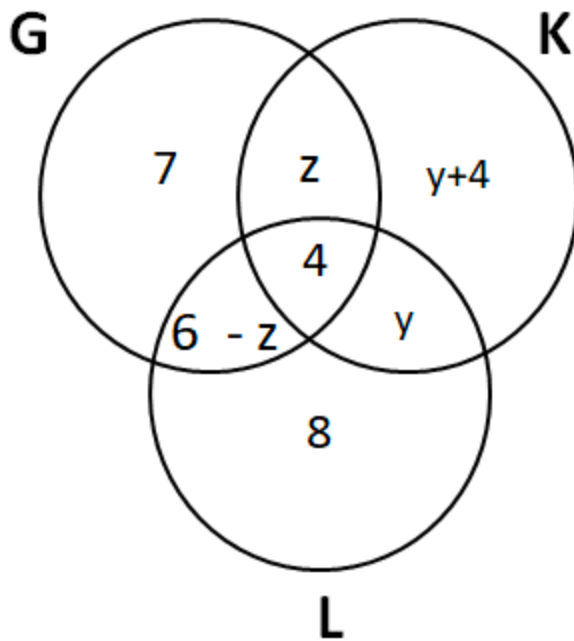
$$= 2x = 8$$

$$= x = 4$$

Let us assume that 'y' students are enrolled in K and L but not G. Then, the number of students enrolled only in

$$K = y + 4$$

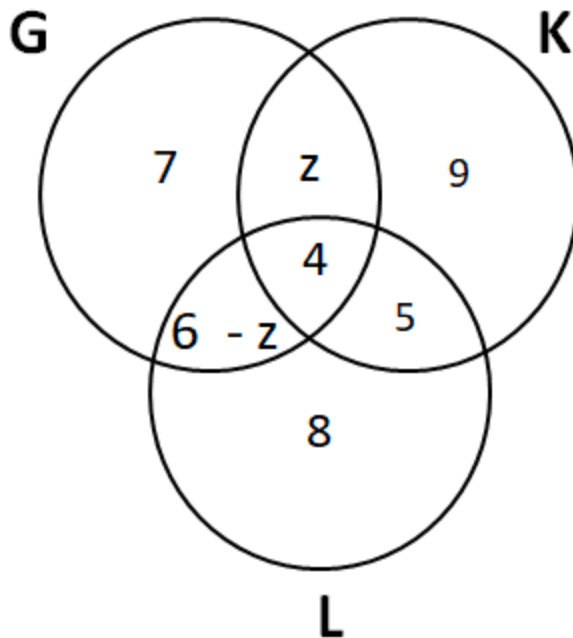
Let us assume that 'z' be the the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = $10 - 4 - z = 6 - z$



It is given that a total of 39 students in the sports.

$$7 + z + 4 + 6 - z + 8 + y + y + 4 = 39$$

$$= y = 5$$



Number of students enrolled in G = 17

Number of students enrolled in K = $9 + 4 + 5 + z = 18 + z$

Number of students enrolled in L = $6 - z + 4 + 5 + 8 = 23 - z$

It is given that the maximum student enrollment is in L.

$$= 23 - z > 18 + z$$

$$= 2z < 5$$

$$= z < 2.5$$

Therefore, we can say that z can take three values = $\{0, 1, 2\}$

It is given that the numbers of students enrolled in K and L are in the ratio 19:22.

$$\frac{18 + z}{23 - z} = \frac{19}{22}$$

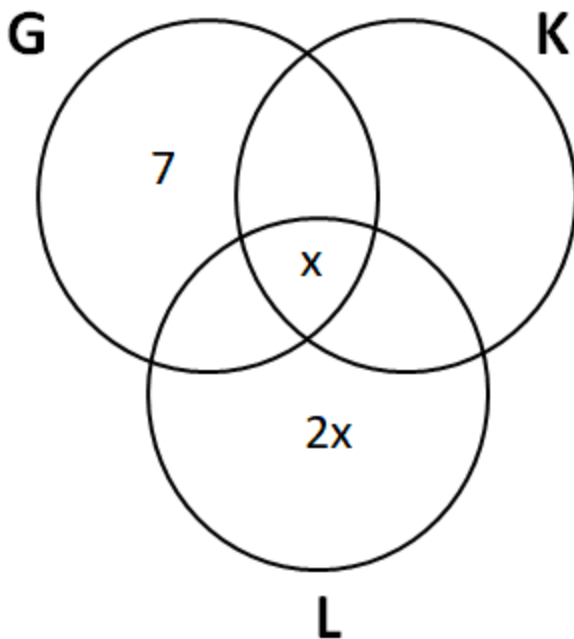
$z = 1$ which is a possible solution as well.

In this case the number of students enrolled in L = $23 - z = 23 - 1 = 22$. Hence, option C is the correct answer.

49.2

Let 'x' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = $2x$

It is given that there are a total of 17 students enrolled in G. Also, ten students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = $17 - 10 = 7$



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the

number of students enrolled only in L = $7 + 1$

= $2x = 8$

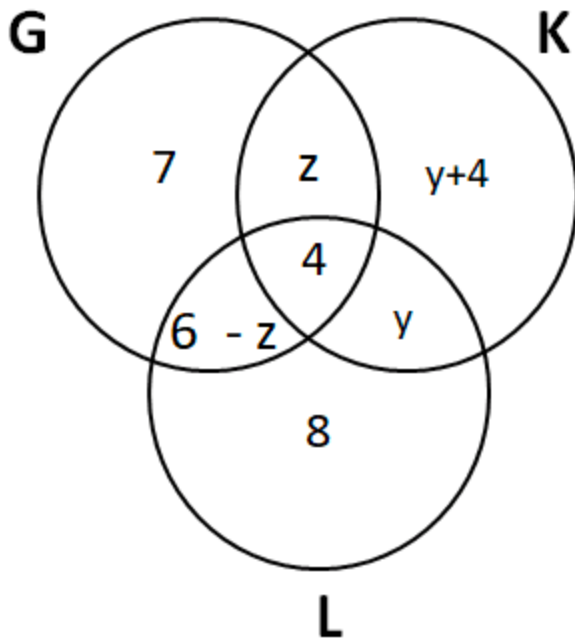


$$= x = 4$$

Let us assume that 'y' students are enrolled in K and L but not G. Then, the number of students enrolled only in

$$K = y + 4$$

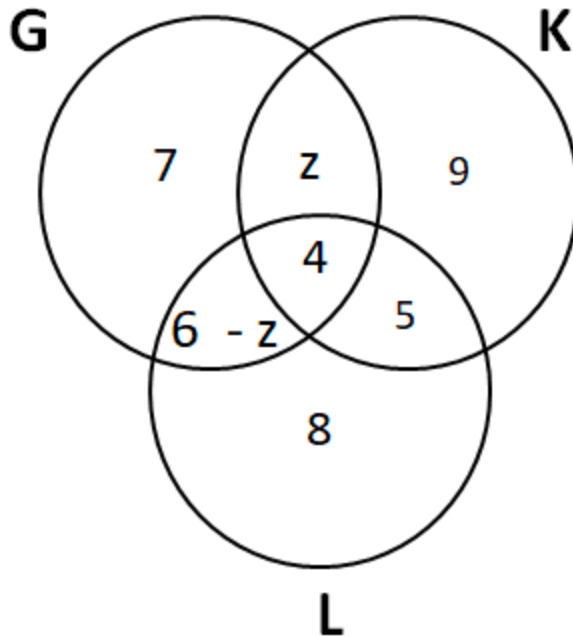
Let us assume that 'z' be the the number of students enrolled in G and K but not L. Then, the number of students enrolled G and L bot not K = $10 - 4 - z = 6 - z$



It is given that a total of 39 students in the sports.

$$7 + z + 4 + 6 - z + 8 + y + y + 4 = 39$$

$$= y = 5$$



Number of students enrolled in G = 17

Number of students enrolled in K = $9 + 4 + 5 + z = 18 + z$

Number of students enrolled in L = $6 - z + 4 + 5 + 8 = 23 - z$

It is given that the maximum student enrollment is in L.

$$= 23 - z > 18 + z$$

$$= 2z < 5$$

$$= z < 2.5$$

Therefore, we can say that z can take three values = $\{0, 1, 2\}$

Hence, the number of students enrolled in K = $18 + z = \{18, 19, 20\}$

It is given that after withdrawal the number of students enrolled in K went down by one.

This one student must have left sports K. Hence we can say that the remaining 3

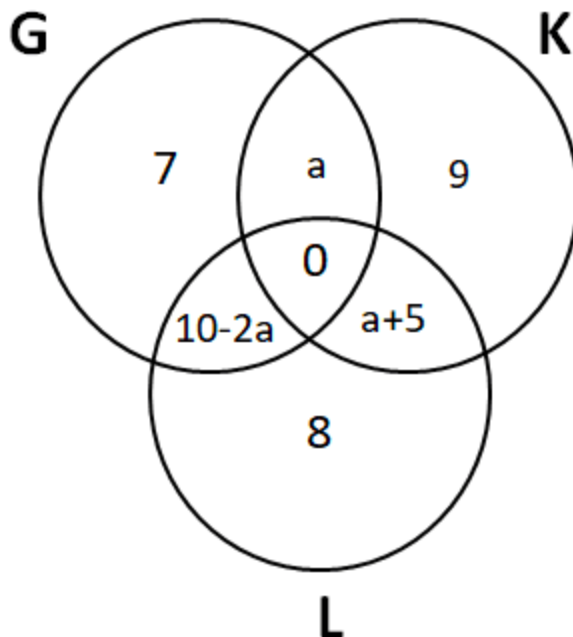
students must have left either G or L.

Before withdraw there were a total of 24 students were enrolled in exactly 1 sports, 11 students were enrolled in exactly 2 courses and 4 students were enrolled in all three courses.

The students which were enrolled in all three sports, withdrew from one of the sports. Hence, we can say that now the number of students who were enrolled in exactly 2 courses = $11 + 4 = 15$.

It is given that the number of students enrolled in G was six less than the number of students enrolled in L. Let 'a' be the number of students who were enrolled in G and K but not L. Then, the number of students who were enrolled in L and K but not G = $a + 5$

Consequently, we can say that the number of students enrolled in G and L but not K = $15 - (2a + 5) = 10 - 2a$



Number of students enrolled in this case = $a + a+5 + 9 = 14 + 2a$. We can see that '14+2a' is an even number. It is given that the number of students enrolled in K went down by one. Therefore, we can say that the number of students enrolled in K earlier

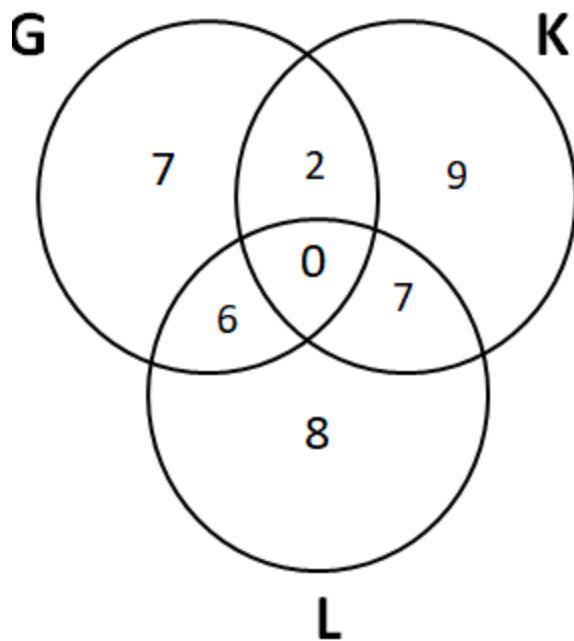
was an odd number.

Hence, the number of students enrolled in $K = 18 + z = \{18, 19, 20\}$

We can see that only '19' is an odd number. Hence, we can say that the number of students enrolled in K after withdrawal = 18

$$= 14 + 2a = 18$$

$$= a = 2$$

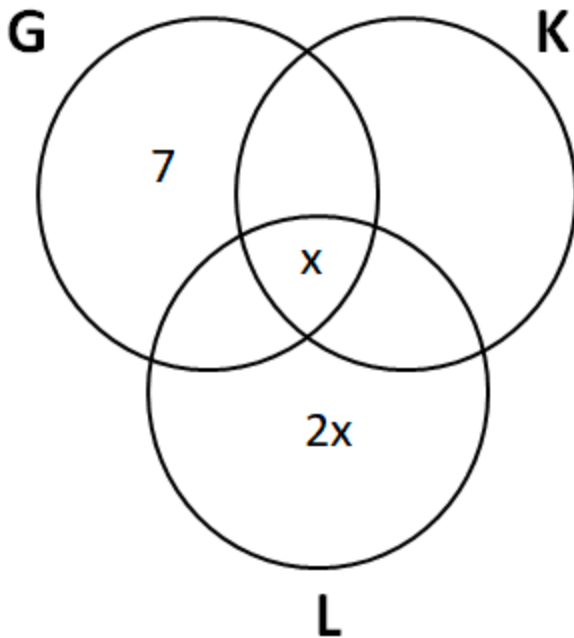


From the diagram we can see that the number of students enrolled in both G and K = 2.



50.A

Let 'x' be the number of students enrolled in all three sports. Then the number of students enrolled only in L = $2x$. It is given that there are a total of 17 students enrolled in G. Also, ten students enrolled in G are also enrolled in at least one more sport. Hence, the number of students enrolled in only G = $17 - 10 = 7$



The number of students enrolled only in G is one less than the number of students enrolled only in L. Hence, the number of students enrolled only in L = $7 + 1$

$$= 2x = 8$$

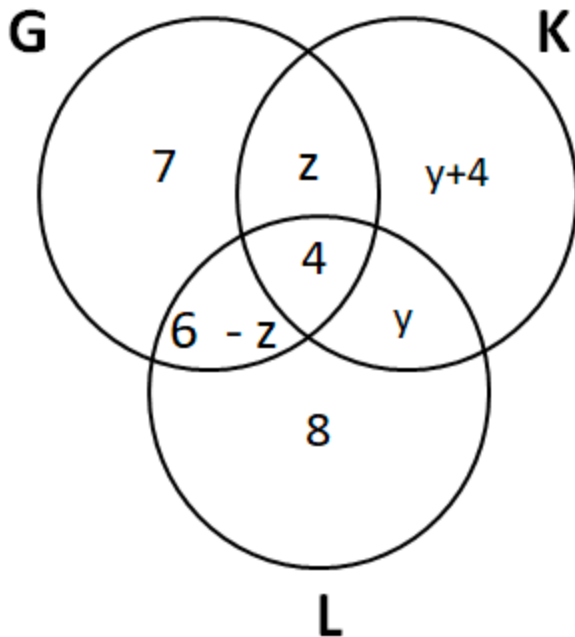
$$= x = 4$$

Let us assume that 'y' students are enrolled in K and L but not G. Then, the number of students enrolled only in

$$K = y + 4$$

Let us assume that 'z' be the the number of students enrolled in G and K but not L. Then,

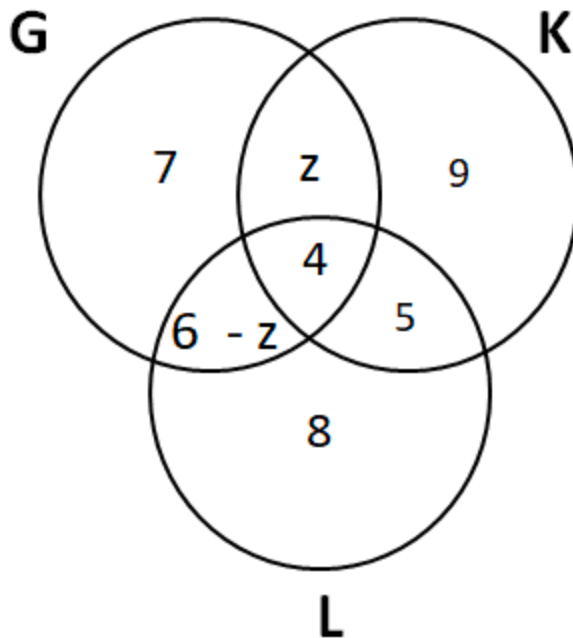
the number of students enrolled G and L but not K = $10 - 4 - z = 6 - z$



It is given that a total of 39 students in the sports.

$$7 + z + 4 + 6 - z + 8 + y + y + 4 = 39$$

$$= y = 5$$



Number of students enrolled in G = 17

Number of students enrolled in K = $9 + 4 + 5 + z = 18 + z$

Number of students enrolled in L = $6 - z + 4 + 5 + 8 = 23 - z$

It is given that the maximum student enrollment is in L.

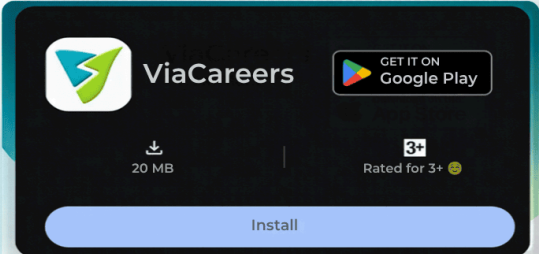
$$= 23 - z > 18 + z$$

$$= 2z < 5$$

$$= z < 2.5$$

Therefore, we can say that z can take three values = $\{0, 1, 2\}$

Hence, the number of students enrolled in K = $18 + z = \{18, 19, 20\}$



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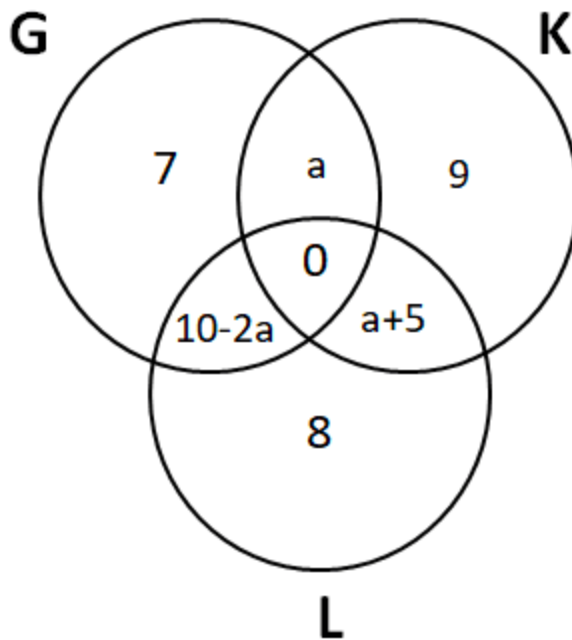
It is given that after withdrawal the number of students enrolled in K went down by one. This one student must have left sports K. Hence we can say that the remaining 3 students must have left either G or L.

Before withdraw there were a total of 24 students were enrolled in exactly 1 sports, 11 students were enrolled in exactly 2 courses and 4 students were enrolled in all three courses.

The students which were enrolled in all three sports, withdrew from one of the sports. Hence, we can say that now the number of students who were enrolled in exactly 2 courses = $11 + 4 = 15$.

It is given that the number of students enrolled in G was six less than the number of students enrolled in L. Let 'a' be the number of students who were enrolled in G and K but not L. Then, the number of students who were enrolled in L and K but not G = $a + 5$

Consequently, we can say that the number of students enrolled in G and L but not K = $15 - (2a + 5) = 10 - 2a$



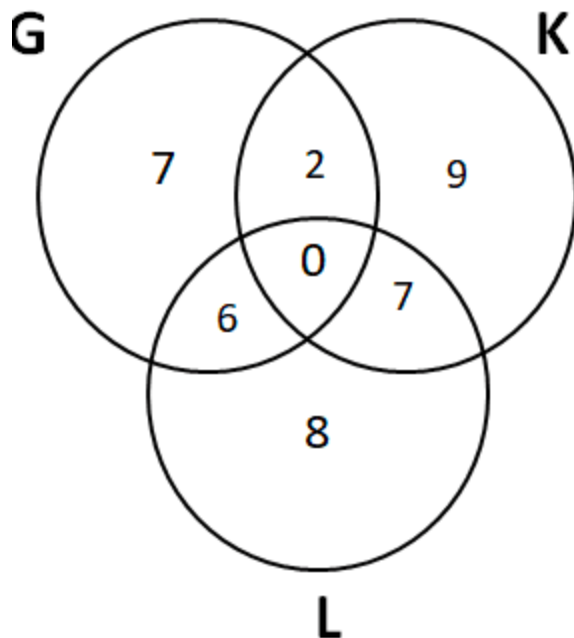
Number of students enrolled in this case = $a + a + 5 + 9 = 14 + 2a$. We can see that ' $14+2a$ ' is an even number. It is given that the number of students enrolled in K went down by one. Therefore, we can say that the number of students enrolled in K earlier was an odd number.

Hence, the number of students enrolled in K = $18 + z = \{18, 19, 20\}$

We can see that only '19' is an odd number. Hence, we can say that the number of students enrolled in K after withdrawal = 18

$$= 14 + 2a = 18$$

$$= a = 2$$



From the diagram we can see that the number of students enrolled in both G and L = 6. Hence, option A is the correct answer.

Explanation [51 - 54]:

Peacock	is	designated	as	the	national	bird	of	India
5688999	35	1135556678	56	458	13666689	1334	79	13366

We can see that India's code is 13366 therefore we can say that I's code is either 3 or 6.

Also, we can see that code for word "is" is 35 therefore we can say that I's code is 3. Consequently, we can say that S's code is 5.

51.A

Also, we can see that code of word 'as' is 56 therefore we can say that A's code is 6. Consequently, we can say that S's code is 5.

There is only one letter 'O' common in words 'of' and 'national'. In code word as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9'.

Consequently, we can say that F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets one of them is 'O'. We can see that there are three 9's in Peacock's code. One of the digit '9' is used for 'O'. Remaining two 9's must represent same letter. We can see that only letter 'C' has appeared twice in Peacock. Therefore, we can say that 'C' is assigned number '9'.

In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6'. Consequently, we can say that code for letter 'D' is '1' because in India rest of the numerals are already taken.



	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common. In code as well only digit '8' is common in two codes.

Hence, we can say that letter code for letter 't' is 8.

In words, 'the' and 'peacock' only letter 'e' is common. In code as well only digit '5' is common in two codes.

Hence, we can say that letter code for letter 'e' is 5. Consequently, we can say that leftover letter, in word "the", 'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "NATIONAL" is 13666689. Hence, we can say that code for the letter L is '1'.

Hence, option A is the correct answer.

52.A

Also, we can see that code of word 'as' is 56 therefore we can say that A's code is 6. Consequently, we can say that S's code is 5.

There is only one letter 'O' common in words 'of' and 'national'. In code as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9'. Consequently, we can say that F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets one of them is 'O'. We can see that there are three 9's in

Peacock's code. One of the digit '9' is used for 'O'. Remaining two 9's must represent same letter. We can see that only letter 'C' has appeared twice in Peacock. Therefore, we can say that 'C' is assigned number '9'.

In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6'. Consequently, we can say that code for letter 'D' is '1' because in India rest of the numerals are already taken.

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common. In code as well only digit '8' is common in two codes.

Hence, we can say that letter code for letter 't' is 8.

In words, 'the' and 'peacock' only letter 'e' is common. In code as well only digit '5' is common in two codes.

Hence, we can say that letter code for letter 'e' is 5. Consequently, we can say that leftover letter, in word "the",

'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "NATIONAL" is 13666689. Hence, we can say that code for the letter L is '1'.

	1	2	3	4	5	6	7	8	9
Letters	L, D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "BIRD" is 1334. 1 corresponds to D and one 3 corresponds to I. Hence, we can say that code for letters 'R' and 'B' are '3' and '4' in any order.

Therefore, we can say that for letter 'B' there are two possible numbers: 3 or 4

Hence, option A is the correct answer.

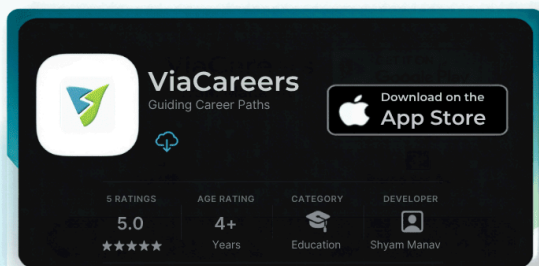
53.B

Also, we can see that code of word 'as' is 56 therefore we can say that A's code is 6. Consequently, we can say that S's code is 5.

There is only one letter 'O' common in words 'of' and 'national'. In code word as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9'. Consequently, we can say that F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets one of them is 'O'. We can see that there are three 9's in Peacock's code. One of the digit '9' is used for 'O'. Remaining two 9's must represent same letter. We can see that only letter 'C' has appeared twice in Peacock. Therefore, we can say that 'C' is assigned number '9'.



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In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6'. Consequently, we can say that code for letter 'D' is '1' because in India rest of the numerals are already taken.

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common. In code as well only digit '8' is common in two codes. Hence, we can say that letter code for letter 't' is 8.

In words, 'the' and 'peacock' only letter 'e' is common. In code as well only digit '5' is common in two codes. Hence, we can say that letter code for letter 'e' is 5. Consequently, we can say that leftover letter, in word "the", 'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "NATIONAL" is 13666689. Hence, we can say that code for the letter L is '1'.

	1	2	3	4	5	6	7	8	9
Letters	L, D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "DESIGNATED" is 1135556678. Hence, we can say that code for the letter 'G' is '7'.

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

We can see that code for word "PEACOCK" is 5688999. Hence, we can say that code for

the letters 'P' and 'K' is '8'.

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

Digit '1' is used for L and D only. We can not figure out the third letter for which digit 1 is used.

Digit '2' is not used for any letter. Hence, we can not figure out all the letters for which digit 2 is correct code.

Digit '3' is used for letter 'I' only. Hence, we can not figure out all the letters for which digit 3 is correct code.

Digit '4' is used for letters 'H' and one of 'B' and 'R'. Hence, we can not figure out all the letters for which digit 4 is correct code.

Digit '5' is used for letters 'S' and 'E'. We can not figure out the third letter for which digit 5 is used.

Digit '6' is used for letters 'A' and 'N'. We can not figure out the third letter for which digit 6 is used.

Digit '7' is used for letters 'G' and 'F'. We can not figure out the third letter for which digit 7 is used.

Digit '8' is used for letters 'T', 'P' and K. Hence, we can say that this is one of the digit for which the complete list of letters associated is known.

Digit '9' is used for letters 'C' and 'O'. Hence, we can say that this is one of the digit for which the complete list of letters associated is known.

Therefore, we can say that for only two digits (8 and 9), the complete list of letters associated is known. Hence, option B is the correct answer.

54.C

Also, we can see that code of word 'as' is 56 therefore we can say that A's code is 6.

Consequently, we can say that S's code is 5.

There is only one letter 'O' common in words 'of' and 'national'. In code word as well only digit '9' is common in both. Hence, we can say that letter 'O' is assigned numerical '9'. Consequently, we can say that F is assigned number 7.

	1	2	3	4	5	6	7	8	9
Letters			I		S	A	F		O

It is given that '9' is assigned to only two alphabets one of them is 'O'. We can see that there are three 9's in

Peacock's code. One of the digit '9' is used for 'O'. Remaining two 9's must represent same letter. We can see that only letter 'C' has appeared twice in Peacock. Therefore, we can say that 'C' is assigned number '9'.

In word national 'N' has appeared twice. In code only digit '6' has appeared more than once. Hence, we can say that code of letter N is '6'. Consequently, we can say that code for letter 'D' is '1' because in India rest of the numerals are already taken.

	1	2	3	4	5	6	7	8	9
Letters	D		I		S	N, A	F		C, O

In words, 'the' and 'national' only letter 't' is common. In code as well only digit '8' is common in two codes.

Hence, we can say that letter code for letter 't' is 8.

In words, 'the' and 'peacock' only letter 'e' is common. In code as well only digit '5' is common in two codes.

Hence, we can say that letter code for letter 'e' is 5. Consequently, we can say that leftover letter, in word "the", 'H's code is 4.

	1	2	3	4	5	6	7	8	9
Letters	D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "NATIONAL" is 13666689. Hence, we can say that code

for the letter L is '1'.

We can see that code for word "DESIGNATED" is 1135556678. Hence, we can say that code for the letter 'G' is '7'.

	1	2	3	4	5	6	7	8	9
Letters	L, D		I	H	S, E	N, A	F	T	C, O

We can see that code for word "PEACOCK" is 5688999. Hence, we can say that code for the letters 'P' and 'K' is '8'.

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

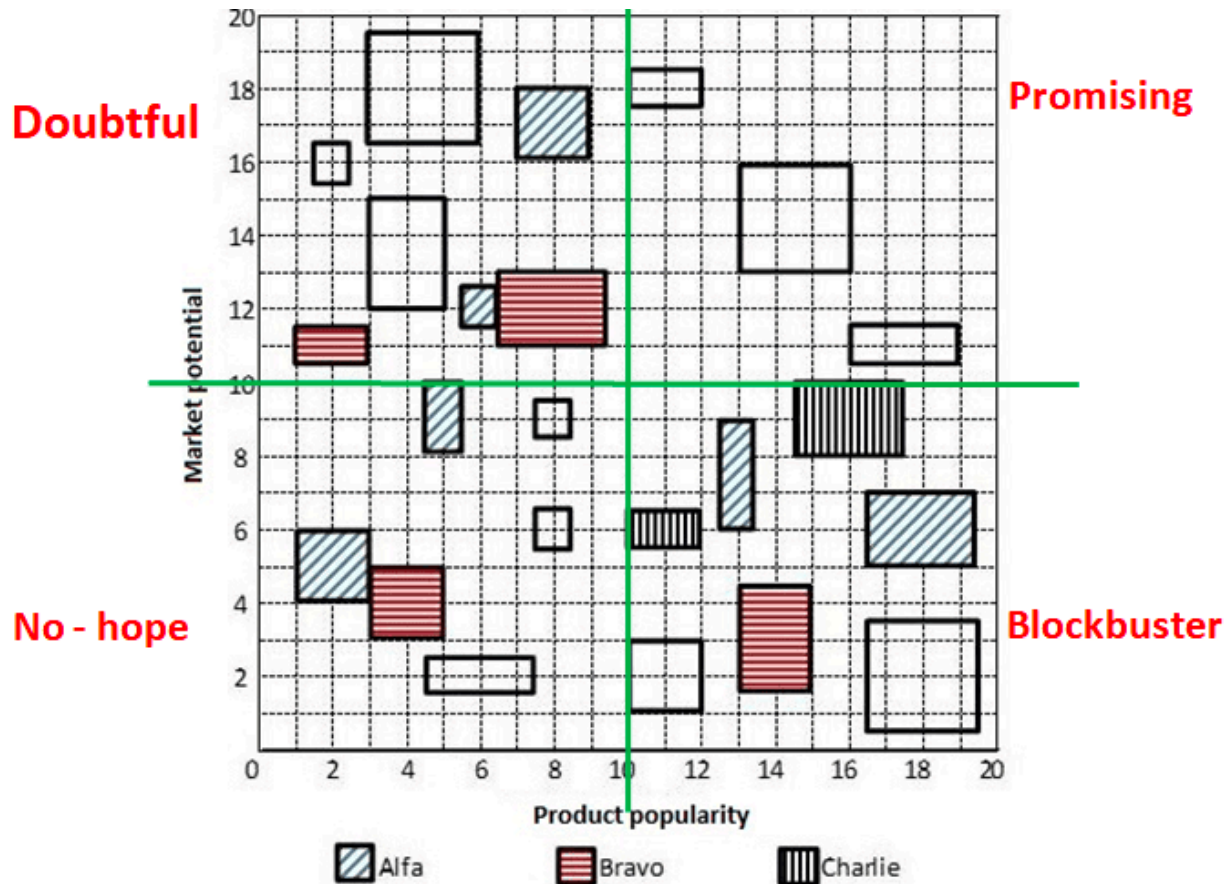


Let us check this by options:

- (A) S,E,Z: If letter 'Z' is assigned code '5' then this case is possible.
- (B) I,B,M: If letters 'B' and 'M' are assigned code '3' then this case is possible.
- (C) S,U,V: If letters 'U' and 'V' are assigned code '5' then this case is possible. But in that case digit 5 will have 4 letters associated with it which is not possible. Hence, this is the answer.
- (D) X,Y,Z: If letters 'X', 'Y' and 'Z' are assigned code '2' then this case is possible.

55.B

Let us divide the given figure in four quadrants (Q1, Q2, Q3, Q4).



Let us solve this problem by considering only one category at a time.

(A) Blockbuster category: We have two information regarding Blockbuster category.

1. Alfa and Bravo had the same number of products in the Blockbuster category.

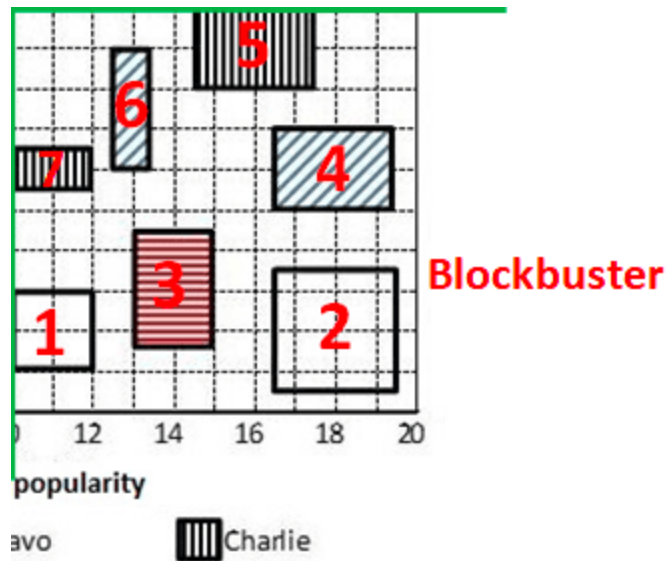
There are a total of 7 products in Blockbuster category. Alfa already has two products in blockbuster category.

If Alfa has 3 products in blockbuster category then Bravo will also have 3 products in Blockbuster category

which is not possible as there are 2 products of Charlie. Hence, we can say that Alfa and Bravo have 2 products each in Blockbuster category whereas Charlie has 3 products in Blockbuster category.

2. It is also given that Charlie had a higher revenue than Bravo from products in the

Blockbuster category



We know that one of the product 1 and 2 is from Charlie and the other is from Bravo.

If product 1 is from Charlie, then we can say that products 1, 7 and 5 are from Charlie. Therefore, revenue generated by products in Charlie category = $2 + 4 + 6 = 12$ units. (Assuming area of a square to be 1 unit)

In this case product 2 and product 4 are from Bravo. Therefore, revenue generated by products in Bravo category = $6 + 9 = 15$ units.

We can see that products from Charlie have a higher revenue than Bravo. Hence, this case is not possible.

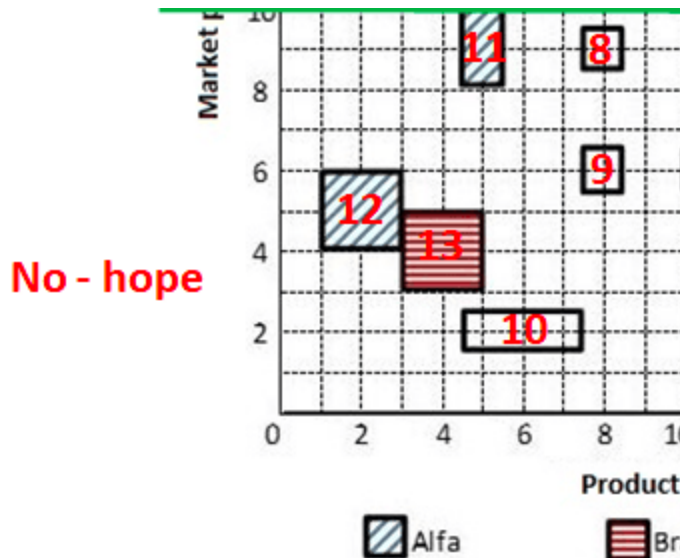
Therefore, we can say that Product 1 is from Bravo and Product 2 is from Charlie. We have determined each product's company name in Blockbuster category.

(B) No-hope category: We have two information regarding No-hope category.

(1) Charlie had more products than Bravo but fewer products than Alfa in the No-hope category. Bravo and Charlie had the same revenue from products in the No-hope

category. There are a total of 6 products in no-hope category.

Therefore, we can say that Alfa, Charlie and Bravo have 3, 2 and 1 products in No-hope category in that order.



Bravo and Charlie had the same revenue from products in the No-hope category.

Revenue generated for Bravo in the No-hope category = 4 units. We need same revenue for Charlie which has 2

products in this category. Hence, we can say that Product 10 and one of product 8 and 9 is from Charlie and

other is from Alfa. Let's assume that product 8 is from Charlie and product 9 is from Alfa.

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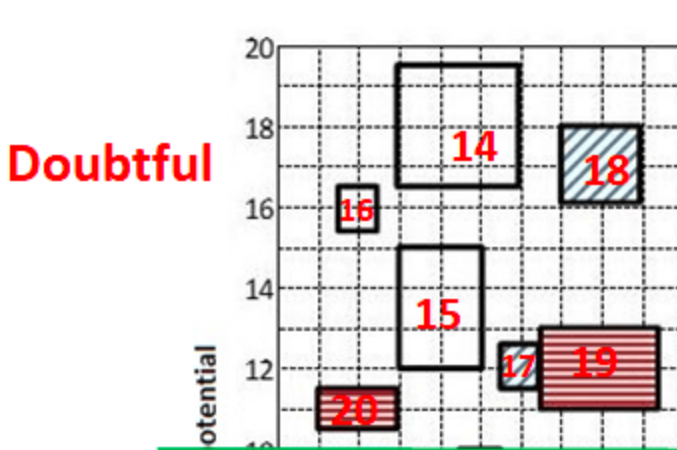
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(C) Doubtful category: We have two information regarding Doubtful category.

(1). Charlie did not have any product in the Doubtful category, while Alfa had one product more than Bravo in this category .

(2). Bravo had a higher revenue than Alfa from products in the Doubtful category.

We can see that there are a total of 7 products in this category. Hence, we can say that 4 products are from Alfa and 3 products are from Bravo.



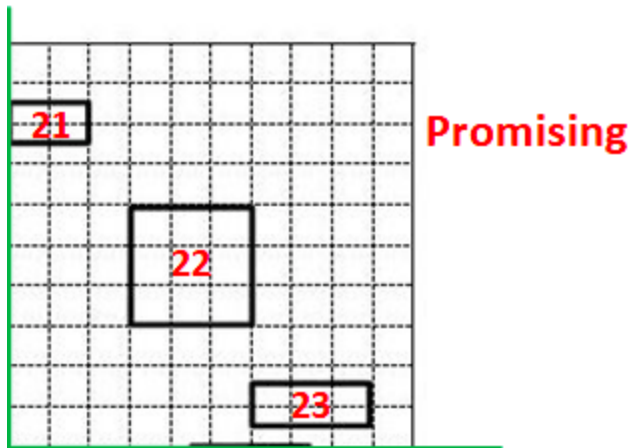
We can see that one of product 14, 15 and 16 is from Bravo company and others are from Alfa company. Bravo will have higher revenue than Alfa only when product no. 14 is from Bravo and others (15 and 16) are from Alfa category.

In this case total revenue by Bravo = Product 14 + Product 19 + Product 20 = 9 + 6 + 2 = 17

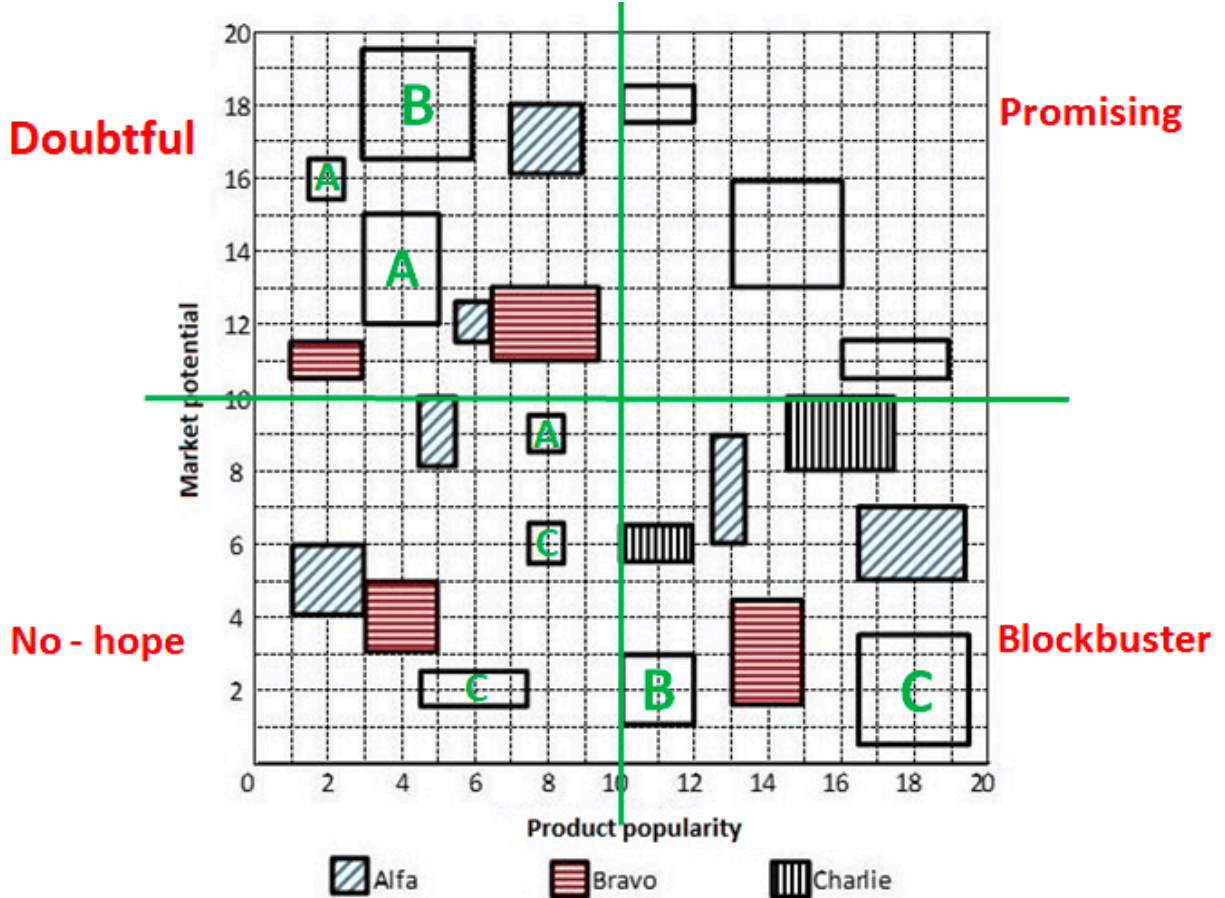
Similarly, total revenue by Charlie = Product 15 + Product 16 + Product 17 + Product 18 = 6 + 1 + 1 + 4 = 12

(D) Promising category: We have only 1 direct information regarding Promising category.

1. Each company had an equal number of products in the Promising category.



There are a total of 3 products in promising category with different revenue. Therefore, we can say that each company had 1 product in promising category. We are given that Alfa and Charlie had the same total revenue considering all products. We can calculate the revenue generated by Alfa and Charlie from the products in categories.



Revenue generated by Charlie from all categories except Promising = From Blockbuster + From No-hope + From Doubtful



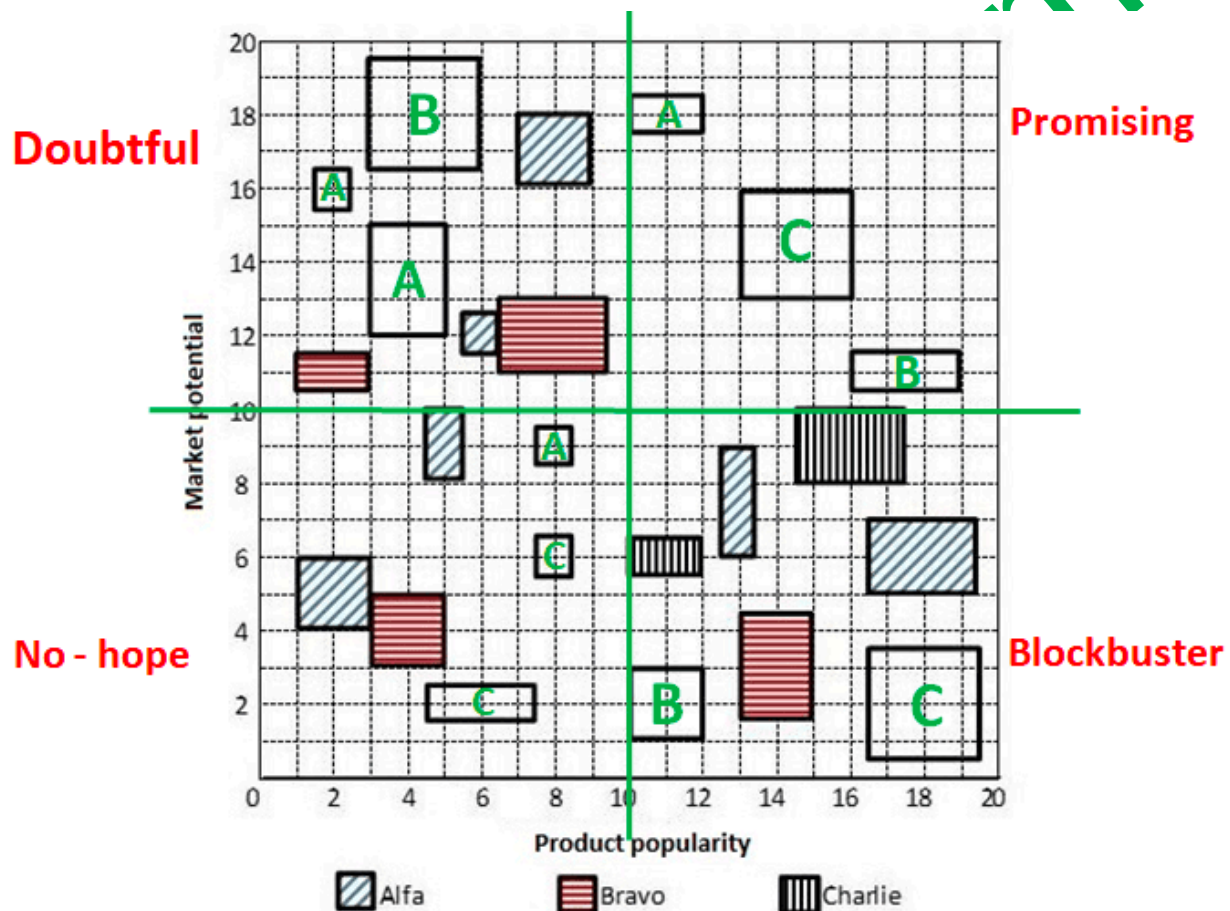
$$= (9+6+2) + (3+1) + (0) = 21 \text{ units}$$

Revenue generated by Alfa from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$(6+3) + (4+2+1) + (1+6+4+1) = 28 \text{ units}$$

We can see the difference between revenue generated by Charlie and Alfa from remaining categories is 7 units.

Hence, we can say that Charlie's product's revenue should be 7 units more than Alfa's product's revenue in Promising category. That is possible only in one case where product 22 is from Charlie and product 21 is from Alfa. Consequently, we can say that product 23 is from Bravo. Now we have identified each product's company name we can answer all the questions.



Revenue generated by the products in Promising category = 2 + 9 + 3 = 14 units.

Revenue generated by the products in Doubtful category = 1 + 9 + 4 + 6 + 2 + 1 + 6 = 29 units.

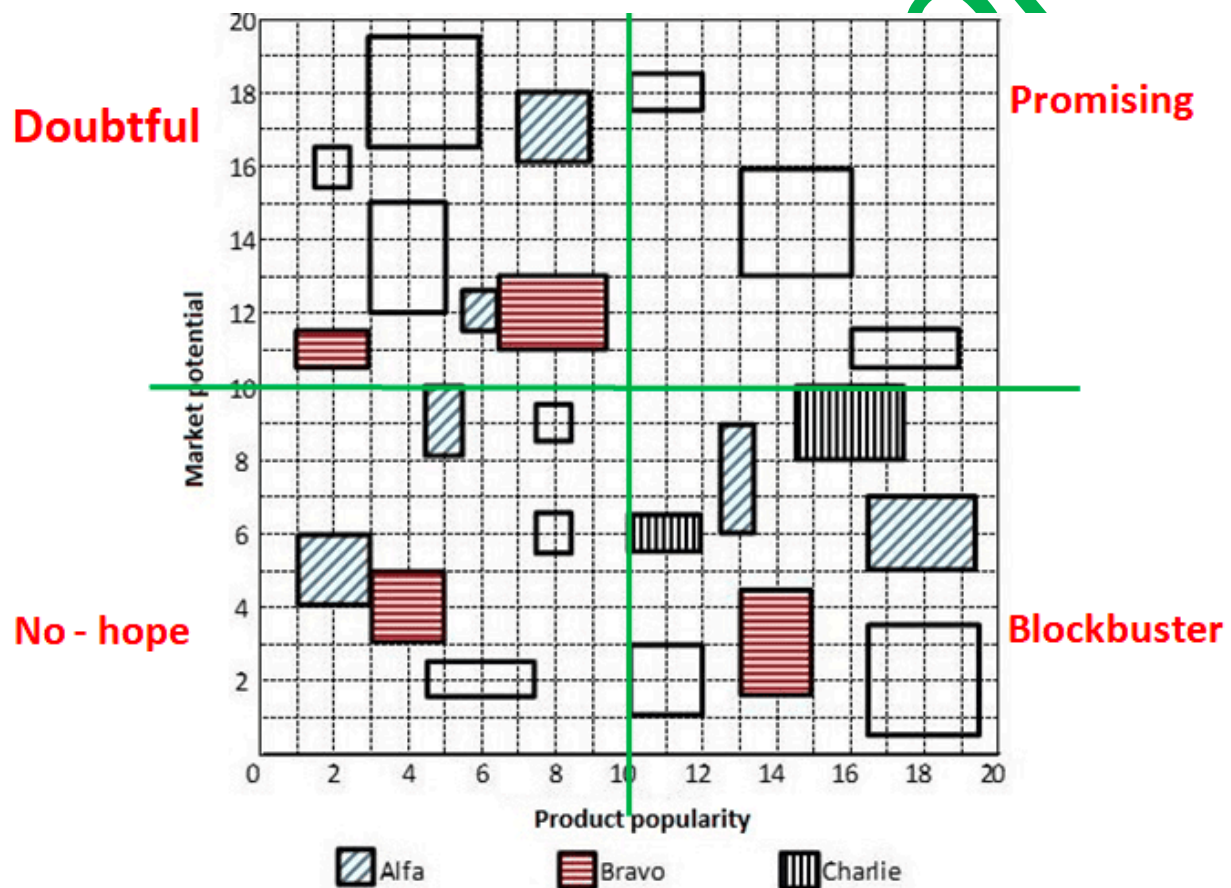
Revenue generated by the products in No-hope category = $4 + 4 + 3 + 2 + 1 + 1 = 15$ units.

Revenue generated by the products in Blockbuster category = $6 + 3 + 6 + 2 + 4 + 6 + 9 = 36$ units.

We can see that the revenue generated is the highest for Blockbuster category. Hence, option B is the correct answer.

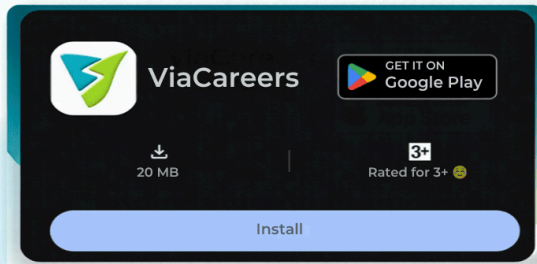
56.A

Let us divide the given figure in four quadrants (Q1, Q2, Q3, Q4).



Let us solve this problem by considering only one category at a time.

(A) Blockbuster category: We have two information regarding Blockbuster category.



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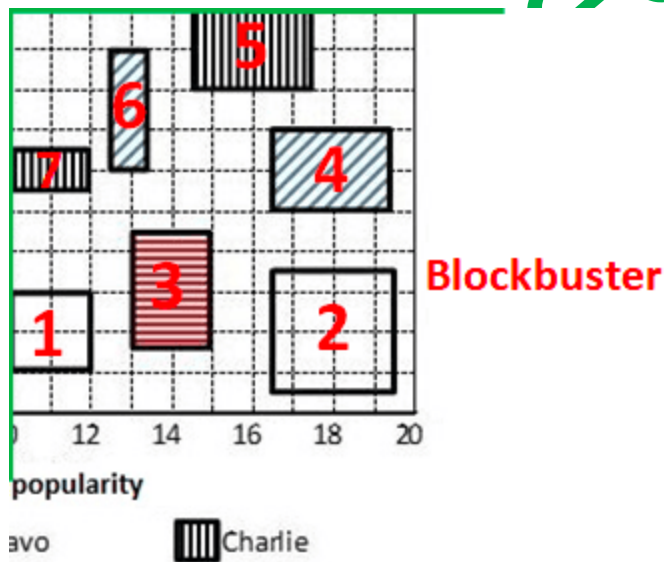
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1. Alfa and Bravo had the same number of products in the Blockbuster category.

There are a total of 7 products in Blockbuster category. Alfa already has two products in blockbuster category.

If Alfa has 3 products in blockbuster category then Bravo will also have 3 products in Blockbuster category which is not possible as there are 2 products of Charlie. Hence, we can say that Alfa and Bravo have 2 products each in Blockbuster category whereas Charlie has 3 products in Blockbuster category.

2. It is also given that Charlie had a higher revenue than Bravo from products in the Blockbuster category.



We know that one of the product 1 and 2 is from Charlie and the other is from Bravo.

If product 1 is from Charlie, then we can say that products 1, 7 and 5 are from Charlie.

Therefore, revenue generated by products in Charlie category = $2 + 4 + 6 = 12$ units.
(Assuming area of a square to be 1 unit)

In this case product 2 and product n are from Bravo. Therefore, revenue generated by products in Bravo category

$$= 6 + 9 = 15 \text{ units.}$$

We can see that products from Charlie have a higher revenue than Bravo. Hence, this case is not possible.

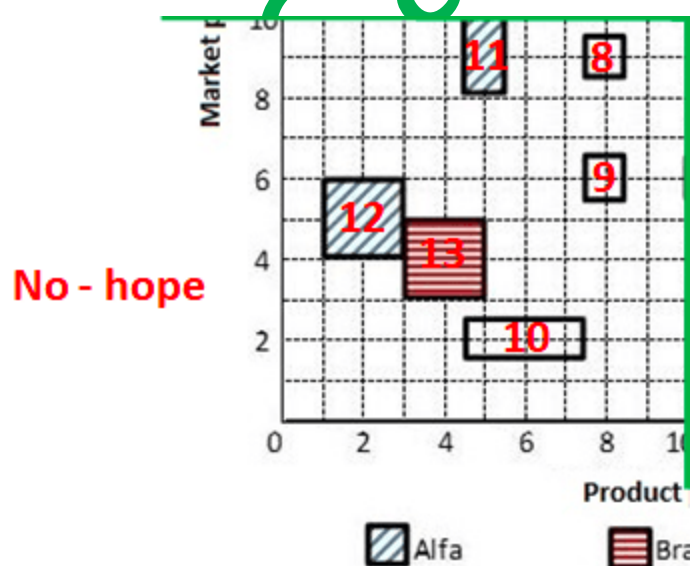
Therefore, we can say that Product 1 is from Bravo and Product 2 is from Charlie. We have determined each product's company name in Blockbuster category.

(B) No-hope category: We have two information regarding No-hope category.

(1) Charlie had more products than Bravo but fewer products than Alfa in the No-hope category. Bravo and

Charlie had the same revenue from products in the No-hope category. There are a total of 6 products in no-hope category.

Therefore, we can say that Alfa, Charlie and Bravo have 3, 2 and 1 products in No-hope category in that order.



Bravo and Charlie had the same revenue from products in the No-hope category.

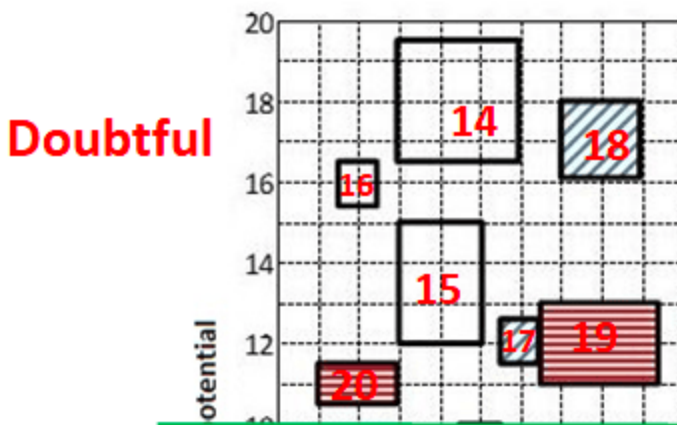
Revenue generated for Bravo in the No-hope category = 4 units. We need same revenue for Charlie which has 2 products in this category. Hence, we can say that Product 10 and one of product 8 and 9 is from Charlie and other is from Alfa. Let's assume that product 8 is from Charlie and product 9 is from Alfa.

(C) Doubtful category: We have two information regarding Doubtful category.

(1). Charlie did not have any product in the Doubtful category, while Alfa had one product more than Bravo in this category .

(2). Bravo had a higher revenue than Alfa from products in the Doubtful category.

We can see that there are a total of 7 products in this category. Hence, we can say that 4 products are from Alfa and 3 products are from Bravo.



We can see that one of product 14, 15 and 16 is from Bravo company and others are from Alfa company. Bravo will have higher revenue than Alfa only when product no. 14

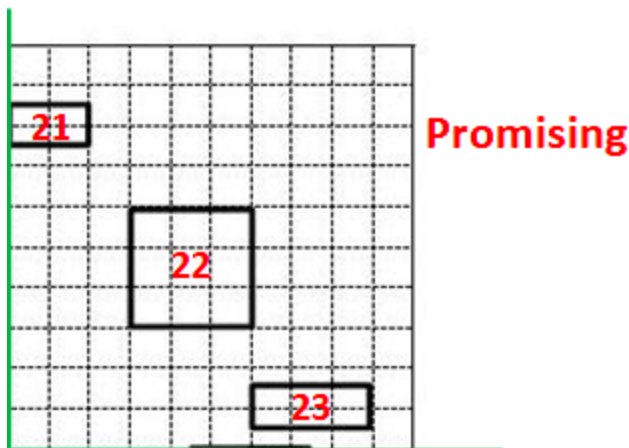
is from Bravo and others (15 and 16) are from Alfa category.

In this case total revenue by Bravo = Product 14 + Product 19 + Product 20 = $9 + 6 + 2 = 17$

Similarly, total revenue by Charlie = Product 15 + Product 16 + Product 17 + Product 18 = $6 + 1 + 1 + 4 = 12$

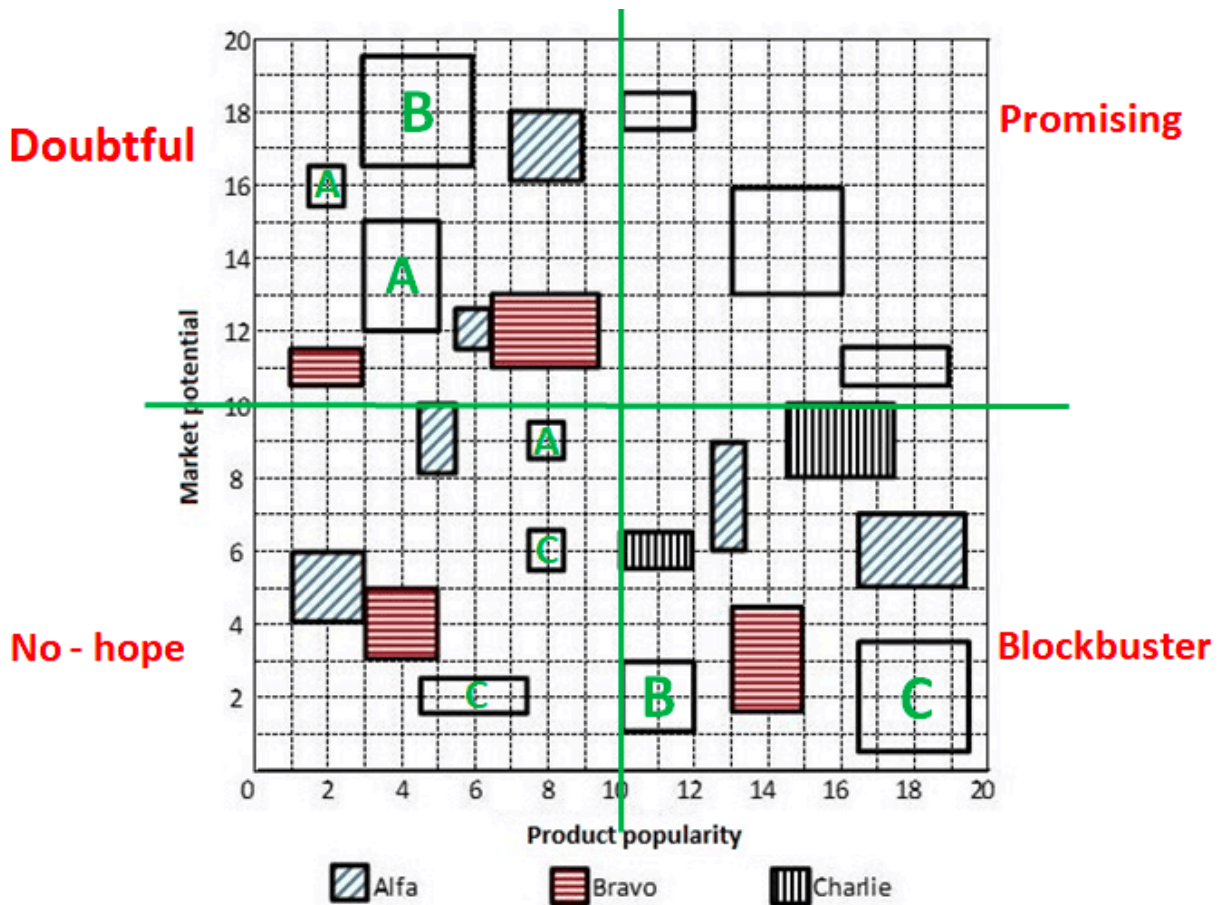
(D) Promising category: We have only 1 direct information regarding Promising category.

1. Each company had an equal number of products in the Promising category.



There are a total of 3 products in promising category with different revenue. Therefore, we can say that each

company had 1 product in promising category. We are given that Alfa and Charlie had the same total revenue considering all products. We can calculate the revenue generated by Alfa and Charlie from the products in categories.



Revenue generated by Charlie from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$(9+6+2) + (3+1) + (0) = 21 \text{ units}$$

Revenue generated by Alfa from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$(6+3) + (4+2+1) + (1+6+4+1) = 28 \text{ units}$$

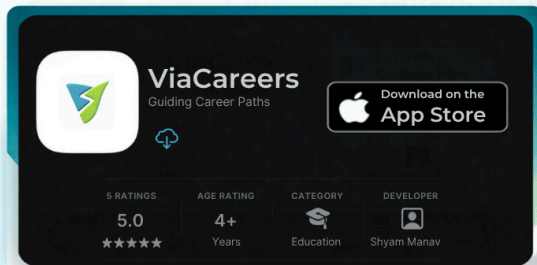
We can see the difference between revenue generated by Charlie and Alfa from remaining categories is 7 units.

Hence, we can say that Charlie's product's revenue should be 7 units more than Alfa's product's revenue in

Promising category. That is possible only in one case where product 22 is from Charlie and product 21 is from

Alfa. Consequently, we can say that product 23 is from Bravo. Now we have identified each product's company

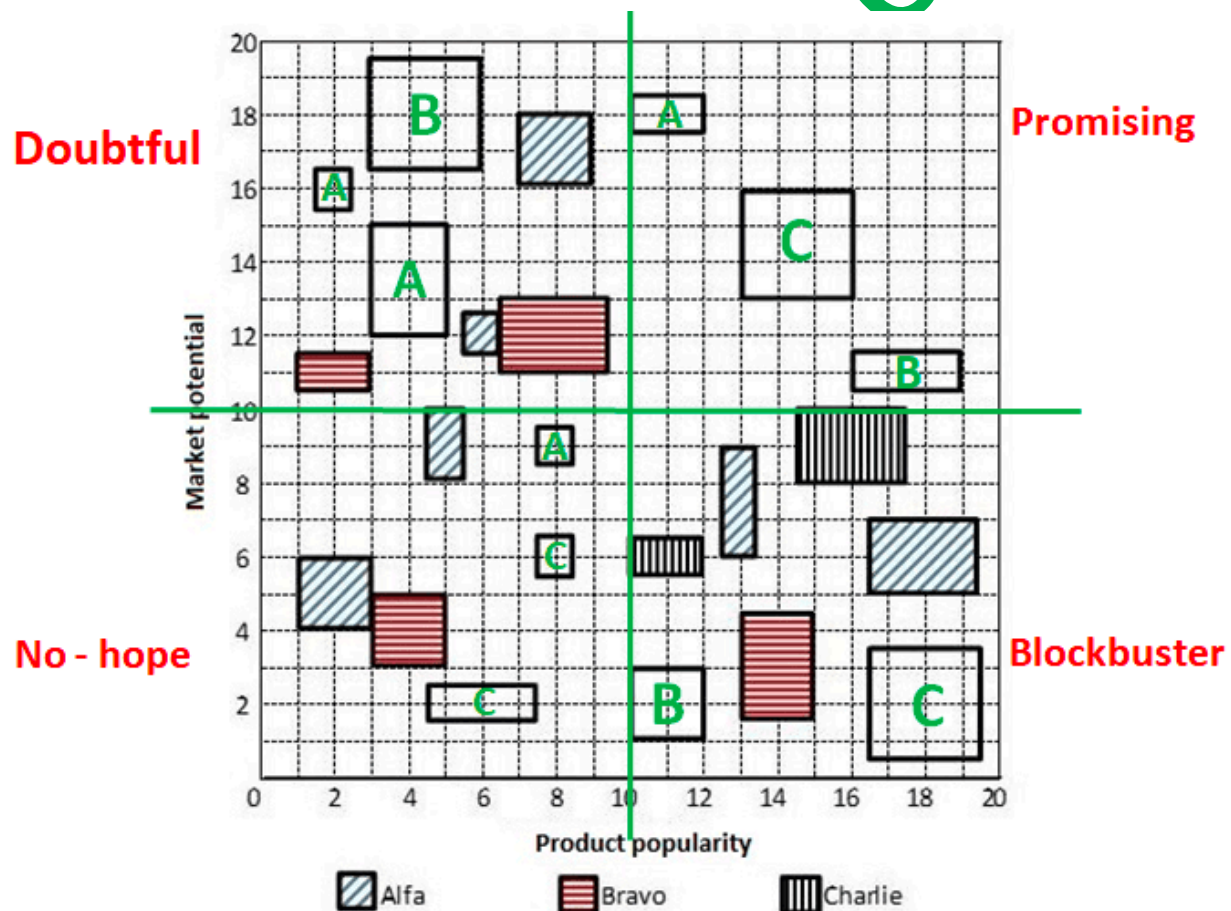
name we can answer all the questions.



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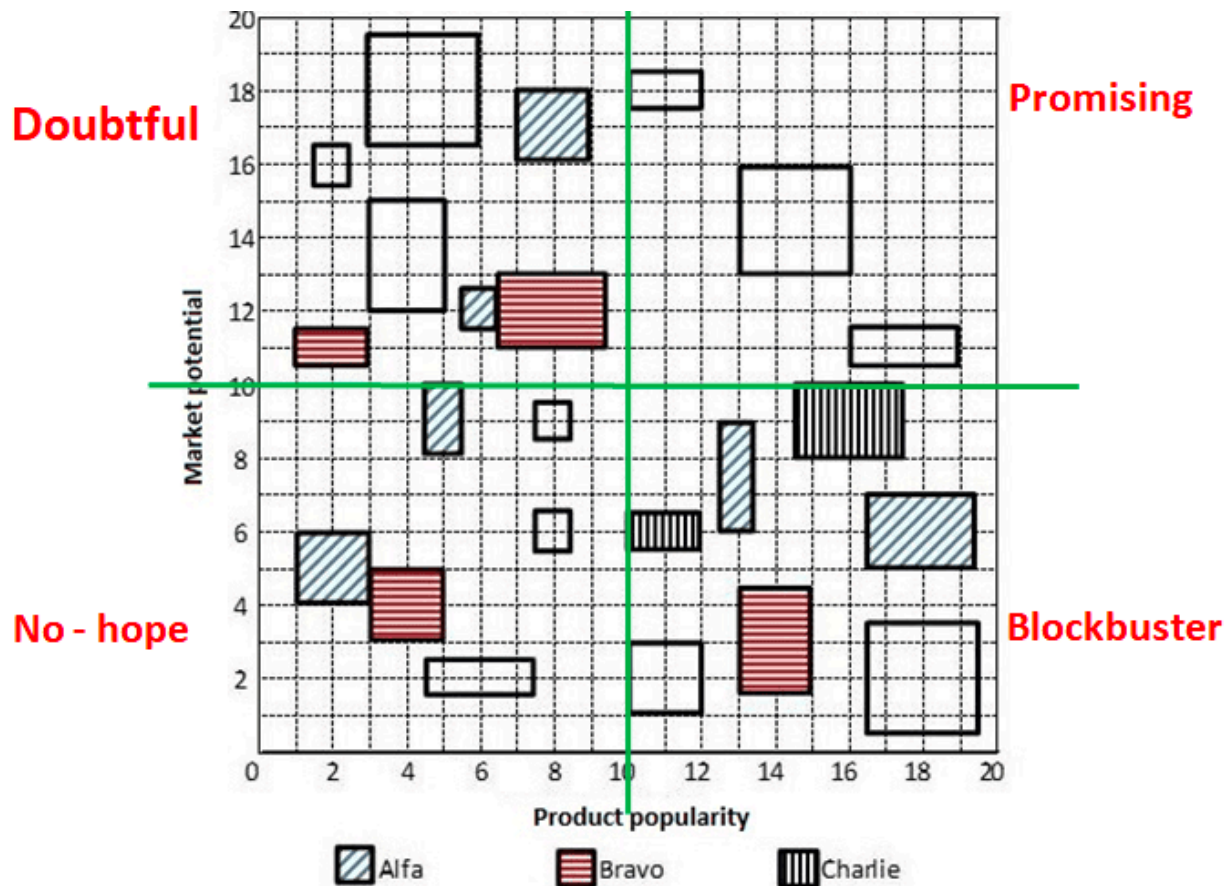
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Bravo had in No-hope, Doubtful, Promising and Blockbuster categories respectively = 1, 3, 1, 2. Hence, option A is the correct answer.

57.B

Let us divide the given figure in four quadrants (Q1, Q2, Q3, Q4).



Let us solve this problem by considering only one category at a time.

(A) Blockbuster category: We have two information regarding Blockbuster category.

1. Alfa and Bravo had the same number of products in the Blockbuster category.

There are a total of 7 products in Blockbuster category. Alfa already has two products in blockbuster category.

If Alfa has 3 products in blockbuster category then Bravo will also have 3 products in

Blockbuster category which is not possible as there are 2 products of Charlie. Hence, we can say that Alfa and Bravo have 2 products each in Blockbuster category whereas Charlie has 3 products in Blockbuster category.

2. It is also given that Charlie had a higher revenue than Bravo from products in the Blockbuster category

Let us solve this problem by considering only one category at a time.

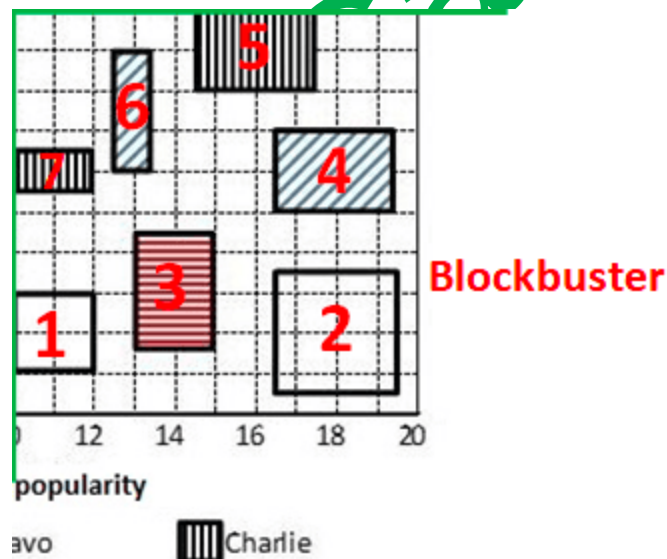
(A) Blockbuster category: We have two information regarding Blockbuster category.

1. Alfa and Bravo had the same number of products in the Blockbuster category.

There are a total of 7 products in Blockbuster category. Alfa already has two products in blockbuster category.

If Alfa has 3 products in blockbuster category then Bravo will also have 3 products in Blockbuster category which is not possible as there are 2 products of Charlie. Hence, we can say that Alfa and Bravo have 2 products each in Blockbuster category whereas Charlie has 3 products in Blockbuster category.

2. It is also given that Charlie had a higher revenue than Bravo from products in the Blockbuster category.



We know that one of the product 1 and 2 is from Charlie and the other is from Bravo.

If product 1 is from Charlie, then we can say that products 1, 7 and 5 are from Charlie. Therefore, revenue

generated by products in Charlie category = $2 + 4 + 6 = 12$ units. (Assuming area of a square to be 1 unit)

In this case product 2 and product n are from Bravo. Therefore, revenue generated by products in Bravo category

= $6 + 9 = 15$ units.

We can see that products from Charlie have a higher revenue than Bravo. Hence, this case is not possible.

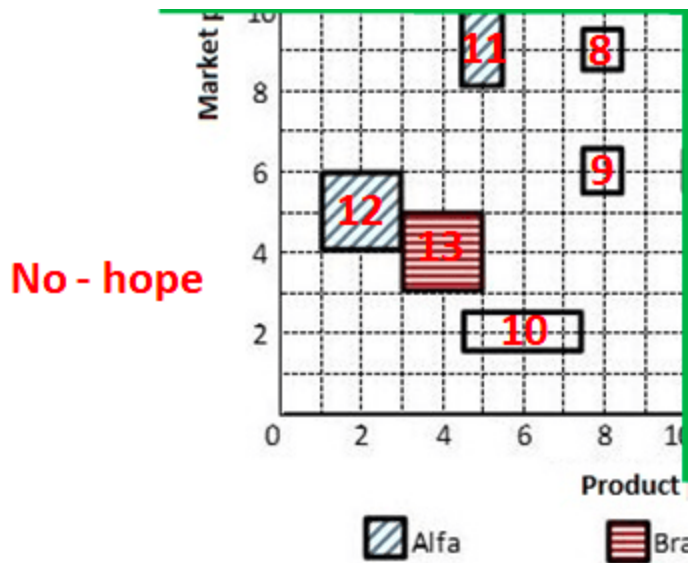
Therefore, we can say that Product 1 is from Bravo and Product 2 is from Charlie. We have determined each product's company name in Blockbuster category.



(B) No-hope category: We have two information regarding No-hope category.

(1) Charlie had more products than Bravo but fewer products than Alfa in the No-hope category. Bravo and Charlie had the same revenue from products in the No-hope category. There are a total of 6 products in no-hope category.

Therefore, we can say that Alfa, Charlie and Bravo have 3, 2 and 1 products in No-hope category in that order.



Bravo and Charlie had the same revenue from products in the No-hope category.

Revenue generated for Bravo in the No-hope category = 4 units. We need same revenue for Charlie which has 2 products in this category. Hence, we can say that Product 10 and one of product 8 and 9 is from Charlie and other is from Alfa. Let's assume that product 8 is from Charlie and product 9 is from Alfa.

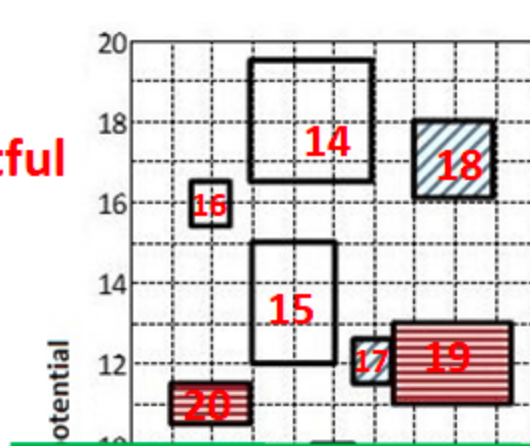
(C) Doubtful category: We have two information regarding Doubtful category.

(1). Charlie did not have any product in the Doubtful category, while Alfa had one product more than Bravo in this category.

(2). Bravo had a higher revenue than Alfa from products in the Doubtful category.

We can see that there are a total of 7 products in this category. Hence, we can say that 4 products are from Alfa and 3 products are from Bravo.

Doubtful



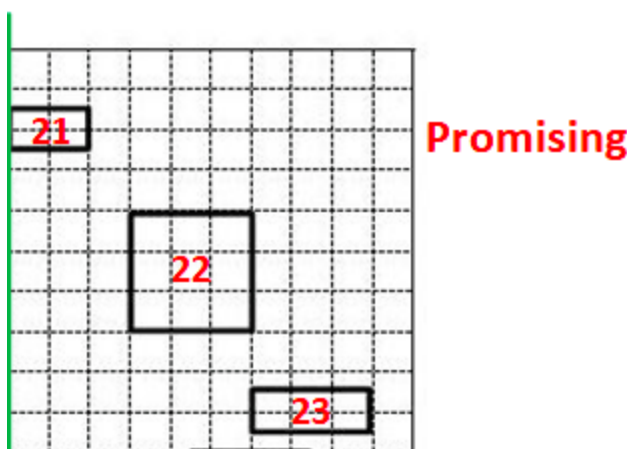
We can see that one of product 14, 15 and 16 is from Bravo company and others are from Alfa company. Bravo will have higher revenue than Alfa only when product no. 14 is from Bravo and others (15 and 16) are from Alfa category.

In this case total revenue by Bravo = Product 14 + Product 19 + Product 20 = $9 + 6 + 2 = 17$

Similarly, total revenue by Charlie = Product 15 + Product 16 + Product 17 + Product 18 = $6 + 1 + 1 + 4 = 12$

(D) Promising category: We have only 1 direct information regarding Promising category.

1. Each company had an equal number of products in the Promising category.





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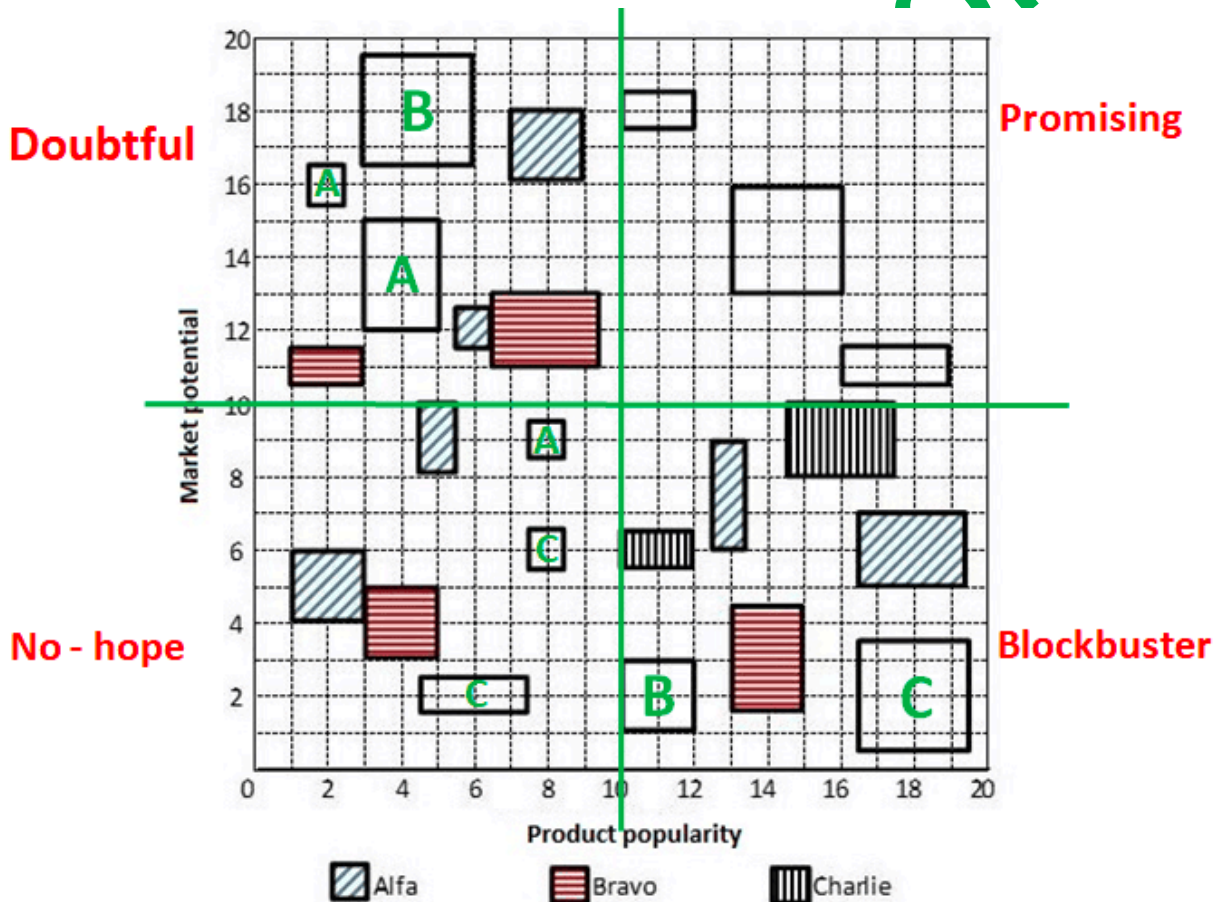
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There are a total of 3 products in promising category with different revenue. Therefore, we can say that each company had 1 product in promising category. We are given that Alfa and Charlie had the same total revenue considering all products. We can calculate the revenue generated by Alfa and Charlie from the products in categories.



Revenue generated by Charlie from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$\Rightarrow (9+6+2) + (3+1) + (0) = 21 \text{ units}$$

Revenue generated by Alfa from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$(6+3) + (4+2+1) + (1+6+4+1) = 28 \text{ units}$$

We can see the difference between revenue generated by Charlie and Alfa from remaining categories is 7 units.

Hence, we can say that Charlie's product's revenue should be 7 units more than Alfa's product's revenue in

Promising category. That is possible only in one case where product 22 is from Charlie and product 21 is from

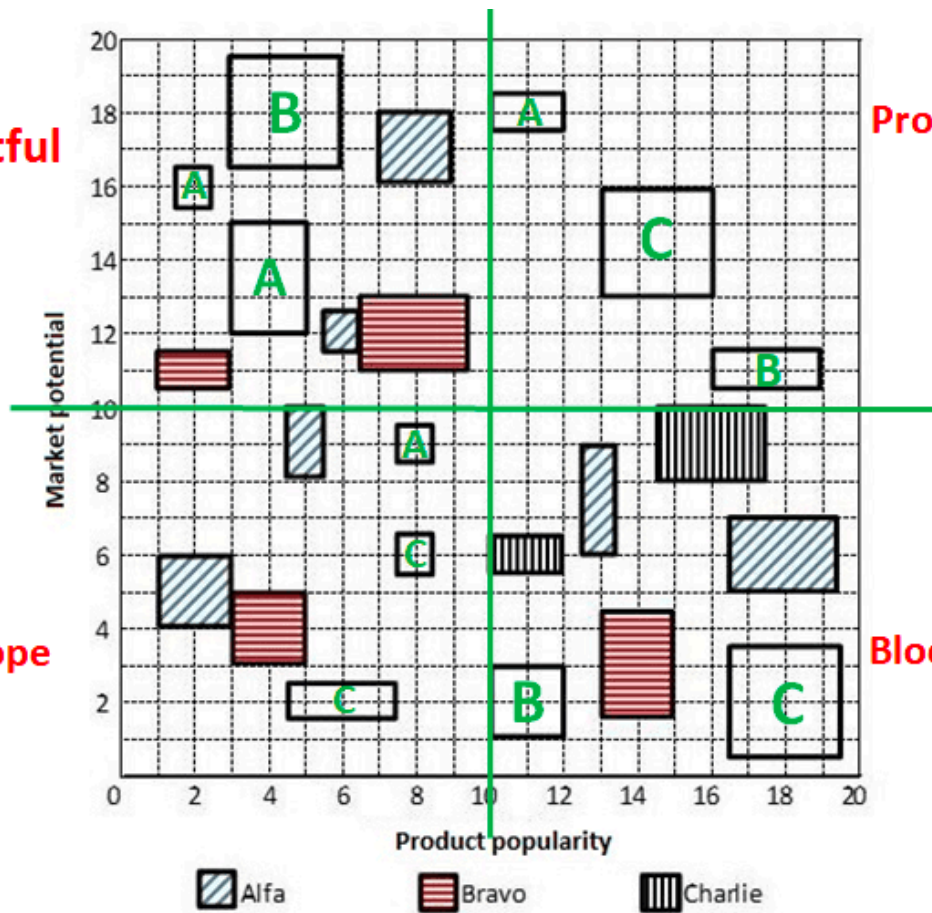
Alfa. Consequently, we can say that product 23 is from Bravo. Now we have identified each product's company name we can answer all the questions.

Doubtful

Promising

No - hope

Blockbuster



Let us check all options.

Option (A): Alfa's revenue from Blockbuster products was the same as Charlie's revenue from Promising products

Alfa's revenue from Blockbuster products = $6 + 3 = 9$ units.

Charlie's revenue from Promising products = 9 units. Hence, this statement is true.

Option (B): Bravo's revenue from Blockbuster products was greater than Alfa's revenue from Doubtful products. Bravo's revenue from Blockbuster products = $6 + 4 = 10$ units.

Alfa's revenue from Doubtful products = $6 + 4 + 1 + 1 = 12$ units. Hence, this statement is false.

Option (C): Bravo and Charlie had the same revenues from No-hope products.

Bravo's revenue from No-hope products = 4 units.

Charlie's revenue from No-hope products = $3 + 1 = 4$ units. Hence, this statement is true.

Option (D): The total revenue from No-hope products was less than the total revenue from Doubtful products



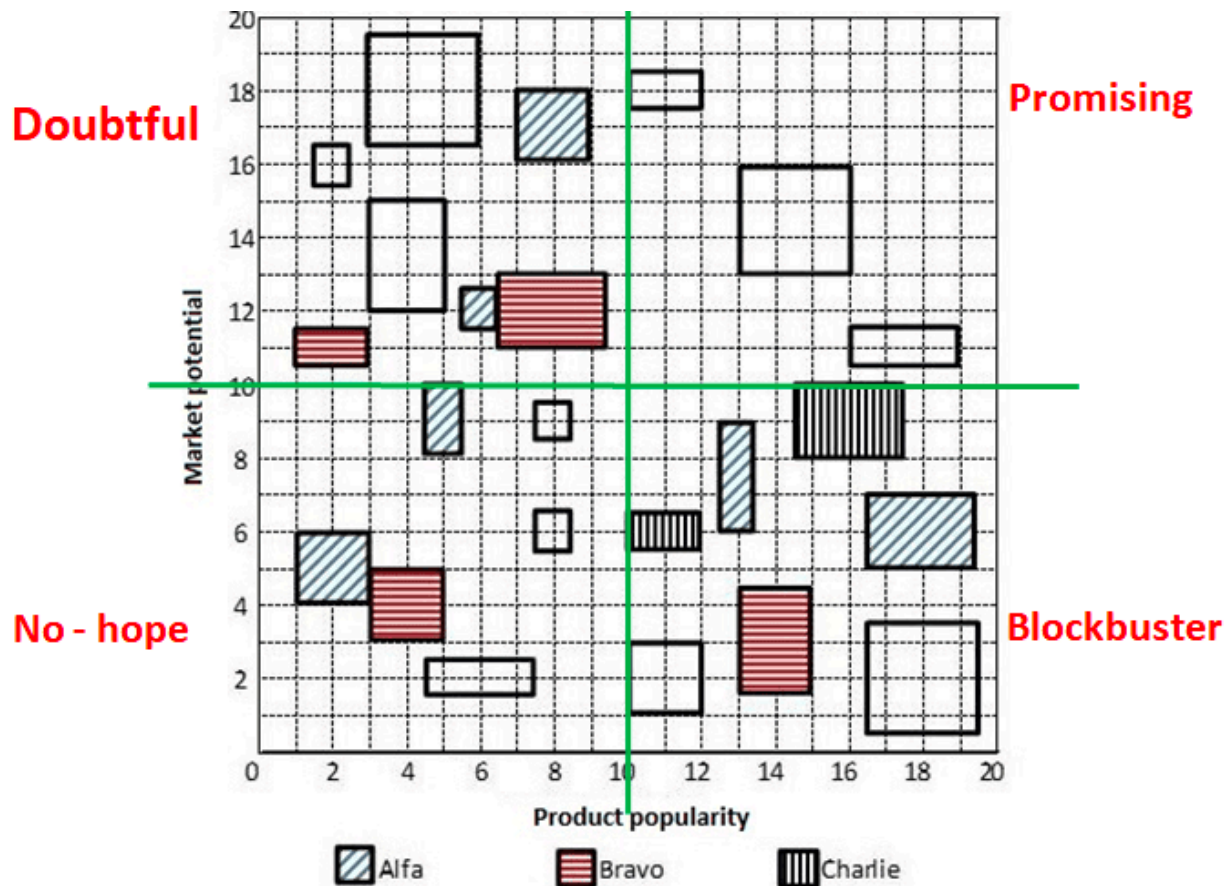
Revenue generated by the products in Doubtful category = $1 + 9 + 4 + 6 + 2 + 1 + 6 = 29$ units.

Revenue generated by the products in No-hope category = $4 + 4 + 3 + 2 + 1 + 1 = 15$ units. Hence, this statement is true.

We can see that statement mentioned in option B is false. Therefore, option B is the correct answer.

58.C

Let us divide the given figure in four quadrants (Q1, Q2, Q3, Q4).



Let us solve this problem by considering only one category at a time.

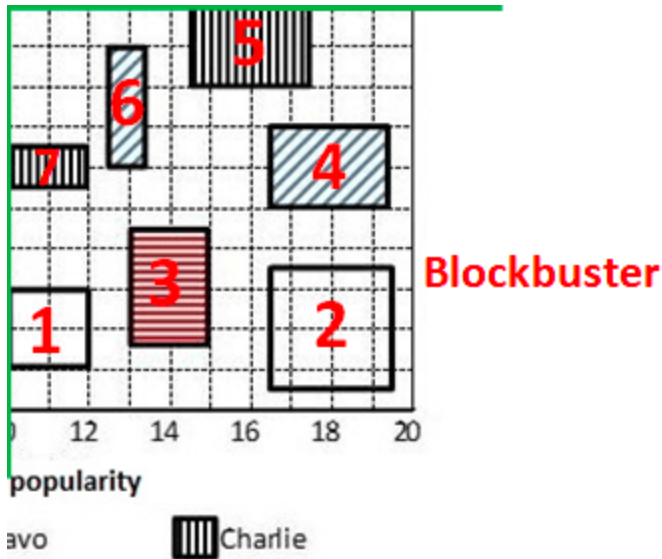
(A) Blockbuster category: We have two information regarding Blockbuster category.

1. Alfa and Bravo had the same number of products in the Blockbuster category.

There are a total of 7 products in Blockbuster category. Alfa already has two products in blockbuster category.

If Alfa has 3 products in blockbuster category then Bravo will also have 3 products in Blockbuster category which is not possible as there are 2 products of Charlie. Hence, we can say that Alfa and Bravo have 2 products each in Blockbuster category whereas Charlie has 3 products in Blockbuster category.

2. It is also given that Charlie had a higher revenue than Bravo from products in the Blockbuster category.



We know that one of the product 1 and 2 is from Charlie and the other is from Bravo. If product 1 is from Charlie, then we can say that products 1, 7 and 5 are from Charlie. Therefore, revenue generated by products in Charlie category = $2 + 4 + 6 = 12$ units. (Assuming area of a square to be 1 unit) In this case product 2 and product 3 are from Bravo. Therefore, revenue generated by products in Bravo category

= $6 + 9 = 15$ units.

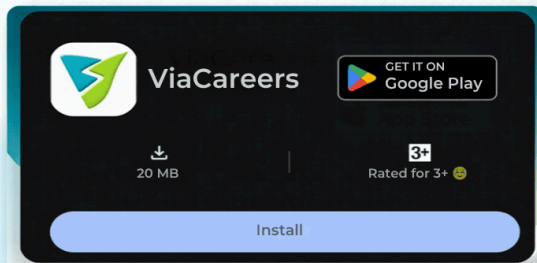
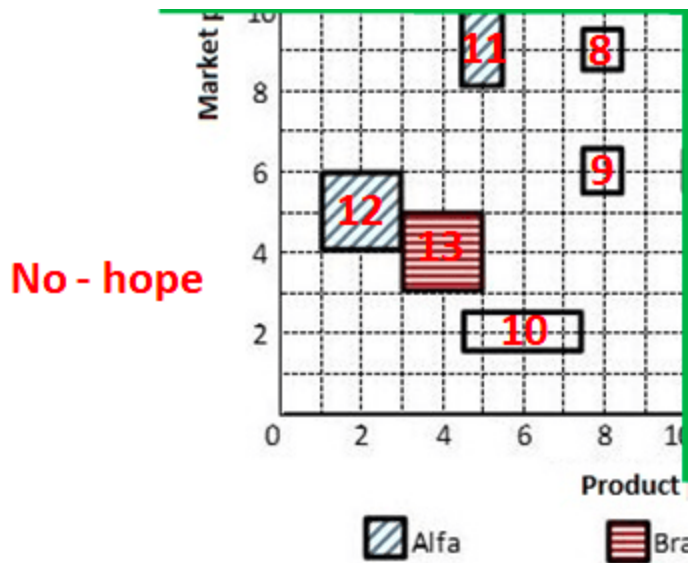
We can see that products from Charlie have a higher revenue than Bravo. Hence, this case is not possible.

Therefore, we can say that Product 1 is from Bravo and Product 2 is from Charlie. We have determined each product's company name in Blockbuster category.

(B) No-hope category: We have two information regarding No-hope category.

(1) Charlie had more products than Bravo but fewer products than Alfa in the No-hope category. Bravo and

Charlie had the same revenue from products in the No-hope category. There are a total of 6 products in no-hope category.



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Bravo and Charlie had the same revenue from products in the No-hope category.

Revenue generated for Bravo in the No-hope category = 4 units. We need same revenue for Charlie which has 2 products in this category. Hence, we can say that Product 10 and one of product 8 and 9 is from Charlie and other is from Alfa. Let's assume that product 8 is from Charlie and product 9 is from Alfa.

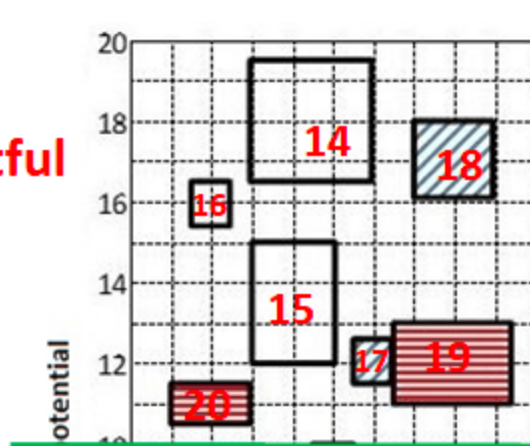
(C) Doubtful category: We have two information regarding Doubtful category.

(1). Charlie did not have any product in the Doubtful category, while Alfa had one product more than Bravo in this category .

(2). Bravo had a higher revenue than Alfa from products in the Doubtful category.

We can see that there are a total of 7 products in this category. Hence, we can say that 4 products are from Alfa and 3 products are from Bravo.

Doubtful



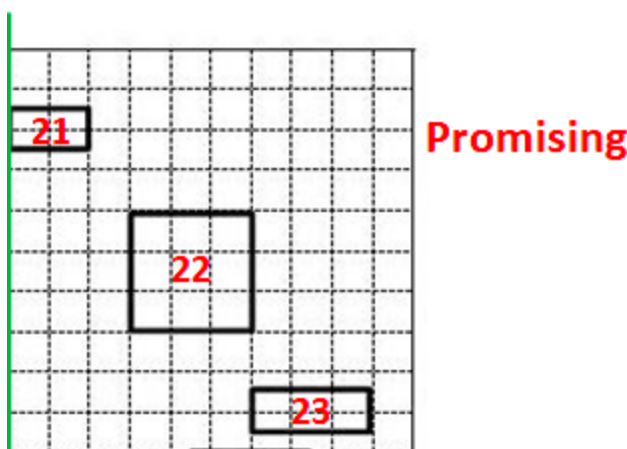
We can see that one of product 14, 15 and 16 is from Bravo company and others are from Alfa company. Bravo will have higher revenue than Alfa only when product no. 14 is from Bravo and others (15 and 16) are from Alfa category.

In this case total revenue by Bravo = Product 14 + Product 19 + Product 20 = 9 + 6 + 2 = 17

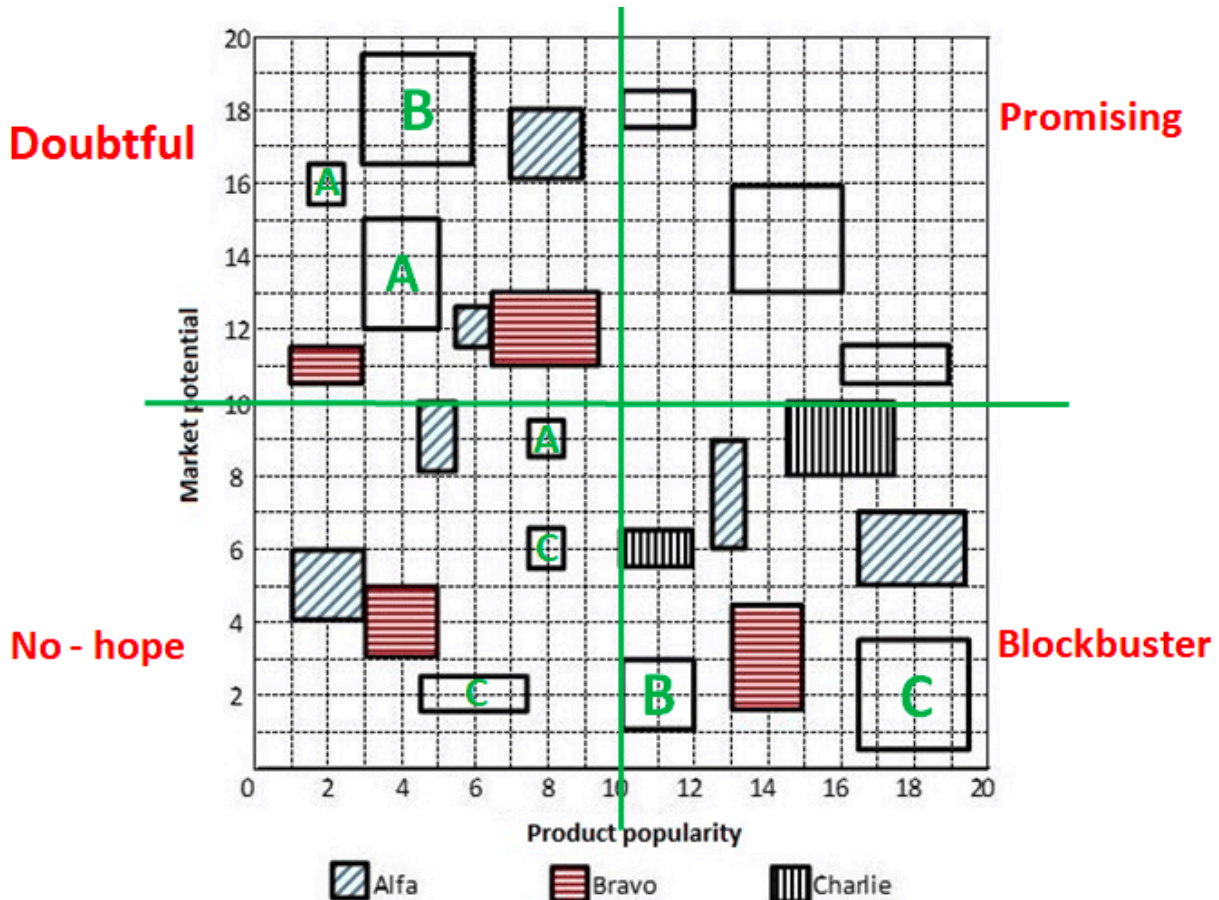
Similarly, total revenue by Alfa = Product 15 + Product 16 + Product 17 + Product 18 = 6 + 1 + 1 + 4 = 12

(D) Promising category: We have only 1 direct information regarding Promising category.

1. Each company had an equal number of products in the Promising category.



There are a total of 3 products in promising category with different revenue. Therefore, we can say that each company had 1 product in promising category. We are given that Alfa and Charlie had the same total revenue considering all products. We can calculate the revenue generated by Alfa and Charlie from the products in categories.



Revenue generated by Charlie from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

$$(9+6+2) + (3+1) + (0) = 21 \text{ units}$$

Revenue generated by Alfa from all categories except Promising = From Blockbuster + From No-hope + From Doubtful

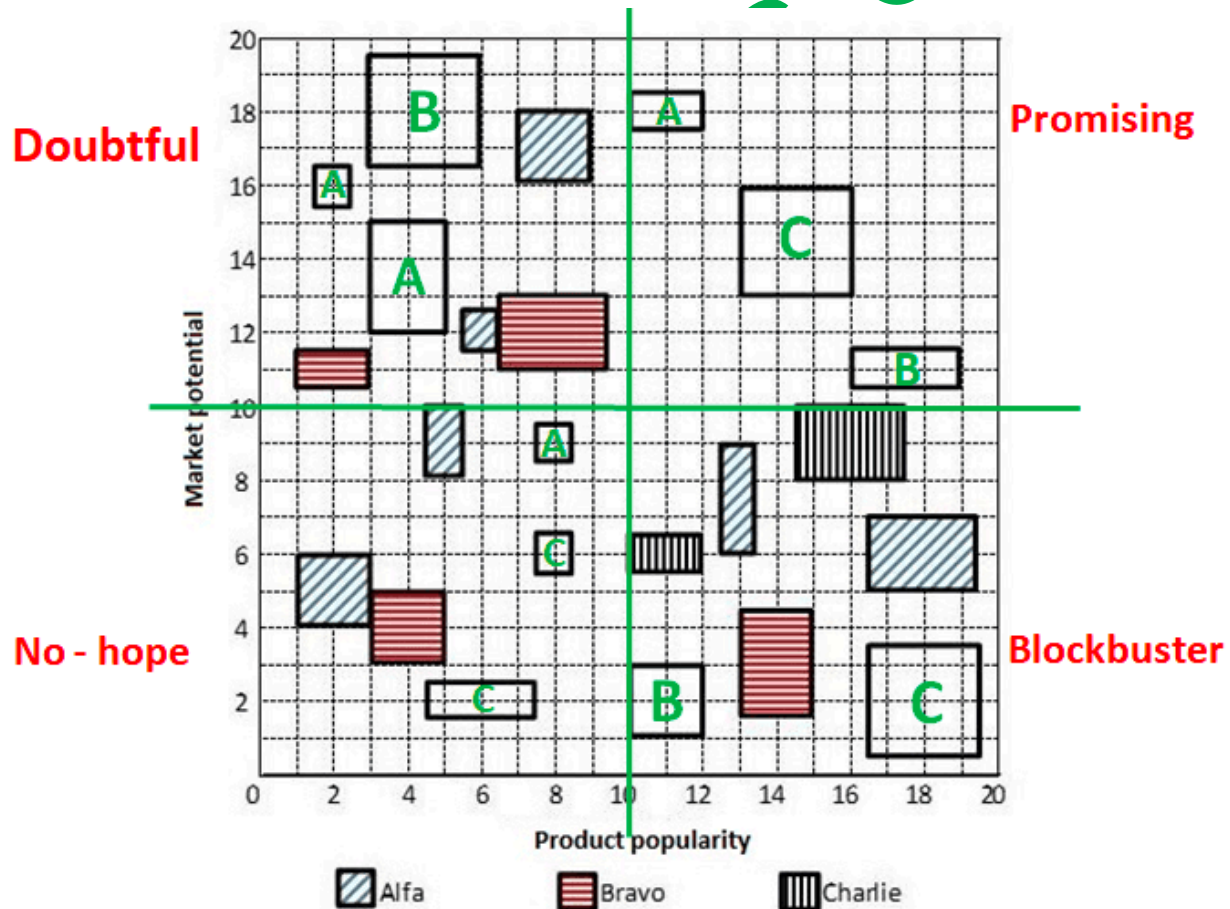
$$(6+3) + (4+2+1) + (1+6+4+1) = 28 \text{ units}$$

We can see the difference between revenue generated by Charlie and Alfa from



remaining categories is 7 units.

Hence, we can say that Charlie's product's revenue should be 7 units more than Alfa's product's revenue in Promising category. That is possible only in one case where product 22 is from Charlie and product 21 is from Alfa. Consequently, we can say that product 23 is from Bravo. Now we have identified each product's company name we can answer all the questions.



Total revenue generated by Bravo products alone = From Blockbuster + From No-hope + From Doubtful + From Promising

$$(6+4) + (4) + (9+6+2) + (3) = 34 \text{ units}$$

One box is equivalent to Rs. 1 crore therefore, we can say that total revenue generated by Bravo = Rs. 34 crores.

Hence, option C is the correct answer.

59.A

It is given that there were a total of 3 rooms and seven candidates. Ganeshan said that he was one among the two candidates allotted to Room 102 whereas Erina said that she is the only person in the room she was allotted to. Therefore, we can say that there were 1 and 4 candidates in either 101 or 103 room. But it is given that Balaram was the third person to enter in the Room 101 therefore we can say that there were 4 candidates in Room 101 and only 1 candidate in room 103.

Room no.	Candidates	Name
101	4	
102	2	
103	1	

Fatima said that three people including Akhil were already in the room that I was allotted to when I entered it. Hence, we can say that Fatima was the last person to enter in 101 and Akhil is the first person who entered in room 101. Chitra said that she was the last person to enter the room she was allotted to. Hence, we can say that Chitra was allotted room no 102 and she entered after Ganeshan. Erina was the only person in room no 103.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil, _____, _____, Fatima
102	2	Ganeshan, Chitra
103	1	Erina

Balaram said he was third to enter room no 101. Hence, we can say that Divya was

second person who entered in room 101.

Since Chitra and Fatima were already in by 7:40 AM we can say that the candidate who entered at 7:45 am is Erina.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil(7:10), Divya, Balaram, Fatima(7:40)
102	2	Ganeshan, Chitra(7:30)
103	1	Erina(7:45)

From the table we can see that Divya was allotted room no 101. Hence, option A is the correct answer.

60.D

It is given that there were a total of 3 rooms and seven candidates. Ganeshan said that he was one among the two candidates allotted to Room 102 whereas Erina said that she is the only person in the room she was allotted to. Therefore, we can say that there were 1 and 4 candidates in either 101 or 103 room. But it is given that Balaram was the third person to enter in the Room 101 therefore we can say that there were 4 candidates in Room 101 and only 1 candidate in room 103.

Room no.	Candidates	Name
101	4	
102	2	
103	1	

Fatima said that three people including Akhil were already in the room that I was allotted to when I entered it.

Hence, we can say that Fatima was the last person to enter in 101 and Akhil is the first person who entered in

room 101.

Chitra said that she was the last person to enter the room she was allotted to. Hence, we can say that Chitra was allotted room no 102 and she entered after Ganeshan.

Erina was the only person in room no 103.

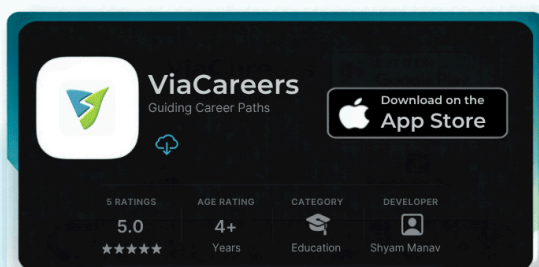
Room no.	Candidates	Name (In sequential order)
101	4	Akhil, _____, _____, Fatima
102	2	Ganeshan, Chitra
103	1	Erina

Balaram said he was third to enter room no 101. Hence, we can say that Divya was second person who entered in room 101.

Since Chitra and Fatima were already in by 7:40 AM we can say that the candidate who entered at 7:45 am is Erina.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil(7:10), Divya, Balaram, Fatima(7:40)
102	2	Ganeshan, Chitra(7:30)
103	1	Erina(7:45)

From the table we can see that Ganeshan is the first person to enter in room 102. Hence, option D is the correct answer.



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61.A

It is given that there were a total of 3 rooms and seven candidates. Ganeshan said that he was one among the two candidates allotted to Room 102 whereas Erina said that she is the only person in the room she was allotted to. Therefore, we can say that there were 1 and 4 candidates in either 101 or 103 room. But it is given that Balaram was the third person to enter in the Room 101 therefore we can say that there were 4 candidates

in Room 101 and only 1 candidate in room 103.

Room no.	Candidates	Name
101	4	
102	2	
103	1	

Fatima said that three people including Akhil were already in the room that I was allotted to when I entered it.

Hence, we can say that Fatima was the last person to enter in 101 and Akhil is the first person who entered in room 101.

Chitra said that she was the last person to enter the room she was allotted to. Hence, we can say that Chitra was allotted room no 102 and she entered after Ganeshan.

Erina was the only person in room no 103.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil, _____, _____, Fatima
102	2	Ganeshan, Chitra
103	1	Erina

Balaram said he was third to enter room no 101. Hence, we can say that Divya was second person who entered in room 101.

Since Chitra and Fatima were already in by 7:40 AM we can say that the candidate who entered at 7:45 am is Erina.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil(7:10), Divya, Balaram, Fatima(7:40)
102	2	Ganeshan, Chitra(7:30)
103	1	Erina(7:45)

From the table we can see that Erina reached the venue at 7:45 am. Hence, option A is the correct answer.

62.A

It is given that there were a total of 3 rooms and seven candidates. Ganeshan said that he was one among the two candidates allotted to Room 102 whereas Erina said that she is the only person in the room she was allotted to. Therefore, we can say that there were 1 and 4 candidates in either 101 or 103 room. But it is given that Balaram was the third person to enter in the Room 101 therefore we can say that there were 4 candidates in Room 101 and only 1 candidate in room 103.

Room no.	Candidates	Name
101	4	
102	2	
103	1	

Fatima said that three people including Akhil were already in the room that I was allotted to when I entered it.

Hence, we can say that Fatima was the last person to enter in 101 and Akhil is the first person who entered in room 101.

Chitra said that she was the last person to enter the room she was allotted to. Hence, we can say that Chitra was allotted room no 102 and she entered after Ganeshan.

Erina was the only person in room no 103.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil, _____, _____, Fatima
102	2	Ganeshan, Chitra
103	1	Erina

Balaram said he was third to enter room no 101. Hence, we can say that Divya was second person who entered in room 101.

Since Chitra and Fatima were already in by 7:40 AM we can say that the candidate who entered at 7:45 am is Erina.

Room no.	Candidates	Name (In sequential order)
101	4	Akhil(7:10), Divya, Balaram, Fatima(7:40)
102	2	Ganeshan, Chitra(7:30)
103	1	Erina(7:45)

In the question it is given that Ganeshan entered the venue before Divya. Therefore, we can say that Ganesh must have entered with Akhil at 7:10 am. In that case, Divya and Balaram must have entered at 7:15 am and 7:25 am respectively. Hence, option A is the correct answer.



63.C

Let '100x' be the number of smartphones sold in year 2016.

Total revenue generated by Azra = $40x \times 15000$ = Rs. 600000x

Total revenue generated by Bysi = $25x \times 20000$ = Rs. 500000x

Total revenue generated by Cxqi = $15x \times 30000$ = Rs. 450000x

Total revenue generated by Dipq = $20x \times 25000$ = Rs. 500000x

We can see that revenue generated by Azra is the highest among all four brands. Hence, option C is the correct answer.

64.C

Let '100x' be the number of smartphones sold in year 2016.

Total revenue generated by Azra = $40x \times 15000 = \text{Rs. } 600000x$

Profitability is defined as the profit as a percentage of the revenue. Therefore, profit generated by Azra = $\frac{30}{100} \times 600000x = \text{Rs. } 180000x$

Total revenue generated by Bysi = $25x \times 20000 = \text{Rs. } 500000x$

Profit generated by Bysi = $\frac{30}{100} \times 500000x = \text{Rs. } 150000x$

Total revenue generated by Cxqi = $15x \times 30000 = \text{Rs. } 450000x$

Profit generated by Cxqi = $\frac{40}{100} \times 450000x = \text{Rs. } 180000x$

Total revenue generated by Dipq = $20x \times 25000 = \text{Rs. } 500000x$

Profit generated by Dipq = $\frac{30}{100} \times 500000x = \text{Rs. } 150000x$

We can see that profit generated by Cxqi is the highest among all four brands. Hence, option C is the correct answer.

65.A

Let '100x' be the number of smartphones sold in year 2016. Then the number of smartphones sold in 2017 = $1.4 \times 100x = 140x$

It is given that Cxqi offered a 40% discount on its unit selling price in 2017 i.e. selling price in 2017 = $0.6 \times 30000 = \text{Rs. } 18000$

Also Cxqi's market share increased by 15% whereas the other three brands lost 5% market share.

Brand	Market Share (%)	No of units	Unit Selling Price (Rs.)	Profitability(%)
Azra	35	49x	15,000	10
Bysi	20	28x	20,000	30
Cxqi	30	42x	18,000	20
Dipq	15	21x	25,000	30

$$\text{Amount of profit generated by Azra} = \frac{10}{100} \times 15000 \times 49x = 73500x$$

$$\text{Amount of profit generated by Bysi} = \frac{30}{100} \times 20000 \times 28x = 168000x$$

$$\text{Amount of profit generated by Cxqi} = \frac{20}{100} \times 18000 \times 42x = 151200x$$

$$\text{Amount of profit generated by Dipq} = \frac{30}{100} \times 25000 \times 21x = 157500x$$

We can see that brand Bysi generated maximum profit in year 2017. Hence, option A is the correct answer.

66.A

Let '100x' be the number of smartphones sold in year 2016.

Total revenue generated by Azra = $40x \times 15000 = \text{Rs. } 600000x$

Profitability is defined as the profit as a percentage of the revenue. Therefore, profit generated by Azra = $\frac{10}{100}$



$*600000x = \text{Rs. } 60000x$

Total revenue generated by Bysi = $25x * 20000 = \text{Rs. } 500000x$

$$\text{Profit generated by Bysi} = \frac{30}{100} * 500000x = \text{Rs. } 150000x$$

$$\text{Total revenue generated by Cxqi} = 15x * 30000 = \text{Rs. } 450000x$$

$$\text{Profit generated by Cxqi} = \frac{40}{100} * 450000x = \text{Rs. } 180000x$$

$$\text{Total revenue generated by Dipq} = 20x * 25000 = \text{Rs. } 500000x$$

$$\text{Profit generated by Dipq} = \frac{30}{100} * 500000x = \text{Rs. } 150000x$$

It is given that the market sales increased by 40%. Therefore, the number of smartphones sold in 2017 = $1.4 * 100x = 140x$

It is given that Cxqi offered a 40% discount on its unit selling price in 2017 i.e. selling price in 2017 = $0.6 * 30000 = \text{Rs. } 18000$

Also Cxqi's market share increased by 15% whereas the other three brands lost 5% market share.

Brand	Market Share (%)	No of units	Unit Selling Price (Rs.)	Profitability(%)
Azra	35	49x	15,000	10
Bysi	20	28x	20,000	30
Cxqi	30	42x	18,000	20
Dipq	15	21x	25,000	30

$$\text{Amount of profit generated by Azra} = \frac{10}{100} * 15000 * 49x = 73500x$$

$$\text{Amount of profit generated by Bysi} = \frac{30}{100} * 20000 * 28x = 168000x$$

$$\text{Amount of profit generated by Cxqi} = \frac{20}{100} * 18000 * 42x = 151200x$$

$$\text{Amount of profit generated by Dipq} = \frac{30}{100} * 25000 * 21x = 157500x$$

We can see that profit of brands Azra, Bysi and Dipq increased in the year 2017 as compared to 2016. Hence, option A is the correct answer.



QUANT

67. 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 = $\frac{20a}{25a}$ hour = 48 minutes.

Hence, 48 is the correct answer.

68. 20

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

$$\text{So, } 5x = 52 - 2x^2$$

$$\text{or, } 2x^2 + 5x - 52 = 0$$

On solving, we get $x = 4$ or $-\frac{13}{2}$

But, it is given that x is a positive number.

$$\text{So, } x = 4$$

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

Hence, 20 is the correct answer.

69.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 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 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.



70.8

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.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 $x = \frac{42}{9}k$

Ratio of Bimal's new score to his original score

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

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

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

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

Hence, option A is the correct answer.

72.6

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

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

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

$$7a > 29b$$

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.

73.7

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

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

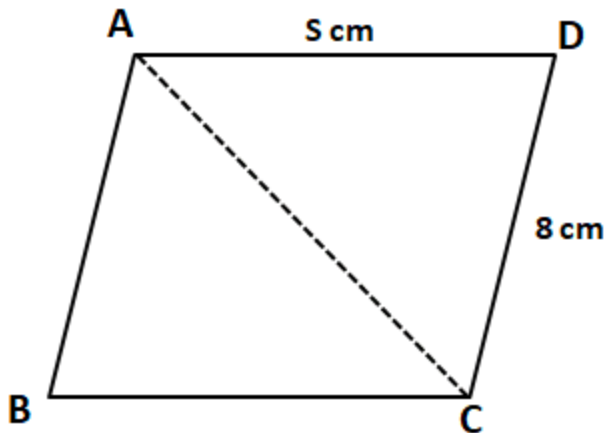
$R = \{1, 3, 7, 8, 9\}$ and $S = \{2, 4, 9, 10\}$

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

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

Thus, there are 7 elements in $(P \Delta Q) \Delta (R \Delta S)$. hence, 7 is the correct answer.

74. B



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

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

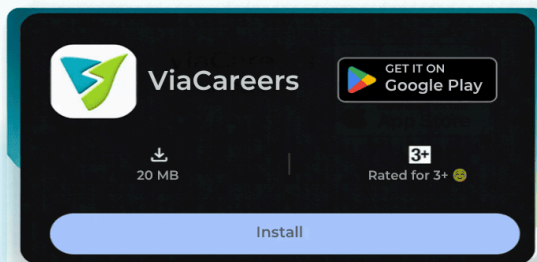
$$\text{Area of triangle ACD} = 24$$

$$\left(\frac{1}{2}\right) * CD * DA * \sin ADC = 24$$

$$AD * \sin ADC = 6$$

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

$$\Rightarrow s \geq 6$$



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75.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)

$$\text{or, } 300S + 100 = 250$$

$$\text{or } S = \frac{1}{2} = 50\%$$

Hence, 50 is the correct answer.

76.1098

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.

$$\Rightarrow nC_2 = 153$$

$$\Rightarrow \frac{n(n-1)}{2} = 153$$

$$\Rightarrow n(n-1) = 306$$

$$\Rightarrow n^2 - n - 306 = 0$$

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

$$\Rightarrow n = 18 \text{ (rejecting } n = -17)$$

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.

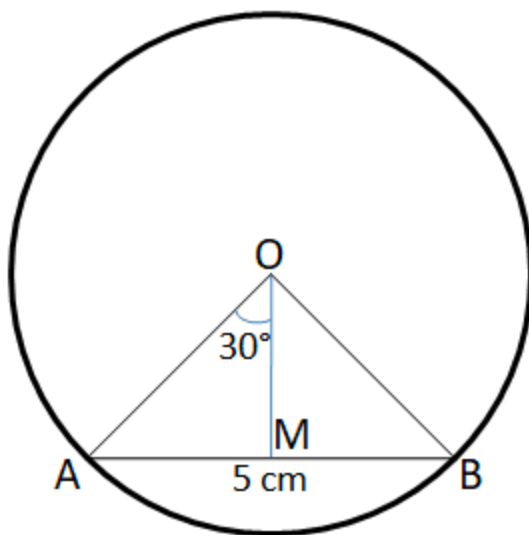
$$\Rightarrow mC2 = 276$$

$$\Rightarrow m = 24$$

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

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

77. A



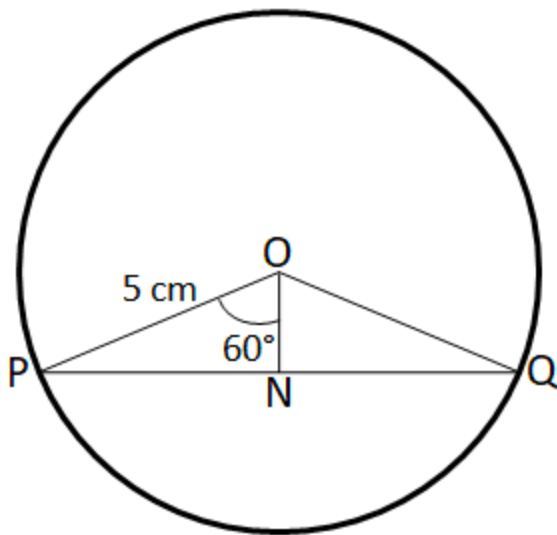
We are given that $AB = 5 \text{ cm}$ and $\angle AOB = 60^\circ$

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

In right angle triangle AMO ,

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

$\Rightarrow AO = 2 \times AM = 2 \times 2.5 = 5 \text{ cm}$. Therefore, we can say that the radius of the circle = 5 cm.



In right angle triangle PNO,

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

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

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

78. 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 $a_{52} = 99, a_{50} = 98$ 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 $a_1 = x - 51 = 74 - 51 = 23$.



79.80707

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

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

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

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

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

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

$$\Rightarrow 80707$$

80.10

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.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 = $a*(8 - t)$ 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 = $b*(6 - t)$ 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

$$= a*(5 - t) + 2b \text{ liters.}$$

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

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

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

$$a*(8 - t) = b*(6 - t)$$

Using equation (1), we can say that

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

$$t = 2$$

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 $= \frac{6*4}{6+4} = 2.4$ 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. 105

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

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

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

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

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

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

Substituting values from equation (1),

$$\Rightarrow v + u = 135$$

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

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

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

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

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

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



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83.5

Time taken to cover first 50 km at 100 km/hr = hr.

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

Time taken to cover 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.D

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

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

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

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

We know that $(a - b)^2 \geq 0$

$$\Rightarrow 97 - 2ab \geq 0$$

$$\Rightarrow ab \leq 48.5$$

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

85.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 = $2(a + b)$

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

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

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

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

$$\Rightarrow a = 4b \text{ or } \frac{b}{4}$$

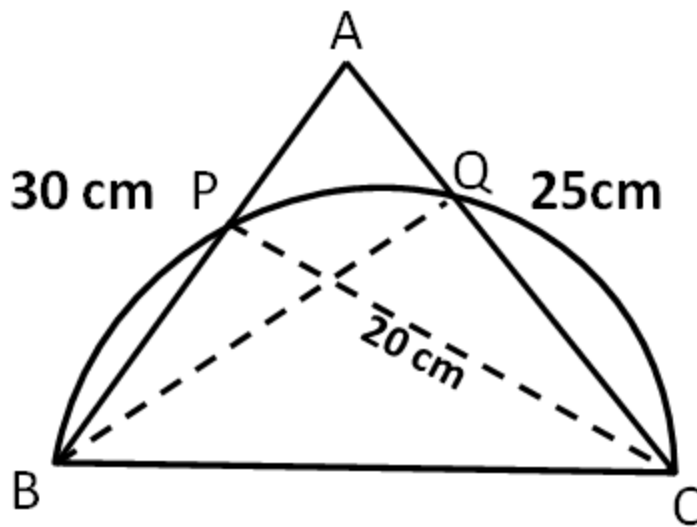
We initially assumed that $a > b$, therefore $a \neq \frac{b}{4}$.

Hence, $a = 4b$

$$\Rightarrow b : a = 1 : 4$$

86.24

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,

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

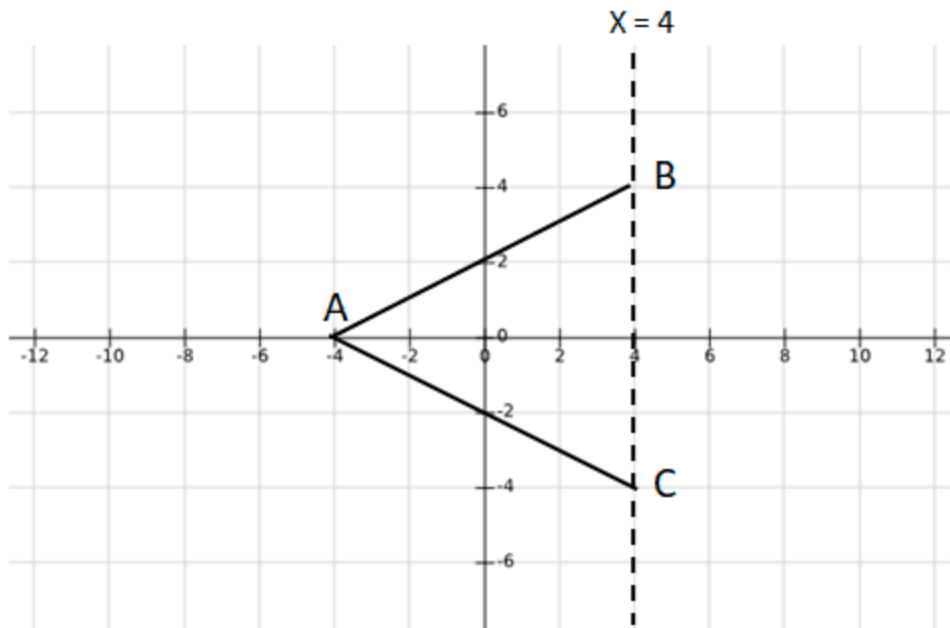
$$\Rightarrow BQ = \frac{AB \times CP}{AC} = \frac{30 \times 20}{25} = 24 \text{ cm.}$$

87.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.



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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.C

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

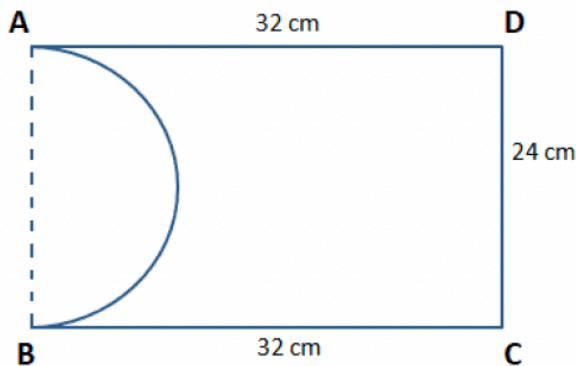
$$\Rightarrow \frac{1}{2} * \pi * \left(\frac{AB^2}{4}\right) = 72 * \pi$$

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

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

$$\Rightarrow AB * BC = 768$$

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



We can see that the perimeter of the remaining shape = AD + DC + BC + Arc(AB)

$$\Rightarrow 32 + 24 + 32 + \pi * 24/2$$

$$\Rightarrow 88 + 12\pi$$

89.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 .

For $n = 1$, the value is 0, for $n = 2$, the value is 1225 which is the 35th multiple of 3.

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. 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. B

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

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

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

92. 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 $(D) \leq 0$

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

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

$$\Rightarrow b \in (-\sqrt{32}, \sqrt{32})$$

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. A

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

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

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

$$\Rightarrow \frac{\log_{10} 2}{\log_{10} 100} - \frac{\log_{10} 4}{\log_{10} 100} + \frac{\log_{10} 5}{\log_{10} 100} - \frac{\log_{10} 10}{\log_{10} 100} + \frac{\log_{10} 20}{\log_{10} 100} - \frac{\log_{10} 25}{\log_{10} 100} + \frac{\log_{10} 50}{\log_{10} 100}$$

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. A

Given that, $p^3 = q^4 = r^5 = s^6$

$$p^3 = s^6$$

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

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

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

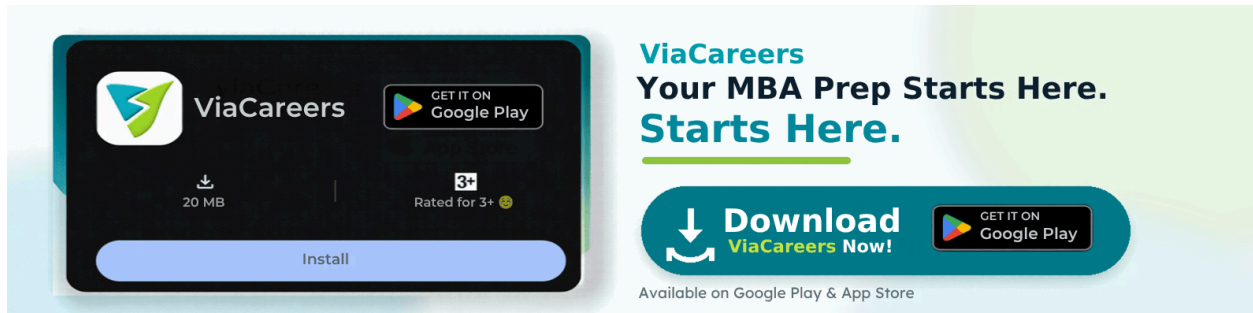
$$\Rightarrow \log_s(pqr)$$

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

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

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

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



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Hence, option A is the correct answer.

95. 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

$$\begin{aligned} \Rightarrow \frac{3 * \frac{18}{18+7} + 4 * \frac{x}{x+1}}{3+4} &= \frac{13}{13+7} \\ \Rightarrow \frac{54}{25} + \frac{4x}{x+1} &= \frac{91}{20} \\ \Rightarrow \frac{4x}{x+1} &= \frac{239}{100} \\ \Rightarrow x &= \frac{239}{161} \end{aligned}$$

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

96.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

$$= 16(R+G) \dots (1)$$

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.

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

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

$$R = 0.5G \dots (2)$$

$$\begin{aligned} \text{Total amount of work left when Ramesh got sick} &= 16(R+G) - 7(R+G) = 9(R+G) = \\ &= 9(0.5G+G) = 13.5G \end{aligned}$$

$$\text{Therefore, time taken by Ganesh to complete the remaining work} = \frac{13.5G}{G} = 13.5 \text{ days.}$$

97. 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 $= 0.1(X+Y) - 0.08X = 0.02X + 0.1Y \dots (1)$

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

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

$\Rightarrow X = (5/3)Y \dots (2)$

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 $= 0.1X+0.2Y - 0.08X = 0.02X + 0.2Y \dots (3)$

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

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

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

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

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

98. 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%.

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

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

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

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

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

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



$$\Rightarrow b + 2c = 45$$

$$\Rightarrow b = 45 - 2c$$

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

$$a - c = 30$$

$$\Rightarrow a = 30 + c$$

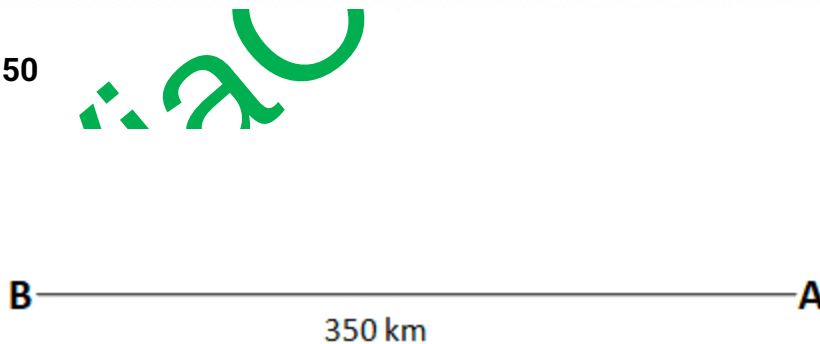
In solution D, B and C are mixed in the ratio 2 : 7

$$\text{So, the concentration of salt in D} = \frac{2b + 7c}{9} = \frac{90 - 4c + 7c}{9} = \frac{90 + 3c}{9}$$

$$\text{Required ratio} = \frac{90 + 3c}{9a} = \frac{90 + 3c}{9(30 + c)} = 1 : 3$$

Hence, option B is the correct answer.

99.50



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.

$$\text{Hence, } (b - a) = \frac{350}{7} = 50 \text{ km/hr.}$$

100.24

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)

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

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

$$\Rightarrow k = 24$$



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