Actual CAT 2023 Slot I (Answer Keys)

Section : Verbal Ability

QNo:- 1 ,Correct Answer:- C

Explanation:- It is not possible to derive Option C directly from the passage. Although the passage does mention the impact of both geographical factors, such as biogeography, and non-geographical factors like culture and history on human phenomena, the use of words like 'most' and 'some' cannot be justified based on the information provided in the passage. Therefore, Option C is the appropriate choice.
Option 1- This statement is directly supported by the passage. The passage mentions that some geographic explanations advanced a century ago were racist, causing all geographic explanations to become tainted by racist associations in the minds of many scholars other than geographers.
Option 2- There is a discussion that the crops and domestic animals that make Australia a food and wool exporter are non-native species brought by overseas colonists.
Option 4- The passage mentions that the development of warm fur clothes among the Inuit living north of the Arctic Circle was not because one influential Inuit leader persuaded others in 1783 to adopt warm fur clothes for no good environmental reason. Instead, it attributes the development to straightforward geographic factors.

QNo:- 2 ,Correct Answer:- B

Explanation:- The passage does not directly condemn non-geographer scholars for possessing outdated interpretations of historical and cultural events. The primary critiques focus on their overemphasis on individual choices, labelling of geographic explanations as deterministic, and refusal to acknowledge the impact of geographic factors, including biogeographic factors, on social and cultural phenomena.

QNo:- 3 ,Correct Answer:- C

Explanation:- The passage does not imply that individuals who are not geographers reject explanations that attribute human behavior to geographical factors. Instead, it suggests that those who are not geographers often respond to such explanations by denouncing the concept of "geographic determinism." The reasons for this reaction include a belief in the central role of humans, a lack of technical knowledge of geography due to disciplinary training, and negative impressions of past geographic analyses that were considered politically offensive.

QNo:- 4 ,Correct Answer:- A

Explanation:- Option 1 accurately reflects the idea presented in the passage. The passage discusses the development of warm fur clothes among the Inuit and the absence of indigenous farming in Aboriginal Australia as outcomes influenced by physical circumstances, such as geographic and biogeographic factors.
While option 2 is partially correct so eliminated. Yet a very close choice.
For option 3 the passage does not explicitly convey the idea that traditional societies, specifically the Inuit and Aboriginal Australians, were self-sufficient and adaptive despite geographical isolation.

QNo:- 5 ,Correct Answer:- A

Explanation:- The passage does not mention the shutting down of the royal office of the Luparii as a contributing factor to the growing wolf population. Instead, it emphasizes factors such as the protected status of wolves in Europe, the decline of hunting as a sport, the efforts of NGOs to track and count the animals, and the increase in woodlands and forest cover in Lozère.
Rest all options are mentioned in the context so can be eliminated.

QNo:- 6 ,Correct Answer:- D

Explanation:- The passage discusses the decline in the number of hunting licenses and the quieter forests due to a

decrease in hunting as a sport. However, it does not specifically state that the inhabitants of Lozère are grappling with this as a problem. On the other hand, the passage mentions issues such as a lack of local schools, jobs, phone and internet connections, and livestock losses due to the return of wolves. That helps us to conclude that 4 is the right choice.

QNo:- 7 ,Correct Answer:- D

Explanation:- The passage does not explicitly mention the divergent and competing interests of specific groups, but it does provide information that implies conflicts between different stakeholders. Based on the information provided, the option that best aligns with the potential conflicts discussed in the passage is the 4^{th} one.
The passage describes how farmers in Lozère are concerned about the return of wolves, as they claim the wolves cause livestock losses. On the other hand, environmentalists may celebrate the return of predators like wolves, considering it a sign of wider ecological health. This suggests a potential conflict of interests between farmers, who are concerned about their livelihoods and livestock, and environmentalists, who may prioritize the ecological balance.

QNo:- 8 ,Correct Answer:- D

Explanation:- The author's claims in the passage seem to revolve around the conflict between farmers and environmentalists regarding the return of wolves, with farmers expressing concerns about livestock losses. If there were reports of wolf attacks on tourists on the rise, it might suggest a different perspective on the impact of wolves in the area, potentially indicating a more immediate threat to human safety rather than just concerns about livestock.
Only option 4 could weaken the emphasis on the environmental benefits mentioned in the passage.
Option 1- This statement is not directly relevant to the author's claims about the conflict between farmers and environmentalists regarding the return of wolves. It doesn't necessarily weaken or strengthen the main arguments in the passage.
Option 2- This statement aligns with the information presented in the passage and supports the author's claims about the return of wolves, which is a central theme in the discussion of conflicts between farmers and environmentalists.
Option 3- This statement is mentioned briefly in the passage, but it doesn't directly relate to the author's claims about the conflict between farmers and environmentalists regarding the return of wolves. While unemployment concerns are mentioned, the primary focus is on the impact of the return of wolves on farmers.

QNo:- 9 ,Correct Answer:- C

Explanation:- The passage emphasizes that mainstream English-language fiction has historically privileged certain perspectives and settings. And the exception is statement 3. It supports the passage's claim by reinforcing the idea that mainstream English-language fiction has a specific focus on the experiences of a particular group rather than weakening it.
For option 1- This statement weakens the passage's claim because it suggests that Indian Ocean novels may also have elements of nostalgia, similar to mainstream English-language fiction.
For option, 2-This statement weakens the passage's claim as it implies that Indian Ocean novels may also fall into the trap of using Orientalist stereotypes, similar to mainstream English-language fiction.
For option 4- This statement weakens the passage's claim because it suggests that there is a diversity in settings even within mainstream English-language novels.
The exception is statement 3. It supports the passage's claim rather than weakening it.

QNo:- 10 ,Correct Answer:- D

Explanation:- The passage discusses the "remapping" achieved by Indian Ocean novels.
Let's evaluate each claim:
Option 1- This claim contributes to the remapping by suggesting that the novels explore regional pasts rather than being confined to national concerns.
Option 2- This claim contributes to the remapping by challenging the traditional focus on the global north and highlighting the global south as the first center of globalization.
Option 3- This claim contributes to the remapping by challenging the Eurocentric view of early international trade

and commerce.
Option 4- This claim does not contribute to the remapping; in fact, it reinforces a Western-centric view by suggesting that cosmopolitanism originated in the West and traveled eastward. Therefore, the correct answer is 4.

QNo:- 11 ,Correct Answer:- D

Explanation:- The passage discusses migration in the Indian Ocean world. Out of all options, 4 is the right one. As this statement is not true according to the passage. The passage emphasizes that the Indian Ocean world's migration networks are distinct from the commonly found narratives centered in Europe or the US. Instead, the novels highlight a largely Islamic space and feature characters of color, suggesting a different orientation from the global north.

For option 1- This statement is consistent with the passage, which mentions that port cities far apart were often more easily connected to each other than too much closer inland cities due to the ease of travel by sea.
For Option 2- This statement is consistent with the passage, which highlights that migration in the Indian Ocean world was shaped by the religious and commercial histories of the region.
For option 3- This statement is consistent with the passage, which mentions that migration is often a matter of force, and travel is portrayed as abandonment rather than adventure.

QNo:- 12 ,Correct Answer:- C

Explanation:- The options 1 and 4 are not the right choice. As in option A the pair suggests a historical and thematic connection, as the Indian Ocean world is associated with historical aspects such as slavery. This pair does not seem to be odd. In option 4, this pair also represents a thematic connection, suggesting that postcolonial novels often explore anti-colonial nationalism. This aligns with the passage's discussion of the early postcolonial literature's concern with national questions.
The lone instance of border crossing in the third one—which we can classify as peculiar—occurs in the Indian Ocean novel world rather than the Postcolonial novel world.

QNo:- 13 ,Correct Answer:- D

Explanation:- In the passage, the author mentions Galbraith’s “The Affluent Society” in the context of Marshall Sahlins's essay, "The Original Affluent Society." The purpose is to highlight how Sahlins's views complement Galbraith’s criticism of consumerism and inequality in contemporary society. So, option 4 is the right choice.
The passage notes that Sahlins's essay challenges contemporary economic life and bourgeois individualism. By referencing Galbraith’s work, the author emphasizes that Sahlins's perspective aligns with the critical stance towards postwar prosperity and inequality presented by Galbraith. Sahlins's essay, with its title nodding toward Galbraith’s work, brings a critical perspective to the contemporary world, showing that alternative ways of living exist. It contrasts the capitalist pursuit of wealth through material production with the idea that foraging societies achieve affluence not by acquiring more but by desiring less. In summary, the mention of Galbraith’s “The Affluent Society” serves to illustrate how Sahlins’s views resonate with and complement Galbraith’s critique of consumerism and inequality in the modern world.
While,
Option 1 is incorrect. The passage does not suggest that Galbraith’s theories refute Sahlins’s thesis. Instead, it emphasizes how their views complement each other in criticizing contemporary society.
Option 2 is incorrect. The passage does not suggest that Galbraith's views directly influenced Sahlins's analysis of prehistoric societies. The mention is about how their perspectives align in critiquing contemporary society.
Option 3 is also incorrect. While the passage discusses the contrast between contemporary growth paths and foragers' ways of living, it does not specifically highlight a pacifist content in foragers' lives.

QNo:- 14 ,Correct Answer:- D

Explanation:- The passage mentions the contemporary Hadza of Tanzania to demonstrate that forager communities, like the Hadza, were aware of alternatives (such as those of surrounding farmers) but actively chose to reject them. This serves as an illustration that foragers make real choices about their ways of living, emphasizing the principle of collective self-determination in societies. So it makes 4th right one.

QNo:- 15 ,Correct Answer:- C

Explanation:- The passage mentions that, when viewed in today's context, not every aspect of Sahlins's essay has aged well. One of the criticisms is that the essay does not thematize the effects of racism, colonialism, and dispossession as heavily as might be expected today. Therefore, the critique is about the essay's treatment of these important issues, suggesting it is cursory or insufficient. This makes the 3rd as the right choice.
For Option 1,it is not a criticism mentioned in the passage. The passage acknowledges that the point of the essay is not so much the empirical validity of the data but its conceptual challenge to contemporary economic life and bourgeois individualism.
Option 2 is not explicitly mentioned as a criticism in the passage. The passage acknowledges that not every aspect of the essay has aged well but does not specifically criticize it for having outdated values.
Option 4 also is not mentioned as a criticism in the passage. The passage does mention Sahlins rebuking evolutionary anthropologists for treating present-day foragers as "left behind" by progress, but it does not frame this as a criticism of Sahlins.

QNo:- 16 ,Correct Answer:- B

Explanation:- The passage suggests that Sahlins's essay, "The Original Affluent Society," aimed to challenge contemporary economic life and bourgeois individualism. It held a critical perspective on the capitalist world's pursuit of wealth through material production and presented foraging societies as examples of an alternative path. The essay contrasts the desire for more material goods in the capitalist world with the foraging societies' pursuit of affluence through wanting less. This aligns with the idea of holding a mirror to an acquisitive society and presenting alternative ways of living.

QNo:- 17 ,Correct Answer:- A

Explanation:- The sentence "This philosophical cut at one's core beliefs, values, and way of life is difficult enough." would best fit at Option B because it logically follows the statement in Option A. Option A discusses how reading philosophy can make the values one has organized their life around appear provincial, wrong, or even evil. Following this, the sentence in Option B, "This philosophical cut at one's core beliefs, values, and way of life is difficult enough," provides an explanation and emphasizes the challenging nature of the experience described in Option A. It helps to convey the emotional and intellectual difficulty that arises when one's fundamental beliefs are scrutinized by philosophical inquiry.

QNo:- 18 ,Correct Answer:- C

Explanation:- The paragraph discusses the genetic link between Native Americans and Japanese people, the migration during the deglaciation period from northern coastal China to Japan, and the surprise that this ancestral source also contributed to the Japanese gene pool. After presenting these findings, the sentence "The discovery helps to explain archaeological similarities between the Paleolithic peoples of China, Japan, and the Americas" logically connects the genetic information to archaeological similarities.
Option 3, which discusses the shared similarities in crafting projectile points, provides a context for introducing the archaeological aspect. Placing the sentence about archaeological similarities after this context makes more sense as it elaborates on the shared cultural aspects mentioned in Option 3.

QNo:- 19 ,Correct Answer:- 3

Explanation:- The theme of the provided sentences except the 3rd one revolves around the irregularities and complexities in the naming of numbers in the English language. It discusses the lack of a systematic rule, the specific patterns for teens and multiples of ten, and highlights the potential confusion that can arise, particularly for learners or those unfamiliar with the language's numerical conventions. The sentences collectively address the intricacies and variations in how numbers are named in English. While Sentence 3 shifts the focus to the learning process of children and their understanding of the differences between numbers like "fourteen" and "forty."

QNo:- 20 ,Correct Answer:- 2

Explanation:- The theme of the provided sentences revolves around the concept of "theory of mind" or "mentalizing," which is the ability to understand and interpret the thoughts, feelings, and intentions of others. The sentences discuss the significance of this cognitive ability for various aspects of human development, including natural language acquisition, social interaction, reflexive thought, moral judgment, and cognitive abilities. The progression of this capacity from early beginnings to adulthood is also highlighted, and there is speculation about its evolutionary origin. Overall, the theme centers on the importance and development of the ability to understand the minds of others in human cognition and behavior.
Here Sentence 2 differs from the rest because it provides alternative terms for the concept discussed in the other sentences. While the other sentences consistently use the term "theory of mind," Sentence 2 introduces synonyms such as 'mentalizing' or 'mindreading' to describe the same cognitive ability. This sentence essentially offers different labels for the concept without introducing new information or aspects of the theme discussed in the surrounding sentences.

QNo:- 21 ,Correct Answer:- 4123

Explanation:- Sentence 4 serves as a general introduction, raising the question about the enduring interest in certain crimes. Then 1 follows logically from the introductory question, delving into the specifics of what makes a case attractive to a particular audience. Then the 2nd sentence provides reasons or factors that contribute to the attractiveness of certain cases, linking back to the question raised in Sentence 1.3rd further explores the nature of the cases in question, emphasizing the appeal of unsolved or mysterious cases.

QNo:- 22 ,Correct Answer:- 4123

Explanation:- 4123 is the sequence that forms a coherent flow, where each sentence logically follows the previous one, building a comprehensive discussion on the impact and sources of bias in AI.
Sentence 4 sets the stage by highlighting the contrast between the localized impact of human-made biased decisions and the broader impact introduced by AI.
Then sentence 1 builds upon the idea introduced in Sentence 4, emphasizing how algorithms, especially those hosted on the internet, can have a widespread impact affecting larger groups of people.
Sentence 2 delves into the distinction between "algorithmic bias" and the actual source of bias, emphasizing that biases are rooted in the data rather than the algorithms themselves.
Sentence 3 concludes by addressing the relative ease of fixing AI biases compared to human-generated biases, emphasizing the practical aspect of addressing biases in AI.

QNo:- 23 ,Correct Answer:- D

Explanation:- The passage discusses colonialism as a historical phenomenon, highlighting its evolution and the factors that led to its transformation in the sixteenth century. It emphasizes the role of technological developments in navigation during that period, which enabled the connection of more remote parts of the world. The emergence of the modern European colonial project is attributed to the newfound ability to move large numbers of people across oceans and maintain political control despite geographical dispersion. The term colonialism is defined in the passage as encompassing European settlement, violent dispossession, and political domination over various regions globally, including the Americas, Australia, and parts of Africa and Asia. Overall, the passage provides a historical context for

colonialism, underlining its earlier forms and the significant changes that occurred during the sixteenth century due to advancements in navigation technology. So option 4th is the correct one.

QNo:- 24 ,Correct Answer:- A

Explanation:- The passage discusses the historical aspect of manipulating information, emphasizing that this practice predates the establishment of modern journalism and rules of integrity. It provides an example from ancient Rome, where political enemies used a smear campaign against Antony with slogans written on coins, illustrating the early use of fake news for political purposes.
The passage then transitions to the 21st century, highlighting the unprecedented scale of information weaponization. It points out that powerful new technology simplifies the fabrication of content, and social networks play a significant role in amplifying falsehoods propagated by states, populist politicians, and dishonest corporate entities. The platforms are described as fertile ground for various manipulative practices, including computational propaganda, trolling, and the deployment of troll armies. Overall, the passage addresses the historical roots of information manipulation and its contemporary manifestations with advanced technology and social media platforms. So the correct choice is option 1.

Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- C

Explanation:- After reading the set, we can write following conditions.
1. There can be either 0 or 1 or 2 candidates form any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members can not vote for candidate from their own department.
4. Non-candidates form same department voted for same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ ,and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate form OQ.
Since the questions are dubious, we can say there would be at least two cases.
Given Only one candidate is from OQ and there are 5 faculties from OQ ⇒ there are 4 non-candidates from OQ.
Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates faculty members from same department voted for the same candidate. So, all 4 non-candidates from OQ can vote for candidates either Q or R.
Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only that implies there is one candidate from BH.
R has got 5 votes which can be only from MS because of condition 4 that implies there are 2 candidates from MS.
Further, it can be determined that there is no candidates from FA. Q has got 13 non- candidates' votes. They would be from remaining departments: FA (9) & OQ (4)
Now let us try to find which candidate is from which department.
From condition (3), R cannot be from MS. And Similarly we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA(9)+OQ(4)
R (6)	P	5 (MS)
S (1)	Q	zero

Subject	**No. of members**	**No. of candidates**	**Other (Voted)**	**Candidates in dept.**
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in same department. So, P is definitely one of the candidate from MS.

R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P & S cannot be together. So, In MS, the candidates would be P & Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

P & Q are from same department.

QNo:- 26 ,Correct Answer:- B

Explanation:- After reading the set, we can write following conditions.
1. There can be either 0 or 1 or 2 candidates form any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members can not vote for candidate from their own department.
4. Non-candidates form same department voted for same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ ,and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate form OQ.
Since the questions are dubious, we can say there would be at least two cases.
Given Only one candidate is from OQ and there are 5 faculties from OQ ⇒ there are 4 non-candidates from OQ.
Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates faculty members from same department voted for the same candidate. So, all 4 non-candidates from OQ can vote for candidates either Q or R.
Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only that implies there is one candidate from BH.
R has got 5 votes which can be only from MS because of condition 4 that implies there are 2 candidates from MS.
Further, it can be determined that there is no candidates from FA. Q has got 13 non- candidates' votes. They would be from remaining departments: FA (9) & OQ (4)
Now let us try to find which candidate is from which department.
From condition (3), R cannot be from MS. And Similarly we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA(9)+OQ(4)
R (6)	P	5 (MS)
S (1)	Q	zero

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in same department. So, P is definitely one of the candidate from MS.
R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P & S cannot be together. So, In MS, the candidates would be P & Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S

BH	3	1	2 (P)	S/R

Q gets 9 from FA and 4 from OQ. So, answer is 9.

QNo:- 27 ,Correct Answer:- D

Explanation:- After reading the set, we can write following conditions.
1. There can be either 0 or 1 or 2 candidates form any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members can not vote for candidate from their own department.
4. Non-candidates form same department voted for same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ ,and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate form OQ.

Since the questions are dubious, we can say there would be at least two cases.
Given Only one candidate is from OQ and there are 5 faculties from OQ ⇒ there are 4 non-candidates from OQ.
Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates faculty members from same department voted for the same candidate. So, all 4 non-candidates from OQ can vote for candidates either Q or R.
Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only that implies there is one candidate from BH.
R has got 5 votes which can be only from MS because of condition 4 that implies there are 2 candidates from MS.
Further, it can be determined that there is no candidates from FA. Q has got 13 non- candidates' votes. They would be from remaining departments: FA (9) & OQ (4)
Now let us try to find which candidate is from which department.
From condition (3), R cannot be from MS. And Similarly we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA(9)+OQ(4)
R (6)	P	5 (MS)
S (1)	Q	zero

Subject	**No. of members**	**No. of candidates**	**Other (Voted)**	**Candidates in dept.**
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in same department. So, P is definitely one of the candidate from MS.
R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P & S cannot be together. So, In MS, the candidates would be P & Q.

Subject	**No. of members**	**No. of candidates**	**Other (Voted)**	**Candidates in dept.**
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

Both statements are true.

QNo:- 28 ,Correct Answer:- D

Explanation:- After reading the set, we can write following conditions.

1. There can be either 0 or 1 or 2 candidates form any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members can not vote for candidate from their own department.
4. Non-candidates form same department voted for same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ ,and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate form OQ.

Since the questions are dubious, we can say there would be at least two cases.
Given Only one candidate is from OQ and there are 5 faculties from OQ ⇒ there are 4 non-candidates from OQ.
Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates faculty members from same department voted for the same candidate. So, all 4 non-candidates from OQ can vote for candidates either Q or R.
Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only that implies there is one candidate from BH.
R has got 5 votes which can be only from MS because of condition 4 that implies there are 2 candidates from MS.
Further, it can be determined that there is no candidates from FA. Q has got 13 non- candidates' votes. They would be from remaining departments: FA (9) & OQ (4)
Now let us try to find which candidate is from which department.
From condition (3), R cannot be from MS. And Similarly we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA(9)+OQ(4)
R (6)	P	5 (MS)
S (1)	Q	zero

Subject	**No. of members**	**No. of candidates**	**Other (Voted)**	**Candidates in dept.**
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in same department. So, P is definitely one of the candidate from MS.
R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P & S cannot be together. So, In MS, the candidates would be P & Q.

Subject	**No. of members**	**No. of candidates**	**Other (Voted)**	**Candidates in dept.**
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

It was either Prof. Ramaswamy or Prof. Samuel.

QNo:- 29 ,Correct Answer:- B

Explanation:- After reading the set, we can write following conditions.
1. There can be either 0 or 1 or 2 candidates form any department.
2. A candidate cannot vote for himself or herself.
3. Faculty members can not vote for candidate from their own department.
4. Non-candidates form same department voted for same candidate.
5. There are 9, 7, 5, 3 faculty members in FA, MS, OQ ,and BH.
6. P, Q, R, S received 3, 14, 6 and 1 votes.
7. There is exactly 1 candidate form OQ.

Since the questions are dubious, we can say there would be at least two cases.

Given Only one candidate is from OQ and there are 5 faculties from OQ ⇒ there are 4 non-candidates from OQ.
Also, P voted for R, Q for S, R for Q and S for P. Given that all non-candidates faculty members from same department voted for the same candidate. So, all 4 non-candidates from OQ can vote for candidates either Q or R.
Now P has got only 2 votes from non-candidates. From condition 4, these 2 votes can be from BH only that implies there is one candidate from BH.
R has got 5 votes which can be only from MS because of condition 4 that implies there are 2 candidates from MS.
Further, it can be determined that there is no candidates from FA. Q has got 13 non- candidates' votes. They would be from remaining departments: FA (9) & OQ (4)
Now let us try to find which candidate is from which department.
From condition (3), R cannot be from MS. And Similarly we can determine for other candidates.

	Voted by candidates	Voted by Members
P(3)	S	2 (BH)
Q (14)	R	13 (FA(9)+OQ(4)
R (6)	P	5 (MS)
S (1)	Q	zero

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P/Q/S
OQ	5	1	4 (Q)	P/R/S
BH	3	1	2 (P)	R/Q/S

And Q has voted for S. So, Q and S cannot be in same department. So, P is definitely one of the candidate from MS.
R has voted for Q. So, R and Q cannot be together. S has voted for P. So, P & S cannot be together. So, In MS, the candidates would be P & Q.

Subject	No. of members	No. of candidates	Other (Voted)	Candidates in dept.
FA	9	0	9 (Q)	×
MS	7	2	5 (R)	P, Q
OQ	5	1	4 (Q)	R/S
BH	3	1	2 (P)	S/R

Only statement (B) is true.

QNo:- 30 ,Correct Answer:- 0

Explanation:- To solve this set, following definitions we need to know:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{no. of items}}$$

Median = middle value after arranging the data in either ascending or descending order.
Mode = the number which is appearing highest number of times
Range = Maximum number – Minimum number
By using Mean formula; we can calculate total of all ratings given by all restaurants to each worker.
For Ullas, U = 2.2 × 5 = 11
V = 3.8 × 5 = 19
W = 3.4 × 5 = 17
X = 3.6 × 5 = 18
Y = 2.6 × 5 = 13
For Ullas, median rating is 2 i.e. middle most rating is 2. So, two lowest ratings are £ 2. Also, mode is 2. It means there should be atleast two 2's in ratings. Range = 3. That means Max rating – Min. rating = 3. R_1 awarded rating of 1 to U. Means maximum rating can be 4 only. So far we have deducted 4 ratings of U and they are are 1, 4, 2, 2. Since total is 11. So, all ratings are 1, 2, 2, 2, 4.
For V, total is 19. If we give 5 rating every time we will get total of 20. It means ratings are 2, 4, 4, 4, 5. (Because range

is 3.)

For w, Similarly we can say, ratings are 1, 2, 4, 5, 5.
For x, ratings are 1, 3, 4, 5, 5.
For y, there are two modes 1 & 4. It means 1 and 4 will occur atleast twice. So, ratings are 1, 1, 3, 4, 4.

$B_1 < B_2 < B_3 < B_4 < B_5$ where B_i = ratings i

	B_1	B_2	B_3	B_4	B_5	Total
U	1	2	2	2	4	11
V	2	4	4	4	5	19
W	1	2	4	5	5	17
X	1	3	4	5	5	18
Y	1	1	3	4	4	13

Now Let us try to find a link between workers and restaurants.

	R_1	R_2	R_3	R_4	R_5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	3.4×5=17	2.2×5=11	3.8×5=19	2.8×5=14	17		

Since total of ratings given by R3 is 19. It is possible only if remaining ratings are 4 & 4. Because all 5's are used.
Let us think, for R4;
Possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4
Total = 14
So, possible cases are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3
But by putting 2, 4, 2, 3, 3, the table is not satisfied.
So, now we can make a new table:

	R_1	R_2	R_3	R_4	R_5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Ans is 0

QNo:- 31 ,Correct Answer:- 0

Explanation:- To solve this set, following definitions we need to know:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{no. of items}}$$

Median = middle value after arranging the data in either ascending or descending order.
Mode = the number which is appearing highest number of times
Range = Maximum number – Minimum number
By using Mean formula; we can calculate total of all ratings given by all restaurants to each worker.
For Ullas, U = 2.2 × 5 = 11
V = 3.8 × 5 = 19
W = 3.4 × 5 = 17
X = 3.6 × 5 = 18
Y = 2.6 × 5 = 13
For Ullas, median rating is 2 i.e. middle most rating is 2. So, two lowest ratings are £ 2. Also, mode is 2. It means there

should be atleast two 2's in ratings. Range = 3. That means Max rating – Min. rating = 3. R_1 awarded rating of 1 to U. Means maximum rating can be 4 only. So far we have deducted 4 ratings of U and they are are 1, 4, 2, 2. Since total is 11. So, all ratings are 1, 2, 2, 2, 4.
For V, total is 19. If we give 5 rating every time we will get total of 20. It means ratings are 2, 4, 4, 4, 5. (Because range is 3.)

For w, Similarly we can say, ratings are 1, 2, 4, 5, 5.
For x, ratings are 1, 3, 4, 5, 5.
For y, there are two modes 1 & 4. It means 1 and 4 will occur atleast twice. So, ratings are 1, 1, 3, 4, 4.

$B_1 < B_2 < B_3 < B_4 < B_5$ where B_i = ratings i

	B_1	B_2	B_3	B_4	B_5	Total
U	1	2	2	2	4	11
V	2	4	4	4	5	19
W	1	2	4	5	5	17
X	1	3	4	5	5	18
Y	1	1	3	4	4	13

Now Let us try to find a link between workers and restaurants.

	R_1	R_2	R_3	R_4	R_5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	3.4×5=17	2.2×5=11	3.8×5=19	2.8×5=14	17		

Since total of ratings given by R3 is 19. It is possible only if remaining ratings are 4 & 4. Because all 5's are used.
Let us think, for R4;
Possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4
Total = 14
So, possible cases are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3
But by putting 2, 4, 2, 3, 3, the table is not satisfied.
So, now we can make a new table:

	R_1	R_2	R_3	R_4	R_5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Ans is 0

QNo:- 32 ,Correct Answer:- 3

Explanation:- To solve this set, following definitions we need to know:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{no. of items}}$$

Median = middle value after arranging the data in either ascending or descending order.
Mode = the number which is appearing highest number of times
Range = Maximum number – Minimum number
By using Mean formula; we can calculate total of all ratings given by all restaurants to each worker.
For Ullas, U = 2.2 × 5 = 11

V = 3.8 × 5 = 19
W = 3.4 × 5 = 17
X = 3.6 × 5 = 18
Y = 2.6 × 5 = 13

For Ullas, median rating is 2 i.e. middle most rating is 2. So, two lowest ratings are £ 2. Also, mode is 2. It means there should be atleast two 2's in ratings. Range = 3. That means Max rating – Min. rating = 3. R_1 awarded rating of 1 to U. Means maximum rating can be 4 only. So far we have deducted 4 ratings of U and they are are 1, 4, 2, 2. Since total is 11. So, all ratings are 1, 2, 2, 2, 4.
For V, total is 19. If we give 5 rating every time we will get total of 20. It means ratings are 2, 4, 4, 4, 5. (Because range is 3.)

For w, Similarly we can say, ratings are 1, 2, 4, 5, 5.
For x, ratings are 1, 3, 4, 5, 5.
For y, there are two modes 1 & 4. It means 1 and 4 will occur atleast twice. So, ratings are 1, 1, 3, 4, 4.

$B_1 < B_2 < B_3 < B_4 < B_5$ where B_i = ratings i

	B_1	B_2	B_3	B_4	B_5	Total
U	1	2	2	2	4	11
V	2	4	4	4	5	19
W	1	2	4	5	5	17
X	1	3	4	5	5	18
Y	1	1	3	4	4	13

Now Let us try to find a link between workers and restaurants.

	R_1	R_2	R_3	R_4	R_5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	3.4×5=17	2.2×5=11	3.8×5=19	2.8×5=14	17		

Since total of ratings given by R3 is 19. It is possible only if remaining ratings are 4 & 4. Because all 5's are used.
Let us think, for R4;
Possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4
Total = 14
So, possible cases are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3
But by putting 2, 4, 2, 3, 3, the table is not satisfied.
So, now we can make a new table:

	R_1	R_2	R_3	R_4	R_5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Ans is 3

QNo:- 33 ,Correct Answer:- 4

Explanation:- To solve this set, following definitions we need to know:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{no. of items}}$$

Median = middle value after arranging the data in either ascending or descending order.
Mode = the number which is appearing highest number of times
Range = Maximum number – Minimum number
By using Mean formula; we can calculate total of all ratings given by all restaurants to each worker.
For Ullas, U = 2.2 × 5 = 11
V = 3.8 × 5 = 19
W = 3.4 × 5 = 17
X = 3.6 × 5 = 18
Y = 2.6 × 5 = 13
For Ullas, median rating is 2 i.e. middle most rating is 2. So, two lowest ratings are £ 2. Also, mode is 2. It means there should be atleast two 2's in ratings. Range = 3. That means Max rating – Min. rating = 3. R_1 awarded rating of 1 to U. Means maximum rating can be 4 only. So far we have deducted 4 ratings of U and they are are 1, 4, 2, 2. Since total is 11. So, all ratings are 1, 2, 2, 2, 4.
For V, total is 19. If we give 5 rating every time we will get total of 20. It means ratings are 2, 4, 4, 4, 5. (Because range is 3.)

For w, Similarly we can say, ratings are 1, 2, 4, 5, 5.
For x, ratings are 1, 3, 4, 5, 5.
For y, there are two modes 1 & 4. It means 1 and 4 will occur atleast twice. So, ratings are 1, 1, 3, 4, 4.

$B_1 < B_2 < B_3 < B_4 < B_5$ where B_i = ratings i

	B_1	B_2	B_3	B_4	B_5	Total
U	1	2	2	2	4	11
V	2	4	4	4	5	19
W	1	2	4	5	5	17
X	1	3	4	5	5	18
Y	1	1	3	4	4	13

Now Let us try to find a link between workers and restaurants.

	R_1	R_2	R_3	R_4	R_5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	3.4×5=17	2.2×5=11	3.8×5=19	2.8×5=14	17		

Since total of ratings given by R3 is 19. It is possible only if remaining ratings are 4 & 4. Because all 5's are used.
Let us think, for R4;
Possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4
Total = 14
So, possible cases are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3
But by putting 2, 4, 2, 3, 3, the table is not satisfied.
So, now we can make a new table:

	R_1	R_2	R_3	R_4	R_5
U	1	2	4	2	2
V	4	2	4	4	5
W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

Ratings are 1, 4, 4, 5, 5.
So, median is 4.

QNo:- 34 ,Correct Answer:- D

Explanation:- To solve this set, following definitions we need to know:

$$\text{Mean} = \frac{\text{Sum of items}}{\text{no. of items}}$$

Median = middle value after arranging the data in either ascending or descending order.
Mode = the number which is appearing highest number of times
Range = Maximum number – Minimum number
By using Mean formula; we can calculate total of all ratings given by all restaurants to each worker.
For Ullas, U = 2.2 × 5 = 11
V = 3.8 × 5 = 19
W = 3.4 × 5 = 17
X = 3.6 × 5 = 18
Y = 2.6 × 5 = 13
For Ullas, median rating is 2 i.e. middle most rating is 2. So, two lowest ratings are £ 2. Also, mode is 2. It means there should be atleast two 2's in ratings. Range = 3. That means Max rating – Min. rating = 3. R_1 awarded rating of 1 to U. Means maximum rating can be 4 only. So far we have deducted 4 ratings of U and they are are 1, 4, 2, 2. Since total is 11. So, all ratings are 1, 2, 2, 2, 4.
For V, total is 19. If we give 5 rating every time we will get total of 20. It means ratings are 2, 4, 4, 4, 5. (Because range is 3.)

For w, Similarly we can say, ratings are 1, 2, 4, 5, 5.
For x, ratings are 1, 3, 4, 5, 5.
For y, there are two modes 1 & 4. It means 1 and 4 will occur atleast twice. So, ratings are 1, 1, 3, 4, 4.

$B_1 < B_2 < B_3 < B_4 < B_5$ where B_i = ratings i

	B_1	B_2	B_3	B_4	B_5	Total
U	1	2	2	2	4	11
V	2	4	4	4	5	19
W	1	2	4	5	5	17
X	1	3	4	5	5	18
Y	1	1	3	4	4	13

Now Let us try to find a link between workers and restaurants.

	R_1	R_2	R_3	R_4	R_5	Ratings	Total
U	1	2	4	2	2	1, 2, 2, 2, 4	11
V	4	2	4	4	5	2, 4, 4, 4, 5	19
W	5	1	5	2/4	4/2	1, 2, 4, 5, 5	17
X	1/3/4	5	5	1/3/4	1/3/4	1, 3, 4, 5, 5	18
Y	3/4/4	1	1	3/4/4	3/4/4	1, 1, 3, 4, 4	13
Total	3.4×5=17	2.2×5=11	3.8×5=19	2.8×5=14	17		

Since total of ratings given by R3 is 19. It is possible only if remaining ratings are 4 & 4. Because all 5's are used.
Let us think, for R4;
Possible ratings are 2, 4, 2/4, 1/3/4 or 3/4/4
Total = 14
So, possible cases are 2, 4, 2, 3, 3 or 2, 4, 4, 1, 3
But by putting 2, 4, 2, 3, 3, the table is not satisfied.
So, now we can make a new table:

	R_1	R_2	R_3	R_4	R_5
U	1	2	4	2	2
V	4	2	4	4	5

W	5	1	5	4	2
X	3	5	5	1	4
Y	4	1	1	3	4

R_1 median = 4 (given twice) (1, 3, 4, 4, 5)
R_2 median = 2 (given twice) (1, 1, 2, 2, 5)
R_3 median = 4 (given twice) (1, 4, 4, 5, 5)
R_4 median = 3 (given once) (1, 2, 3, 4, 4)
R_5 median = 4 (given twice) (2, 2, 4, 4, 5)
So, answer is R_4

QNo:- 35 ,Correct Answer:- 0

Explanation:- Given slots are twenty 15 minutes slots starting at 9AM and ending at 2PM. Then applicants are scheduled in each slot.
Total number of applicants = 10 × 20 = 200
No. of US applications = 50% of Total
= 50% of 200 = 100
Since the number of US applications was the same in all slots.

$$\text{So, US applications in each slot} = \frac{100}{20} = 5$$

It is given that I, V and N were scheduled for Schengen visa processing in that order. Their slot was 9:15 AM. It means the number of shengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30AM slot in others category. So, the number of applicants in other category in each slot is at least 2.
Since the number of applicants in each slots is 10. So, it can be inferred that number of Schengen and others applicants is 3 and 2 respectively. Hence the number of UK applicants is 0 in each slot.

Total number of counters = 10
US counters = 4
UK counters = 2
Schengen counters = 2
Others counters = 2

Given that US and UK application requires 10 mins of processing time.
Vijay was called at 9:25 A.M. (5^{th} in line).
It is possible if processing time for Schengen visa is 12.5 mins. On a particular day, I, V and N were scheduled for Schengen visa processing in given order. They had 9:15 AM slot but entered at 9:20 A.M. when they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be UK and 2 would be others.
So, for US (Processing time is 10 mins) slots counter-wise are,
C_1 : 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20
C_2 : 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
C_3 : 9:10, 9:25, 9:40, 9:50, 10:00, 10:10
C_4 : 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 mins) slots are
C1 : 9:12.30, 9:25. 9:37.30
C2 : 9:12.30, 9:32.30, 9:45

For others (5 mins) slots are
C1 → 9:05, 9:20, 9:35
C2 → 9:05, 9:20, 9:35

0 is the answer.

QNo:- 36 ,Correct Answer:- 200

Explanation:- Given slots are twenty 15 minutes slots starting at 9AM and ending at 2PM. Then applicants are scheduled in each slot.
Total number of applicants = 10 × 20 = 200
No. of US applications = 50% of Total
= 50% of 200 = 100
Since the number of US applications was the same in all slots.

So, US applications in each slot = $\frac{100}{20} = 5$

It is given that I, V and N were scheduled for Schengen visa processing in that order. Their slot was 9:15 AM. It means the number of shengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30AM slot in others category. So, the number of applicants in other category in each slot is at least 2.
Since the number of applicants in each slots is 10. So, it can be inferred that number of Schengen and others applicants is 3 and 2 respectively. Hence the number of UK applicants is 0 in each slot.

Total number of counters = 10
US counters = 4
UK counters = 2
Schengen counters = 2
Others counters = 2

Given that US and UK application requires 10 mins of processing time.
Vijay was called at 9:25 A.M. (5^{th} in line).
It is possible if processing time for Schengen visa is 12.5 mins. On a particular day, I, V and N were scheduled for Schengen visa processing in given order. They had 9:15 AM slot but entered at 9:20 A.M. when they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be UK and 2 would be others.
So, for US (Processing time is 10 mins) slots counter-wise are,
C_1 : 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20
C_2 : 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
C_3 : 9:10, 9:25, 9:40, 9:50, 10:00, 10:10
C_4 : 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 mins) slots are
C1 : 9:12.30, 9:25. 9:37.30
C2 : 9:12.30, 9:32.30, 9:45

For others (5 mins) slots are
C1 → 9:05, 9:20, 9:35
C2 → 9:05, 9:20, 9:35

For the others, the time taken to process are application is 5 mins. Time taken to process 40 applications is 40 × 5 = 200 mins.

QNo:- 37 ,Correct Answer:- A

Explanation:- Given slots are twenty 15 minutes slots starting at 9AM and ending at 2PM. Then applicants are scheduled in each slot.
Total number of applicants = 10 × 20 = 200
No. of US applications = 50% of Total
= 50% of 200 = 100
Since the number of US applications was the same in all slots.
So, US applications in each slot = $\frac{100}{20} = 5$
It is given that I, V and N were scheduled for Schengen visa processing in that order. Their slot was 9:15 AM. It means the number of shengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30AM slot in others category. So, the number of applicants in other category in each slot is at least 2.
Since the number of applicants in each slots is 10. So, it can be inferred that number of Schengen and others applicants is 3 and 2 respectively. Hence the number of UK applicants is 0 in each slot.

Total number of counters = 10
US counters = 4
UK counters = 2
Schengen counters = 2
Others counters = 2

Given that US and UK application requires 10 mins of processing time.
Vijay was called at 9:25 A.M. (5^{th} in line).
It is possible if processing time for Schengen visa is 12.5 mins. On a particular day, I, V and N were scheduled for Schengen visa processing in given order. They had 9:15 AM slot but entered at 9:20 A.M. when they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be UK and 2 would be others.
So, for US (Processing time is 10 mins) slots counter-wise are,
C_1 : 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20
C_2 : 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
C_3 : 9:10, 9:25, 9:40, 9:50, 10:00, 10:10
C_4 : 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 mins) slots are
C1 : 9:12.30, 9:25. 9:37.30
C2 : 9:12.30, 9:32.30, 9:45

For others (5 mins) slots are
C1 → 9:05, 9:20, 9:35
C2 → 9:05, 9:20, 9:35

Nandini's application is 6th in Schengen application. So, her process will end at 9:45 AM True

QNo:- 38 ,Correct Answer:- B

Explanation:- Given slots are twenty 15 minutes slots starting at 9AM and ending at 2PM. Then applicants are scheduled in each slot.
Total number of applicants = 10 × 20 = 200
No. of US applications = 50% of Total
= 50% of 200 = 100
Since the number of US applications was the same in all slots.
So, US applications in each slot = $\frac{100}{20} = 5$
It is given that I, V and N were scheduled for Schengen visa processing in that order. Their slot was 9:15 AM. It means the number of shengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30AM slot in others category. So, the number of applicants in other category in each slot is at least 2.
Since the number of applicants in each slots is 10. So, it can be inferred that number of Schengen and others applicants is 3 and 2 respectively. Hence the number of UK applicants is 0 in each slot.

Total number of counters = 10
US counters = 4
UK counters = 2
Schengen counters = 2
Others counters = 2

Given that US and UK application requires 10 mins of processing time.
Vijay was called at 9:25 A.M. (5^{th} in line).
It is possible if processing time for Schengen visa is 12.5 mins. On a particular day, I, V and N were scheduled for Schengen visa processing in given order. They had 9:15 AM slot but entered at 9:20 A.M. when they entered VPO,

exactly 6 out of 10 counters were either processing applications or had finished processing ones and ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be UK and 2 would be others.
So, for US (Processing time is 10 mins) slots counter-wise are,
C_1 : 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20
C_2 : 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
C_3 : 9:10, 9:25, 9:40, 9:50, 10:00, 10:10
C_4 : 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 mins) slots are
C1 : 9:12.30, 9:25. 9:37.30
C2 : 9:12.30, 9:32.30, 9:45

For others (5 mins) slots are
C1 → 9:05, 9:20, 9:35
C2 → 9:05, 9:20, 9:35

Option 3) the process for O was completed before 9:45 A.M. True
Option 2) The application process for Mahira started after Nandini's. For Mahira, starting time is 9:30 A.M.
So, for Nandini, starting time is 9:32.30. False.
So, option 2 is answer.

QNo:- 39 ,Correct Answer:- B

Explanation:- Given slots are twenty 15 minutes slots starting at 9AM and ending at 2PM. Then applicants are scheduled in each slot.
Total number of applicants = 10 × 20 = 200
No. of US applications = 50% of Total
= 50% of 200 = 100
Since the number of US applications was the same in all slots.
So, US applications in each slot $= \frac{100}{20} = 5$
It is given that I, V and N were scheduled for Schengen visa processing in that order. Their slot was 9:15 AM. It means the number of shengen applicants in each slot is at least 3.

Similarly, it is given that M and O were scheduled in the 9:30AM slot in others category. So, the number of applicants in other category in each slot is at least 2.
Since the number of applicants in each slots is 10. So, it can be inferred that number of Schengen and others applicants is 3 and 2 respectively. Hence the number of UK applicants is 0 in each slot.

Total number of counters = 10
US counters = 4
UK counters = 2
Schengen counters = 2
Others counters = 2

Given that US and UK application requires 10 mins of processing time.
Vijay was called at 9:25 A.M. (5^{th} in line).
It is possible if processing time for Schengen visa is 12.5 mins. On a particular day, I, V and N were scheduled for Schengen visa processing in given order. They had 9:15 AM slot but entered at 9:20 A.M. when they entered VPO, exactly 6 out of 10 counters were either processing applications or had finished processing ones and ready to start processing the next. Hence at 9:20 A.M. there are exactly 4 free counters. Out of these 4 free counters, 2 would be UK and 2 would be others.
So, for US (Processing time is 10 mins) slots counter-wise are,
C_1 : 9:10, 9:20, 9:30, 9:40, 9:55, 10:10, 10:20
C_2 : 9:10, 9:25, 9:35, 9:45, 9:55, 10:10
C_3 : 9:10, 9:25, 9:40, 9:50, 10:00, 10:10

C_4 : 9:10, 9:25, 9:40, 9:55, 10:05, 10:15

For Schengen visa (12.5 mins) slots are
C1 : 9:12.30, 9:25. 9:37.30
C2 : 9:12.30, 9:32.30, 9:45

For others (5 mins) slots are
C1 → 9:05, 9:20, 9:35
C2 → 9:05, 9:20, 9:35

From the slots, we can see that the first slot took 20 mins to complete, and after that the remaining 19 slots took 15 mins each to complete the US application process.
So, Total time taken = 20 + 15 × 19 = 305 mins.
Hence end time will be = 9 AM + 305 Mins = 2:05 P.M.

QNo:- 40 ,Correct Answer:- 3

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Explanation:-

Road

We can determine following by reading the set:
1. Row 1 has two occupied houses one in each block means one out of A_1, B_1, C_1 is occupied. One out of D_1, E_1, F_1 is occupied
Also, it means 4 are vacant.
2. E_1 and E_2 are vacant.
3. The costeliest house (vacant) in block xx is worth 24 lacs.
4. The cheapest house (vacant) in block yy is worth 15 lacs.
5. One out of E_1 or E_2 is of worth 15 lacs.
6. There is only are house with parking space in block yy.

Let a = road adjacency value
Let b = neighbor count.
Where a = 0/1/2
Where b = 0/1/2/3

There can be 2 possibilities for the house worth 24 lacs:

Case 1: - A house has parking space:
Quoted price = 12 + 5a + 3b = 24
⇒ 5a + 3b = 12
The only possible solution is a = 0, b = 4.
But b can't be 4 as maximum no. of neighbors can be 3.

Case 2:- House has not parking space.
Quoted price = 10 + 5a + 3b = 24
⇒ 5a + 3b = 14
⇒ a = 1, b = 3
It means the house has 1 roads adjacent and 3 neighbours i.e. occupied houses.
The only possibility is B_2
So, we can determine B_2 is vacant and worth 24 lacs. Also A_2, B_1 and C_2 are unoccupied.
From condition (1), we can say A_1 & C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied
× = Unoccupied

For Block YY:

Both E_1 and E_2 are vacant.

By condition 4, either price of E_1 or E_2 is 15 Lacs.

Two cases arise:-

Case 1: If E_1 is of 15 Lacs.

Road adjacency value = 0.

If this house has no parking space then

$10 + 5 \times 0 + 3b = 15$

$\Rightarrow 3b = 5$ Never possible.

If E_1 has parking space,

$12 + 5 \times 0 + 3b = 15$

$\Rightarrow 3b = 3 \Rightarrow b = 1$.

Means E_1 has one occupied neighboring house. E_2 is already vacant. So, It can be either D_1 or F_1. So, there would be 2 possibilities

√	×	×				×	×	√
D_1	E_1	F_1		or		D_1	E_1	F_1
×	×	√				√	×	×
D_2	E_2	F_2				D_2	E_2	F_2

Case 2:

If E_2 is of 15 Lacs.

We already know a = 1.

If E_2 has parking space:

$12+ 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$ (Not possible)

If E_2 has no parking space:

$10 + 5 \times 1 + 3b = 15 \Rightarrow b = 0$

Means D_2, E_1 and F_2 are vacant.

That implies D1 & F_1 are occupied by condition that column D and column F has at least one occupied house. But it is a contradiction to condition 1.

So, this is an invalid case.

Answer is 3.

QNo:- 41 ,Correct Answer:- A

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Explanation:-

Road

We can determine following by reading the set:

1. Row 1 has two occupied houses one in each block means one out of A_1, B_1, C_1 is occupied. One out of D_1, E_1, F_1 is occupied

Also, it means 4 are vacant.

2. E_1 and E_2 are vacant.

3. The costeliest house (vacant) in block xx is worth 24 lacs.

4. The cheapest house (vacant) in block yy is worth 15 lacs.
5. One out of E_1 or E_2 is of worth 15 lacs.
6. There is only are house with parking space in block yy.

Let a = road adjacency value
Let b = neighbor count.
Where a = 0/1/2
Where b = 0/1/2/3

There can be 2 possibilities for the house worth 24 lacs:

Case 1: - A house has parking space:

Quoted price = 12 + 5a + 3b = 24
⇒ 5a + 3b = 12
The only possible solution is a = 0, b = 4.
But b can't be 4 as maximum no. of neighbors can be 3.

Case 2:- House has not parking space.

Quoted price = 10 + 5a + 3b = 24
⇒ 5a + 3b = 14
⇒ a = 1, b = 3
It means the house has 1 roads adjacent and 3 neighbours i.e. occupied houses.
The only possibility is B_2
So, we can determine B_2 is vacant and worth 24 lacs. Also A_2, B_1 and C_2 are unoccupied.
From condition (1), we can say A_1 & C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied
× = Unoccupied

For Block YY:

Both E_1 and E_2 are vacant.
By condition 4, either price of E_1 or E_2 is 15 Lacs.
Two cases arise:-

Case 1: If E_1 is of 15 Lacs.

Road adjacency value = 0.
If this house has no parking space then
10 + 5 × 0 + 3b = 15
⇒ 3b = 5 Never possible.
If E_1 has parking space,
12 + 5 × 0 + 3b = 15
⇒ 3b = 3 ⇒ b = 1.
Means E_1 has one occupied neighboring house. E_2 is already vacant. So, It can be either D_1 or F_1. So, there would be 2 possibilities

√	×	×				×	×	√
D_1	E_1	F_1		or		D_1	E_1	F_1
×	×	√				√	×	×
D_2	E_2	F_2				D_2	E_2	F_2

Case 2:

If E_2 is of 15 Lacs.
We already know a = 1.
If E_2 has parking space:
12+ 5 × 1 + 3b = 15 ⇒ 3b = - 2 (Not possible)

If E_2 has no parking space:
$10 + 5 \times 1 + 3b = 15 \Rightarrow b = 0$
Means D_2, E_1 and F_2 are vacant.
That implies D1 & F_1 are occupied by condition that column D and column F has at least one occupied house. But it is a contradiction to condition 1.
So, this is an invalid case.

B_1 is definitely occupied.

QNo:- 42 ,Correct Answer:- C

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Explanation:-

Road

We can determine following by reading the set:
1. Row 1 has two occupied houses one in each block means one out of A_1, B_1, C_1 is occupied. One out of D_1, E_1, F_1 is occupied
Also, it means 4 are vacant.
2. E_1 and E_2 are vacant.
3. The costeliest house (vacant) in block xx is worth 24 lacs.
4. The cheapest house (vacant) in block yy is worth 15 lacs.
5. One out of E_1 or E_2 is of worth 15 lacs.
6. There is only are house with parking space in block yy.

Let a = road adjacency value
Let b = neighbor count.
Where a = 0/1/2
Where b = 0/1/2/3

There can be 2 possibilities for the house worth 24 lacs:

Case 1: - A house has parking space:
Quoted price = $12 + 5a + 3b = 24$
$\Rightarrow 5a + 3b = 12$
The only possible solution is a = 0, b = 4.
But b can't be 4 as maximum no. of neighbors can be 3.

Case 2:- House has not parking space.
Quoted price = $10 + 5a + 3b = 24$
$\Rightarrow 5a + 3b = 14$
$\Rightarrow a = 1, b = 3$
It means the house has 1 roads adjacent and 3 neighbours i.e. occupied houses.
The only possibility is B_2
So, we can determine B_2 is vacant and worth 24 lacs. Also A_2, B_1 and C_2 are unoccupied.
From condition (1), we can say A_1 & C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied
× = Unoccupied

For Block YY:
Both E_1 and E_2 are vacant.

By condition 4, either price of E_1 or E_2 is 15 Lacs.
Two cases arise:-

Case 1: If E_1 is of 15 Lacs.
Road adjacency value = 0.
If this house has no parking space then
$10 + 5 \times 0 + 3b = 15$
$\Rightarrow 3b = 5$ Never possible.
If E_1 has parking space,
$12 + 5 \times 0 + 3b = 15$
$\Rightarrow 3b = 3 \Rightarrow b = 1$.
Means E_1 has one occupied neighboring house. E_2 is already vacant. So, It can be either D_1 or F_1. So, there would be 2 possibilities

√	×	×				×	×	√
D_1	E_1	F_1		or		D_1	E_1	F_1
×	×	√				√	×	×
D_2	E_2	F_2				D_2	E_2	F_2

Case 2:
If E_2 is of 15 Lacs.
We already know a = 1.
If E_2 has parking space:
$12+ 5 \times 1 + 3b = 15 \Rightarrow 3b = -2$ (Not possible)
If E_2 has no parking space:
$10 + 5 \times 1 + 3b = 15 \Rightarrow b = 0$
Means D_2, E_1 and F_2 are vacant.
That implies D1 & F_1 are occupied by condition that column D and column F has at least one occupied house. But it is a contradiction to condition 1.
So, this is an invalid case.

Exactly 3.

QNo:- 43 ,Correct Answer:- 21

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Explanation:-

Road

We can determine following by reading the set:
1. Row 1 has two occupied houses one in each block means one out of A_1, B_1, C_1 is occupied. One out of D_1, E_1, F_1 is occupied
Also, it means 4 are vacant.
2. E_1 and E_2 are vacant.
3. The costeliest house (vacant) in block xx is worth 24 lacs.
4. The cheapest house (vacant) in block yy is worth 15 lacs.
5. One out of E_1 or E_2 is of worth 15 lacs.
6. There is only are house with parking space in block yy.
Let a = road adjacency value
Let b = neighbor count.
Where a = 0/1/2
Where b = 0/1/2/3
There can be 2 possibilities for the house worth 24 lacs:

Case 1: - A house has parking space:

Quoted price = 12 + 5a + 3b = 24

⇒ 5a + 3b = 12

The only possible solution is a = 0, b = 4.

But b can't be 4 as maximum no. of neighbors can be 3.

Case 2:- House has not parking space.

Quoted price = 10 + 5a + 3b = 24

⇒ 5a + 3b = 14

⇒ a = 1, b = 3

It means the house has 1 roads adjacent and 3 neighbours i.e. occupied houses.

The only possibility is B_2

So, we can determine B_2 is vacant and worth 24 lacs. Also A_2, B_1 and C_2 are unoccupied.

From condition (1), we can say A_1 & C_1 are unoccupied.

Block XX

×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied

× = Unoccupied

For Block YY:

Both E_1 and E_2 are vacant.

By condition 4, either price of E_1 or E_2 is 15 Lacs.

Two cases arise:-

Case 1: If E_1 is of 15 Lacs.

Road adjacency value = 0.

If this house has no parking space then

10 + 5 × 0 + 3b = 15

⇒ 3b = 5 Never possible.

If E_1 has parking space,

12 + 5 × 0 + 3b = 15

⇒ 3b = 3 ⇒ b = 1.

Means E_1 has one occupied neighboring house. E_2 is already vacant. So, It can be either D_1 or F_1. So, there would be 2 possibilities

√	×	×				×	×	√
D_1	E_1	F_1		or		D_1	E_1	F_1
×	×	√				√	×	×
D_2	E_2	F_2				D_2	E_2	F_2

Case 2:

If E_2 is of 15 Lacs.

We already know a = 1.

If E_2 has parking space:

12+ 5 × 1 + 3b = 15 ⇒ 3b = - 2 (Not possible)

If E_2 has no parking space:

10 + 5 × 1 + 3b = 15 ⇒ b = 0

Means D_2, E_1 and F_2 are vacant.

That implies D1 & F_1 are occupied by condition that column D and column F has at least one occupied house. But it is a contradiction to condition 1.

So, this is an invalid case.

Maximum possible quoted price = 10 + 5 × 1 + 3 ×2 = 21 Lacs.

QNo:- 44 ,Correct Answer:- C

Block XX				Block YY		
A_1	B_1	C_1	Road	D_1	E_1	F_1
A_2	B_2	C_2		D_2	E_2	F_2

Explanation:-

Road

We can determine following by reading the set:
1. Row 1 has two occupied houses one in each block means one out of A_1, B_1, C_1 is occupied. One out of D_1, E_1, F_1 is occupied
Also, it means 4 are vacant.
2. E_1 and E_2 are vacant.
3. The costeliest house (vacant) in block xx is worth 24 lacs.
4. The cheapest house (vacant) in block yy is worth 15 lacs.
5. One out of E_1 or E_2 is of worth 15 lacs.
6. There is only are house with parking space in block yy.

Let a = road adjacency value
Let b = neighbor count.
Where a = 0/1/2
Where b = 0/1/2/3

There can be 2 possibilities for the house worth 24 lacs:

Case 1: - A house has parking space:
Quoted price = 12 + 5a + 3b = 24
⇒ 5a + 3b = 12
The only possible solution is a = 0, b = 4.
But b can't be 4 as maximum no. of neighbors can be 3.

Case 2:- House has not parking space.
Quoted price = 10 + 5a + 3b = 24
⇒ 5a + 3b = 14
⇒ a = 1, b = 3
It means the house has 1 roads adjacent and 3 neighbours i.e. occupied houses.
The only possibility is B_2
So, we can determine B_2 is vacant and worth 24 lacs. Also A_2, B_1 and C_2 are unoccupied.
From condition (1), we can say A_1 & C_1 are unoccupied.

Block XX		
×	√	×
A_1	B_1	C_1
A_2	B_2	C_2
√	(24L) ×	√

√ = occupied
× = Unoccupied

For Block YY:
Both E_1 and E_2 are vacant.
By condition 4, either price of E_1 or E_2 is 15 Lacs.
Two cases arise:-

Case 1: If E_1 is of 15 Lacs.
Road adjacency value = 0.
If this house has no parking space then
10 + 5 × 0 + 3b = 15

⇒ 3b = 5 Never possible.
If E_1 has parking space,
12 + 5 × 0 + 3b = 15
⇒ 3b = 3 ⇒ b = 1.
Means E_1 has one occupied neighboring house. E_2 is already vacant. So, It can be either D_1 or F_1. So, there would be 2 possibilities

√	×	×				×	×	√
D_1	E_1	F_1		or		D_1	E_1	F_1
×	×	√				√	×	×
D_2	E_2	F_2				D_2	E_2	F_2

Case 2:
If E_2 is of 15 Lacs.
We already know a = 1.
If E_2 has parking space:
12+ 5 × 1 + 3b = 15 ⇒ 3b = - 2 (Not possible)
If E_2 has no parking space:
10 + 5 × 1 + 3b = 15 ⇒ b = 0
Means D_2, E_1 and F_2 are vacant.
That implies D1 & F_1 are occupied by condition that column D and column F has at least one occupied house. But it is a contradiction to condition 1.
So, this is an invalid case.

E_1 has parking space.

Section : Quantitative Ability

QNo:- 45 ,Correct Answer:- D

Explanation:- $\text{Log}_x (x^2+12) = 4$
$(x^2+12) = x^4$
$x^4 - (x^2+12) = 0$
$x^4 - x^2 - 12 = 0$
$(x^2 - 4)(x^2 + 3) = 0$
$x^2 = 4$ and $x^2 = -3$
Here x^2 cannot be negative so rejecting -3.
$x^2 = 4$
x = 2 and x = -2.
Now again x is in the base here, so it cannot be negative. As such x = -2 rejected.
Finally we get, x = 2.
Further we are given,
$3 \log_y x = 1$
$\log_y x = 1/3$
$x = y^{1/3}$
$2 = y^{1/3}$
Cube on both side, we get
8 = y
Finally, x + y = 2 + 8 =10.

QNo:- 46 ,Correct Answer:- C

Explanation:- Solution: Firstly doing prime factorization
$168 = 2^3 \times 3^1 \times 7^1$
$1134 = 2^1 \times 3^4 \times 7^1$
The least positive integer value of n in 1134^n to make it a factor of 168
$1134^n / 168$
We need atleast 2^3 in numerator, so minimum value of n must be 3.
$1134^3 = 2^3 \times 3^{12} \times 7^3$
$168 = 2^3 \times 3^1 \times 7^1$
The least positive integer value of m in 168^m to make it a factor of 1134^n
We need atleast 3^{12} in numerator, so minimum value of m must be 12.
Finally m + n = 12 +3 =15.

QNo:- 47 ,Correct Answer:- C

Explanation:- $x^2 + (x-2y-1)^2 = -4y(x+y)$
$x^2 + 4y(x+y) + (x-2y-1)^2 = 0$
$x^2 + 4yx + 4y^2 + (x-2y-1)^2 = 0$
$(x+2y)^2 + (x-2y-1)^2 = 0$
As both of these are square, so they none of them could be negative.
In order to make the sum as zero, they must be individually zero.
As such, $(x - 2y - 1)^2 = 0 \Rightarrow x - 2y - 1 = 0 \Rightarrow x - 2y = 1$. So, answer is 1.

QNo:- 48 ,Correct Answer:- B

Explanation:-
$\sqrt{5x+9} + \sqrt{5x-9} = 3(2+\sqrt{2})$
$\sqrt{5x+9} + \sqrt{5x-9} = 6 + 3\sqrt{2}$
$\sqrt{5x+9} + \sqrt{5x-9} = \sqrt{36} + \sqrt{18}$
Here we can observe difference between $\sqrt{5x+9}$ and $\sqrt{5x-9}$ also $\sqrt{36}$ and $\sqrt{18}$ is same.
From here we can equate,
$\sqrt{5x+9} = \sqrt{36}$
so, 5x + 9 = 36
10x + 9 = 63
$\sqrt{10x+9} = \sqrt{63}$
$\sqrt{10x+9} = 3\sqrt{7}$.

QNo:- 49 ,Correct Answer:- 3

Explanation:- $2|x|(x^2 + 1) = 5x^2$
Let y = |x|
so $y^2 = x^2$
rewriting the equation
$2y(y^2 + 1) = 5y^2$
we can cancel y from both the sides, means x = 0
we are left with
$2(y^2 + 1) = 5y$
$2y^2 + 2 = 5y$
$2y^2 - 5y + 2 = 0$
y = ½ and 2.
we need integral value, so leaving 1/2.
We have y =0, 2

means |x| = 0 and 2
so x can have 3 values i.e. 0, 2, -2. So 3 values.

QNo:- 50 ,Correct Answer:- 6

Explanation:- Sum of roots = -b/a
$\alpha + \beta = 3$
and product of roots is = c/a
$\alpha * \beta = K/2$
For the second equation,
Sum of roots, $\alpha + \beta + \alpha * \beta = -P$
$3 + k/2 = -P$
Product of roots, $(\alpha + \beta)* \alpha * \beta = P$
$3* k/2 = P$
Solving these two, we get
K = -3/2
P = -9/4
Solving 8(K - P) = 8 [-3/2 - (-9/4)] = 6
The answer will be 6.

QNo:- 51 ,Correct Answer:- 2

Explanation:- $x^3 + (2r + 1)x^2 + (4r + 1)x + 2 = 0$
Here the product of all three roots = d/a = -2
One of the roots is given as -2
So, product of two roots, a*b = 1
so we can conclude b = 1/a
Now sum of all the three roots = -b/a
a + 1/a -2 = -(2r + 1)
a + 1/a = -2r + 1
we know that, value of a + 1/a lies between -2 and 2.
we can conclude
$-2 \leq a + 1/a \leq 2$
$= -2 \leq -2r + 1 \leq 2$
Adding 1
$-3 \leq -2r \leq 3$
Dividing by 2
$-3/2 \leq -r \leq 3/2$
multiplying by -1
$3/2 \leq r \leq -3/2$. So minimum possible non negative integral value will be 2.

QNo:- 52 ,Correct Answer:- A

Explanation:- Using the formula for angle between the hands of clock.
q = M 11/2 – 30 H
q = Angle between the two hands.
H = Position of hour hand initially
M = Position of Minute hand lastly.
At 8:48
q = 48 × 11/2 – 30× 8 = 24 degree increasing 24 by 50%, we get = 36 degree.
time between 8 and 9 the hands of a clock make an angle of 36 degree
q = M 11/2 – 30 H
36 = M 11/2 – 30× 8
m = 552/11 = 50 (2/11)
Difference in minutes = 50 (2/11) – 48 = 24/11

QNo:- 53 ,Correct Answer:- A

Explanation:- The ratio of coffee and cocoa in the mixture Q is 16 : 9. Means ratio of final to total coffee = 16:25
By applying the formula for repeated mixture,
$\frac{16}{9} = 1[1 - \frac{taken\ Out}{total}]^2$
$\frac{taken\ Out}{total} = \frac{1}{5}$
It means, in first go, 1/5 of coffee is replaced be cocoa powder and in second go, 1/5 of mixture was replaced by cocoa powder.
cocoa in mixture P = 1/5
and cocoa in mixture Q is = 9/25
ratio of cocoa in mixture P to that in mixture Q is (1/5) / (9/25) = 5:9

QNo:- 54 ,Correct Answer:- B

Explanation:- Let marks of each girl = g and marks of each boy = m
(4 g + 6 b)/ 10 = 24
4 g + 6 b = 240
2 g + 3 b = 120 – (I)
Given, marks of any girl is at most double the marks of any boy i.e. g = 2 b (max)
but marks of any girl is not less than the marks of any boy i.e. g = b (min)
putting max and min value of g in equation (I) , we get
at g = 2 b, 4 b + 3 b = 120 ⇒ b = 17.14
at g = b, 2 b + 3 b = 120 ⇒ b = 24
we need to solve for 2 g + 6 b
at g = 2 b, 4 b + 6 b ⇒ 10 b ⇒ 10 × 17.14 = 171.4
at g = b, 2 b + 6 b ⇒ 8 b ⇒ 8 × 24 = 192
So value range for 172 till 192, total 21 values

QNo:- 55 ,Correct Answer:- D

Explanation:- Lets go by options,
Option 1,
26862 – 8×80 = 26222 (Not a palindrome)
Option 2,
26862 – 8×90 = 26142 (Not a palindrome)
Option 3,
26862 – 8×110 = 25980 (Not a palindrome)
Option 4,
26862 – 8×100 = 26062 (a palindrome)
Correct answer to the question must be option 4.

QNo:- 56 ,Correct Answer:- C

Explanation:- let CP of first = a and CP of second = b
Profit of 20% on a.
SP of first will be = 1.2 a
Loss of 10% on second.
SP of second will be = 0.9 b
SP of both is same
1.2 a = 0.9 b
or 0.9 b = 1.2 a
to have a profit of 10% on b means 1.1 b

when 0.9 b = 1.2 a
then 1.1 b = 1.466 a
that means a profit of 47% on first object A.

QNo:- 57 ,Correct Answer:- A

Explanation:- Ratio of the salaries of Sita, Gita and Mita is given as 5: 6 : 7
After respective hike of 20% , 25% and 20%, it becomes = 6: 7.5: 8.4.
The second year, after Sita and Mita get salary hikes of 40% and 25%, respectively, we get = 8.4: x: 10.5.
Now given, the salary of Gita becomes equal to the mean salary of the three friends which is = x
(8.4 + x + 10.5) /3 = x
x = 9.45
Salary of Gita increases from 7.5 to 9.45, so percentage increase will be = (9.45 – 7.5)/ 7.5 × 100 = 26%

QNo:- 58 ,Correct Answer:- 972

Explanation:- $S_a/S_b = \sqrt{Tb/Ta}$

$54/S_b = \sqrt{(\frac{24}{6})}$

$S_b = 27$

Total distance = 54 × 6 + 27 × 24 = 972 km. Correct answer to the question must be 972.

QNo:- 59 ,Correct Answer:- 20808

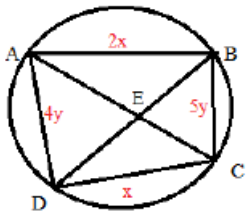
Explanation:- Let initial investment made by Sunil be 'x'
As compounded half-yearly, time becomes 12 and rate becomes 2% for Anil and time becomes 10 and rate becomes 2% for Sunil.
$22000(1.02)^{12} = x(1.02)^{10} \times 1.1$
x = 20808. Correct answer to the question must be 20808.

QNo:- 60 ,Correct Answer:- 27

Explanation:- Kamal takes twice as much time as Amal to do the same amount of job.
So, if one day work of Amal is '2a' then one day work of Kamal will be 'a'.
Let one day work of Sunil be 'x'
Now, amount of job that Amal, Sunil and Kamal can individually do in a day, are inharmonic progression
So 2/x = 1/2a + 1/ a
x = 4/3a
Means, one day work of Sunil is '4/3a'
Amal and Sunil work for 4 days and 9 days, respectively, Kamal needs to work for 16 days to finish the remaining job means total work will be = 8 a +12 a + 16 a = 36 a
Time taken by Sunil to finish the job working alone = 36a/ (4/3a) = 27 days.
Correct answer to the question must be 27 days.

QNo:- 61 ,Correct Answer:- B

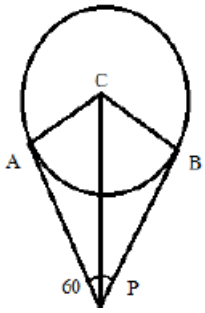
Explanation:- In triangle AED and triangle BEC



∠DAE = ∠CBE (angle by same arc)
∠ADE = ∠BCE (angle by same arc)
So triangle AED and triangle BEC are similar.
AE/BE = AD/BC = DE/CE =4/5. – (I)
Similarly, triangle AED and triangle BEC will be similar.
AE/ED = AB/DC = BE/CE =2/1 – (II)
from (I) and (II)
AE : CE = 8:5.

QNo:- 62 ,Correct Answer:- D

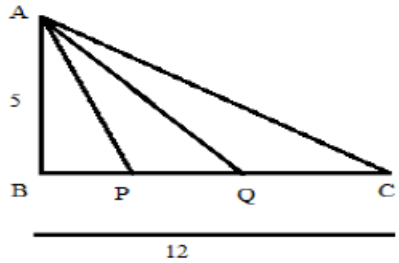
Explanation:- From equation,
$x^2 + y^2 + 4x - 6y - 3 = 0$
We can conclude that centre of circle will be at (-2,3)
$\text{Radius} = \sqrt{16}\ [(-2)^2 + (3)^2 - (-3)]$
$\text{Radius} = \sqrt{16} = 4$
In triangle APC,



∠A = 90
∠APC = 30
∠ACP = 60
As AC is 4, then CP will be 8.
For point P, x coordinate is given as 6.
Applying distance formula,
$[(x-x_1)^2+(y-y_1)^2]^{1/2} = 8$
putting x,y =-2,3 and x_1,y_1 = 6,y
we get y =3.
Correct answer to the question must be (6,3)

QNo:- 63 ,Correct Answer:- 2

Explanation:- Here the height of all the 3 triangles are equal, so area will be dependent on base.
Given, ΔABC is 1.5 times the area of ΔABP



So length of BC = 1.5 BP
BP = 8
BC = 12 (Given)
BP, BQ and BC are in arithmetic progression.
BQ = (8+12) / 2 = 10
PQ = 10 – 8 = 2. Correct answer to the question must be 2.

QNo:- 64 ,Correct Answer:- A

Explanation:- $1/(\sqrt{x}+\sqrt{z})+1/(\sqrt{x}+\sqrt{y})=2/(\sqrt{y}+\sqrt{z})$
$(\sqrt{x}-\sqrt{z})/(x-z)+(\sqrt{x}+\sqrt{y})/(x-y)=2(\sqrt{y}-\sqrt{z})/(y-z)$
now going by options, using option 1.
when y, x, z are in arithmetic progression, x-z will be d, x-y will be –d and y-z will be 2d.
$(\sqrt{x}-\sqrt{z})/d+(\sqrt{x}+\sqrt{y})/-d=2(\sqrt{y}-\sqrt{z})/2d$
$(\sqrt{x}-\sqrt{z})-(\sqrt{x}+\sqrt{y})=\sqrt{y}-\sqrt{z}$
$\sqrt{y}-\sqrt{z}=\sqrt{y}-\sqrt{z}$
it means this is satisfied. Correct answer to the question must be option 1.

QNo:- 65 ,Correct Answer:- A

Explanation:- Considering all single digit number = 9 numbers
Considering 2 digit number = _ × _
First place can be filled in 9 ways because cannot take zero.
Second place can be filled in 9 ways because repetition not allowed.
= 9×9 = 81 numbers
Considering 3 digit number = _ × _ × _
First place can be filled in 9 ways because cannot take zero.
Second place can be filled in 9 ways because repetition not allowed.
Third place can be filled in 8 ways because repetition not allowed.
= 9×9 × 8 = 648 numbers. Total = 9 + 81 + 648 = 738 numbers.

QNo:- 66 ,Correct Answer:- 19

Explanation:- No. of organisms on first day = 2, Second = 2×2+3 = 7, Third = 7 × 2+3 = 17
Forth = 17 × 2 + 3 = 37, Fifth = 37 × 2 + 3 = 77
Sixth = 77× 2 +3 = 157
Seventh = 157× 2 + 3 = 317
When you look carefully you will realize, after 7 steps there is NO much impact of +3 so we can consider that after seventh term it only becomes double.
So considering a GP with first term a =157, r =2 and Tn >10,00,000
n will be 12. So total it must be 7 + 12 =19th term. Correct answer to the question must be 19.

Section : Verbal Ability

QNo:- 1 ,Correct Answer:- B

Explanation:- In the passage, the author mentions that historians, in dealing with basic facts like the date and location of historical events (e.g., the Battle of Hastings in 1066), rely on "auxiliary sciences" of history, which include archaeology. The author notes that accuracy in such basic facts is important for historians but compares praising a historian for accuracy to praising an architect for using well-seasoned timber - a necessary condition but not the essential function. The passage implies that archaeology and other auxiliary sciences support historians in establishing these basic facts. Refer to the lines “But praise a historian…..”
Therefore, option 2 is the most appropriate choice based on the information provided in the passage.

QNo:- 2 ,Correct Answer:- B

Explanation:- Option 2 is the correct answer as it agrees with the perspective of the passage that the interpretation of facts can be subjective and influenced by different perspectives. The passage argues that historians play a vital role in selecting and interpreting facts, and Option 2 supports this by suggesting that facts, like truth, can be relative.

QNo:- 3 ,Correct Answer:- C

Explanation:- According to the passage, the role of historians is not limited to establishing basic facts. They are expected to delve deeper into understanding the context and motivations behind historical events. This requires a selective and interpretive approach to historical writing. Option 3 is the only one that reflects this comprehensive and contextual approach to historical writing, focusing on understanding the underlying causes and influences that shaped the historical event.

QNo:- 4 ,Correct Answer:- C

Explanation:- Option 2 provides an accurate representation of the common-sense perspective described in the passage. This perspective acknowledges historical methods beyond positivism, as stated in option 4. According to the passage, the common-sense view also involves a fallacious belief that historical facts are objective and independent of interpretation, as mentioned in option 1. That takes us to the right option i.e. option 3 because it is rather contrasting what is being said in the passage.

QNo:- 5 ,Correct Answer:- C

Explanation:-
Option A- This is a valid criticism according to the passage. The author points out that Deneen fails to recognize liberalism's historical ability to reform itself and address internal problems.
Option B- This is a valid criticism. The passage suggests that while Deneen accurately highlights the current problems with liberalism, he may be overly pessimistic about its future.
Option D is also a valid criticism.
Only option C is the right answer. Although the passage is critical of Deneen's extreme pessimism regarding the future of liberalism, his narrow definition of liberalism limited to individual freedoms, and his fixation on the essence of liberalism, it doesn't address his tendency to look back to premodern notions specifically.

QNo:- 6 ,Correct Answer:- D

Explanation:-
Let's evaluate each option-
Option A introduces the idea of a return to past liberalism, which is not explicitly mentioned in the passage. The author does criticize the current state of liberalism and its problems but doesn't specifically address the possibility of

returning to a past form of liberalism.
For option B. While the passage criticizes the Davos elite, it focuses more on their hypocrisy and accumulation of wealth rather than how they have captured the debate around liberalism. The primary emphasis is on their actions rather than their control of the debate.
Option C introduces a positive aspect of the rise in liberalism, which is not consistent with the author's overall criticism of the current state of liberalism and the actions of the Davos elite.
In contrast, option D aligns with the passage's emphasis on the hypocrisy of the liberal rich and their accumulation of wealth while professing to adhere to liberal values. Therefore, option D is the most accurate interpretation based on the information provided in the passage.

QNo:- 7 ,Correct Answer:- A

Explanation:-
For option B- "'The gap between liberalism's claims about itself and the lived reality of the citizenry' is now so wide that 'the lie can no longer be accepted.'" - This statement highlights a significant gap between liberalism's claims and the lived reality of the citizens, indicating a disillusionment with liberalism.
For option C-"Democracy has degenerated into a theatre of the absurd." - This statement suggests a negative assessment of the current state of democracy, indicating a decline in its quality.
For option D- ". . . the creation of a business aristocracy, the rise of vast companies." - This statement points to the creation of a business aristocracy and the rise of large companies, indicating a concentration of economic power, which could be seen as evidence of the decline of liberalism.
So except option A rest are evidence in the context of the passage.

QNo:- 8 ,Correct Answer:- D

Explanation:-
The author is most likely to agree with Option 4 as it supports the author's argument in the passage that liberalism has a history of reforming itself in response to challenges. The author emphasizes that liberalism's success is not solely due to its dominance over the past century, but rather its ability to address internal issues and adapt to change. Rest all options are eliminated. For example, in the case of option 3, the passage doesn't explicitly address the need to find a substitute for liberalism, and the author's emphasis is more on the potential for reform within liberalism. Therefore, the author is likely to disagree with this statement.

QNo:- 9 ,Correct Answer:- D

Explanation:-
The passage suggests that one solution to the environmental impact of fast fashion is to buy high-quality items that shed less and last longer. This aligns with the concept of 'slow fashion,' which emphasizes durable and long-lasting clothing as opposed to the disposable nature of fast fashion.

QNo:- 10 ,Correct Answer:- D

Explanation:-
The irony of "thrifting" and its potential for unforeseen environmental effects are discussed in the chapter. The paragraph raises a possible environmental concern with thrift shopping, despite the fact that it is frequently viewed as a sustainable and environmentally beneficial activity. The article specifically cites a study that Patagonia commissioned that shows worn-out clothing—often seen in thrift stores—has a tendency to shed a greater number of microfibers. These microfibers contribute to the microfiber pollution that can wind up in rivers and seas. Therefore, by shedding microfibers during the washing of old items, thrift shopping—despite its ecologically conscientious objectives to decrease waste—may cause environmental difficulties.

QNo:- 11 ,Correct Answer:- A

Explanation:-

The central idea of the passage revolves around the environmental impact of the fashion industry, the promotion of second-hand shopping as a sustainable alternative, and the potential challenges and considerations associated with second-hand consumption. To identify the statement that would undermine the central idea, we need to look for an option that contradicts or diminishes the importance of these key elements.
For option B- This statement supports the central idea by addressing the environmental impact of clothes ending up in landfills. It does not undermine the central idea.
For option D- This statement is not directly related to the central idea of the environmental impact of the fashion industry and the benefits of second-hand shopping. It introduces a new aspect of purchasing behaviour but does not necessarily undermine the main focus of the passage.
Option A would go against the main idea of the passage because it emphasizes the significance of second-hand shopping not only for purchasing high-quality clothing but also as a sustainable and eco-friendly alternative to fast fashion. If second-hand stores limit their inventory to only high-quality items, it could reduce the variety and affordability that make second-hand shopping accessible and eco-friendly for a larger audience.

QNo:- 12 ,Correct Answer:- B

Explanation:-
The author does not explicitly mention the reasons why companies like ThredUP have not caught on in the UK. However, based on the information provided in the passage, we can infer the likely reasons. Let's analyze each option:
Option A- This is consistent with the passage, as it suggests that high-end retailers prioritize their brand image over sustainability.
Option B- The passage does not provide information about the purchasing habits of the British regarding second-hand clothing, so we cannot confirm or deny this statement.
Option C- This is consistent with the passage, as it mentions that high-end retailers would rather put brand before sustainability, implying that recycling might not be financially attractive for them.
Option D- This is consistent with the passage, as it suggests that luxury brands are hesitant to circulate their latest season stock at lower prices, indicating a concern about devaluing their products.

QNo:- 13 ,Correct Answer:- B

Explanation:-
The passage suggests that Netflix, along with other global firms, contributes to a shared cultural experience by providing content that can be enjoyed across different European countries. The author emphasizes the importance of having something in common, such as binge-watching the same series, as a form of cultural unity. The use of Netflix to pump the same content into homes across the continent is portrayed as a positive aspect of cultural integration.

QNo:- 14 ,Correct Answer:- A

Explanation:-
First, we will eliminate options C and D. If anything, suggests success in appealing to audiences outside of Europe and does not necessarily weaken the idea of cultural unity within Europe and 4th one is only information about age-related preferences but doesn't specifically address the shared cultural experience or lack thereof. Option B is something related to Netflix's business so eliminated.
Considering the options, **Option A (Research shows there is a wide variance in the popularity and viewing of Netflix shows across different EU countries)** is the one that would likely weaken the author's conclusion by indicating that the popularity and viewing habits of Netflix shows vary significantly across European countries, suggesting a lack of a unified cultural experience.

QNo:- 15 ,Correct Answer:- D

Explanation:-
According to the passage, although Netflix has established offices in various European countries, the ultimate decision-making power still lies with the American executives. As a result, the content produced by Netflix may still exhibit a somewhat mid-Atlantic quality, and the company's executive decisions are still primarily controlled by

Americans. Thus, it would be inaccurate to claim that Netflix has fully transformed into a truly European entity.
Rest all are options can be considered from the author's point of view so eliminated.

QNo:- 16 ,Correct Answer:- C

Explanation:-
The passage suggests that certain genres, like murder mystery dramas, have a more universal appeal. Additionally, given the emphasis on Netflix's ability to provide content that can be enjoyed across borders and the success of shows like "Lupin," which is a French crime caper, a murder mystery drama set in North Africa and France aligns with the potential for a more widespread appeal across the EU. So option 3 is the right choice.

QNo:- 17 ,Correct Answer:- B

Explanation:-
The highlighted sentence talks about the traditional view held dualism, the coexistence of advanced and traditional economic sectors, as a defining feature of developing countries, in contrast to developed countries where advanced technologies and high productivity were assumed to dominate.
The reason for placing the missing sentence in **Option 2** is to maintain the logical flow of ideas within the paragraph. The sentence talks about "productive dualism" in developing countries, and it logically fits right after the introduction of this concept in the first sentence of the paragraph. This placement helps to establish the context and sets the stage for the subsequent discussion about the changing relevance of this dualism and the widening gap between winners and those left behind.

QNo:- 18 ,Correct Answer:- A

Explanation:-
The highlighted sentence emphasizes a re-evaluation of historical documentation regarding kissing practices.
In the first two lines, the passage suggests that lip kissing's earliest evidence, traced to South Asia 3,500 years ago, possibly influenced the spread of the practice and herpes simplex virus 1 to other regions. Additionally, the research by Dr. Troels Pank Arbøll and Dr. Sophie Lund Rasmussen indicates that kissing was established in the Middle East 4,500 years ago, drawing from early Mesopotamian sources. So it will be correct to put the emphasis part after this to continue the correct flow of information. So option 1 is the right choice.

QNo:- 19 ,Correct Answer:- 2

Explanation:-
Sentence 2 is the odd one out.
The sentences form a coherent paragraph discussing an early indication of broader censorship, the escalating trend in banning and challenging books in the US, the specific example of the widely acclaimed fantasy novel Northern Lights being banned, and the American Library Association documenting an unprecedented number of reported book challenges in 2022. While option 2 is talking about efforts to ban books are essentially attempts to stifle the voices of authors who have demonstrated immense bravery in sharing their stories, highlighting the censorship's impact on freedom of expression and diverse narratives and making it the odd one in the same order.

QNo:- 20 ,Correct Answer:- 3

Explanation:-
The other sentences (1, 2, 4, and 5) form a coherent paragraph discussing the concept of "children in self-care," its association with negative outcomes like loneliness and academic problems, the replacement of "latchkey" with "children in self-care" in research and practice, and recent research findings contradicting the belief that self-care is beneficial for development. While sentence 3 highlights a cautionary note in the discussion about self-care and its association with negative outcomes.

QNo:- 21 ,Correct Answer:- 4132

Explanation:-
The correct sequence is 4132:
sentence 4 introduces the idea that human consciousness is considered an emergent property of the brain, setting the context for the discussion.
sentence 1 then elaborates on the concept introduced in Sentence 4, comparing the organization of neurons to that of ants in a colony and emphasizing that no single neuron holds complex information.
sentence 3 builds on the idea by highlighting the collective contribution of all neurons to generate complex human emotions.
Sentence 2 finally provides additional information about the complexity of the human brain and how neurobiologists recognize that complex interconnections give rise to emergent qualities.
Together, these sentences form a coherent paragraph that explores the concept of human consciousness as an emergent property of the brain and the intricate interplay of neurons in generating complex mental processes.

QNo:- 22 ,Correct Answer:- 4312

Explanation:-
The correct sequence 4312:
Sentence 4 introduces the idea that Western Christian concepts often overlook or deny the presence of a genuine and lasting African tradition.
Sentence 3 follows up on the idea from Sentence 4, contradicting the views that deny the existence of African tradition and asserting the reality of a rich local cultural ethos.
Sentence 1 introduces an example of contemporary African writing, 'The Bottled Leopard,' that expresses the theme discussed earlier by using two children and backgrounds to contrast different cultures.
Sentence 2 provides more information about Chukwuemeka Ike's exploration of the conflict, portraying the Western tradition as condescending and unaccommodating towards local African practices.
Together, these sentences form a coherent paragraph by presenting the theme of conflict between Western and African traditions, offering an example from contemporary African writing, and providing insights into the views and realities of the coexistence of these cultures.

QNo:- 23 ,Correct Answer:- A

Explanation:-
Option A is the right choice as the passage talks about how Heatwaves are worsening due to climate change, disproportionately affecting vulnerable groups like the elderly, children, and those with medical conditions or low incomes. Research in the UK suggests that even at-risk individuals may not perceive themselves as vulnerable during extreme heat, impacting the effectiveness of early warnings. The passage emphasizes the role of news media in conveying the dangers and societal impacts of extreme heat.

QNo:- 24 ,Correct Answer:- C

Explanation:-
The passage talks about how People naturally create counterfactual alternatives to reality, pondering "if only" or "what if" scenarios that explain the past and influence future decisions. This cognitive process, develops ping throughout childhood, also impacts emotions, moral judgments, and reasoning about others' beliefs. Counterfactual thinking serves multifaceted roles, shaping perceptions of causality and contributing to various aspects of human cognition and decision-making. So, option 3 is the right choice.

Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- C

Explanation:-
Given that each firm raised Rs 1 crore in its first and last year. Also, each annual increase and decrease was either of Rs 1 crore or by Rs 2 crores.
Let us consider for Alfloo,
First year of existence, 2009 = Rs 1 crore = Last year of existence, 2016
Let amount raised in 2010, 2011, 2012, 2013, 2014, 2015 be a, b, c, d, e and f respectively
Solving, 1 + a + b + c + d + e + f + 1 = 21
⇒ a + b + c + d + e + f = 19
Now, even if we consider minimum annual increase and decrease annually,
The values can be a = 2, b = 3, c = 4 or 5, d = 5 or 4, e = 3 and f = 2
Now for Bzygoo,
First year of existence, 2012 = Rs 1 crore = Last year of existence, 2015
The possibilities for the amount raised in 2013 = 2 or 3 and in 2014 = 3 or 2 respectively
Thus the total amount raised by Bzygoo = Rs 7 crores
Now for Czechy,
First year of existence, 2013 = Rs 1 crore
Total amount raised = Rs 9 crores
Now, if we consider Year 2016 as the last year of existence
The possible values of amount raised for
Year 2014 = 2 or 3, Year 2015 = 3 or 2 and Year 2016 = 1
The possible sum = Rs 7 crores (maximum)
So, the last year of existence for the firm Czechy has to be 2017 with only possible values
Year 2013 = 1, Year 2014 = 2, Year 2015 = 3, Year 2016 = 2 and Year 2017 = 1
Thus, the total amount raised = Rs 9 crores
Now for Drjbna,
First year of existence, 2011 = Rs 1 crore = Last year of existence, 2015
Total amount raised = Rs 10 crores
The only possible value of amount raised for
Year 2012 = 2, Year 2013 = 4 and Year 2014 = 2
Now for Elavalaki,
Total amount raised = Rs 13 crores
First year of existence, 2011 = Rs 1 crore but last year of existence is not given
Considering the minimum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 2, Year 2012 = 3 or 4, Year 2013 = 4 or 3, Year 2014 = 2 and Year 2015 = 1 (such that Year 2015 is the last year of existence)
Considering the maximum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 3, Year 2012 = 5, Year 2013 = 3, Year 2014 = 1 (such that Year 2014 is the last year of existence)
The rest of the information can be gathered as follows-

Year/Firm	Alfloo	Bzygoo	Czechy	Drjbna	Elavalaki		Total (crores)
2009	1	–	–	–	–	–	1
2010	2	–	–	–	1	1	3
2011	3	–	–	1	2	3	6/7
2012	4/5	1	–	2	3/4	5	10/11/12/13
2013	5/4	2/3	1	4	4/3	3	14/15/16/17
2014	3	3/2	2	2	2	1	10/11/12
2015	2	1	3	1	1	–	7/8
2016	1	–	2	–	–	–	3
2017	–	–	1	–	–	–	1
Total (crores)	21	7	9	10	13	13	60

The amount raised by only firms Czechy and Drjbna can be concluded with certainty in each year.

QNo:- 26 ,Correct Answer:- D

Explanation:-
Given that each firm raised Rs 1 crore in its first and last year. Also, each annual increase and decrease was either of Rs 1 crore or by Rs 2 crores.
Let us consider for Alfloo,
First year of existence, 2009 = Rs 1 crore = Last year of existence, 2016
Let amount raised in 2010, 2011, 2012, 2013, 2014, 2015 be a, b, c, d, e and f respectively
Solving, 1 + a + b + c + d + e + f + 1 = 21
⇒ a + b + c + d + e + f = 19
Now, even if we consider minimum annual increase and decrease annually,
The values can be a = 2, b = 3, c = 4 or 5, d = 5 or 4, e = 3 and f = 2
Now for Bzygoo,
First year of existence, 2012 = Rs 1 crore = Last year of existence, 2015
The possibilities for the amount raised in 2013 = 2 or 3 and in 2014 = 3 or 2 respectively
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Year 2014 = 2 or 3, Year 2015 = 3 or 2 and Year 2016 = 1
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Year 2010 = 1, Year 2011 = 3, Year 2012 = 5, Year 2013 = 3, Year 2014 = 1 (such that Year 2014 is the last year of existence)
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Year/Firm	Alfloo	Bzygoo	Czechy	Drjbna	Elavalaki		Total (crores)
2009	1	–	–	–	–	–	1
2010	2	–	–	–	1	1	3
2011	3	–	–	1	2	3	6/7
2012	4/5	1	–	2	3/4	5	10/11/12/13
2013	5/4	2/3	1	4	4/3	3	14/15/16/17
2014	3	3/2	2	2	2	1	10/11/12
2015	2	1	3	1	1	–	7/8
2016	1	–	2	–	–	–	3
2017	–	–	1	–	–	–	1
Total (crores)	21	7	9	10	13	13	60

The total amount of money raised in 2015 can be either Rs. 7 crores or Rs. 8 crores

QNo:- 27 ,Correct Answer:- 17

Explanation:-
Given that each firm raised Rs 1 crore in its first and last year. Also, each annual increase and decrease was either of Rs 1 crore or by Rs 2 crores.
Let us consider for Alfloo,
First year of existence, 2009 = Rs 1 crore = Last year of existence, 2016
Let amount raised in 2010, 2011, 2012, 2013, 2014, 2015 be a, b, c, d, e and f respectively
Solving, 1 + a + b + c + d + e + f + 1 = 21
⇒ a + b + c + d + e + f = 19
Now, even if we consider minimum annual increase and decrease annually,
The values can be a = 2, b = 3, c = 4 or 5, d = 5 or 4, e = 3 and f = 2
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Now, if we consider Year 2016 as the last year of existence
The possible values of amount raised for
Year 2014 = 2 or 3, Year 2015 = 3 or 2 and Year 2016 = 1
The possible sum = Rs 7 crores (maximum)
So, the last year of existence for the firm Czechy has to be 2017 with only possible values
Year 2013 = 1, Year 2014 = 2, Year 2015 = 3, Year 2016 = 2 and Year 2017 = 1
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Now for Drjbna,
First year of existence, 2011 = Rs 1 crore = Last year of existence, 2015
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Year 2012 = 2, Year 2013 = 4 and Year 2014 = 2
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Considering the maximum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 3, Year 2012 = 5, Year 2013 = 3, Year 2014 = 1 (such that Year 2014 is the last year of existence)
The rest of the information can be gathered as follows-

Year/Firm	Alfloo	Bzygoo	Czechy	Drjbna	Elavalaki		Total (crores)
2009	1	–	–	–	–	–	1
2010	2	–	–	–	1	1	3
2011	3	–	–	1	2	3	6/7
2012	4/5	1	–	2	3/4	5	10/11/12/13
2013	5/4	2/3	1	4	4/3	3	14/15/16/17
2014	3	3/2	2	2	2	1	10/11/12
2015	2	1	3	1	1	–	7/8
2016	1	–	2	–	–	–	3
2017	–	–	1	–	–	–	1
Total (crores)	21	7	9	10	13	13	60

The largest possible total amount of money that could have been raised in 2013 = Rs. 17 crores

QNo:- 28 ,Correct Answer:- A

Explanation:-
Given that each firm raised Rs 1 crore in its first and last year. Also, each annual increase and decrease was either of Rs 1 crore or by Rs 2 crores.
Let us consider for Alfloo,
First year of existence, 2009 = Rs 1 crore = Last year of existence, 2016
Let amount raised in 2010, 2011, 2012, 2013, 2014, 2015 be a, b, c, d, e and f respectively
Solving, 1 + a + b + c + d + e + f + 1 = 21
⇒ a + b + c + d + e + f = 19
Now, even if we consider minimum annual increase and decrease annually,
The values can be a = 2, b = 3, c = 4 or 5, d = 5 or 4, e = 3 and f = 2
Now for Bzygoo,
First year of existence, 2012 = Rs 1 crore = Last year of existence, 2015
The possibilities for the amount raised in 2013 = 2 or 3 and in 2014 = 3 or 2 respectively
Thus the total amount raised by Bzygoo = Rs 7 crores
Now for Czechy,
First year of existence, 2013 = Rs 1 crore
Total amount raised = Rs 9 crores
Now, if we consider Year 2016 as the last year of existence
The possible values of amount raised for
Year 2014 = 2 or 3, Year 2015 = 3 or 2 and Year 2016 = 1
The possible sum = Rs 7 crores (maximum)
So, the last year of existence for the firm Czechy has to be 2017 with only possible values
Year 2013 = 1, Year 2014 = 2, Year 2015 = 3, Year 2016 = 2 and Year 2017 = 1
Thus, the total amount raised = Rs 9 crores
Now for Drjbna,
First year of existence, 2011 = Rs 1 crore = Last year of existence, 2015
Total amount raised = Rs 10 crores
The only possible value of amount raised for
Year 2012 = 2, Year 2013 = 4 and Year 2014 = 2
Now for Elavalaki,
Total amount raised = Rs 13 crores
First year of existence, 2011 = Rs 1 crore but last year of existence is not given
Considering the minimum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 2, Year 2012 = 3 or 4, Year 2013 = 4 or 3, Year 2014 = 2 and Year 2015 = 1 (such that Year 2015 is the last year of existence)
Considering the maximum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 3, Year 2012 = 5, Year 2013 = 3, Year 2014 = 1 (such that Year 2014 is the last year of existence)
The rest of the information can be gathered as follows-

Year/Firm	Alfloo	Bzygoo	Czechy	Drjbna	Elavalaki		Total (crores)
2009	1	–	–	–	–	–	1
2010	2	–	–	–	1	1	3
2011	3	–	–	1	2	3	6/7
2012	4/5	1	–	2	3/4	5	10/11/12/13
2013	5/4	2/3	1	4	4/3	3	14/15/16/17
2014	3	3/2	2	2	2	1	10/11/12
2015	2	1	3	1	1	–	7/8
2016	1	–	2	–	–	–	3
2017	–	–	1	–	–	–	1
Total (crores)	21	7	9	10	13	13	60

If Elavalaki raised Rs. 3 crores in 2013, then Elavalaki raised Rs. 4 crores in 2014
Hence, the smallest possible total amount of money raised in 2012
= 4 + 1 + 2 + 4 = Rs. 11 crores

QNo:- 29 ,Correct Answer:- D

Explanation:-
Given that each firm raised Rs 1 crore in its first and last year. Also, each annual increase and decrease was either of Rs 1 crore or by Rs 2 crores.
Let us consider for Alfloo,
First year of existence, 2009 = Rs 1 crore = Last year of existence, 2016
Let amount raised in 2010, 2011, 2012, 2013, 2014, 2015 be a, b, c, d, e and f respectively
Solving, 1 + a + b + c + d + e + f + 1 = 21
⇒ a + b + c + d + e + f = 19
Now, even if we consider minimum annual increase and decrease annually,
The values can be a = 2, b = 3, c = 4 or 5, d = 5 or 4, e = 3 and f = 2
Now for Bzygoo,
First year of existence, 2012 = Rs 1 crore = Last year of existence, 2015
The possibilities for the amount raised in 2013 = 2 or 3 and in 2014 = 3 or 2 respectively
Thus the total amount raised by Bzygoo = Rs 7 crores
Now for Czechy,
First year of existence, 2013 = Rs 1 crore
Total amount raised = Rs 9 crores
Now, if we consider Year 2016 as the last year of existence
The possible values of amount raised for
Year 2014 = 2 or 3, Year 2015 = 3 or 2 and Year 2016 = 1
The possible sum = Rs 7 crores (maximum)
So, the last year of existence for the firm Czechy has to be 2017 with only possible values
Year 2013 = 1, Year 2014 = 2, Year 2015 = 3, Year 2016 = 2 and Year 2017 = 1
Thus, the total amount raised = Rs 9 crores
Now for Drjbna,
First year of existence, 2011 = Rs 1 crore = Last year of existence, 2015
Total amount raised = Rs 10 crores
The only possible value of amount raised for
Year 2012 = 2, Year 2013 = 4 and Year 2014 = 2
Now for Elavalaki,
Total amount raised = Rs 13 crores
First year of existence, 2011 = Rs 1 crore but last year of existence is not given
Considering the minimum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 2, Year 2012 = 3 or 4, Year 2013 = 4 or 3, Year 2014 = 2 and Year 2015 = 1 (such that Year 2015 is the last year of existence)
Considering the maximum amounts the possible values of amount raised for
Year 2010 = 1, Year 2011 = 3, Year 2012 = 5, Year 2013 = 3, Year 2014 = 1 (such that Year 2014 is the last year of existence)
The rest of the information can be gathered as follows-

Year/Firm	Alfloo	Bzygoo	Czechy	Drjbna	Elavalaki		Total (crores)
2009	1	–	–	–	–	–	1
2010	2	–	–	–	1	1	3
2011	3	–	–	1	2	3	6/7
2012	4/5	1	–	2	3/4	5	10/11/12/13
2013	5/4	2/3	1	4	4/3	3	14/15/16/17
2014	3	3/2	2	2	2	1	10/11/12
2015	2	1	3	1	1	–	7/8
2016	1	–	2	–	–	–	3
2017	–	–	1	–	–	–	1
Total (crores)	21	7	9	10	13	13	60

If total amount raised in 2014 = Rs. 12 crores
⇒ amount raised by Bzygoo in 2014 = Rs. 3 crores

⇒ amount raised by Bzygoo in 2013 = Rs 2 crores
Also, amount raised by Elavalaki in 2013 = Rs 3 crore or Rs 4 crores
Hence, Bzygoo raised the same amount of money as Elavalaki in 2013, it is not possible

QNo:- 30 ,Correct Answer:- A

Explanation:-
Let the total score of Day 1, Day 2, Day 3, Day 4 and Day 5 of all the participants be a, b, c, d and e respectively.
As per the Table 1,
a + b = 15 × 2 = 30, b + c = 15.5 × 2 = 31, c + d = 16 × 2 = 32 and d + e = 17 × 2 = 34
Point 2, total score on Day 3 = total score on Day 4
⇒ c = d = 16 (each)
⇒ e = 34 – 16 = 18, b = 31 – 16 = 15 and a = 30 – 15 = 15
Point 1, Chatur score on any day = 3, 6 or 9
The only possibility of his Day 2 score being unique highest = 9
His only minimum score on Day 1 = 3
⇒ Chatur's score on Day 3, Day 4 and Day 5 = 6 (each)
Also, Akhil's Day 4 score = Chatur's Day 1 score = 3
⇒ Bimal's Day 4 score = 16 – (3 + 6) = 7
Now being same rank,
Akhil's Day 3 score = Bimal's Day 3 score = 5 (each)
Point 3, Bimal's Day 1 score = Bimal's Day 3 score = 5
⇒ Akhil's Day 1 score = 15 – (5 + 3) = 7
Now for Day 2, let the score of Akhil = p and Bimal = q
Solving, p + q + 9 = 15 ⇒ p + q = 6
Since, the rank of Akhil is 2 and Bimal is 3
Possible values of p = 4 or 5 and q = 2 or 1
Now for Day 5, let the score of Akhil = x and Bimal = y
Solving, x + y + 6 = 18 ⇒ x + y = 12
Since, the rank of Akhil is 3 and Bimal is 1
Possible value of x = 5 or 4 and y = 7 or 8
(y cannot be 9 as that being unique highest)
The rest of the information can be gathered as follows-

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
Akhil	7	4/5	5	3	5/4	23/24/ 25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total	15	15	16	16	18	80

Akhil's score on Day 1 = 7

QNo:- 31 ,Correct Answer:- D

Explanation:-
Let the total score of Day 1, Day 2, Day 3, Day 4 and Day 5 of all the participants be a, b, c, d and e respectively.
As per the Table 1,
a + b = 15 × 2 = 30, b + c = 15.5 × 2 = 31, c + d = 16 × 2 = 32 and d + e = 17 × 2 = 34
Point 2, total score on Day 3 = total score on Day 4
⇒ c = d = 16 (each)
⇒ e = 34 – 16 = 18, b = 31 – 16 = 15 and a = 30 – 15 = 15
Point 1, Chatur score on any day = 3, 6 or 9
The only possibility of his Day 2 score being unique highest = 9
His only minimum score on Day 1 = 3
⇒ Chatur's score on Day 3, Day 4 and Day 5 = 6 (each)

Also, Akhil's Day 4 score = Chatur's Day 1 score = 3
⇒ Bimal's Day 4 score = 16 – (3 + 6) = 7
Now being same rank,
Akhil's Day 3 score = Bimal's Day 3 score = 5 (each)
Point 3, Bimal's Day 1 score = Bimal's Day 3 score = 5
⇒ Akhil's Day 1 score = 15 – (5 + 3) = 7
Now for Day 2, let the score of Akhil = p and Bimal = q
Solving, p + q + 9 = 15 ⇒ p + q = 6
Since, the rank of Akhil is 2 and Bimal is 3
Possible values of p = 4 or 5 and q = 2 or 1
Now for Day 5, let the score of Akhil = x and Bimal = y
Solving, x + y + 6 = 18 ⇒ x + y = 12
Since, the rank of Akhil is 3 and Bimal is 1
Possible value of x = 5 or 4 and y = 7 or 8
(y cannot be 9 as that being unique highest)
The rest of the information can be gathered as follows-

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
Akhil	7	4/5	5	3	5/4	23/24/ 25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total	15	15	16	16	18	80

Chatur attains the maximum possible score

QNo:- 32 ,Correct Answer:- 25

Explanation:-
Let the total score of Day 1, Day 2, Day 3, Day 4 and Day 5 of all the participants be a, b, c, d and e respectively.
As per the Table 1,
a + b = 15 × 2 = 30, b + c = 15.5 × 2 = 31, c + d = 16 × 2 = 32 and d + e = 17 × 2 = 34
Point 2, total score on Day 3 = total score on Day 4
⇒ c = d = 16 (each)
⇒ e = 34 – 16 = 18, b = 31 – 16 = 15 and a = 30 – 15 = 15
Point 1, Chatur score on any day = 3, 6 or 9
The only possibility of his Day 2 score being unique highest = 9
His only minimum score on Day 1 = 3
⇒ Chatur's score on Day 3, Day 4 and Day 5 = 6 (each)
Also, Akhil's Day 4 score = Chatur's Day 1 score = 3
⇒ Bimal's Day 4 score = 16 – (3 + 6) = 7
Now being same rank,
Akhil's Day 3 score = Bimal's Day 3 score = 5 (each)
Point 3, Bimal's Day 1 score = Bimal's Day 3 score = 5
⇒ Akhil's Day 1 score = 15 – (5 + 3) = 7
Now for Day 2, let the score of Akhil = p and Bimal = q
Solving, p + q + 9 = 15 ⇒ p + q = 6
Since, the rank of Akhil is 2 and Bimal is 3
Possible values of p = 4 or 5 and q = 2 or 1
Now for Day 5, let the score of Akhil = x and Bimal = y
Solving, x + y + 6 = 18 ⇒ x + y = 12
Since, the rank of Akhil is 3 and Bimal is 1
Possible value of x = 5 or 4 and y = 7 or 8
(y cannot be 9 as that being unique highest)
The rest of the information can be gathered as follows-

	Day 1	Day 2	Day 3	Day 4	Day 5	Total

Akhil	7	4/5	5	3	5/4	23/24/ 25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total	15	15	16	16	18	80

The minimum possible total score of Bimal = 25

QNo:- 33 ,Correct Answer:- B

Explanation:-
Let the total score of Day 1, Day 2, Day 3, Day 4 and Day 5 of all the participants be a, b, c, d and e respectively.
As per the Table 1,
a + b = 15 × 2 = 30, b + c = 15.5 × 2 = 31, c + d = 16 × 2 = 32 and d + e = 17 × 2 = 34
Point 2, total score on Day 3 = total score on Day 4
⇒ c = d = 16 (each)
⇒ e = 34 – 16 = 18, b = 31 – 16 = 15 and a = 30 – 15 = 15
Point 1, Chatur score on any day = 3, 6 or 9
The only possibility of his Day 2 score being unique highest = 9
His only minimum score on Day 1 = 3
⇒ Chatur's score on Day 3, Day 4 and Day 5 = 6 (each)
Also, Akhil's Day 4 score = Chatur's Day 1 score = 3
⇒ Bimal's Day 4 score = 16 – (3 + 6) = 7
Now being same rank,
Akhil's Day 3 score = Bimal's Day 3 score = 5 (each)
Point 3, Bimal's Day 1 score = Bimal's Day 3 score = 5
⇒ Akhil's Day 1 score = 15 – (5 + 3) = 7
Now for Day 2, let the score of Akhil = p and Bimal = q
Solving, p + q + 9 = 15 ⇒ p + q = 6
Since, the rank of Akhil is 2 and Bimal is 3
Possible values of p = 4 or 5 and q = 2 or 1
Now for Day 5, let the score of Akhil = x and Bimal = y
Solving, x + y + 6 = 18 ⇒ x + y = 12
Since, the rank of Akhil is 3 and Bimal is 1
Possible value of x = 5 or 4 and y = 7 or 8
(y cannot be 9 as that being unique highest)
The rest of the information can be gathered as follows-

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
Akhil	7	4/5	5	3	5/4	23/24/ 25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total	15	15	16	16	18	80

If the total score of Bimal is a multiple of 3, the only possibility = 27
⇒ Bimal's Day 2 score = 2 ⇒ Akhil's Day 2 score = 4

QNo:- 34 ,Correct Answer:- 26

Explanation:-
Let the total score of Day 1, Day 2, Day 3, Day 4 and Day 5 of all the participants be a, b, c, d and e respectively.
As per the Table 1,
a + b = 15 × 2 = 30, b + c = 15.5 × 2 = 31, c + d = 16 × 2 = 32 and d + e = 17 × 2 = 34
Point 2, total score on Day 3 = total score on Day 4
⇒ c = d = 16 (each)
⇒ e = 34 – 16 = 18, b = 31 – 16 = 15 and a = 30 – 15 = 15

Point 1, Chatur score on any day = 3, 6 or 9
The only possibility of his Day 2 score being unique highest = 9
His only minimum score on Day 1 = 3
⇒ Chatur's score on Day 3, Day 4 and Day 5 = 6 (each)
Also, Akhil's Day 4 score = Chatur's Day 1 score = 3
⇒ Bimal's Day 4 score = 16 – (3 + 6) = 7
Now being same rank,
Akhil's Day 3 score = Bimal's Day 3 score = 5 (each)
Point 3, Bimal's Day 1 score = Bimal's Day 3 score = 5
⇒ Akhil's Day 1 score = 15 – (5 + 3) = 7
Now for Day 2, let the score of Akhil = p and Bimal = q
Solving, p + q + 9 = 15 ⇒ p + q = 6
Since, the rank of Akhil is 2 and Bimal is 3
Possible values of p = 4 or 5 and q = 2 or 1
Now for Day 5, let the score of Akhil = x and Bimal = y
Solving, x + y + 6 = 18 ⇒ x + y = 12
Since, the rank of Akhil is 3 and Bimal is 1
Possible value of x = 5 or 4 and y = 7 or 8
(y cannot be 9 as that being unique highest)
The rest of the information can be gathered as follows-

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
Akhil	7	4/5	5	3	5/4	23/24/ 25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total	15	15	16	16	18	80

If Akhil's total score = 24 ⇒ Bimal's total score = 26. Answer is 26

QNo:- 35 ,Correct Answer:- B

Explanation:-
Firstly, if all the given three conditions satisfy, the sum of number of coins in the box could be = 1 + 1 + 9 = 11, but that is not giving the average as distinct integer. Thus, either exactly one condition satisfies or exactly two conditions satisfy.
For 1st row, 2nd column box, the median number of coins is 9, so the maximum number of coins is also 9. Thus as mentioned in Table 2, two sacks have more than 5 coins and exactly one condition (iii) satisfies. So, the third sack must contain coins less than or equal to 5. Also, the average number of coins per sack in any box is a distinct integer, so the only value that satisfies the coins in third sack = 3, such that the average coins in the box = (3 + 9 + 9)/3 = 7
For 2nd row, 1st column box, given that two or more conditions satisfies, but since the median number of coins = 2, so, exactly two conditions (i and iii) satisfies. Also, only one sack contains more than 5 coins. Thus the average coins in the box = 1 + 2 + 9 = 12/3 = 4
For 3rd row, 1st column, median number of coins in the box = 8, all three sacks contains more than 5 coins and only 1 condition satisfies. So, that condition must be (iii) condition i.e. the maximum coins = 9. Also, to make average an integer, the number of coins in third sack must be 7. The average number of coins in the box = (7 + 8 + 9)/3 = 8
For 3rd row, 2nd column, two conditions satisfies and two sacks contain more than 5 coins. Thus, the conditions that satisfy must be (i) and (iii). So, the only possible average in the box = (1 + 8 + 9)/3 = 6
Now, since for each and each column the total is same, so the average is also the same. Sum of distinct integers from 1 to 9 = 45, so the sum of each row and each column = 15, which is also the average of the boxes for each row and each column. Hence, the sum of number of coins in each row and each column must be = 45
The sum for 1st row, 1st column = 45 – (12 + 36) = 9
Only possible average = (1 + 1 + 7)/3 = 3 satisfying other given conditions as well
The sum of 2nd row, 2nd column = 45 – (21 + 18) = 6
Only possible average = (1 + 2 + 3)/3 = 2 satisfying other given conditions as well
The sum of 1st row, 3rd column = 45 – (9 + 21) = 15
Only possible average = (1 + 6 + 8)/3 = 5 satisfying other given conditions as well

The sum of 2nd row, 3rd column = 45 – (12 + 6) = 27
Only possible average = (9 + 9 + 9)/3 = 9 satisfying other given conditions as well
The sum of 3rd row, 3rd column = 45 – (24 + 18) = 3
Only possible average = (1 + 1 + 1)/3 = 1 satisfying other given conditions as well
The rest of the information can be gathered as follows-

	1st column	2nd column	3rd column	Total
1st row	Sum = 1 + 1 + 7 = 9 Average = 3	Sum = 3 + 9 + 9 = 21 Average = 7	Sum = 1 + 6 + 8 = 15 Average = 5	45
2nd row	Sum = 1 + 2 + 9 = 12 Average = 4	Sum = 1 + 2 + 3 = 6 Average = 2	Sum = 9 + 9 + 9 = 27 Average = 9	45
3rd row	Sum = 7 + 8 + 9 = 24 Average = 8	Sum = 1 + 8 + 9 = 18 Average = 6	Sum = 1 + 1 + 1 = 3 Average = 1	45
Total	45	45	45	

The total number of coins in all the boxes in the 3rd row = 45

QNo:- 36 ,Correct Answer:- D

Explanation:-
Firstly, if all the given three conditions satisfy, the sum of number of coins in the box could be = 1 + 1 + 9 = 11, but that is not giving the average as distinct integer. Thus, either exactly one condition satisfies or exactly two conditions satisfy.
For 1st row, 2nd column box, the median number of coins is 9, so the maximum number of coins is also 9. Thus as mentioned in Table 2, two sacks have more than 5 coins and exactly one condition (iii) satisfies. So, the third sack must contain coins less than or equal to 5. Also, the average number of coins per sack in any box is a distinct integer, so the only value that satisfies the coins in third sack = 3, such that the average coins in the box = (3 + 9 + 9)/3 = 7
For 2nd row, 1st column box, given that two or more conditions satisfies, but since the median number of coins = 2, so, exactly two conditions (i and iii) satisfies. Also, only one sack contains more than 5 coins. Thus the average coins in the box = 1 + 2 + 9 = 12/3 = 4
For 3rd row, 1st column, median number of coins in the box = 8, all three sacks contains more than 5 coins and only 1 condition satisfies. So, that condition must be (iii) condition i.e. the maximum coins = 9. Also, to make average an integer, the number of coins in third sack must be 7. The average number of coins in the box = (7 + 8 + 9)/3 = 8
For 3rd row, 2nd column, two conditions satisfies and two sacks contain more than 5 coins. Thus, the conditions that satisfy must be (i) and (iii). So, the only possible average in the box = (1 + 8 + 9)/3 = 6
Now, since for each and each column the total is same, so the average is also the same. Sum of distinct integers from 1 to 9 = 45, so the sum of each row and each column = 15, which is also the average of the boxes for each row and each column. Hence, the sum of number of coins in each row and each column must be = 45
The sum for 1st row, 1st column = 45 – (12 + 36) = 9
Only possible average = (1 + 1 + 7)/3 = 3 satisfying other given conditions as well
The sum of 2nd row, 2nd column = 45 – (21 + 18) = 6
Only possible average = (1 + 2 + 3)/3 = 2 satisfying other given conditions as well
The sum of 1st row, 3rd column = 45 – (9 + 21) = 15
Only possible average = (1 + 6 + 8)/3 = 5 satisfying other given conditions as well
The sum of 2nd row, 3rd column = 45 – (12 + 6) = 27
Only possible average = (9 + 9 + 9)/3 = 9 satisfying other given conditions as well
The sum of 3rd row, 3rd column = 45 – (24 + 18) = 3
Only possible average = (1 + 1 + 1)/3 = 1 satisfying other given conditions as well
The rest of the information can be gathered as follows-

	1st column	2nd column	3rd column	Total
1st row	Sum = 1 + 1 + 7 = 9 Average = 3	Sum = 3 + 9 + 9 = 21 Average = 7	Sum = 1 + 6 + 8 = 15 Average = 5	45
2nd row	Sum = 1 + 2 + 9 = 12 Average = 4	Sum = 1 + 2 + 3 = 6 Average = 2	Sum = 9 + 9 + 9 = 27 Average = 9	45

3rd row	Sum = 7 + 8 + 9 = 24 Average = 8	Sum = 1 + 8 + 9 = 18 Average = 6	Sum = 1 + 1 + 1 = 3 Average = 1	45
Total	45	45	45	

The boxes having at least one sack containing 9 coins = 5
(1st row, 2nd column), (2nd row, 1st column), (2nd row, 3rd column), (3rd row, 1st column) and (3rd row, 2nd column)

QNo:- 37 ,Correct Answer:- 4

Explanation:-
Firstly, if all the given three conditions satisfy, the sum of number of coins in the box could be = 1 + 1 + 9 = 11, but that is not giving the average as distinct integer. Thus, either exactly one condition satisfies or exactly two conditions satisfy.
For 1st row, 2nd column box, the median number of coins is 9, so the maximum number of coins is also 9. Thus as mentioned in Table 2, two sacks have more than 5 coins and exactly one condition (iii) satisfies. So, the third sack must contain coins less than or equal to 5. Also, the average number of coins per sack in any box is a distinct integer, so the only value that satisfies the coins in third sack = 3, such that the average coins in the box = (3 + 9 + 9)/3 = 7
For 2nd row, 1st column box, given that two or more conditions satisfies, but since the median number of coins = 2, so, exactly two conditions (i and iii) satisfies. Also, only one sack contains more than 5 coins. Thus the average coins in the box = 1 + 2 + 9 = 12/3 = 4
For 3rd row, 1st column, median number of coins in the box = 8, all three sacks contains more than 5 coins and only 1 condition satisfies. So, that condition must be (iii) condition i.e. the maximum coins = 9. Also, to make average an integer, the number of coins in third sack must be 7. The average number of coins in the box = (7 + 8 + 9)/3 = 8
For 3rd row, 2nd column, two conditions satisfies and two sacks contain more than 5 coins. Thus, the conditions that satisfy must be (i) and (iii). So, the only possible average in the box = (1 + 8 + 9)/3 = 6
Now, since for each and each column the total is same, so the average is also the same. Sum of distinct integers from 1 to 9 = 45, so the sum of each row and each column = 15, which is also the average of the boxes for each row and each column. Hence, the sum of number of coins in each row and each column must be = 45
The sum for 1st row, 1st column = 45 – (12 + 36) = 9
Only possible average = (1 + 1 + 7)/3 = 3 satisfying other given conditions as well
The sum of 2nd row, 2nd column = 45 – (21 + 18) = 6
Only possible average = (1 + 2 + 3)/3 = 2 satisfying other given conditions as well
The sum of 1st row, 3rd column = 45 – (9 + 21) = 15
Only possible average = (1 + 6 + 8)/3 = 5 satisfying other given conditions as well
The sum of 2nd row, 3rd column = 45 – (12 + 6) = 27
Only possible average = (9 + 9 + 9)/3 = 9 satisfying other given conditions as well
The sum of 3rd row, 3rd column = 45 – (24 + 18) = 3
Only possible average = (1 + 1 + 1)/3 = 1 satisfying other given conditions as well
The rest of the information can be gathered as follows-

	1st column	2nd column	3rd column	Total
1st row	Sum = 1 + 1 + 7 = 9 Average = 3	Sum = 3 + 9 + 9 = 21 Average = 7	Sum = 1 + 6 + 8 = 15 Average = 5	45
2nd row	Sum = 1 + 2 + 9 = 12 Average = 4	Sum = 1 + 2 + 3 = 6 Average = 2	Sum = 9 + 9 + 9 = 27 Average = 9	45
3rd row	Sum = 7 + 8 + 9 = 24 Average = 8	Sum = 1 + 8 + 9 = 18 Average = 6	Sum = 1 + 1 + 1 = 3 Average = 1	45
Total	45	45	45	

The number of boxes having the average and median number of coins in the three sacks in that box is same = 4
(2nd row, 2nd column), 2nd row, 3rd column), (3rd row, 1st column) and (3rd row, 3rd column)

QNo:- 38 ,Correct Answer:- 9

Explanation:-
Firstly, if all the given three conditions satisfy, the sum of number of coins in the box could be = 1 + 1 + 9 = 11, but that is not giving the average as distinct integer. Thus, either exactly one condition satisfies or exactly two conditions satisfy.
For 1st row, 2nd column box, the median number of coins is 9, so the maximum number of coins is also 9. Thus as mentioned in Table 2, two sacks have more than 5 coins and exactly one condition (iii) satisfies. So, the third sack must contain coins less than or equal to 5. Also, the average number of coins per sack in any box is a distinct integer, so the only value that satisfies the coins in third sack = 3, such that the average coins in the box = (3 + 9 + 9)/3 = 7
For 2nd row, 1st column box, given that two or more conditions satisfies, but since the median number of coins = 2, so, exactly two conditions (i and iii) satisfies. Also, only one sack contains more than 5 coins. Thus the average coins in the box = 1 + 2 + 9 = 12/3 = 4
For 3rd row, 1st column, median number of coins in the box = 8, all three sacks contains more than 5 coins and only 1 condition satisfies. So, that condition must be (iii) condition i.e. the maximum coins = 9. Also, to make average an integer, the number of coins in third sack must be 7. The average number of coins in the box = (7 + 8 + 9)/3 = 8
For 3rd row, 2nd column, two conditions satisfies and two sacks contain more than 5 coins. Thus, the conditions that satisfy must be (i) and (iii). So, the only possible average in the box = (1 + 8 + 9)/3 = 6
Now, since for each and each column the total is same, so the average is also the same. Sum of distinct integers from 1 to 9 = 45, so the sum of each row and each column = 15, which is also the average of the boxes for each row and each column. Hence, the sum of number of coins in each row and each column must be = 45
The sum for 1st row, 1st column = 45 – (12 + 36) = 9
Only possible average = (1 + 1 + 7)/3 = 3 satisfying other given conditions as well
The sum of 2nd row, 2nd column = 45 – (21 + 18) = 6
Only possible average = (1 + 2 + 3)/3 = 2 satisfying other given conditions as well
The sum of 1st row, 3rd column = 45 – (9 + 21) = 15
Only possible average = (1 + 6 + 8)/3 = 5 satisfying other given conditions as well
The sum of 2nd row, 3rd column = 45 – (12 + 6) = 27
Only possible average = (9 + 9 + 9)/3 = 9 satisfying other given conditions as well
The sum of 3rd row, 3rd column = 45 – (24 + 18) = 3
Only possible average = (1 + 1 + 1)/3 = 1 satisfying other given conditions as well
The rest of the information can be gathered as follows-

	1st column	2nd column	3rd column	Total
1st row	Sum = 1 + 1 + 7 = 9 Average = 3	Sum = 3 + 9 + 9 = 21 Average = 7	Sum = 1 + 6 + 8 = 15 Average = 5	45
2nd row	Sum = 1 + 2 + 9 = 12 Average = 4	Sum = 1 + 2 + 3 = 6 Average = 2	Sum = 9 + 9 + 9 = 27 Average = 9	45
3rd row	Sum = 7 + 8 + 9 = 24 Average = 8	Sum = 1 + 8 + 9 = 18 Average = 6	Sum = 1 + 1 + 1 = 3 Average = 1	45
Total	45	45	45	

Number of sacks having exactly one coin = 9

QNo:- 39 ,Correct Answer:- 5

Explanation:-
Firstly, if all the given three conditions satisfy, the sum of number of coins in the box could be = 1 + 1 + 9 = 11, but that is not giving the average as distinct integer. Thus, either exactly one condition satisfies or exactly two conditions satisfy.
For 1st row, 2nd column box, the median number of coins is 9, so the maximum number of coins is also 9. Thus as mentioned in Table 2, two sacks have more than 5 coins and exactly one condition (iii) satisfies. So, the third sack must contain coins less than or equal to 5. Also, the average number of coins per sack in any box is a distinct integer, so the only value that satisfies the coins in third sack = 3, such that the average coins in the box = (3 + 9 + 9)/3 = 7
For 2nd row, 1st column box, given that two or more conditions satisfies, but since the median number of coins = 2, so, exactly two conditions (i and iii) satisfies. Also, only one sack contains more than 5 coins. Thus the average coins in the box = 1 + 2 + 9 = 12/3 = 4

For 3rd row, 1st column, median number of coins in the box = 8, all three sacks contains more than 5 coins and only 1 condition satisfies. So, that condition must be (iii) condition i.e. the maximum coins = 9. Also, to make average an integer, the number of coins in third sack must be 7. The average number of coins in the box = (7 + 8 + 9)/3 = 8
For 3rd row, 2nd column, two conditions satisfies and two sacks contain more than 5 coins. Thus, the conditions that satisfy must be (i) and (iii). So, the only possible average in the box = (1 + 8 + 9)/3 = 6
Now, since for each and each column the total is same, so the average is also the same. Sum of distinct integers from 1 to 9 = 45, so the sum of each row and each column = 15, which is also the average of the boxes for each row and each column. Hence, the sum of number of coins in each row and each column must be = 45
The sum for 1st row, 1st column = 45 – (12 + 36) = 9
Only possible average = (1 + 1 + 7)/3 = 3 satisfying other given conditions as well
The sum of 2nd row, 2nd column = 45 – (21 + 18) = 6
Only possible average = (1 + 2 + 3)/3 = 2 satisfying other given conditions as well
The sum of 1st row, 3rd column = 45 – (9 + 21) = 15
Only possible average = (1 + 6 + 8)/3 = 5 satisfying other given conditions as well
The sum of 2nd row, 3rd column = 45 – (12 + 6) = 27
Only possible average = (9 + 9 + 9)/3 = 9 satisfying other given conditions as well
The sum of 3rd row, 3rd column = 45 – (24 + 18) = 3
Only possible average = (1 + 1 + 1)/3 = 1 satisfying other given conditions as well
The rest of the information can be gathered as follows-

	1st column	2nd column	3rd column	Total
1st row	Sum = 1 + 1 + 7 = 9 Average = 3	Sum = 3 + 9 + 9 = 21 Average = 7	Sum = 1 + 6 + 8 = 15 Average = 5	45
2nd row	Sum = 1 + 2 + 9 = 12 Average = 4	Sum = 1 + 2 + 3 = 6 Average = 2	Sum = 9 + 9 + 9 = 27 Average = 9	45
3rd row	Sum = 7 + 8 + 9 = 24 Average = 8	Sum = 1 + 8 + 9 = 18 Average = 6	Sum = 1 + 1 + 1 = 3 Average = 1	45
Total	45	45	45	

Number of boxes having all three sacks contain different number of coins = 5
(1st row, 3rd column), (2nd row, 1st column), (2nd row, 2nd column), (3rd row, 1st column) and (3rd row, 2nd column)

QNo:- 40 ,Correct Answer:- C

Explanation:-
Since the time slot varies for different visitors as well as rides, so let's arrange the data with respect to rides vs visitors and fill the time slot and corresponding spending accordingly.
From point 1, Chitra spend Rs 50 and completed her rides by 11 am without any wait, so she must have taken 2 rides Ride-1 (Rs 20) and Ride-3 (Rs 30)
From point 2, Anjali took Ride-1 at 11 am after waiting for Chitra to complete, so Chitra took Ride-3 from 9 am to 10 am and Ride-1 from 10 am to 11 am respectively
From point 3, Bipasha first of three rides is from 11:30 am to 12:30 pm
Also, by 12:15 pm, all three have spent same amount = Rs 50 each (same as Chitra's complete spending by 11 am)
So, Bipasha's ride from 11:30 am to 12:30 am must be Ride 2 amounting Rs 50
Also, Anjali's second ride must be Ride-3 from 12 pm to 1 pm (without any wait and total spending of Rs 50 by 12:15 pm)
Also, Bipasha's other two rides cannot be Ride-3 as it should be completed by 1 pm
From point 4, the last ride taken by Anjali and Bipasha was the same
Let's say Anjali's last ride was Ride-4 from 1 pm to 2 pm just after Ride-3 taken from 12 pm to 1 pm as Anjali never took a break mentioned
So, for Bipasha's last ride, she could have reached 1:30 pm and taken the Ride-4 from 2 pm to 3 pm after 30 mins wait for Anjali
So, Bipasha's second ride could be Ride-1 from 12:30 pm to 1:30 pm
But that is not possible as she took a 1-hour coffee break after completing her second ride.
Thus, this is only possible if Anjali took Ride-2 from 1 pm to 2 pm and her last ride is Ride-4 from 2 pm to 3 pm respectively

Such that Bipasha's second ride is Ride-1 from 12:30 pm to 1:30 pm and then 1-hour coffee break from 1:30 pm to 2:30 pm and then 30 min wait for Anjali from 2:30 pm to 3 pm and finally the last ride, Ride-4 from 3 pm to 4 pm
The rest of the information can be gathered as follows-

Ride	Price (Rs)	Anjali	Bipasha	Chitra
Ride-1	20	11 am to 12 pm	12:30 pm to 1:30 pm	10 am to 11 am
Ride-2	50	1 pm to 2 pm	11:30 am to 12:30 pm	–
Ride-3	30	12 pm to 1 pm	–	9 am to 10 am
Ride-4	40	2 pm to 3 pm	3 pm to 4 pm	–
Total Spending		Rs 140	Rs 110	Rs 50

The total amount spent on tickets by Bipasha = Rs 110

QNo:- 41 ,Correct Answer:- C

Explanation:-
Since the time slot varies for different visitors as well as rides, so let's arrange the data with respect to rides vs visitors and fill the time slot and corresponding spending accordingly.
From point 1, Chitra spend Rs 50 and completed her rides by 11 am without any wait, so she must have taken 2 rides Ride-1 (Rs 20) and Ride-3 (Rs 30)
From point 2, Anjali took Ride-1 at 11 am after waiting for Chitra to complete, so Chitra took Ride-3 from 9 am to 10 am and Ride-1 from 10 am to 11 am respectively
From point 3, Bipasha first of three rides is from 11:30 am to 12:30 pm
Also, by 12:15 pm, all three have spent same amount = Rs 50 each (same as Chitra's complete spending by 11 am)
So, Bipasha's ride from 11:30 am to 12:30 am must be Ride 2 amounting Rs 50
Also, Anjali's second ride must be Ride-3 from 12 pm to 1 pm (without any wait and total spending of Rs 50 by 12:15 pm)
Also, Bipasha's other two rides cannot be Ride-3 as it should be completed by 1 pm
From point 4, the last ride taken by Anjali and Bipasha was the same
Let's say Anjali's last ride was Ride-4 from 1 pm to 2 pm just after Ride-3 taken from 12 pm to 1 pm as Anjali never took a break mentioned
So, for Bipasha's last ride, she could have reached 1:30 pm and taken the Ride-4 from 2 pm to 3 pm after 30 mins wait for Anjali
So, Bipasha's second ride could be Ride-1 from 12:30 pm to 1:30 pm
But that is not possible as she took a 1-hour coffee break after completing her second ride.
Thus, this is only possible if Anjali took Ride-2 from 1 pm to 2 pm and her last ride is Ride-4 from 2 pm to 3 pm respectively
Such that Bipasha's second ride is Ride-1 from 12:30 pm to 1:30 pm and then 1-hour coffee break from 1:30 pm to 2:30 pm and then 30 min wait for Anjali from 2:30 pm to 3 pm and finally the last ride, Ride-4 from 3 pm to 4 pm
The rest of the information can be gathered as follows-

Ride	Price (Rs)	Anjali	Bipasha	Chitra
Ride-1	20	11 am to 12 pm	12:30 pm to 1:30 pm	10 am to 11 am
Ride-2	50	1 pm to 2 pm	11:30 am to 12:30 pm	–
Ride-3	30	12 pm to 1 pm	–	9 am to 10 am
Ride-4	40	2 pm to 3 pm	3 pm to 4 pm	–
Total Spending		Rs 140	Rs 110	Rs 50

All the rides that Anjali completed by 2 pm were Ride-1, Ride-2, and Ride-3

QNo:- 42 ,Correct Answer:- D

Explanation:-
Since the time slot varies for different visitors as well as rides, so let's arrange the data with respect to rides vs visitors and fill the time slot and corresponding spending accordingly.
From point 1, Chitra spend Rs 50 and completed her rides by 11 am without any wait, so she must have taken 2 rides Ride-1 (Rs 20) and Ride-3 (Rs 30)
From point 2, Anjali took Ride-1 at 11 am after waiting for Chitra to complete, so Chitra took Ride-3 from 9 am to 10 am and Ride-1 from 10 am to 11 am respectively
From point 3, Bipasha first of three rides is from 11:30 am to 12:30 pm
Also, by 12:15 pm, all three have spent same amount = Rs 50 each (same as Chitra's complete spending by 11 am)
So, Bipasha's ride from 11:30 am to 12:30 am must be Ride 2 amounting Rs 50
Also, Anjali's second ride must be Ride-3 from 12 pm to 1 pm (without any wait and total spending of Rs 50 by 12:15 pm)
Also, Bipasha's other two rides cannot be Ride-3 as it should be completed by 1 pm
From point 4, the last ride taken by Anjali and Bipasha was the same
Let's say Anjali's last ride was Ride-4 from 1 pm to 2 pm just after Ride-3 taken from 12 pm to 1 pm as Anjali never took a break mentioned
So, for Bipasha's last ride, she could have reached 1:30 pm and taken the Ride-4 from 2 pm to 3 pm after 30 mins wait for Anjali
So, Bipasha's second ride could be Ride-1 from 12:30 pm to 1:30 pm
But that is not possible as she took a 1-hour coffee break after completing her second ride.
Thus, this is only possible if Anjali took Ride-2 from 1 pm to 2 pm and her last ride is Ride-4 from 2 pm to 3 pm respectively
Such that Bipasha's second ride is Ride-1 from 12:30 pm to 1:30 pm and then 1-hour coffee break from 1:30 pm to 2:30 pm and then 30 min wait for Anjali from 2:30 pm to 3 pm and finally the last ride, Ride-4 from 3 pm to 4 pm
The rest of the information can be gathered as follows-

Ride	Price (Rs)	Anjali	Bipasha	Chitra
Ride-1	20	11 am to 12 pm	12:30 pm to 1:30 pm	10 am to 11 am
Ride-2	50	1 pm to 2 pm	11:30 am to 12:30 pm	–
Ride-3	30	12 pm to 1 pm	–	9 am to 10 am
Ride-4	40	2 pm to 3 pm	3 pm to 4 pm	–
Total Spending		Rs 140	Rs 110	Rs 50

Ride-1 was taken by all three visitors

QNo:- 43 ,Correct Answer:- 6

Explanation:-
Since the time slot varies for different visitors as well as rides, so let's arrange the data with respect to rides vs visitors and fill the time slot and corresponding spending accordingly.
From point 1, Chitra spend Rs 50 and completed her rides by 11 am without any wait, so she must have taken 2 rides Ride-1 (Rs 20) and Ride-3 (Rs 30)
From point 2, Anjali took Ride-1 at 11 am after waiting for Chitra to complete, so Chitra took Ride-3 from 9 am to 10 am and Ride-1 from 10 am to 11 am respectively
From point 3, Bipasha first of three rides is from 11:30 am to 12:30 pm
Also, by 12:15 pm, all three have spent same amount = Rs 50 each (same as Chitra's complete spending by 11 am)

So, Bipasha's ride from 11:30 am to 12:30 am must be Ride 2 amounting Rs 50
Also, Anjali's second ride must be Ride-3 from 12 pm to 1 pm (without any wait and total spending of Rs 50 by 12:15 pm)
Also, Bipasha's other two rides cannot be Ride-3 as it should be completed by 1 pm
From point 4, the last ride taken by Anjali and Bipasha was the same
Let's say Anjali's last ride was Ride-4 from 1 pm to 2 pm just after Ride-3 taken from 12 pm to 1 pm as Anjali never took a break mentioned
So, for Bipasha's last ride, she could have reached 1:30 pm and taken the Ride-4 from 2 pm to 3 pm after 30 mins wait for Anjali
So, Bipasha's second ride could be Ride-1 from 12:30 pm to 1:30 pm
But that is not possible as she took a 1-hour coffee break after completing her second ride.
Thus, this is only possible if Anjali took Ride-2 from 1 pm to 2 pm and her last ride is Ride-4 from 2 pm to 3 pm respectively
Such that Bipasha's second ride is Ride-1 from 12:30 pm to 1:30 pm and then 1-hour coffee break from 1:30 pm to 2:30 pm and then 30 min wait for Anjali from 2:30 pm to 3 pm and finally the last ride, Ride-4 from 3 pm to 4 pm
The rest of the information can be gathered as follows-

Ride	Price (Rs)	Anjali	Bipasha	Chitra
Ride-1	20	11 am to 12 pm	12:30 pm to 1:30 pm	10 am to 11 am
Ride-2	50	1 pm to 2 pm	11:30 am to 12:30 pm	–
Ride-3	30	12 pm to 1 pm	–	9 am to 10 am
Ride-4	40	2 pm to 3 pm	3 pm to 4 pm	–
Total Spending		Rs 140	Rs 110	Rs 50

Total rides taken by Anjali and Chitra = 4 + 2 = 6

QNo:- 44 ,Correct Answer:- 140

Explanation:-
Since the time slot varies for different visitors as well as rides, so let's arrange the data with respect to rides vs visitors and fill the time slot and corresponding spending accordingly.
From point 1, Chitra spend Rs 50 and completed her rides by 11 am without any wait, so she must have taken 2 rides Ride-1 (Rs 20) and Ride-3 (Rs 30)
From point 2, Anjali took Ride-1 at 11 am after waiting for Chitra to complete, so Chitra took Ride-3 from 9 am to 10 am and Ride-1 from 10 am to 11 am respectively
From point 3, Bipasha first of three rides is from 11:30 am to 12:30 pm
Also, by 12:15 pm, all three have spent same amount = Rs 50 each (same as Chitra's complete spending by 11 am)
So, Bipasha's ride from 11:30 am to 12:30 am must be Ride 2 amounting Rs 50
Also, Anjali's second ride must be Ride-3 from 12 pm to 1 pm (without any wait and total spending of Rs 50 by 12:15 pm)
Also, Bipasha's other two rides cannot be Ride-3 as it should be completed by 1 pm
From point 4, the last ride taken by Anjali and Bipasha was the same
Let's say Anjali's last ride was Ride-4 from 1 pm to 2 pm just after Ride-3 taken from 12 pm to 1 pm as Anjali never took a break mentioned
So, for Bipasha's last ride, she could have reached 1:30 pm and taken the Ride-4 from 2 pm to 3 pm after 30 mins wait for Anjali
So, Bipasha's second ride could be Ride-1 from 12:30 pm to 1:30 pm
But that is not possible as she took a 1-hour coffee break after completing her second ride.
Thus, this is only possible if Anjali took Ride-2 from 1 pm to 2 pm and her last ride is Ride-4 from 2 pm to 3 pm respectively
Such that Bipasha's second ride is Ride-1 from 12:30 pm to 1:30 pm and then 1-hour coffee break from 1:30 pm to 2:30 pm and then 30 min wait for Anjali from 2:30 pm to 3 pm and finally the last ride, Ride-4 from 3 pm to 4 pm

The rest of the information can be gathered as follows-

Ride	Price (Rs)	Anjali	Bipasha	Chitra
Ride-1	20	11 am to 12 pm	12:30 pm to 1:30 pm	10 am to 11 am
Ride-2	50	1 pm to 2 pm	11:30 am to 12:30 pm	–
Ride-3	30	12 pm to 1 pm	–	9 am to 10 am
Ride-4	40	2 pm to 3 pm	3 pm to 4 pm	–
Total Spending		Rs 140	Rs 110	Rs 50

The total amount spent by Anjali = Rs 140

Section : Quantitative Ability

QNo:- 45 ,Correct Answer:- C

Explanation:-

$$\frac{x}{y}<\frac{x+3}{y-3}$$

$$\Rightarrow \frac{x}{y}-\frac{x+3}{y-3}<0$$

$$\Rightarrow \frac{-3(x+y)}{y(y-3)}<0 \Rightarrow \frac{x+y}{y(y-3)}>0 \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Three cases arise:
Case 1: When y < 0 then y & y - 3 both are negative
From (1), x + y > 0
So, when y < 0 then y > - x
which is correct
Case 2: When 0 < y < 3 then y > 0 but y - 3 < 0
So, from (1), x + y < 0
So, when 0 < y < 3 then x + y < 0
Case 3: When y > 3, then both y > 0 and y - 3 > 0
So, from (1), x + y > 0
So, when y > 3 then x + y > 0

QNo:- 46 ,Correct Answer:- D

Explanation:-
Since k divides (m + 2n), k must also divides (2m + 4n)
Also, k divides (3m + 4n) => k divides (m + 2m + 4n)
So, k must divide m as well
Again k divides (m + 2n), k must also divides (3m + 6n)
Also, k divides (3m + 4n) => k divides (3m + 6n – 2n)
So, k must divide 2n as well
Hence, k must be a common divisor of m and 2n

QNo:- 47 ,Correct Answer:- C

Explanation:-

Given equation can be written as

$\left(2^{2x^2}\right)^2 - 2 \cdot 2^{2x^2} \cdot 2^{x+15} + \left(2^{x+15}\right)^2 = 0$ ..... (1)

As we know, $(a - b)^2 = a^2 - 2ab + b^2$

So the above equation reduces to

$\left(2^{2x^2} - 2^{x+15}\right)^2 = 0$

$\Rightarrow 2^{2x^2} = 2^{x+15}$

=> $2x^2 = x + 15$

=> $2x^2 - x - 15 = 0$

=> $2x^2 - 6x + 5x - 15 = 0$

=> $(2x + 5)(x - 3) = 0$

=> $x = -5/2$ or 3

Required sum = -5/2 + 3 = 1/2

QNo:- 48 ,Correct Answer:- C

Explanation:-

$a^m \times b^n = 144^{145} = (2^4 \times 3^2)^{145} = 2^{580} \times 3^{290}$

=> $a^m \times b^n = (3^{290})^1 \times 2^{580}$

To maximise (n – m), n has to be maximum and m has to be minimum

The maximum possible value of n = 580 when b = 2 and the minimum possible value of m = 1 when $a = 3^{290}$

Hence, maximum value of (n – m) = 580 – 1 = 579

QNo:- 49 ,Correct Answer:- 6

Explanation:-

$(x – 1)^2 + 2kx + 11 = 0$

=> $x^2 – 2x + 1 + 2kx + 11 = 0$

=> $x^2 + x(2k – 2) + 12 = 0$

Since roots are not real,

=> $(2k – 2)^2 – 4 \times 1 \times 12 < 0$

=> $4k^2 + 4 – 8k – 48 < 0$

=> $4k^2 – 8k – 44 < 0$

=> $k^2 – 2k – 11 < 0$

=> $k^2 – 2k + 1 – 12 < 0$

=> $(k – 1)^2 < 12$

So, the largest integral value of k = 4 which satisfies the above inequality

Now, since k and y are positive numbers, AM ≥ GM

$\text{So, } \frac{\frac{k}{4y} + 9y}{2} \geq \sqrt{\frac{k}{4y} \cdot 9y}$

$\Rightarrow \frac{k}{4y} + 9y \geq 2\sqrt{\frac{9k}{4}}$

$\Rightarrow \frac{k}{4y} + 9y \geq 3\sqrt{k}$

$\text{Now } k = 4, \text{ So, } \frac{k}{4y} + 9y \geq 3\sqrt{4} \text{ i.e. } 6$

Hence, the required answer is 6

QNo:- 50 ,Correct Answer:- 15

Explanation:-
Since the required number has exactly 4 factors
So, the number should be either in the form of p^3 or p × q, where p and q are prime numbers
For p^3 , possible numbers < 50 are 2^3 and 3^3, 2 such numbers are possible
For p ×q, possible numbers < 50 are 2 × 3, 2 × 5, 2 × 7, 2 × 11, 2 × 13, 2 × 17, 2 × 19, 2 × 23, 3 × 5, 3 × 7, 3 × 11, 3 × 13, 5 × 7, 13 such numbers are there
Hence, in total, there are 15 such numbers

QNo:- 51 ,Correct Answer:- 7

Explanation:-

$$\text{Given } \log_{\sqrt{3}} x+\frac{\log_x 5^2}{\log_x 5^{-3}}=\frac{16}{3} \text{ (because } 5^2=25 \text{ and } 0.008=5^{-3})$$

$$\Rightarrow 2\log_3 x+\frac{2\log_x 5}{(-3)\log_x 5}=\frac{16}{3}$$

$$\Rightarrow 2\log_3 x=\frac{16}{3}+\frac{2}{3}=6$$

=> $\log_3 x = 3$ => $x = 27$
Now, $\log_3 (3x^2) = \log_3 3 \times 27 \times 27 = \log_3 3^7$
=> $x = 7$

QNo:- 52 ,Correct Answer:- D

Explanation:-
Let time taken by inlet pipe A = a hrs.
Then time taken by outlet pipe B = (a - 1) hrs.
Then time taken by outlet pipe C = C hrs.
When all pipes work together, tank gets filled in 2 hrs.

$$\text{So, } \frac{1}{a}+\frac{1}{c}-\frac{1}{a-1}=\frac{1}{2} \ldots\ldots\ldots\ldots (1)$$

When B & C are turned on together and pipe B is turned off after one hour, then pipe C takes another 1. 25 hours to fill the tank.

$$\frac{2.25}{C}-\frac{1}{a-1}=1\Rightarrow\frac{9}{4C}-\frac{1}{a-1}=1 \ldots\ldots\ldots (2)$$

Also, a < 5. Solving (1) & (2)

$$\frac{9}{4}\left(\frac{1}{2}-\frac{1}{a}+\frac{1}{a-1}\right)-\frac{1}{a-1}=1$$

$$\Rightarrow\frac{9}{8}-\frac{9}{4a}+\frac{9}{4(a-1)}-\frac{1}{a-1}=1$$

$$\Rightarrow\frac{9}{4a}-\frac{5}{4(a-1)}=\frac{1}{8}$$

$$\Rightarrow\frac{9}{a}-\frac{5}{a-1}=\frac{1}{2}\Rightarrow\frac{9a-9-5a}{a(a-1)}=\frac{1}{2}$$

$\Rightarrow 8a - 18 = a^2 - a$
$\Rightarrow a^2 - 9a + 18 = 0 \Rightarrow a = 6, 3$ but $a < 5$
So, a = 3
Put a = 3 in (2),

$$\frac{9}{4C}-\frac{1}{a-1}=1\Rightarrow\frac{9}{4C}-\frac{1}{2}=1$$

$$\Rightarrow\frac{9}{4C}=\frac{3}{2}$$

$$\Rightarrow C=\frac{3}{2}\text{hrs}=1.5 \text{ hrs}=90\text{mins.}$$

QNo:- 53 ,Correct Answer:- A

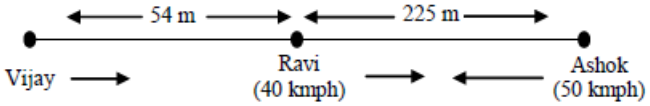
Explanation:-
Minu's profit for the 1st time selling to Kanu = 20% of 1000 = Rs 200
So, cost price for Kanu = 1000 + 200 = Rs 1200
Now, cost price for Minu for the 2nd time = 1200 - 20% of 1200 = Rs 960
Since, total profit for Minu = Rs 500, so profit for the 2nd time = 500 - 200 = Rs 300
Percenetage profit by Minu when sold to Tanu = 300/960 × 100 = 31.25%

QNo:- 54 ,Correct Answer:- B

Explanation:-
Let the total number of employee = 5x and total salary = 6y
So, number of employees in manufacturing deaprtment = 20% of 5x = x
=> number of non-manufacturing employees = 5x - x = 4x
Total salary withdrawn by manufacturing employees = 1/6 × 6y = y
Total salary withdrawn by non-manufacturing employees = 6y - y = 5y
Average salary of manufacturing employees = y/x
Average salary of non-manufacturing employees = 5y/4x
Hence, required ratio = y/x : 5y/4x = 4:5

QNo:- 55 ,Correct Answer:- A

Explanation:-



$$\text{Time taken by R \& A to meet} = \frac{225}{(40+50)\frac{5}{18}} \text{ secs}$$

$$= \frac{225}{90} \times \frac{18}{5} = 9 \text{ secs.}$$

That means V should meet R after 9 secs

$$\text{So, speed of Ravi} = \frac{54}{(V-40)\frac{5}{18}} = 9$$

$$\Rightarrow V - 40 = \frac{54}{9} \times \frac{18}{5} = \frac{108}{5} \text{ kmph}$$

So, V = 40 + 21.6 = 61.6 kmph

QNo:- 56 ,Correct Answer:- B

Explanation:-
Let price and weight of stone be P and w
So, P is directly proportional to w^2
=> $P = kw^2$ where k is a constant
Also weight of stone = 18 units and the stone is broken into four parts of distinct weights
Now, maximum possible total price of all 4 pieces would be when one of the piece has maximum possible weight
So, the weights would be 1, 2, 3 and 12
And similarly, minimum possible total price of all 4 pieces would be when the weights are as closest as possible
So, the weights would be 3, 4, 5 and 6
So, maximum price = $k (1^2 + 2^2 + 3^2 + 12^2) = k (1 + 4 + 9 + 144) = 158k$
and minimum price = $k (3^2 + 4^2 + 5^2 + 6^2) = k (9 + 16 + 25 + 36) = 86k$

Given 158k - 86 k = 72k = 288000 => k = 4000
Price of original piece = kw^2 = 4000 $(18)^2$ = Rs 1296000

QNo:- 57 ,Correct Answer:- C

Explanation:-
Given, P = Rs 200000 and R% = 8% p.a. => 4% per half year
Amount after first year
$= 200000\left(1+\frac{4}{100}\right)^2 = 216320 \text{ Rs.}$
Interest paid after 1st year = Rs 10320
Outstanding amount to be paid = 216320 - 10320 = Rs 206000
$\text{Compound amount after two more years} = 206000\left(1+\frac{4}{100}\right)^4 = 240991 \text{ Rs. (approx.)}$
Compound interest of last 2 years = 240991 - 200000 = Rs 40991
Compound interest paid in all 3 years = 10320 + 40991 = Rs 51311

QNo:- 58 ,Correct Answer:- 407

Explanation:-
Let the number of white shirts = x and blue shirts = y
Total CP = 1000x + 1125y
=> Total MP = 1.25 × (1000x + 1125y)
and Total SP = 0.9 × 1.25 × (1000x + 1125y) = 1.125 (1000x + 1125y)
Profit = 0.125 (1000x + 1125y) = 51000
=> 1000x + 1125y = 408000
=> 8x + 9y = 3264
=> 9y = 8 (408 - x)
So, y should be a multiple of 8
If y = 8, x = 399 => x + y = 407
If y = 16, y = 390 => x + y = 406
If y = 24, y = 381 => x + y = 405
and so on
Hence, maximum possible value of x + y = 407

Alternate approach
Let average cost of all shirts = 4a
Then average MP = 4a + 25% of 4a = 5a
$\text{Average S.P.} = 5a-\frac{10}{100}(5a)=4.5a$
Average Profit = S.P. - C.P. = 0.5a
Let the total number of shirts = n
Then n (0.5) a = 51000
⇒ an = 102000 ..... (1)
Now n has to be maximized i.e. a has to be minimized i.e. 4a has to be minimized.
i.e. 4a > 1000 ⇒ a > 250
$\Rightarrow \frac{102000}{n} > 250 \quad \text{.....(from (1))}$
⇒ n < 408
n_{max} = 407

QNo:- 59 ,Correct Answer:- 16

Explanation:-

The total amount = 352n
Also, 352n = 2 × 506 + (n - 2) y, where y ≤ 330
where y = per head money received by other people

$$\Rightarrow \frac{352n-1012}{n-2} = y$$
$$\Rightarrow \frac{352n-1012}{n-2} \le 330$$
$$\Rightarrow \frac{352n-1012-330n+660}{n-2} \le 0$$
$$\Rightarrow \frac{22n-352}{n-2} \le 0$$
$$\Rightarrow \frac{n-16}{n-2} \le 0$$
$$\Rightarrow \frac{(n-16)(n-2)}{(n-2)^2} \le 0 \Rightarrow (n-16)(n-2) \le 0$$

=> 2 ≤ n ≤ 16
So, the maximum possible value of n = 16

QNo:- 60 ,Correct Answer:- 7

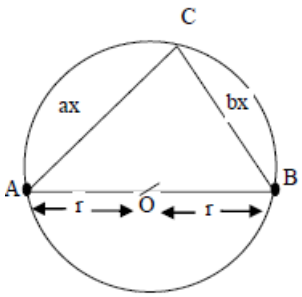
Explanation:-
The volume of milk in the container becomes less than that of water means the percentage of milk should be < 50% of the total
Every time 4 litres is removed out of 40 litres i.e. $1/10^{th}$ is removed
Let the process is repeated n number of times
So, the remaining milk

$$= 1 \times \frac{9}{10} \times \frac{9}{10} \times \frac{9}{10} \ldots\ldots \text{n times} < \frac{1}{2}$$
$$\Rightarrow \left(\frac{9}{10}\right)^n < \frac{1}{2}$$

By trial and error, we may calculate that the smallest value of n = 7

QNo:- 61 ,Correct Answer:- C

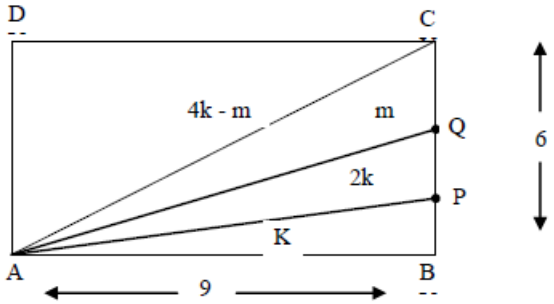
Explanation:-
Given AC : BC = a : b
So, let us assume AC = ax, BC = bx
Since angle made in semi-circle is 90°
So, $AC^2 + BC^2 = AB^2$
$\Rightarrow (ax)^2 + (bx)^2 = (2r)^2$



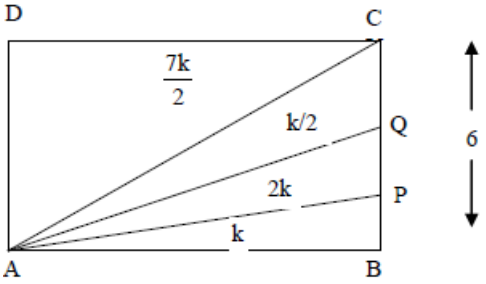
$$\Rightarrow x^2 = \frac{4r^2}{a^2+b^2}$$
$$\text{Ar.}(\Delta ABC) = \frac{1}{2}(ax)(bx) = \frac{1}{2}(abx^2) = \frac{1}{2}ab\left(\frac{4r^2}{a^2+b^2}\right) = \frac{2abr^2}{a^2+b^2}$$

QNo:- 62 ,Correct Answer:- B

Explanation:-



Let the area of triangle ABP = k
=> area of AQCD = 4 (Area of ABP) = 4k
Now area (ABP), area (APQ) and area (AQCD) are in GP
=> k, ?, 4k are in GP
=> area (APQ) = 2k
Let area (AQC) = m
Also, area (ADC) = 4k - m = half of the rectangle
= area (ACB) = 3k + m
=> 4k - m = 3k + m
=> k = 2m
Now the rectangle looks like



Now Area (APB) : Area (AQP) : Area (ACQ)

$$= \frac{1}{2}AB \cdot BP : \frac{1}{2}AB \cdot PQ : \frac{1}{2}AB \cdot CQ$$

$$= BP : PQ : CQ = K : 2k : \frac{k}{2} = 2 : 4 : 1$$

QNo:- 63 ,Correct Answer:- 45

Explanation:-

Case 1: When x - y > 0 & x - 5 > 0
Equation becomes,
x - y - (x - 5) = 2
⇒ y = 3 where x > 5 and x > y

Case 2: When x - y < 0 and x - 5 < 0
⇒ x < y and x < 5
So, equation becomes,
- (x - y) + (x - 5) = 2
⇒ y = 7 where x < 5 and x < y

Case 3: When x - y < 0 & x - 5 > 0
⇒ x < y & x > 5
So, equation becomes
- (x - y) - (x - 5) = 2

⇒ y - 2x = - 3 ⇒ 2x - y = 3, x < y, x > 5

Case 4: When x - y > 0 and x - 5 < 0

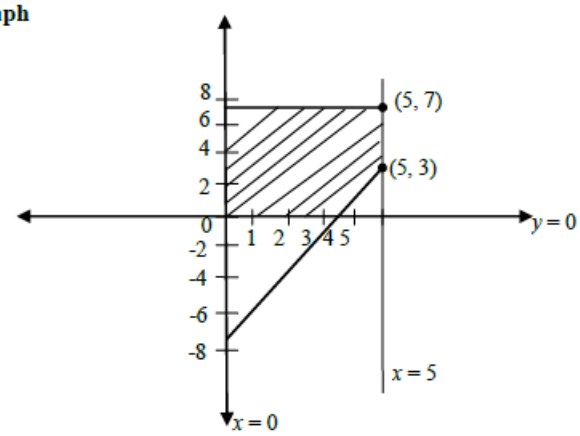
⇒ x > y and x < 5

So, equation becomes

x - y + x - 5 = 2

⇒ 2x - y = 7 where x > y and x < 5

Graph



So, we can see the required figure is a trapezium.

So required area is 1/2. (14 + 4) 5 = 45

QNo:- 64 ,Correct Answer:- A

Explanation:-

Let both the series are

a, a + q, a + 2q..... = a_1, a_2, a_3.....

and b, b + p, b + 2p ..... = b_1, b_2, b_3.....

Where p & q are prime nos.

Given b_2 = 0 ⇒ b + p = 0 ⇒ b = - p

So, the series becomes,

- p, 0, p, 2p, ... = bn series.

Now, b_{19} = - p + (19 - 1)p = 17p.

And similarly b_9 = 7p

$a_5 = b_9$ = 7p & $a_{19} = b_{19}$ = 17p

⇒ a + 4q = 7p and a + 18q = 17p

By solving both eqns, we will get $q = \frac{5}{7}p$

Since p & q are primes; So, p = 7, q = 5 & a = 29.

So, a_{11} = a + 10q = 29 + 10 (5) = 79

QNo:- 65 ,Correct Answer:- B

Explanation:-

Since 2 pq - 20 = 52 - 2 pq

⇒ 4pq = 72 ⇒ pq = 18

Also, $p^2 + q^2 - 29 = 2pq - 20$

⇒ $p^2 + q^2 = 36 - 20 + 29 = 45$.

Now $p^3 - q^3 = (p - q)(p^2 + q^2 + pq)$

= (p - q) (45 + 18) = 63 (p - q) ..... (1)

Also, $p^2 + q^2 - 29 = 2pq - 20$

⇒ $p^2 + q^2 - 2pq = 9$

$\Rightarrow (p - q)^2 = 9 \Rightarrow p - q = \pm 3$..... (2)
Combining (1) & (2),
$(p^3 - q^3)_{max} = 63 \times 3 = 189$
$(p^3 - q^3)_{min} = 63 \times (-3) = -189$
So, required difference = 189 - (- 189) = 378

QNo:- 66 ,Correct Answer:- 967

Explanation:-
$a_n = 13 + 6 (n - 1) = 6n + 7 = 7, 13, 19, 25, 31, 37, 43....$
$b_n = 15 + 7 (n - 1) = 8 + 7n = 8, 15, 22, 29, 36, 43.....$
Since, we are looking for common terms.
First common term is 43.
All the common terms should be in the form of
n(L.C.M. (6, 7)) + 43 = 42n + 43.
Now 42n + 43 < 1000
$\Rightarrow 42n < 957$
$\Rightarrow n < \frac{957}{42}$
$\Rightarrow n < 22.7$.....
$\Rightarrow$ the largest possible value of n = 22.
So, the largest 3 digit integer = 42n + 43 = 42 (22) + 43 = 967.

Actual CAT 2023 Slot III (Answer Keys)

Section : Verbal Ability

QNo:- 1 ,Correct Answer:- D

Explanation:- The passage emphasizes Pinker's focus on how rationality improves decision-making in various real-world contexts.
- 1 is incorrect because the passage doesn't specifically link Pinker's views to public attention on development issues.
- 2 is incorrect as the passage suggests that Pinker doesn't fully develop the ethical dimensions of rationality.
- 3 is incorrect because, although Pinker discusses statistics, the passage doesn't limit his views on rationality to gaining expertise in scientific disciplines.

QNo:- 2 ,Correct Answer:- D

Explanation:- The passage suggests that Pinker's focus on conscious reasoning contrasts with the role of epiphanies in significant achievements, a point not fully aligned with ancient philosophers.
- 1 is incorrect to eliminate because both Pinker and the philosophers recognize an ethical dimension to rationality.
- 2 is incorrect to eliminate as awareness of assumptions and knowledge gaps is central to both Pinker's and the philosophers' views.
- 3 is incorrect to eliminate because independent conclusions regardless of speaker authority are in line with both Pinker's and the philosophers' rational approach.

QNo:- 3 ,Correct Answer:- B

Explanation:- The author highlights that Pinker's treatment of the moral aspects of rationality is less developed compared to ancient philosophers.
- 1 is incorrect because the author doesn't focus on similarities but rather on Pinker's lack of depth compared to the philosophers.
- 3 is incorrect because there's no explicit mention of the philosophers' influence on Pinker's arguments.
- 4 is incorrect as the reference to philosophers is more about ethical and rational thinking, not about dreams and visions.

QNo:- 4 ,Correct Answer:- B

Explanation:- These examples are used to show that significant achievements can arise from intuitive insights, not just conscious reasoning.
- 1 is incorrect because the passage doesn't make a distinction between sciences and other fields in the context of these achievements.
- 3 is incorrect as it focuses narrowly on scientific fields, whereas the passage discusses broader domains including music and arts.
- 4 is incorrect because the passage doesn't suggest that European achievements contradict Pinker's views; rather, it highlights the role of intuition alongside reasoning.

QNo:- 5 ,Correct Answer:- C

Explanation:- The central idea is that strict cultural property laws diminish archaeological discoveries. If UNESCO finances research, it counters the negative impact of these laws.
- 1 is incorrect because museums in source countries displaying antiques align with the passage's emphasis on cultural property laws.
- 2 is incorrect as it doesn't undermine the central idea; the passage focuses on poor countries.
- 4 is incorrect because apologies from Western countries don't directly address the issue of reduced archaeological discoveries.

QNo:- 6 ,Correct Answer:- A

Explanation:- The paradox in the passage is that while patrimony laws were meant to protect artifacts, they led to fewer discoveries.
- 2 is incorrect as it focuses on auctioneers, which is not the central paradox discussed.
- 3 is incorrect because the withholding of treasures from museums is not the paradox addressed.
- 4 is incorrect as it suggests neglect of historical sites, which is not the main issue presented in the passage.

QNo:- 7 ,Correct Answer:- A

Explanation:- The passage mentions that new archaeological discoveries typically increase tourism and enhance cultural pride.
- 2 is incorrect as it's the strictness of the laws, not the laws themselves, that's a concern.
- 3 is incorrect because generating funds for future discoveries isn't directly stated as a reason for their importance.
- 4 is incorrect as Western imperialism is not cited as a reason for their importance in the passage.

QNo:- 8 ,Correct Answer:- C

Explanation:- The author advocates for collaborative international archaeological research but does not suggest allowing foreign countries to exhibit artifacts found in the source countries.
Option A) allowing foreign countries to analyze and exhibit archaeological finds could be inferred as a recommended strategy, as it aligns with the idea of international collaboration and sharing the benefits of discoveries.
Option B) is in appropriate because the author praises China's approach of dropping restrictive laws and engaging in international collaboration.
Option C) funding institutes in other countries to undertake archaeological exploration in the source country, reaping the benefits of cutting-edge techniques, does not directly align with the author's recommendations. The passage suggests easing restrictions to encourage foreign investment and collaboration but does not specifically recommend funding foreign institutions to conduct the exploration. The focus is more on modifying laws to enable and encourage international collaboration and investment directly within the source countries, rather than funding external entities to carry out the work
Option D) is incorrect to eliminate because it aligns with the author’s suggestion to incentivize foreign investment in archaeological explorations.

QNo:- 9 ,Correct Answer:- C

Explanation:- The passage mentions that recent studies do not overlook the differences between national romanticisms but characterize them in terms of philosophical questions and concerns.

- 1 is incorrect to eliminate as the passage supports the idea that characterizing romantic aesthetics is both possible and desirable.
- 2 is incorrect to eliminate because the passage states that romantic aesthetics are often expressed through fragments, aphorisms, and poems.
- 4 is incorrect to eliminate as the passage mentions that many romantics rejected the idea of aesthetics as a separate domain.

QNo:- 10 ,Correct Answer:- A

Explanation:- The passage suggests that recent studies characterize romanticism in terms of "particular philosophical questions and concerns" rather than a single definition or specific time/place.

- 2 is incorrect because discrediting Lovejoy’s skepticism is not the stated reason for their approach.
- 3 is incorrect as the passage doesn't suggest that a general analysis is impossible.

- 4 is incorrect because the passage does not indicate that recent studies prefer to highlight the paradox of romantic aesthetics.

QNo:- 11 ,Correct Answer:- D

Explanation:- The passage quotes Lovejoy, who pointed out the difficulty due to the lack of a "single real entity, or type of entity" that romanticism designates, indicating unclear conceptual contours.

- 1 is incorrect because the passage doesn't describe the history of romantic literature as controversial or scandalous.
- 2 is incorrect because the elusive nature of romantic aesthetics is a challenge, but not the main difficulty.
- 3 is incorrect as the passage does not suggest the absence of written accounts as the main difficulty.

QNo:- 12 ,Correct Answer:- B

Explanation:- The passage states that the most characteristic romantic commitment is the idea that the character of art and beauty should shape all aspects of human life.

- 1 is incorrect because the passage explicitly states that many romantics rejected this view.
- 3 is incorrect as the passage suggests that beauty and art should be central in the lives of ordinary people, not just philosophers and artists.
- 4 is incorrect because the passage does not suggest that aesthetics is considered irrelevant to human existence.

QNo:- 13 ,Correct Answer:- D

Explanation:- The passage does not suggest that the decentralized nature of renewable resources like solar power is a reason for the failure of climate change policies. Instead, it points to power utilities sabotaging decentralized solar power for their own interests.

- 1 is incorrect to eliminate because the marginalization of non-European perspectives is mentioned as a contributing factor to policy failures.
- 2 is incorrect to eliminate as it's mentioned that greed benefiting from non-renewable resources is a challenge.
- 3 is incorrect to eliminate because the global dominance of oil economies is discussed as a significant hurdle.

QNo:- 14 ,Correct Answer:- D

Explanation:- The use of the pronoun "who" for Gaia reflects a view of the Earth as a living entity, which is aligned with Ghosh's incorporation of non-European perspectives on the Earth. If it were true that non-European societies predominantly perceived the Earth as a non-living resource, this would contradict the basis for using a pronoun that implies personification, making its use inappropriate.

- 1 is incorrect because establishing a cause-effect relationship between human activities and climate change aligns with personifying the Earth, not contradicting it.
- 2 is incorrect as the title of Ghosh's book is irrelevant to the appropriateness of the pronoun for Gaia.
- 3 is incorrect because new evidence from modern western science about the Earth being inanimate does not directly relate to the use of the pronoun in the context of Ghosh's focus on non-European perspectives.

QNo:- 15 ,Correct Answer:- C

Explanation:- The passage suggests that the colonization of the Banda Islands by the Dutch is used by Ghosh as an example of how European colonialism's view of Earth as a resource to exploit contributed to the current climate crisis.

- 1 is incorrect because systemic violence is not the main focus of the discussion in the context of climate change.
- 2 is incorrect as the passage does not imply that this was the first historical instance of climate change processes.
- 4 is incorrect because the passage does not primarily focus on the role of crop cultivation in contributing to climate

change.

QNo:- 16 ,Correct Answer:- D

Explanation:- The passage suggests that academic discourses have often supported the viewpoints of colonialists and their backers, rather than consistently raising awareness about environmental preservation.

- 1 is incorrect to eliminate as the passage implies a connection between colonialism and climate change.
- 2 is incorrect to eliminate because the passage suggests that contemporary perceptions of nature are rooted in colonialist processes.
- 3 is incorrect to eliminate as it's implied that there is much to learn from non-European and pre-colonial societies regarding environmental policy.

QNo:- 17 ,Correct Answer:- C

Explanation:- The sentence fits best at position (C). The paragraph initially discusses how an argument can be defined and how the relation of support between premises and conclusion works. After these theoretical definitions and views, the sentence at C provides a contrasting perspective by suggesting a shift from theoretical abstraction to considering arguments within the context of actual human activities. It serves as a transitional statement that bridges the more abstract, theoretical discussion of arguments with their practical, real-world applications, as mentioned in the final sentence of the paragraph.

- (A) is incorrect because the beginning of the paragraph is already defining an argument, and the missing sentence would be out of context as an introduction.
- (B) is incorrect because it continues the theoretical discussion on how premises support conclusions, and the missing sentence introduces a different perspective.
- (D) is incorrect as it is the conclusion of the paragraph where the focus shifts to the practical applications of arguments in human communication, and the sentence would be out of place here.

QNo:- 18 ,Correct Answer:- C

Explanation:- The paragraph introduces the interconnected nature of different elements and their collective impact on violence and governance. It further Delves into how criminal activities can financially fuel armed conflicts, supporting NSAGs. Finally Concluding with the aftermath of conflicts, discussing the surplus arms and the challenges in achieving sustainable peace. The right placement of the given sentence should be 3rd blank as the sentence Expands on the consequences of armed conflicts by highlighting how they weaken state control and foster an environment conducive to organized crime. This can be seen as a continuation of the idea that armed conflicts provide financial streams to NSAGs, indicating a broader socio-political impact.

QNo:- 19 ,Correct Answer:- 2

Explanation:- The sentence fits best at position (C). The paragraph initially discusses how an argument can be defined and how the relation of support between premises and conclusion works. After these theoretical definitions and views, the sentence at C provides a contrasting perspective by suggesting a shift from theoretical abstraction to considering arguments within the context of actual human activities. It serves as a transitional statement that bridges the more abstract, theoretical discussion of arguments with their practical, real-world applications, as mentioned in the final sentence of the paragraph.

- (A) is incorrect because the beginning of the paragraph is already defining an argument, and the missing sentence would be out of context as an introduction.
- (B) is incorrect because it continues the theoretical discussion on how premises support conclusions, and the missing sentence introduces a different perspective.
- (D) is incorrect as it is the conclusion of the paragraph where the focus shifts to the practical applications of arguments in human communication, and the sentence would be out of place here.

QNo:- 20 ,Correct Answer:- 2

Explanation:- Sentence 2, while related to the broader theme of indigenous populations and their decline, is more focused on the historical context of colonization and its impact on the indigenous population as a whole, rather than specifically on the Bo language or its speakers. Therefore, the odd sentence should be 2
It addresses the broader historical context of the decline of the indigenous population due to colonization, which, although related, does not directly tie into the specific narrative about the Bo language and its last speaker, which is the central theme in the other sentences.

QNo:- 21 ,Correct Answer:- 3142

Explanation:- The correct sequence is 3-1-4-2

3rd sentence sets the stage by introducing the issue of e-waste and its potential for recycling. It identifies the problem, making it a natural starting point for the paragraph. 1st sentence introduces Veena Sahajwalla and her belief in a new solution to this problem. This builds on the context provided in sentence 3. 4th sentence describes Sahajwalla's specific plan to address the e-waste problem, which logically follows her introduction and her belief in a new solution. 2nd sentence provides the detailed method of how Sahajwalla's plan (introduced in sentence 4) will be executed, making it an appropriate conclusion to the paragraph.
In this sequence, the paragraph flows logically from identifying the broader issue (e-waste recycling), to introducing an expert who believes in a new solution, to outlining her specific plan, and finally detailing the execution of that plan.

QNo:- 22 ,Correct Answer:- 2431

Explanation:- The correct sequence is: 2-4-3-1

- Start with sentence 2, which sets the historical context of learning methods before the printing press. Continue with sentence 4, which describes the direct impact of the printing press on learning. Follow with sentence 3, which elaborates on the broader cultural shift to reading and literacy. Conclude with sentence 1, which brings the discussion to the present day, showing the lasting influence of these historical changes.

QNo:- 23 ,Correct Answer:- B

Explanation:- The passage discusses how societal expectations of perfectionism have shifted over time. In the 1950s, perfectionism was about conforming to the mass culture's norms, while contemporary perfectionism involves standing out through individuality. This summary effectively encapsulates this evolution from conformism to non-

conformism. The essence is captured by 2nd option only. 1 is incorrect because it oversimplifies the passage's focus on perfectionism as a means to attract attention, which is not the main point. 3 is incorrect as it focuses solely on the role of media in reflecting and perpetuating perfectionism, while the passage discusses a broader societal shift in the concept of perfectionism. 4 is incorrect because it emphasizes the tension and conflict arising from the changing definition of perfectionism, which isn't the central focus of the passage. The passage is more about the evolution of what constitutes perfectionism rather than the conflicts it causes.

QNo:- 24 ,Correct Answer:- A

Explanation:-
Option 1 effectively encapsulates the main idea of the passage, which is the improvement in the island's ecosystem, particularly the increase in bird populations and plant growth, following the reduction or absence of pests. It covers both the revival of birds and the positive impact on the plant life. 2 is incorrect because it overemphasizes the aspect of environmental protection without specifically mentioning the crucial role of the absence of pests, which is a key point in the passage. 3 is incorrect as it inaccurately suggests an increase in predatory birds due to pests, which contradicts the passage's focus on the recovery of the ecosystem after the reduction of pests. 4 is incorrect because it narrows the focus to only the protection of plants and birds, missing the broader ecological improvement and the interconnectedness of various elements in the ecosystem described in the passage.

Section : DI & Reasoning

QNo:- 25 ,Correct Answer:- 14

Explanation:- Let us assume, A is the total number of AC's sold
⟹ From the information that the total number of ACs sold in the city, 25% were of Window variant
⟹ Window AC's = A/4 and Split AC's = 3A/4
Now, let us assume B is the total number of inverter ACs
⟹ From the information that among the Inverter ACs sold, 20% were of Window variant.
⟹ Window Inverter AC's = B/5 and Window Non-Inverter AC's = 4B/5

Table (A)			
Split (3A/4)		**Window (A/4)**	
Inv (4B/5)	Non - Inv	Inv (B/5)	Non – Inv

From - Condition-3
⟹ A/4 – B/5 = 6 and 4B/5 = 36 ⟹ B = 46 and A = 60.

Total = 60			
Split = 45		**Window = 15**	
Inv = 36	Non – Inv = 9	Inv = 9	Non – Inv = 6

Now, from condition-6
a) D1 & D4 sold "0" window Non-inverter ACs ⟹ D2 & D3 sold 6 window non-inverter ACs, it is given that D2 sold twice as many as D3 ⟹ D2 sold 4 and D3 sold 2 ACs of this type.
From condition-2
b) Let us assume, D1 sold "x" window inverter ACs ⟹ Number of split inverter ACs sold is 13-x From condition-4
c) Number of split ACs sold by D1 will be "2x"
From condition-5
d) Let us assume 'y' is the number of window ACs sold by D3 & D4 ⟹ D2 sold 3y ACs of this type. From condition-7
e) Let us assume 'z' is the number of split inverter ACs sold by D3 and D4 ⟹ D2 sold 2z ACs of this type. Let us use a, b, c, d, and e make a table:

D1 Total =	
Split =	**Window = x**

Inv = 13 – x	Non – Inv =	Inv = x	Non – Inv = 0
D2 Total =			
Split =		**Window = 3y**	
Inv = 2z	Non – Inv =	Inv =	Non – Inv = 4
D3 Total =			
Split =		**Window = y**	
Inv = z	Non – Inv = 3	Inv =	Non – Inv = 2
D4 Total			
Split =		**Window = y**	
Inv = z	Non – Inv =	Inv =	Non – Inv = 0

We know that the total number of window ACs is 15
$\implies x + 3y + y + y = 15 \implies x + 5y = 15$, also x and y should be greater than or equal to 2 from condition – 1
$\implies x = 5$ and $y = 2$ is the only solution.
Filling this in the table:

D1 Total =			
Split =		**Window = 5**	
Inv = 8	Non – Inv =	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 2z	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split =		**Window = 2**	
Inv = z	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = z	Non – Inv =	Inv = 2	Non – Inv = 0

Now, Number of split inverter ACs is 36
$\implies 8 + 2z + z + z = 36 \implies 4z = 28 \implies z = 7$.
Filling this and using (5), the number of split AC's sold by D1 is 2*5 = 10.

D1 Total = 15			
Split = 10		**Window = 5**	
Inv = 8	Non – Inv = 2	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 14	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split = 10		**Window = 2**	
Inv = 7	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = 7	Non – Inv =	Inv = 2	Non – Inv = 0

From the table, we see that 14 split inverter ACs are sold.

QNo:- 26 ,Correct Answer:- 25

Explanation:- Let us assume, A is the total number of AC's sold
⟹ From the information that the total number of ACs sold in the city, 25% were of Window variant
⟹ Window AC's = A/4 and Split AC's = 3A/4
Now, let us assume B is the total number of inverter ACs
⟹ From the information that among the Inverter ACs sold, 20% were of Window variant.
⟹ Window Inverter AC's = B/5 and Window Non-Inverter AC's = 4B/5

Table (A)			
Split (3A/4)		**Window (A/4)**	
Inv (4B/5)	Non - Inv	Inv (B/5)	Non – Inv

From - Condition-3
⟹ A/4 – B/5 = 6 and 4B/5 = 36 ⟹ B = 46 and A = 60.

Total = 60			
Split = 45		**Window = 15**	
Inv = 36	Non – Inv = 9	Inv = 9	Non – Inv = 6

Now, from condition-6
a) D1 & D4 sold "0" window Non-inverter ACs ⟹ D2 & D3 sold 6 window non-inverter ACs, it is given that D2 sold twice as many as D3 ⟹ D2 sold 4 and D3 sold 2 ACs of this type.
From condition-2
b) Let us assume, D1 sold "x" window inverter ACs ⟹ Number of split inverter ACs sold is 13-x From condition-4
c) Number of split ACs sold by D1 will be "2x"
From condition-5
d) Let us assume 'y' is the number of window ACs sold by D3 & D4 ⟹ D2 sold 3y ACs of this type. From condition-7
e) Let us assume 'z' is the number of split inverter ACs sold by D3 and D4 ⟹ D2 sold 2z ACs of this type. Let us use a, b, c, d, and e make a table:

D1 Total =			
Split =		**Window = x**	
Inv = 13 – x	Non – Inv =	Inv = x	Non – Inv = 0
D2 Total =			
Split =		**Window = 3y**	
Inv = 2z	Non – Inv =	Inv =	Non – Inv = 4
D3 Total =			
Split =		**Window = y**	
Inv = z	Non – Inv = 3	Inv =	Non – Inv = 2
D4 Total			
Split =		**Window = y**	
Inv = z	Non – Inv =	Inv =	Non – Inv = 0

We know that the total number of window ACs is 15
⟹ x + 3y + y + y = 15 ⟹ x + 5y = 15, also x and y should be greater than or equal to 2 from condition – 1
⟹ x = 5 and y = 2 is the only solution.
Filling this in the table:

D1 Total =			
Split =		Window = 5	
Inv = 8	Non – Inv =	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		Window = 6	
Inv = 2z	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split =		Window = 2	
Inv = z	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		Window = 2	
Inv = z	Non – Inv =	Inv = 2	Non – Inv = 0

Now, Number of split inverter ACs is 36
$\Longrightarrow 8 + 2z + z + z = 36 \Longrightarrow 4z = 28 \Longrightarrow z = 7$.
Filling this and using (5), the number of split AC's sold by D1 is 2*5 = 10.

D1 Total = 15			
Split = 10		Window = 5	
Inv = 8	Non – Inv = 2	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		Window = 6	
Inv = 14	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split = 10		Window = 2	
Inv = 7	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		Window = 2	
Inv = 7	Non – Inv =	Inv = 2	Non – Inv = 0

From this table, we see that total number of non-inverter ACs is 9 + 6 = 15.
Required percentage is 15 out of 60 $\Longrightarrow$ 25%.

QNo:- 27 ,Correct Answer:- 33

Explanation:- Let us assume, A is the total number of AC's sold
$\Longrightarrow$ From the information that the total number of ACs sold in the city, 25% were of Window variant
$\Longrightarrow$ Window AC's = A/4 and Split AC's = 3A/4
Now, let us assume B is the total number of inverter ACs
$\Longrightarrow$ From the information that among the Inverter ACs sold, 20% were of Window variant.
$\Longrightarrow$ Window Inverter AC's = B/5 and Window Non-Inverter AC's = 4B/5

Table (A)			
Split (3A/4)		Window (A/4)	
Inv (4B/5)	Non - Inv	Inv (B/5)	Non – Inv

From - Condition-3

$\Longrightarrow A/4 - B/5 = 6$ and $4B/5 = 36 \Longrightarrow B = 46$ and $A = 60$.

Total = 60			
Split = 45		Window = 15	
Inv = 36	Non – Inv = 9	Inv = 9	Non – Inv = 6

Now, from condition-6
a) D1 & D4 sold "0" window Non-inverter ACs $\Longrightarrow$ D2 & D3 sold 6 window non-inverter ACs, it is given that D2 sold twice as many as D3 $\Longrightarrow$ D2 sold 4 and D3 sold 2 ACs of this type.
From condition-2
b) Let us assume, D1 sold "x" window inverter ACs $\Longrightarrow$ Number of split inverter ACs sold is 13-x From condition-4
c) Number of split ACs sold by D1 will be "2x"
From condition-5
d) Let us assume 'y' is the number of window ACs sold by D3 & D4 $\Longrightarrow$ D2 sold 3y ACs of this type. From condition-7
e) Let us assume 'z' is the number of split inverter ACs sold by D3 and D4 $\Longrightarrow$ D2 sold 2z ACs of this type. Let us use a, b, c, d, and e make a table:

D1 Total =			
Split =		Window = x	
Inv = 13 – x	Non – Inv =	Inv = x	Non – Inv = 0
D2 Total =			
Split =		Window = 3y	
Inv = 2z	Non – Inv =	Inv =	Non – Inv = 4
D3 Total =			
Split =		Window = y	
Inv = z	Non – Inv = 3	Inv =	Non – Inv = 2
D4 Total			
Split =		Window = y	
Inv = z	Non – Inv =	Inv =	Non – Inv = 0

We know that the total number of window ACs is 15
$\Longrightarrow x + 3y + y + y = 15 \Longrightarrow x + 5y = 15$, also x and y should be greater than or equal to 2 from condition – 1
$\Longrightarrow x = 5$ and $y = 2$ is the only solution.
Filling this in the table:

D1 Total =			
Split =		Window = 5	
Inv = 8	Non – Inv =	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		Window = 6	
Inv = 2z	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split =		Window = 2	
Inv = z	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		Window = 2	
Inv = z	Non – Inv =	Inv = 2	Non – Inv = 0

Now, Number of split inverter ACs is 36

$\Rightarrow 8 + 2z + z + z = 36 \Rightarrow 4z = 28 \Rightarrow z = 7$.
Filling this and using (5), the number of split AC's sold by D1 is 2*5 = 10.

D1 Total = 15			
Split = 10		**Window = 5**	
Inv = 8	Non – Inv = 2	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 14	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split = 10		**Window = 2**	
Inv = 7	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = 7	Non – Inv =	Inv = 2	Non – Inv = 0

Total number of ACs sold by D2 and D4 = 60 - D1 - D3 = 60 - 15 - 12 = 33.

QNo:- 28 ,Correct Answer:- A

Explanation:- Let us assume, A is the total number of AC's sold
$\Rightarrow$ From the information that the total number of ACs sold in the city, 25% were of Window variant
$\Rightarrow$ Window AC's = A/4 and Split AC's = 3A/4
Now, let us assume B is the total number of inverter ACs
$\Rightarrow$ From the information that among the Inverter ACs sold, 20% were of Window variant.
$\Rightarrow$ Window Inverter AC's = B/5 and Window Non-Inverter AC's = 4B/5

Table (A)			
Split (3A/4)		**Window (A/4)**	
Inv (4B/5)	Non - Inv	Inv (B/5)	Non – Inv

From - Condition-3
$\Rightarrow$ A/4 – B/5 = 6 and 4B/5 = 36 $\Rightarrow$ B = 46 and A = 60.

Total = 60			
Split = 45		**Window = 15**	
Inv = 36	Non – Inv = 9	Inv = 9	Non – Inv = 6

Now, from condition-6
a) D1 & D4 sold "0" window Non-inverter ACs $\Rightarrow$ D2 & D3 sold 6 window non-inverter ACs, it is given that D2 sold twice as many as D3 $\Rightarrow$ D2 sold 4 and D3 sold 2 ACs of this type.
From condition-2
b) Let us assume, D1 sold "x" window inverter ACs $\Rightarrow$ Number of split inverter ACs sold is 13-x From condition-4
c) Number of split ACs sold by D1 will be "2x"
From condition-5
d) Let us assume 'y' is the number of window ACs sold by D3 & D4 $\Rightarrow$ D2 sold 3y ACs of this type. From condition-7
e) Let us assume 'z' is the number of split inverter ACs sold by D3 and D4 $\Rightarrow$ D2 sold 2z ACs of this type. Let us use a, b, c, d, and e make a table:

D1 Total =	
Split =	**Window = x**

Inv = 13 – x	Non – Inv =	Inv = x	Non – Inv = 0
D2 Total =			
Split =		**Window = 3y**	
Inv = 2z	Non – Inv =	Inv =	Non – Inv = 4
D3 Total =			
Split =		**Window = y**	
Inv = z	Non – Inv = 3	Inv =	Non – Inv = 2
D4 Total			
Split =		**Window = y**	
Inv = z	Non – Inv =	Inv =	Non – Inv = 0

We know that the total number of window ACs is 15
$\implies x + 3y + y + y = 15 \implies x + 5y = 15$, also x and y should be greater than or equal to 2 from condition – 1
$\implies x = 5$ and $y = 2$ is the only solution.
Filling this in the table:

D1 Total =			
Split =		**Window = 5**	
Inv = 8	Non – Inv =	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 2z	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split =		**Window = 2**	
Inv = z	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = z	Non – Inv =	Inv = 2	Non – Inv = 0

Now, Number of split inverter ACs is 36
$\implies 8 + 2z + z + z = 36 \implies 4z = 28 \implies z = 7$.
Filling this and using (5), the number of split AC's sold by D1 is 2*5 = 10.

D1 Total = 15			
Split = 10		**Window = 5**	
Inv = 8	Non – Inv = 2	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 14	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split = 10		**Window = 2**	
Inv = 7	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = 7	Non – Inv =	Inv = 2	Non – Inv = 0

We see that D1 & D3 sold 27 ACs together which is less than 60 – 27 = 33 sold by D2 & D4.
⟹ Option – A is definitely false.

QNo:- 29 ,Correct Answer:- A

Explanation:- Let us assume, A is the total number of AC's sold
⟹ From the information that the total number of ACs sold in the city, 25% were of Window variant
⟹ Window AC's = A/4 and Split AC's = 3A/4
Now, let us assume B is the total number of inverter ACs
⟹ From the information that among the Inverter ACs sold, 20% were of Window variant.
⟹ Window Inverter AC's = B/5 and Window Non-Inverter AC's = 4B/5

Table (A)			
Split (3A/4)		**Window (A/4)**	
Inv (4B/5)	Non - Inv	Inv (B/5)	Non – Inv

From - Condition-3
⟹ A/4 – B/5 = 6 and 4B/5 = 36 ⟹ B = 46 and A = 60.

Total = 60			
Split = 45		**Window = 15**	
Inv = 36	Non – Inv = 9	Inv = 9	Non – Inv = 6

Now, from condition-6
a) D1 & D4 sold "0" window Non-inverter ACs ⟹ D2 & D3 sold 6 window non-inverter ACs, it is given that D2 sold twice as many as D3 ⟹ D2 sold 4 and D3 sold 2 ACs of this type.
From condition-2
b) Let us assume, D1 sold "x" window inverter ACs ⟹ Number of split inverter ACs sold is 13-x From condition-4
c) Number of split ACs sold by D1 will be "2x"
From condition-5
d) Let us assume 'y' is the number of window ACs sold by D3 & D4 ⟹ D2 sold 3y ACs of this type. From condition-7
e) Let us assume 'z' is the number of split inverter ACs sold by D3 and D4 ⟹ D2 sold 2z ACs of this type. Let us use a, b, c, d, and e make a table:

D1 Total =			
Split =		**Window = x**	
Inv = 13 – x	Non – Inv =	Inv = x	Non – Inv = 0
D2 Total =			
Split =		**Window = 3y**	
Inv = 2z	Non – Inv =	Inv =	Non – Inv = 4
D3 Total =			
Split =		**Window = y**	
Inv = z	Non – Inv = 3	Inv =	Non – Inv = 2
D4 Total			
Split =		**Window = y**	
Inv = z	Non – Inv =	Inv =	Non – Inv = 0

We know that the total number of window ACs is 15
⟹ x + 3y + y + y = 15 ⟹ x + 5y = 15, also x and y should be greater than or equal to 2 from condition – 1
⟹ x = 5 and y = 2 is the only solution.

Filling this in the table:

D1 Total =			
Split =		**Window = 5**	
Inv = 8	Non – Inv =	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 2z	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split =		**Window = 2**	
Inv = z	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = z	Non – Inv =	Inv = 2	Non – Inv = 0

Now, Number of split inverter ACs is 36
$\Longrightarrow 8 + 2z + z + z = 36 \Longrightarrow 4z = 28 \Longrightarrow z = 7$.
Filling this and using (5), the number of split AC's sold by D1 is 2*5 = 10.

D1 Total = 15			
Split = 10		**Window = 5**	
Inv = 8	Non – Inv = 2	Inv = 5	Non – Inv = 0
D2 Total =			
Split =		**Window = 6**	
Inv = 14	Non – Inv =	Inv = 2	Non – Inv = 4
D3 Total =			
Split = 10		**Window = 2**	
Inv = 7	Non – Inv = 3	Inv = 0	Non – Inv = 2
D4 Total			
Split =		**Window = 2**	
Inv = 7	Non – Inv =	Inv = 2	Non – Inv = 0

Number of non-inverter ACs sold is 1 + 4 = 5

QNo:- 30 ,Correct Answer:- 60

Explanation:-
It is given that there are only three female students - Amala, Koli, and Rini - and only three male students - Biman, Mathew, and Shyamal - in a course.
It is also known that the aggregate score in the course is a weighted average of the two components, with the weights being positive and adding to 1.
Let the project score component be x, which implies the test score component will be (1-x). The projects are done in groups of two, with each group consisting of a female and a male student, which implies there are three groups for the project. It is also known that both the group members obtain the same score in the project. The score obtained in the project is 40, 60, and 80, respectively.
Therefore, we can say that each female student will consist of a different group, and no two male students or female students will be in the same group.
For the test scores, there are six scores given for six students among which four are distinct and the remaining two are average scores, which is 60. It is also known that the maximum score possible is 80, and the minimum score is 40.

Hence, the distinct scores are 80, 70, 50, and 40 (since all the test scores are multiple of 10), and the remaining two scores are 60, and 60, respectively.
From point 3, we know that Amala's score in the project was double that of Koli in the same, but Koli scored 20 more than Amala in the test. Hence, we can say the score obtained by Amala in the project is 80, and the score obtained by Koli is 40, which implies the score obtained by Rini in the project is 60. Now, Koli scored 20 more than Amala in the test, which implies the score obtained by Koli can be either 80, 70, or 60.
The score obtained by them is given below:

Students	Test Scores	Project Scores
Amala	40/50/60	80
Koli	60/70/80	40
Rini		60
Biman		
Mathew		
Shyamal		

It is known that Amala had the highest aggregate score, and Shyamal scored the second highest on the test. He scored two more than Koli, but two less than Amala in the aggregate.
Hence, the score obtained by Shyamal in the test is 70, which implies Koli can't score 70 in the test $\Rightarrow$ Amala can't score 50 in the test.

Students	Test Scores	Project Scores
Amala	40/60	80
Koli	60/80	40
Rini		60
Biman		
Mathew		
Shyamal	70	

It is given that Shyamal scored two more than Koli, but two less than Amala in the aggregate. Hence, the aggregate score of Amala is 4 more than Koli. It is also known that Amala had the highest aggregate score.

Case 1: The test score of Amala is 40

Students	Test Scores	Project Scores	Aggregate Score
Amala	40	80	40 (1 – x) + 80x
Koli	60	40	60 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, $40(1 - x) + 80x = 60(1 - x) + 40x + 4$
$\Rightarrow 60x = 24$
$\Rightarrow x = 0.4$
Hence, the aggregate score obtained by Amala is $40(1 – 0.4) + 80 * 4 = 56$
The minimum aggregate score of Shyamal is $70(1 – 0.4) + 40 * 0.4 = 58$, which is greater than Amala.
Hence, Case 1 is not possible.
Hence, the table is given below:

Students	Test Scores	Project Scores	Aggregate Score
Amala	60	80	60 (1 – x) + 80x
Koli	80	40	80 (1 – x) + 40x
Rini		60	
Biman			
Mathew			

Shyamal	70		

Therefore, 60(1 - x) + 80x = 80(1 - x) + 40x + 4
$\Longrightarrow$ 60 + 20x = 84 – 40x
$\Longrightarrow$ 60x = 24 $\Longrightarrow$ x = 0.4
Hence, the aggregate score of Amala is 60 (1 – 0.4) + 80 * 0.4 = 68, which implies the aggregate score of Shyamal is (68 – 2) = 66
Hence, the score obtained by Shyamal in Project is {66 – 70*(0.6)}/0.4 = 60.
It is also known that Biman scored second lowest in the test, which implies the score of Biman in the test is 50, and he scored the lowest in the aggregate. It is also known that Mathew scored more than Rini in the project, but less than her in the test. Hence, Mathew scored 80 in the project (since Rini scored 60 in the project), and Biman scored 40 in the project.

Similarly, Rini Scored more than Mathew on the test, which implies the score obtained by Rini is 60, and the score obtained by Mathew is 40 in the test.
Hence, the final table will look like this:

Students	Test Scores (T)	Project Scores (P)	Aggregate Score (T * 0.6 + P* 0.4)	Project Pair
Amala	60	80	68	Amala, Mathew
Koli	80	40	64	Koli, Biman
Rini	60	60	60	Rini, Shyamal
Biman	50	40	46	Biman, Koli
Mathew	40	80	56	Mathew, Amala
Shyamal	70	60	66	Shyamal, Rini

Hence, the score obtained by Rini in the project is 60

QNo:- 31 ,Correct Answer:- B

Explanation:-
It is given that there are only three female students - Amala, Koli, and Rini - and only three male students - Biman, Mathew, and Shyamal - in a course.
It is also known that the aggregate score in the course is a weighted average of the two components, with the weights being positive and adding to 1.
Let the project score component be x, which implies the test score component will be (1-x). The projects are done in groups of two, with each group consisting of a female and a male student, which implies there are three groups for the project. It is also known that both the group members obtain the same score in the project. The score obtained in the project is 40, 60, and 80, respectively.
Therefore, we can say that each female student will consist of a different group, and no two male students or female students will be in the same group.
For the test scores, there are six scores given for six students among which four are distinct and the remaining two are average scores, which is 60. It is also known that the maximum score possible is 80, and the minimum score is 40.
Hence, the distinct scores are 80, 70, 50, and 40 (since all the test scores are multiple of 10), and the remaining two scores are 60, and 60, respectively.
From point 3, we know that Amala's score in the project was double that of Koli in the same, but Koli scored 20 more than Amala in the test. Hence, we can say the score obtained by Amala in the project is 80, and the score obtained by Koli is 40, which implies the score obtained by Rini in the project is 60. Now, Koli scored 20 more than Amala in the test, which implies the score obtained by Koli can be either 80, 70, or 60.
The score obtained by them is given below:

Students	Test Scores	Project Scores
Amala	40/50/60	80
Koli	60/70/80	40
Rini		60
Biman		
Mathew		

Shyamal		

It is known that Amala had the highest aggregate score, and Shyamal scored the second highest on the test. He scored two more than Koli, but two less than Amala in the aggregate.
Hence, the score obtained by Shyamal in the test is 70, which implies Koli can't score 70 in the test ⟹ Amala can't score 50 in the test.

Students	Test Scores	Project Scores
Amala	40/60	80
Koli	60/80	40
Rini		60
Biman		
Mathew		
Shyamal	70	

It is given that Shyamal scored two more than Koli, but two less than Amala in the aggregate. Hence, the aggregate score of Amala is 4 more than Koli. It is also known that Amala had the highest aggregate score.

Case 1: The test score of Amala is 40

Students	Test Scores	Project Scores	Aggregate Score
Amala	40	80	40 (1 – x) + 80x
Koli	60	40	60 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, 40(1 - x) + 80x = 60(1 - x) + 40x + 4
⟹ 60x = 24
⟹ x = 0.4
Hence, the aggregate score obtained by Amala is 40(1 – 0.4) + 80 * 4 = 56
The minimum aggregate score of Shyamal is 70(1 – 0.4) + 40 * 0.4 = 58, which is greater than Amala.
Hence, Case 1 is not possible.
Hence, the table is given below:

Students	Test Scores	Project Scores	Aggregate Score
Amala	60	80	60 (1 – x) + 80x
Koli	80	40	80 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, 60(1 - x) + 80x = 80(1 - x) + 40x + 4
⟹ 60 + 20x = 84 – 40x
⟹ 60x = 24 ⟹ x = 0.4
Hence, the aggregate score of Amala is 60 (1 – 0.4) + 80 * 0.4 = 68, which implies the aggregate score of Shyamal is (68 – 2) = 66
Hence, the score obtained by Shyamal in Project is {66 – 70*(0.6)}/0.4 = 60.
It is also known that Biman scored second lowest in the test, which implies the score of Biman in the test is 50, and he scored the lowest in the aggregate. It is also known that Mathew scored more than Rini in the project, but less than her in the test. Hence, Mathew scored 80 in the project (since Rini scored 60 in the project), and Biman scored 40 in the project.
Similarly, Rini Scored more than Mathew on the test, which implies the score obtained by Rini is 60, and the score obtained by Mathew is 40 in the test.

Hence, the final table will look like this:

Students	Test Scores (T)	Project Scores (P)	Aggregate Score (T * 0.6 + P* 0.4)	Project Pair
Amala	60	80	68	Amala, Mathew
Koli	80	40	64	Koli, Biman
Rini	60	60	60	Rini, Shyamal
Biman	50	40	46	Biman, Koli
Mathew	40	80	56	Mathew, Amala
Shyamal	70	60	66	Shyamal, Rini

Hence, the weight of the test component is 0.60
The correct option is B

QNo:- 32 ,Correct Answer:- A

Explanation:-
It is given that there are only three female students - Amala, Koli, and Rini - and only three male students - Biman, Mathew, and Shyamal - in a course.
It is also known that the aggregate score in the course is a weighted average of the two components, with the weights being positive and adding to 1.
Let the project score component be x, which implies the test score component will be (1-x). The projects are done in groups of two, with each group consisting of a female and a male student, which implies there are three groups for the project. It is also known that both the group members obtain the same score in the project. The score obtained in the project is 40, 60, and 80, respectively.
Therefore, we can say that each female student will consist of a different group, and no two male students or female students will be in the same group.
For the test scores, there are six scores given for six students among which four are distinct and the remaining two are average scores, which is 60. It is also known that the maximum score possible is 80, and the minimum score is 40.
Hence, the distinct scores are 80, 70, 50, and 40 (since all the test scores are multiple of 10), and the remaining two scores are 60, and 60, respectively.
From point 3, we know that Amala's score in the project was double that of Koli in the same, but Koli scored 20 more than Amala in the test. Hence, we can say the score obtained by Amala in the project is 80, and the score obtained by Koli is 40, which implies the score obtained by Rini in the project is 60. Now, Koli scored 20 more than Amala in the test, which implies the score obtained by Koli can be either 80, 70, or 60.
The score obtained by them is given below:

Students	Test Scores	Project Scores
Amala	40/50/60	80
Koli	60/70/80	40
Rini		60
Biman		
Mathew		
Shyamal		

It is known that Amala had the highest aggregate score, and Shyamal scored the second highest on the test. He scored two more than Koli, but two less than Amala in the aggregate.
Hence, the score obtained by Shyamal in the test is 70, which implies Koli can't score 70 in the test $\Rightarrow$ Amala can't score 50 in the test.

Students	Test Scores	Project Scores
Amala	40/60	80
Koli	60/80	40
Rini		60
Biman		
Mathew		
Shyamal	70	

It is given that Shyamal scored two more than Koli, but two less than Amala in the aggregate. Hence, the aggregate score of Amala is 4 more than Koli. It is also known that Amala had the highest aggregate score.

Case 1: The test score of Amala is 40

Students	Test Scores	Project Scores	Aggregate Score
Amala	40	80	40 (1 – x) + 80x
Koli	60	40	60 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, 40(1 - x) + 80x = 60(1 - x) + 40x + 4
$\Longrightarrow$ 60x = 24
$\Longrightarrow$ x = 0.4
Hence, the aggregate score obtained by Amala is 40(1 – 0.4) + 80 * 4 = 56
The minimum aggregate score of Shyamal is 70(1 – 0.4) + 40 * 0.4 = 58, which is greater than Amala.
Hence, Case 1 is not possible.
Hence, the table is given below:

Students	Test Scores	Project Scores	Aggregate Score
Amala	60	80	60 (1 – x) + 80x
Koli	80	40	80 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, 60(1 – x) + 80x = 80(1 – x) + 40x + 4
$\Longrightarrow$ 60 + 20x = 84 – 40x
$\Longrightarrow$ 60x = 24 $\Longrightarrow$ x = 0.4
Hence, the aggregate score of Amala is 60 (1 – 0.4) + 80 * 0.4 = 68, which implies the aggregate score of Shyamal is (68 – 2) = 66
Hence, the score obtained by Shyamal in Project is {66 – 70*(0.6)}/0.4 = 60.
It is also known that Biman scored second lowest in the test, which implies the score of Biman in the test is 50, and he scored the lowest in the aggregate. It is also known that Mathew scored more than Rini in the project, but less than her in the test. Hence, Mathew scored 80 in the project (since Rini scored 60 in the project), and Biman scored 40 in the project.

Similarly, Rini Scored more than Mathew on the test, which implies the score obtained by Rini is 60, and the score obtained by Mathew is 40 in the test.
Hence, the final table will look like this:

Students	Test Scores (T)	Project Scores (P)	Aggregate Score (T * 0.6 + P* 0.4)	Project Pair
Amala	60	80	68	Amala, Mathew
Koli	80	40	64	Koli, Biman
Rini	60	60	60	Rini, Shyamal
Biman	50	40	46	Biman, Koli
Mathew	40	80	56	Mathew, Amala
Shyamal	70	60	66	Shyamal, Rini

Hence, the maximum aggregate score obtained is 68. The correct option is A

QNo:- 33 ,Correct Answer:- 40

Explanation:-
It is given that there are only three female students - Amala, Koli, and Rini - and only three male students - Biman, Mathew, and Shyamal - in a course.
It is also known that the aggregate score in the course is a weighted average of the two components, with the weights being positive and adding to 1.
Let the project score component be x, which implies the test score component will be (1-x). The projects are done in groups of two, with each group consisting of a female and a male student, which implies there are three groups for the project. It is also known that both the group members obtain the same score in the project. The score obtained in the project is 40, 60, and 80, respectively.
Therefore, we can say that each female student will consist of a different group, and no two male students or female students will be in the same group.
For the test scores, there are six scores given for six students among which four are distinct and the remaining two are average scores, which is 60. It is also known that the maximum score possible is 80, and the minimum score is 40.
Hence, the distinct scores are 80, 70, 50, and 40 (since all the test scores are multiple of 10), and the remaining two scores are 60, and 60, respectively.
From point 3, we know that Amala's score in the project was double that of Koli in the same, but Koli scored 20 more than Amala in the test. Hence, we can say the score obtained by Amala in the project is 80, and the score obtained by Koli is 40, which implies the score obtained by Rini in the project is 60. Now, Koli scored 20 more than Amala in the test, which implies the score obtained by Koli can be either 80, 70, or 60.
The score obtained by them is given below:

Students	Test Scores	Project Scores
Amala	40/50/60	80
Koli	60/70/80	40
Rini		60
Biman		
Mathew		
Shyamal		

It is known that Amala had the highest aggregate score, and Shyamal scored the second highest on the test. He scored two more than Koli, but two less than Amala in the aggregate.
Hence, the score obtained by Shyamal in the test is 70, which implies Koli can't score 70 in the test $\Rightarrow$ Amala can't score 50 in the test.

Students	Test Scores	Project Scores
Amala	40/60	80
Koli	60/80	40
Rini		60
Biman		
Mathew		
Shyamal	70	

It is given that Shyamal scored two more than Koli, but two less than Amala in the aggregate. Hence, the aggregate score of Amala is 4 more than Koli. It is also known that Amala had the highest aggregate score.

Case 1: The test score of Amala is 40

Students	Test Scores	Project Scores	Aggregate Score
Amala	40	80	40 (1 – x) + 80x
Koli	60	40	60 (1 – x) + 40x
Rini		60	
Biman			
Mathew			

Shyamal	70		

Therefore, 40(1 - x) + 80x = 60(1 - x) + 40x + 4
$\Rightarrow$ 60x = 24
$\Rightarrow$ x = 0.4
Hence, the aggregate score obtained by Amala is 40(1 – 0.4) + 80 * 4 = 56
The minimum aggregate score of Shyamal is 70(1 – 0.4) + 40 * 0.4 = 58, which is greater than Amala.
Hence, Case 1 is not possible.
Hence, the table is given below:

Students	Test Scores	Project Scores	Aggregate Score
Amala	60	80	60 (1 – x) + 80x
Koli	80	40	80 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, 60(1 – x) + 80x = 80(1 – x) + 40x + 4
$\Rightarrow$ 60 + 20x = 84 – 40x
$\Rightarrow$ 60x = 24 $\Rightarrow$ x = 0.4
Hence, the aggregate score of Amala is 60 (1 – 0.4) + 80 * 0.4 = 68, which implies the aggregate score of Shyamal is (68 – 2) = 66
Hence, the score obtained by Shyamal in Project is {66 – 70*(0.6)}/0.4 = 60.
It is also known that Biman scored second lowest in the test, which implies the score of Biman in the test is 50, and he scored the lowest in the aggregate. It is also known that Mathew scored more than Rini in the project, but less than her in the test. Hence, Mathew scored 80 in the project (since Rini scored 60 in the project), and Biman scored 40 in the project.

Similarly, Rini Scored more than Mathew on the test, which implies the score obtained by Rini is 60, and the score obtained by Mathew is 40 in the test.
Hence, the final table will look like this:

Students	Test Scores (T)	Project Scores (P)	Aggregate Score (T * 0.6 + P* 0.4)	Project Pair
Amala	60	80	68	Amala, Mathew
Koli	80	40	64	Koli, Biman
Rini	60	60	60	Rini, Shyamal
Biman	50	40	46	Biman, Koli
Mathew	40	80	56	Mathew, Amala
Shyamal	70	60	66	Shyamal, Rini

Hence, the score obtained by Mathew in the test is 40

QNo:- 34 ,Correct Answer:- C

Explanation:-
It is given that there are only three female students - Amala, Koli, and Rini - and only three male students - Biman, Mathew, and Shyamal - in a course.
It is also known that the aggregate score in the course is a weighted average of the two components, with the weights being positive and adding to 1.
Let the project score component be x, which implies the test score component will be (1-x). The projects are done in groups of two, with each group consisting of a female and a male student, which implies there are three groups for the project. It is also known that both the group members obtain the same score in the project. The score obtained in the project is 40, 60, and 80, respectively.
Therefore, we can say that each female student will consist of a different group, and no two male students or female students will be in the same group.

For the test scores, there are six scores given for six students among which four are distinct and the remaining two are average scores, which is 60. It is also known that the maximum score possible is 80, and the minimum score is 40.
Hence, the distinct scores are 80, 70, 50, and 40 (since all the test scores are multiple of 10), and the remaining two scores are 60, and 60, respectively.
From point 3, we know that Amala's score in the project was double that of Koli in the same, but Koli scored 20 more than Amala in the test. Hence, we can say the score obtained by Amala in the project is 80, and the score obtained by Koli is 40, which implies the score obtained by Rini in the project is 60. Now, Koli scored 20 more than Amala in the test, which implies the score obtained by Koli can be either 80, 70, or 60.
The score obtained by them is given below:

Students	Test Scores	Project Scores
Amala	40/50/60	80
Koli	60/70/80	40
Rini		60
Biman		
Mathew		
Shyamal		

It is known that Amala had the highest aggregate score, and Shyamal scored the second highest on the test. He scored two more than Koli, but two less than Amala in the aggregate.
Hence, the score obtained by Shyamal in the test is 70, which implies Koli can't score 70 in the test $\Longrightarrow$ Amala can't score 50 in the test.

Students	Test Scores	Project Scores
Amala	40/60	80
Koli	60/80	40
Rini		60
Biman		
Mathew		
Shyamal	70	

It is given that Shyamal scored two more than Koli, but two less than Amala in the aggregate. Hence, the aggregate score of Amala is 4 more than Koli. It is also known that Amala had the highest aggregate score.

Case 1: The test score of Amala is 40

Students	Test Scores	Project Scores	Aggregate Score
Amala	40	80	40 (1 – x) + 80x
Koli	60	40	60 (1 – x) + 40x
Rini		60	
Biman			
Mathew			
Shyamal	70		

Therefore, $40(1 - x) + 80x = 60(1 - x) + 40x + 4$
$\Longrightarrow 60x = 24$
$\Longrightarrow x = 0.4$
Hence, the aggregate score obtained by Amala is $40(1 – 0.4) + 80 * 4 = 56$
The minimum aggregate score of Shyamal is $70(1 – 0.4) + 40 * 0.4 = 58$, which is greater than Amala.
Hence, Case 1 is not possible.
Hence, the table is given below:

Students	Test Scores	Project Scores	Aggregate Score
Amala	60	80	60 (1 – x) + 80x
Koli	80	40	80 (1 – x) + 40x
Rini		60	

Biman			
Mathew			
Shyamal	70		

Therefore, 60(1 – x) + 80x = 80(1 – x) + 40x + 4
$\Longrightarrow$ 60 + 20x = 84 – 40x
$\Longrightarrow$ 60x = 24 $\Longrightarrow$ x = 0.4
Hence, the aggregate score of Amala is 60 (1 – 0.4) + 80 * 0.4 = 68, which implies the aggregate score of Shyamal is (68 – 2) = 66
Hence, the score obtained by Shyamal in Project is {66 – 70*(0.6)}/0.4 = 60.
It is also known that Biman scored second lowest in the test, which implies the score of Biman in the test is 50, and he scored the lowest in the aggregate. It is also known that Mathew scored more than Rini in the project, but less than her in the test. Hence, Mathew scored 80 in the project (since Rini scored 60 in the project), and Biman scored 40 in the project.

Similarly, Rini Scored more than Mathew on the test, which implies the score obtained by Rini is 60, and the score obtained by Mathew is 40 in the test.
Hence, the final table will look like this:

Students	Test Scores (T)	Project Scores (P)	Aggregate Score (T * 0.6 + P* 0.4)	Project Pair
Amala	60	80	68	Amala, Mathew
Koli	80	40	64	Koli, Biman
Rini	60	60	60	Rini, Shyamal
Biman	50	40	46	Biman, Koli
Mathew	40	80	56	Mathew, Amala
Shyamal	70	60	66	Shyamal, Rini

From the table, we can see that (Amala, Mathew), (Koli, Biman), and (Shyama, Rini) are the three groups for the project.
Hence, the correct option is C

QNo:- 35 ,Correct Answer:- D

Explanation:-
It is given that none of the streets has more than one team traveling along it in any direction at any point in time (point 1), which implies at 9.00 hrs, all 4 teams have chosen different roots from the starting point.

It is also known that Teams 2 and 3 are the only ones in stations E and D respectively at 10:00 hrs, and Team 1 and Team 4 are the only teams that patrol the street connecting stations A and E.

It is only possible when Team 2 traveled (A – E) via F, and Team 3 reached station D via station C.

It is also known that Teams 1 and 3 are the only ones in Station E at 10:30 hrs, and Team 4 never passes through Stations B, D, or F. Hence, Team 1 must have chosen the (A – B) root at the starting point, and Team 4 has chosen the (A – E) root at 9.00 hrs.

Hence, Team 1 will reach B at 9.30, and come to A at 10.00 hrs. After that, they will go to E at 10.30 hrs.

Since Team 4 never passes through stations B, D, or F. Team 4 only can pass through stations A, E, and C. Hence, the roots of team 4 to reach station E at 11.30 will be (A – E – A – C – A – E) or (A – E – A – E – A– E).

Since team 1 is already traveling to E from A at 10.00 hrs, at that time team 4 can't choose the same route. Hence, the final route for team 4 to reach E at 11.30 is (A – E – A – C – A – E), and at 12.00 hrs, team 4 will come back to station A.

Hence, the complete route diagram for team 4 is (A – E – A – C – A – E – A)

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00

1	A	B	A	E			
2	A	F	E				
3	A	C	D				
4	A	E	A	C	A	E	A

We can see that team 1 is at station E at 10.30 hrs, and they will reach station B at 11.30 hrs, which is only possible when they travel to B via A.

Hence, the complete route diagram for team 1 is (A – B – A – E – A – B – A). It is also known that Teams 1 and 3 are the only ones in station E at 10:30 hrs.

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E				
3	A	C	D	E			
4	A	E	A	C	A	E	A

The only possible root for Team 2 at 10.00 hrs is from E to F since they can't choose E to D because Team 3 is already on this route. Since team 3 has to reach A at 12.00. The only possible combination for team 3 is E – D – C – A

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F			
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

Now the roots for team 2 going back to A is from F at 10.30 hrs (F – A – F – A) or (F – E – F – A).
Hence, the final table is given below:

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F	A/E	F	A
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

From the table, we can see that among the options station E is visited the largest number of times.

QNo:- 36 ,Correct Answer:- 2

Explanation:-
It is given that none of the streets has more than one team traveling along it in any direction at any point in time (point 1), which implies at 9.00 hrs, all 4 teams have chosen different roots from the starting point.

It is also known that Teams 2 and 3 are the only ones in stations E and D respectively at 10:00 hrs, and Team 1 and Team 4 are the only teams that patrol the street connecting stations A and E.

It is only possible when Team 2 traveled (A – E) via F, and Team 3 reached station D via station C.

It is also known that Teams 1 and 3 are the only ones in Station E at 10:30 hrs, and Team 4 never passes through Stations B, D, or F. Hence, Team 1 must have chosen the (A – B) root at the starting point, and Team 4 has chosen the (A – E) root at 9.00 hrs.

Hence, Team 1 will reach B at 9.30, and come to A at 10.00 hrs. After that, they will go to E at 10.30 hrs.

Since Team 4 never passes through stations B, D, or F. Team 4 only can pass through stations A, E, and C. Hence, the roots of team 4 to reach station E at 11.30 will be (A – E – A – C – A – E) or (A – E – A – E – A– E).

Since team 1 is already traveling to E from A at 10.00 hrs, at that time team 4 can't choose the same route. Hence, the final route for team 4 to reach E at 11.30 is (A – E – A – C – A – E), and at 12.00 hrs, team 4 will come back to station A.

Hence, the complete route diagram for team 4 is (A – E – A – C – A – E – A)

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E			
2	A	F	E				
3	A	C	D				
4	A	E	A	C	A	E	A

We can see that team 1 is at station E at 10.30 hrs, and they will reach station B at 11.30 hrs, which is only possible when they travel to B via A.

Hence, the complete route diagram for team 1 is (A – B – A – E – A – B – A). It is also known that Teams 1 and 3 are the only ones in station E at 10:30 hrs.

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E				
3	A	C	D	E			
4	A	E	A	C	A	E	A

The only possible root for Team 2 at 10.00 hrs is from E to F since they can't choose E to D because Team 3 is already on this route. Since team 3 has to reach A at 12.00. The only possible combination for team 3 is E – D – C – A

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F			
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

Now the roots for team 2 going back to A is from F at 10.30 hrs (F – A – F – A) or (F – E – F – A).
Hence, the final table is given below:

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F	A/E	F	A
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

From the table, we can see that the teams have passed through B 2 times in this given period.

QNo:- 37 ,Correct Answer:- A

Explanation:-
It is given that none of the streets has more than one team traveling along it in any direction at any point in time (point 1), which implies at 9.00 hrs, all 4 teams have chosen different roots from the starting point.

It is also known that Teams 2 and 3 are the only ones in stations E and D respectively at 10:00 hrs, and Team 1 and Team 4 are the only teams that patrol the street connecting stations A and E.

It is only possible when Team 2 traveled (A – E) via F, and Team 3 reached station D via station C.

It is also known that Teams 1 and 3 are the only ones in Station E at 10:30 hrs, and Team 4 never passes through

Stations B, D, or F. Hence, Team 1 must have chosen the (A – B) root at the starting point, and Team 4 has chosen the (A – E) root at 9.00 hrs.

Hence, Team 1 will reach B at 9.30, and come to A at 10.00 hrs. After that, they will go to E at 10.30 hrs.

Since Team 4 never passes through stations B, D, or F. Team 4 only can pass through stations A, E, and C. Hence, the roots of team 4 to reach station E at 11.30 will be (A – E – A – C – A – E) or (A – E – A – E – A– E).

Since team 1 is already traveling to E from A at 10.00 hrs, at that time team 4 can't choose the same route. Hence, the final route for team 4 to reach E at 11.30 is (A – E – A – C – A – E), and at 12.00 hrs, team 4 will come back to station A.

Hence, the complete route diagram for team 4 is (A – E – A – C – A – E – A)

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E			
2	A	F	E				
3	A	C	D				
4	A	E	A	C	A	E	A

We can see that team 1 is at station E at 10.30 hrs, and they will reach station B at 11.30 hrs, which is only possible when they travel to B via A.

Hence, the complete route diagram for team 1 is (A – B – A – E – A – B – A). It is also known that Teams 1 and 3 are the only ones in station E at 10:30 hrs.

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E				
3	A	C	D	E			
4	A	E	A	C	A	E	A

The only possible root for Team 2 at 10.00 hrs is from E to F since they can't choose E to D because Team 3 is already on this route. Since team 3 has to reach A at 12.00. The only possible combination for team 3 is E – D – C – A

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F			
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

Now the roots for team 2 going back to A is from F at 10.30 hrs (F – A – F – A) or (F – E – F – A).
Hence, the final table is given below:

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F	A/E	F	A
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

From the table, we can see that at 10.15 hrs, team 3 is travelling from station D to station E.
The correct option is A.

QNo:- 38 ,Correct Answer:- 2

Explanation:-

It is given that none of the streets has more than one team traveling along it in any direction at any point in time (point 1), which implies at 9.00 hrs, all 4 teams have chosen different roots from the starting point.

It is also known that Teams 2 and 3 are the only ones in stations E and D respectively at 10:00 hrs, and Team 1 and Team 4 are the only teams that patrol the street connecting stations A and E.

It is only possible when Team 2 traveled (A – E) via F, and Team 3 reached station D via station C.

It is also known that Teams 1 and 3 are the only ones in Station E at 10:30 hrs, and Team 4 never passes through Stations B, D, or F. Hence, Team 1 must have chosen the (A – B) root at the starting point, and Team 4 has chosen the (A – E) root at 9.00 hrs.

Hence, Team 1 will reach B at 9.30, and come to A at 10.00 hrs. After that, they will go to E at 10.30 hrs.

Since Team 4 never passes through stations B, D, or F. Team 4 only can pass through stations A, E, and C. Hence, the roots of team 4 to reach station E at 11.30 will be (A – E – A – C – A – E) or (A – E – A – E – A– E).

Since team 1 is already traveling to E from A at 10.00 hrs, at that time team 4 can't choose the same route. Hence, the final route for team 4 to reach E at 11.30 is (A – E – A – C – A – E), and at 12.00 hrs, team 4 will come back to station A.

Hence, the complete route diagram for team 4 is (A – E – A – C – A – E – A)

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E			
2	A	F	E				
3	A	C	D				
4	A	E	A	C	A	E	A

We can see that team 1 is at station E at 10.30 hrs, and they will reach station B at 11.30 hrs, which is only possible when they travel to B via A.

Hence, the complete route diagram for team 1 is (A – B – A – E – A – B – A). It is also known that Teams 1 and 3 are the only ones in station E at 10:30 hrs.

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E				
3	A	C	D	E			
4	A	E	A	C	A	E	A

The only possible root for Team 2 at 10.00 hrs is from E to F since they can't choose E to D because Team 3 is already on this route. Since team 3 has to reach A at 12.00. The only possible combination for team 3 is E – D – C – A

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F			
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

Now the roots for team 2 going back to A is from F at 10.30 hrs (F – A – F – A) or (F – E – F – A).
Hence, the final table is given below:

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F	A/E	F	A
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

From the table, we can see that team 4 passed station E 2 times in a day

QNo:- 39 ,Correct Answer:- C

Explanation:-
It is given that none of the streets has more than one team traveling along it in any direction at any point in time (point 1), which implies at 9.00 hrs, all 4 teams have chosen different roots from the starting point.

It is also known that Teams 2 and 3 are the only ones in stations E and D respectively at 10:00 hrs, and Team 1 and Team 4 are the only teams that patrol the street connecting stations A and E.

It is only possible when Team 2 traveled (A – E) via F, and Team 3 reached station D via station C.

It is also known that Teams 1 and 3 are the only ones in Station E at 10:30 hrs, and Team 4 never passes through Stations B, D, or F. Hence, Team 1 must have chosen the (A – B) root at the starting point, and Team 4 has chosen the (A – E) root at 9.00 hrs.

Hence, Team 1 will reach B at 9.30, and come to A at 10.00 hrs. After that, they will go to E at 10.30 hrs.

Since Team 4 never passes through stations B, D, or F. Team 4 only can pass through stations A, E, and C. Hence, the roots of team 4 to reach station E at 11.30 will be (A – E – A – C – A – E) or (A – E – A – E – A– E).

Since team 1 is already traveling to E from A at 10.00 hrs, at that time team 4 can't choose the same route. Hence, the final route for team 4 to reach E at 11.30 is (A – E – A – C – A – E), and at 12.00 hrs, team 4 will come back to station A.

Hence, the complete route diagram for team 4 is (A – E – A – C – A – E – A)

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E			
2	A	F	E				
3	A	C	D				
4	A	E	A	C	A	E	A

We can see that team 1 is at station E at 10.30 hrs, and they will reach station B at 11.30 hrs, which is only possible when they travel to B via A.

Hence, the complete route diagram for team 1 is (A – B – A – E – A – B – A). It is also known that Teams 1 and 3 are the only ones in station E at 10:30 hrs.

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E				
3	A	C	D	E			
4	A	E	A	C	A	E	A

The only possible root for Team 2 at 10.00 hrs is from E to F since they can't choose E to D because Team 3 is already on this route. Since team 3 has to reach A at 12.00. The only possible combination for team 3 is E – D – C – A

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F			
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

Now the roots for team 2 going back to A is from F at 10.30 hrs (F – A – F – A) or (F – E – F – A).

Hence, the final table is given below:

Team	9.00	9.30	10.00	10.30	11.00	11.30	12.00
1	A	B	A	E	A	B	A
2	A	F	E	F	A/E	F	A
3	A	C	D	E	D	C	A
4	A	E	A	C	A	E	A

From the table, we can see that 2 teams (teams 3 and 4) have passed through station C on the given day.
The correct option is C

QNo:- 40 ,Correct Answer:- 120

Explanation:-
Given that in every month, both online and offline registration numbers were multiples of 10. From (2), in Jan, the number of offline registrations was twice that of online registrations.
$\Rightarrow$ If x is number of online registrations $\Rightarrow$ 2x is the number of offline registrations $\Rightarrow$ 3x is the total number of registrations.
According to the data given in the table $\Rightarrow$ 3x should lie between the minimum and maximum total number of registrations. $\Rightarrow$ x = 40 (as x should also be a multiple of 10)
$\Rightarrow$ In Jan $\Rightarrow$ (40, 80) are the online and offline registrations respectively.
Similarly from (3) $\Rightarrow$ In Apr (80, 40) are the online and offline registrations respectively.

From – 5, the number of online registrations is highest in May $\Rightarrow$ In may there are 100 online registrations. The lowest possible number of offline registrations is 30 and maximum possible total registrations is 130 $\Rightarrow$ In May (100, 30) are the online and offline registrations respectively.

Let us assume, 'x' to be the number of offline registrations in May = number of online registrations in March.

Let us capture all this data in a table:

Month	Online	Offline	Total
Jan	40	80	120
Feb	y	x	
Mar	x	z	
Apr	80	40	120
May	100	30	130

From the table given in the question, 50 is the median for Offline data
$\Rightarrow$ x should lie between 50 and 80 (included)
For 80 to be the median for the online data $\Rightarrow$ y lie between 80 and 100 (included).
Now, consider Feb $\Rightarrow$ Minimum value of y + x = 80 + 50 = 130 (which is the maximum value possible of the total possible registrations)
$\Rightarrow$ x = 50 and y = 80
Since, 110 is the minimum number of total registrations, the only possibility is in March $\Rightarrow$ 50 + z = 110 $\Rightarrow$ z = 60.
Now, filling the complete table we get,

Month	Online	Offline	Total
Jan	40	80	120
Feb	80	50	130
Mar	50	60	110
Apr	80	40	120
May	100	30	130

The total number of registrations in April is 120.

QNo:- 41 ,Correct Answer:- 40

Explanation:-
Given that in every month, both online and offline registration numbers were multiples of 10. From (2), in Jan, the number of offline registrations was twice that of online registrations.
$\Rightarrow$ If x is number of online registrations $\Rightarrow$ 2x is the number of offline registrations $\Rightarrow$ 3x is the total number of registrations.
According to the data given in the table $\Rightarrow$ 3x should lie between the minimum and maximum total number of registrations. $\Rightarrow$ x = 40 (as x should also be a multiple of 10)

⟹ In Jan ⟹ (40, 80) are the online and offline registrations respectively.
Similarly from (3) ⟹ In Apr (80, 40) are the online and offline registrations respectively.

From – 5, the number of online registrations is highest in May ⟹ In may there are 100 online registrations. The lowest possible number of offline registrations is 30 and maximum possible total registrations is 130 ⟹ In May (100, 30) are the online and offline registrations respectively.

Let us assume, 'x' to be the number of offline registrations in May = number of online registrations in March.

Let us capture all this data in a table:

Month	Online	Offline	Total
Jan	40	80	120
Feb	y	x	
Mar	x	z	
Apr	80	40	120
May	100	30	130

From the table given in the question, 50 is the median for Offline data
⟹ x should lie between 50 and 80 (included)
For 80 to be the median for the online data ⟹ y lie between 80 and 100 (included).
Now, consider Feb ⟹ Minimum value of y + x = 80 + 50 = 130 (which is the maximum value possible of the total possible registrations)
⟹ x = 50 and y = 80
Since, 110 is the minimum number of total registrations, the only possibility is in March ⟹ 50 + z = 110 ⟹ z = 60.
Now, filling the complete table we get,

Month	Online	Offline	Total
Jan	40	80	120
Feb	80	50	130
Mar	50	60	110
Apr	80	40	120
May	100	30	130

The number of online registrations in Jan is 40.

QNo:- 42 ,Correct Answer:- A

Explanation:-
Given that in every month, both online and offline registration numbers were multiples of 10. From (2), in Jan, the number of offline registrations was twice that of online registrations.
⟹ If x is number of online registrations ⟹ 2x is the number of offline registrations ⟹ 3x is the total number of registrations.
According to the data given in the table ⟹ 3x should lie between the minimum and maximum total number of registrations. ⟹ x = 40 (as x should also be a multiple of 10)
⟹ In Jan ⟹ (40, 80) are the online and offline registrations respectively.
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From – 5, the number of online registrations is highest in May ⟹ In may there are 100 online registrations. The lowest possible number of offline registrations is 30 and maximum possible total registrations is 130 ⟹ In May (100, 30) are the online and offline registrations respectively.

Let us assume, 'x' to be the number of offline registrations in May = number of online registrations in March.

Let us capture all this data in a table:

Month	Online	Offline	Total
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From the table given in the question, 50 is the median for Offline data
$\Rightarrow$ x should lie between 50 and 80 (included)
For 80 to be the median for the online data $\Rightarrow$ y lie between 80 and 100 (included).
Now, consider Feb $\Rightarrow$ Minimum value of y + x = 80 + 50 = 130 (which is the maximum value possible of the total possible registrations)
$\Rightarrow$ x = 50 and y = 80
Since, 110 is the minimum number of total registrations, the only possibility is in March $\Rightarrow$ 50 + z = 110 $\Rightarrow$ z = 60.
Now, filling the complete table we get,

Month	Online	Offline	Total
Jan	40	80	120
Feb	80	50	130
Mar	50	60	110
Apr	80	40	120
May	100	30	130

1) In May, there are 30 offline registrations (smallest) $\Rightarrow$ True
2) In Mar, we have smallest number of total registrations $\Rightarrow$ False.

QNo:- 43 ,Correct Answer:- C

Explanation:-
Given that in every month, both online and offline registration numbers were multiples of 10. From (2), in Jan, the number of offline registrations was twice that of online registrations.
$\Rightarrow$ If x is number of online registrations $\Rightarrow$ 2x is the number of offline registrations $\Rightarrow$ 3x is the total number of registrations.
According to the data given in the table $\Rightarrow$ 3x should lie between the minimum and maximum total number of registrations. $\Rightarrow$ x = 40 (as x should also be a multiple of 10)
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Let us assume, 'x' to be the number of offline registrations in May = number of online registrations in March.

Let us capture all this data in a table:

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From the table given in the question, 50 is the median for Offline data
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Now, consider Feb ⟹ Minimum value of y + x = 80 + 50 = 130 (which is the maximum value possible of the total possible registrations)
⟹ x = 50 and y = 80
Since, 110 is the minimum number of total registrations, the only possibility is in March ⟹ 50 + z = 110 ⟹ z = 60.
Now, filling the complete table we get,

Month	Online	Offline	Total
Jan	40	80	120
Feb	80	50	130
Mar	50	60	110
Apr	80	40	120
May	100	30	130

The number of offline registrations in Feb is 50.

QNo:- 44 ,Correct Answer:- C

Explanation:-
Given that in every month, both online and offline registration numbers were multiples of 10. From (2), in Jan, the number of offline registrations was twice that of online registrations.
⟹ If x is number of online registrations ⟹ 2x is the number of offline registrations ⟹ 3x is the total number of registrations.
According to the data given in the table ⟹ 3x should lie between the minimum and maximum total number of registrations. ⟹ x = 40 (as x should also be a multiple of 10)
⟹ In Jan ⟹ (40, 80) are the online and offline registrations respectively.
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From – 5, the number of online registrations is highest in May ⟹ In may there are 100 online registrations. The lowest possible number of offline registrations is 30 and maximum possible total registrations is 130 ⟹ In May (100, 30) are the online and offline registrations respectively.

Let us assume, 'x' to be the number of offline registrations in May = number of online registrations in March.

Let us capture all this data in a table:

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From the table given in the question, 50 is the median for Offline data
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Now, consider Feb ⟹ Minimum value of y + x = 80 + 50 = 130 (which is the maximum value possible of the total possible registrations)
⟹ x = 50 and y = 80
Since, 110 is the minimum number of total registrations, the only possibility is in March ⟹ 50 + z = 110 ⟹ z = 60.
Now, filling the complete table we get,

Month	Online	Offline	Total

Jan	40	80	120
Feb	80	50	130
Mar	50	60	110
Apr	80	40	120
May	100	30	130

Total registrations in Jan = Apr = 120 and Feb = May = 130.

Section : Quantitative Ability

QNo:- 45 ,Correct Answer:- A

Explanation:- If 3 terms a, b and c are in AP, then we know that 2b = a + c.

Using Base Change rule in this question, we can say that $\frac{\log_3(2^x-9)}{\log_3 4}$ can be written as $\log_4(2^x-9)$ and $\frac{\log_5(2^x+\frac{17}{2})}{\log_5 4}$ can be written as $\log_4(2^x+\frac{17}{2})$.

Also $\frac{1}{2}$ can be written as $\log_4 2$. So we get the new terms as $\log_4 2$, $\log_4(2^x-9)$ and $\log_4(2^x+\frac{17}{2})$.

Using the concept of AP, we get $2\times\log_4(2^x-9)=\log_4 2+\log_4(2^x+\frac{17}{2})$.

$\Rightarrow \log_4(2^x-9)^2=\log_4[2(2^x+\frac{17}{2})] \Rightarrow (2^x-9)^2=2.2^x+17.$

If we put 2^x = y, we get y^2 – 18y +81 = 2y +17 ⇒ y^2 – 20y + 64 = 0 ⇒ (y – 4)(y – 16) = 0
⇒ y = 4 or 16 ⇒ x = 2 or 4.
But x = 2 is not valid because then (2^x – 9) will become negative. Hence x = 4 is the right solution.
So terms will be $\log_4 2$, $\log_4 7$. $\log_4(\frac{49}{2})$.

⇒ common difference = $\log_4 7 - \log_4 2 = \log_4(\frac{7}{2})$.

QNo:- 46 ,Correct Answer:- B

Explanation:-

$x^8+\frac{1}{x^8}=47$. Let us put $x^4=a \Rightarrow a^2+\frac{1}{a^2}=47$

Now $(a+\frac{1}{a})^2=a^2+\frac{1}{a^2}+2 \Rightarrow (a+\frac{1}{a})^2=49 \Rightarrow a+\frac{1}{a}=7 \Rightarrow x^4+\frac{1}{x^4}=7$

Put $x^2=b \Rightarrow b^2+\frac{1}{b^2}=47$. Now $(b+\frac{1}{b})^2=b^2+\frac{1}{b^2}+2 \Rightarrow (b+\frac{1}{b})^2=9$

$\Rightarrow b+\frac{1}{b}=3 \Rightarrow x^2+\frac{1}{x^2}=3$.

Also $(x+\frac{1}{x})^2=x^2+\frac{1}{x^2}+2 \Rightarrow (x+\frac{1}{x})^2=5 \Rightarrow x+\frac{1}{x}=\sqrt{5}$

Now $(x+\frac{1}{x})^3=x^3+\frac{1}{x^3}+3(x+\frac{1}{x}) \Rightarrow 5\sqrt{5}=x^3+\frac{1}{x^3}+3\sqrt{5} \Rightarrow x^3+\frac{1}{x^3}=2\sqrt{5}$

Lets put $x^3=d \Rightarrow d+\frac{1}{d}=2\sqrt{5}$.

Now $x^9+\frac{1}{x^9}=d^3+\frac{1}{d^3}$ is to be calculated.

$(d+\frac{1}{d})^3=d^3+\frac{1}{d^3}+3(d+\frac{1}{d}) \Rightarrow 40\sqrt{5}=d^3+\frac{1}{d^3}+6\sqrt{5} \Rightarrow d^3+\frac{1}{d^3}=34\sqrt{5}$

$\Rightarrow x^9+\frac{1}{x^9}=34\sqrt{5}$

QNo:- 47 ,Correct Answer:- B

Explanation:- x + y = 4 and (a +5)x + (b^2 – 15)y = 8b have infinitely many solutions for x and y.

Hence $\frac{a+5}{1}=\frac{b^2-15}{1}=\frac{8b}{4}$.

So $b^2 – 15 = 2b \Rightarrow b^2 – 2b – 15 = 0$

$\Rightarrow (b – 5)(b+3) = 0 \Rightarrow b = 5$ or -3.

Also a + 5 = 2b ⇒ a + 5 = 10 or a + 5 = -6 ⇒ a = -11 or 5.

Maximum value of ab will be when we take a = -11 and b = -3.

So maximum product = 33.

QNo:- 48 ,Correct Answer:- A

Explanation:- $8^m = 2^{3m}$ and $8^n = 2^{3n}$. Smallest value of n + m is asked. So we will take m as 1⇒ $2^{3m} = 2^3$.

Since there are 41 integers between 8^m and 8^n, so they would be 2^4,2^5,....till 2^{44}.

So 2^{3n} should be 2^{45} ⇒ n = 15. Hence minimum value of n + m is 1 + 15 = 16.

QNo:- 49 ,Correct Answer:- 5

Explanation:- $5^{n-1} < 3^{n+1}$. n can take values from 1 to 5 because if n = 6, then we get $5^5 < 3^7$ which is wrong as 3125 is greater than 2187. Hence maximum value of n is 5. If we take n = 5, we get $3^{5+1} < 2^{5+m} \Rightarrow 729 < 2^{5+m} \Rightarrow$ m has to minimum 5 so that we get $729 < 2^{10}$ or 729 < 1024.

Hence answer is 5.

QNo:- 50 ,Correct Answer:- 9

Explanation:- x^2 + bx + c = 0. Let its roots be m and n. Hence m + n = -b and mn = c.

Also $\frac{1}{n}-\frac{1}{m}=\frac{1}{3}$ and $\frac{1}{n^2}+\frac{1}{m^2}=\frac{5}{9}$.

Now $(\frac{1}{n}-\frac{1}{m})^2=\frac{1}{n^2}+\frac{1}{m^2}-\frac{2}{mn}\Rightarrow\frac{1}{9}=\frac{5}{9}-\frac{2}{mn}\Rightarrow mn=\frac{9}{2}$

$(\frac{1}{n}+\frac{1}{m})^2=\frac{1}{n^2}+\frac{1}{m^2}+\frac{2}{mn}\Rightarrow\frac{5}{9}+\frac{4}{9}=1$

$\Rightarrow\frac{1}{n}+\frac{1}{m}=1\Rightarrow\frac{m+n}{mn}=1\Rightarrow m+n=\frac{9}{2}\Rightarrow b=-\frac{9}{2}$

or $\frac{1}{n}+\frac{1}{m}=-1\Rightarrow\frac{m+n}{mn}=-1\Rightarrow m+n=-\frac{9}{2}\Rightarrow b=\frac{9}{2}\Rightarrow b+c=\frac{9}{2}+\frac{9}{2}=9$

QNo:- 51 ,Correct Answer:- 468

Explanation:- Number of factors in number N = $a^p \times b^q \times c^r$..... where a, b and c are prime numbers.
As numbers have 15 factors ⇒ $a^2 \times b^4$ form is possible only. ⇒ $3^2 \times 2^4$ = 144 and $2^2 \times 3^4$ = 324 are the two numbers.
Hence their sum = 144 + 324 = 468.

QNo:- 52 ,Correct Answer:- A

Explanation:- Ratio of cocoa : sugar is 3 : 2 and ratio of coffee : sugar is 7 : 3.
Total 5 litres of A has 3 litres of cocoa and 2 litres of sugar
Total 10 litres of B has 7 litres of coffee and 3 litres of sugar
Since A and B are mixed in the ratio 2 : 3, so total 15 litres will be divided in this ratio. Hence we take 6 litres of A and 9 litres of B.

Quantity of cocoa will be $\frac{3}{5}\times 6 = 3.6$ litres (From A)

Quantity of sugar will be $\frac{2}{5}\times 6 = 2.4$ litres (From A)

Quantity of coffee will be $\frac{7}{10}\times 9 = 6.3$ litres (From B)

Quantity of sugar will be $\frac{3}{10}\times 9 = 2.7$ litres (From B)

Total mixture = 15 + 15 = 30 litres. Mixture C will have 3.6 litres cocoa, 6.3 litres coffee and 2.4 + 2.7 = 5.1 litres of sugar.

Hence required percentage = $\frac{5.1}{30}\times 100 = 17\%$.

QNo:- 53 ,Correct Answer:- C

Explanation:- Suppose Rahul takes a days, Rakshita takes b days and Gurmeet takes c days.

As per the question, $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}<\frac{1}{7}$.....(1) and $\frac{1}{a}+\frac{1}{c}>\frac{1}{15}$.....(2).

Also it is given that $6(\frac{1}{a}+\frac{1}{b}+\frac{1}{c})+\frac{3}{b}=1$.....(3).

Putting the values from equation (1) and (2), we get $6(<\frac{1}{7})+\frac{3}{b}=1\Rightarrow\frac{3}{b}=1-(<\frac{1}{7})\Rightarrow$

$\frac{3}{b}>\frac{1}{7}\Rightarrow b<21$. Also $\frac{9}{b}+(>\frac{6}{15})=1\Rightarrow\frac{9}{b}=1-(>\frac{6}{15})\Rightarrow\frac{9}{b}<\frac{9}{15}\Rightarrow b>15$.

Hence b can be 16, 17 and 20. So 21 is not possible.

QNo:- 54 ,Correct Answer:- D

Explanation:- Population in 2020 = 100000
It is given that there is y% decrease in population from 2020 to 2021 and x% increase in population from 2021 to 2022. Also it is given that population of 2022 is greater than population of 2020.
This means x is greater than y because had it been x = y, even then population of 2022 would have been less the population of 2020.
Difference between x and y is 10. Minimum popuation in 2021 is to be calculated by options::
Option (1) which is 72000 ⇒ y = 28 and x = 38 ⇒ Population in 2022 = 72000 × 1.38 = 99360. Hence it is possible.
Option (2) which is 75000 ⇒ y = 25 and x = 35 ⇒ Population in 2022 = 75000 × 1.35 = 101250. Hence it is possible.
Option (3) which is 74000 ⇒ y = 26 and x = 36 ⇒ Population in 2022 = 74000 × 1.36 = 100640. Hence it is possible.
Option (4) which is 73000 ⇒ y = 27 and x = 37 ⇒ Population in 2022 = 73000 × 1.37 = 100010. Since 100010 is minimum of all ⇒ 73000 is the answer.

QNo:- 55 ,Correct Answer:- A

Explanation:- CP of cloth = 100 per metre. SP of cloth = 110 per metre. But he gets 5 cm free for 100 cm and also gives 95 cm instead of 100 cm.

So he gets $\frac{5}{100}$ and $\frac{5}{95}$ extra $\Rightarrow \frac{1}{20}$ and $\frac{1}{19}$. So SP $= 110 \times (1+\frac{1}{20})(1+\frac{1}{19})$

But he gives 5% discount $\Rightarrow$ Net SP $= 110 \times \frac{21}{20} \times \frac{20}{19} \times \frac{95}{100} = 115.5.$

So profit = 15.5%

QNo:- 56 ,Correct Answer:- B

Explanation:- Let the average of A, B and C = a ⇒ A + B + C = 3a.....(1)

Also $\frac{A+B+C+D}{4} = a - x$ .....(2) and $\frac{A+B+C+E}{4} = a + 2x$ .....(3)

It is given that E – D = 12 ⇒ 3a + D = 4a – 4x ⇒ D = a – 4x. Also 3a + E = 4a + 8x
⇒ E = a + 8x. As E – D = 12, so a + 8x – a + 4x = 12 ⇒ x = 1.

QNo:- 57 ,Correct Answer:- D

Explanation:- Let x be the speed of 1st boat in still water and y be the speed of river ⇒ speed of d/s = x + y and speed of u/s = x – y. As per the question, (x +y)2 = (x –y)3 ⇒ x +y : x – y = 3 : 2. Hence the ratio of speed of d/s : speed of u/s = 3 : 2 ⇒ x + y = 3 and x – y = 2 ⇒ x = 2.5 and y = 0.5 or x = 5 and y = 1⇒ Distance = (5 + 1)2 = 12 km

Let the speed of the other boat = a $\Rightarrow \frac{12}{a-1} + \frac{12}{a+1} = 6 \Rightarrow a^2 - 1 = 4a \Rightarrow a^2 - 4a - 1 = 0$

$\Rightarrow a = \frac{4 \pm 2\sqrt{5}}{2} = 2 + \sqrt{5}$.

Hence speed of slower boat = 2 + $\sqrt{5}$.
Time taken by slower boat to reach from A to B is

$$\frac{12}{2+\sqrt{5}+1} = \frac{12}{3+\sqrt{5}} \times \frac{3-\sqrt{5}}{3-\sqrt{5}} = \frac{36-12\sqrt{5}}{4} = 9 - 3\sqrt{5} = 3(3 - \sqrt{5})$$

QNo:- 58 ,Correct Answer:- 36

Explanation:- Let us assume the efficiency of Gautam as G and efficiency of Suhani as S.
Hence we get the equation as (G + S)20 = (0.6G + 1.5S)20 ⇒ 4G = 5S ⇒ G : S = 5 : 4.
So ratio of time taken by G and S will be in the ratio 4 : 5.

Lets assume Gautam takes 4x days and Suhani takes 5x days to complete the work

$\Rightarrow \frac{1}{4x}+\frac{1}{5x}=\frac{1}{20} \Rightarrow x = 9.$

Hence faster worker takes 36 days to complete the work.

QNo:- 59 ,Correct Answer:- 42

Explanation:- A : B = 3 : 4. Let us take collection/week of A as 3x and B as 4x

⇒ In 5 weeks, A collected 3x × 5 = 15x which is a multiple of 7.

In 3 weeks, B collected 4x × 3 = 12x which is a multiple of 24 ⇒ x is an even multiple of 7

⇒ Lowest possible value of x is 14.

So number of coins collections by A in one week is 3x = 3 × 14 = 42.

QNo:- 60 ,Correct Answer:- 340

Explanation:- Let M be the number of mangoes, B be the number of bananas and A be the number of apples. So as per the question, M = 0.4 (M + B + A) ⇒ 5M = 2M + 2B + 2A ⇒ 3M = 2B + 2A.....(1).

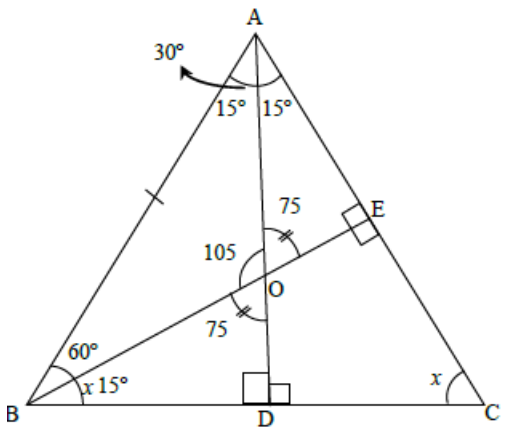
Also $\frac{M}{2}+B-96+\frac{3}{5}A=\frac{1}{2}(M+B+A)$

⇒ 5B + 10B – 960 + 6A = 5M + 5B + 5A

⇒ A +5B = 960.....(2). Now we need to minimise M + B + A, so we should maximise B which should be 189. Hence we get A = 15. Putting these values in equation (1), we get the value of M as 136. Hence min imum total of M, B and A is 136 + 189 + 15 = 340.

QNo:- 61 ,Correct Answer:- C

Explanation:-



As ∠AOB = 105°, so ∠EOD = 105° (Vertically opp. angles)

Also as triangle ABC is isoceles with AB = AC, so ∠ABC = ∠ACB = x (say)

Now in Quadrilateral OECD, 105° + 90° + x + 90° = 360° ⇒ x = 75°

Hence ∠BAC = 180° – (75 + 75)° = 30°. Also ∠AOE =

$\angle BOD = \frac{360-(105+105)}{2} = 75°$

Now in triangle OBD, 75° + 90° + ∠OBD = 180° ⇒ ∠OBD = 15°.

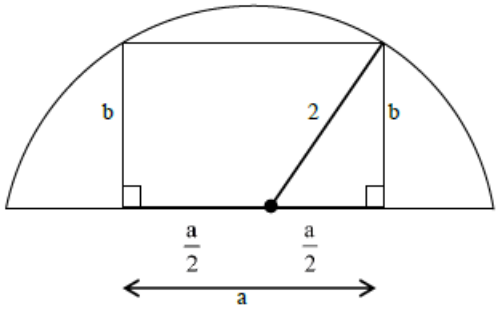
Hence ∠ABO = 75° - 15° = 60°. Also in triangle BAO, 60° + ∠BAO + 105° = 180° ⇒ ∠BAO = 15°. Now we can see that triangle BAE is a 30° – 60° – 90° triangle.

If we take AB = h (hypotenuse), then BE = $\frac{h}{2}$ (side opposite to 30°).

Now in triangle ABD, $\frac{AD}{AB} = \sin 75 \Rightarrow \frac{AD}{h} = \sin 75 \Rightarrow AD = h \sin 75 = h \cos 15$

Hence ratio of $\frac{AD}{BE} = \frac{h\cos 15}{h/2} = 2\cos 15$

QNo:- 62 ,Correct Answer:- B



Explanation:-

Let length of the rectangle be a and breadth be b.

So we get the equation as $2^2 = b^2 + \left(\frac{a}{2}\right)^2$

$\Rightarrow \frac{a^2}{4} + b^2 = 4$ .....(1).

Area of rectangle = ab which can be written as twice of

Geometric Mean of $\frac{a^2}{4}$ and b^2 which is equal to $2\sqrt{\frac{a^2}{4} \times b^2}$

For maximum area, equality condition of AM and GM should be satisfied

$\Rightarrow \frac{\frac{a^2}{4} + b^2}{2} = \sqrt{\frac{a^2}{4} \times b^2} \Rightarrow \frac{a^2}{4} + b^2 = 2\sqrt{\frac{a^2}{4} \times b^2}$

Squaring both sides,

$(\frac{a^2}{4} + b^2)^2 = 4(\frac{a^2 \times b^2}{4}) \Rightarrow \frac{a^2}{16} + b^4 + \frac{2a^2b^2}{4} = a^2b^2 \Rightarrow \frac{a^2}{16} + b^4 = \frac{a^2b^2}{2}$

$\Rightarrow a^4 + 16b^4 = 8a^2b^2 \Rightarrow a^4 - 8a^2b^2 + 16b^4 = 0 \Rightarrow (a^2 - 4b^2)^2 = 0 \Rightarrow a^2 = 4b^2$.

Hence $\frac{a^2}{b^2} = 4 \Rightarrow \frac{a}{b} = 2 \Rightarrow a : b = 2 : 1$

QNo:- 63 ,Correct Answer:- 54

Explanation:- Let number of sides be n.

Hence $180 - \frac{360}{n} - \frac{360}{n} = 120 \Rightarrow \frac{720}{n} = 60 \Rightarrow n = 12.$

Number of diagonals = ${}^nC_2 - n$. Putting n = 12, we get ${}^{12}C_2 - 12 = 66 - 12 = 54$

QNo:- 64 ,Correct Answer:- C

Explanation:-

Given sequence is $1 + (1 + \frac{1}{3})\frac{1}{4} + (1 + \frac{1}{3} + \frac{1}{9})\frac{1}{16} + (1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27})\frac{1}{64} + \ldots\ldots$

Which can be written as

$1(1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64} \ldots\ldots) + \frac{1}{3}(\frac{1}{4} + \frac{1}{16} + \frac{1}{64} \ldots\ldots) + \frac{1}{9}(\frac{1}{16} + \frac{1}{64} + \frac{1}{256} + \ldots\ldots$

These are 3 different infinite GPs whose sums will be the first 3 terms of the final GP whose sum is required.

Hence 1st three terms of the final GP are $S_1 = \frac{1}{1-\frac{1}{4}} = \frac{4}{3}$,

$S_2 = \frac{1}{3}(\frac{\frac{1}{4}}{1-\frac{1}{4}}) = \frac{1}{9}$ and $S_3 = \frac{1}{9}(\frac{\frac{1}{16}}{1-\frac{1}{4}}) = \frac{1}{108}$.

Hence final sequence becomes $\frac{4}{3} + \frac{1}{9} + \frac{1}{108} + \ldots\ldots$

It is an infinite GP with 1st term $\frac{4}{3}$ and $r = \frac{1}{12}$

$\Rightarrow$ Final answer $= \frac{\frac{4}{3}}{1-\frac{1}{12}} = \frac{4}{3} \times \frac{12}{11} = \frac{16}{11}$

QNo:- 65 ,Correct Answer:- B

Explanation:- $a_n = 46 + 8n$, $b_n = 98 + 4n$.

Putting the values of n as 1, 2, 3..... in the 1st sequence we get values as 54, 62, 70.....

Putting the values of n as 1, 2, 3..... in the 2nd sequence we get values as 102, 106, 110, 114.....

So the common terms to both the sequences is 102, 110, 118.....

But last term in the 1st sequence is 846 when we put n = 100 and last term in the 2nd sequence is 498 when we put n = 100.

Also the common sequence is 102, 110..... is of the form 8k + 6. Hence last number of this form in this sequence is 494.

So we get the final sequence as 102, 110, 118, ...494. Number of terms in this sequence: 102 + (n -1) 8 = 494 $\Rightarrow$ n = 50. Sum of these terms = 50/2 (102 + 494) = 14900.

QNo:- 66 ,Correct Answer:- 3

Explanation:- Given that f(3x+2y, 2x – 5y) = 19x.

Multiplying 1st function by 5 and 2nd function by 2, we get 15x + 10y and 4x – 10y.

Now on adding these 2 functions, we get 15x + 10y + 4x – 10y = 19x.

Using the same operation for f(x,2x), we get 5x + 2(2x) = 27 $\Rightarrow$ 9x = 27 $\Rightarrow$ x = 3