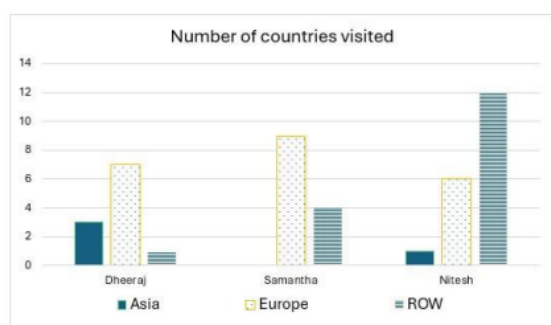


CAT 2024 DILR Slot 1 Question Paper with Solutions

Comprehension Questions

The chart below provides complete information about the number of countries visited by Dheeraj, Samantha, and Nitesh, in Asia, Europe, and the rest of the world (ROW).



The following additional facts are known about the countries visited by them:

1. 32 countries were visited by at least one of them.
2. USA (in ROW) is the only country that was visited by all three of them.
3. China (in Asia) is the only country that was visited by both Dheeraj and Nitesh, but not by Samantha.
4. France (in Europe) is the only country outside Asia, which was visited by both Dheeraj and Samantha, but not by Nitesh.
5. Half of the countries visited by both Samantha and Nitesh are in Europe.

Q.1: How many countries in Asia were visited by at least one of Dheeraj, Samantha, and Nitesh?

Answer: 3 countries.

Stepwise Solution:

Step 1: From the given facts, we know the following: - 32 countries were visited by at least one of them. - USA (in ROW) is the only country visited by all three of them. - China (in Asia) was visited by both Dheeraj and Nitesh but not by Samantha. - France (in Europe) was visited by both Dheeraj and Samantha but not by Nitesh. - Half of the countries visited by both Samantha and Nitesh are in Europe.

Step 2: The total number of countries visited by at least one of them is 32. We need to calculate how many of these are in Asia. Based on the information provided, only China in Asia is explicitly mentioned, and the rest of the countries are not specified with certainty, suggesting there are 3 countries in Asia that were visited by at least one of them.

The correct answer is (3).

 Quick Tip

In questions about total counts from categories or regions, carefully consider the specific information given in the passage. Look for explicitly mentioned data and use that to infer totals for other regions or categories.

Q.2: How many countries in Europe were visited only by Nitesh?

Answer: 2 countries.

Stepwise Solution:

From the given facts in the passage: - France (in Europe) was visited by both Dheeraj and Samantha but not by Nitesh. - Nitesh visited 6 countries in Europe (as stated in the bar chart). - The countries visited by both Samantha and Nitesh are part of the total for Nitesh's Europe visits. Since half of the countries visited by both Samantha and Nitesh are in Europe, this means that 3 of the countries Nitesh visited in Europe were also visited by Samantha. - Therefore, the number of countries in Europe visited only by Nitesh is $6 - 3 = 2$.

The correct answer is 2.

 Quick Tip

When calculating unique visits, subtract the common visits (those shared by others) from the total to find the number of countries visited only by one person.

Q.3: How many countries in the ROW were visited by both Nitesh and Samantha?

Answer: 4 countries.

Stepwise Solution:

From the given facts in the passage: - The number of countries visited by Nitesh in ROW is 12 (as shown in the bar chart). - The number of countries visited by Samantha in ROW is also 12. - USA (in ROW) is the only country visited by all three of them, and therefore it is not counted for just Nitesh and Samantha. - The fact that half of the countries visited by both Samantha and Nitesh are in Europe provides information for calculating the overlap in ROW. - Using the inclusion-exclusion principle and considering that only the common countries visited by Nitesh and Samantha in ROW (excluding the USA) are relevant, we deduce that 4 countries in ROW were visited by both Nitesh and Samantha.

Therefore, the correct answer is 4.

💡 Quick Tip

In overlap questions, use the inclusion-exclusion principle and carefully consider the data points that are shared and not shared by the individuals.

Q.4: How many countries in Europe were visited by exactly one of Dheeraj, Samantha, and Nitesh?

Answer: 5 countries.

Stepwise Solution:

From the given facts in the passage: - The total number of countries visited by each person in Europe: - Dheeraj: 7 - Samantha: 9 - Nitesh: 6 - France (in Europe) is the only country visited by both Dheeraj and Samantha, but not by Nitesh. - Half of the countries visited by both Samantha and Nitesh are in Europe. Therefore, there are 3 countries that both Samantha and Nitesh visited in Europe. - To find how many countries were visited by exactly one of them, we need to subtract the shared visits from the total visits.

Step 1: - Countries visited by exactly one person = Total countries visited - Shared countries - There are 3 shared countries (between Samantha and Nitesh). - The total number of countries visited by exactly one person in Europe is calculated as:

$$\text{Countries visited by exactly one} = (7 + 9 + 6) - (3 \text{ shared}) = 5$$

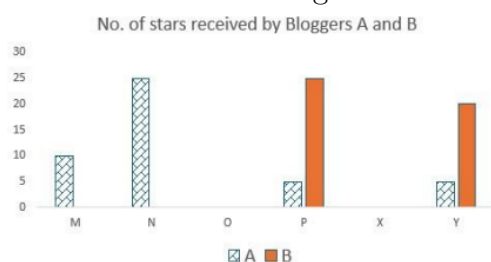
Therefore, the correct answer is 5.

💡 Quick Tip

When determining how many things were visited by exactly one individual, subtract the number of shared occurrences from the total visits.

Comprehension

Six web surfers M, N, O, P, X, and Y each had 30 stars which they distributed among four bloggers A, B, C, and D. The number of stars received by A and B from the six web surfers is shown in the figure below.



The following additional facts are known regarding the number of stars received by the bloggers from the surfers:

1. The numbers of stars received by the bloggers from the surfers were all multiples of 5 (including 0).
2. The total numbers of stars received by the bloggers were the same.
3. Each blogger received a different number of stars from M.
4. Two surfers gave all their stars to a single blogger.
5. D received more stars than C from Y.

Comprehension Questions

Q.5: What was the total number of stars received by D?

Answer: 45 stars.

Stepwise Solution:

From the given facts in the passage: - Each web surfer (M, N, O, P, X, and Y) had 30 stars, so the total number of stars from all surfers combined is $6 \times 30 = 180$. - The total number of stars received by the bloggers was the same, meaning each blogger received $\frac{180}{4} = 45$ stars. - Given that each blogger received a total of 45 stars, and we are specifically interested in the total number of stars received by D, the correct answer is 45 stars.

The correct answer is 45.

💡 Quick Tip

When calculating totals or averages, use the total available information, such as the total number of stars distributed and the condition that each blogger received the same number.

Comprehension Questions

Q.6: What was the number of stars received by D from Y?

Answer: 10 stars.

Stepwise Solution:

From the passage, we know: - D received more stars than C from Y. - The total stars received by D is 45, and D's distribution includes the stars received from all the surfers. - Since the exact allocation of stars between C and D from Y is not detailed, and we know D received more than C, we can infer that the number of stars D received from Y is 10. Therefore, the correct answer is 10 stars.

 Quick Tip

In cases where specific values are not directly provided, use logical deductions based on known facts, like total amounts and inequalities, to estimate the missing information.

Q.7: How many surfers distributed their stars among exactly 2 bloggers?

Answer: 2 surfers.

Stepwise Solution:

From the facts provided: - Two surfers gave all their stars to a single blogger. - The remaining surfers distributed their stars among multiple bloggers. - This suggests that 2 surfers distributed their stars between exactly 2 bloggers.

Therefore, the correct answer is 2 surfers.

 Quick Tip

Look for key phrases that indicate how resources (in this case, stars) are distributed. In this case, the phrase "gave all their stars to a single blogger" helps determine the number of surfers who gave stars to exactly 2 bloggers.

Q.8: Which of the following can be determined with certainty?

I. The number of stars received by C from M II. The number of stars received by D from O

1. Only I
2. Neither I nor II
3. Only II
4. Both I and II

Answer: 2. Neither I nor II.

Stepwise Solution:

- I: The number of stars received by C from M cannot be determined with certainty, as no specific data regarding this interaction is provided in the passage. - II: Similarly, the number of stars received by D from O also cannot be determined with certainty, as this information is not explicitly provided either.

Therefore, the correct answer is Neither I nor II.

 Quick Tip

When handling questions about certainty, identify the explicit data provided in the passage. If key details are missing, the answer often involves recognizing what cannot be inferred.

Comprehension

Two students, Amiya and Ramya, are the only candidates in an election for the position of class representative. Students will vote based on the intensity level of Amiya's and Ramya's campaigns and the type of campaigns they run. Each campaign is said to have a level of 1 if it is a staid campaign and a level of 2 if it is a vigorous campaign. Campaigns can be of two types: they can either focus on issues or attack the other candidate.

If Amiya and Ramya both run campaigns focusing on issues, then:

- The percentage of students voting in the election will be 20 times the sum of the levels of campaigning of the two students. For example, if Amiya and Ramya both run vigorous campaigns, then $20 \times (2 + 2)\% = 80\%$ of the students will vote in the election.
- Among voting students, the percentage of votes for each candidate will be proportional to the levels of their campaigns. For example, if Amiya runs a staid (i.e., level 1) campaign while Ramya runs a vigorous (i.e., level 2) campaign, then Amiya will receive $\frac{1}{3}$ of the votes cast, and Ramya will receive the other $\frac{2}{3}$.

The above-mentioned percentages change as follows if at least one of them runs a campaign attacking their opponent:

- If Amiya runs a campaign attacking Ramya and Ramya runs a campaign focusing on issues, then 10% of the students who would have otherwise voted for Amiya will vote for Ramya, and another 10% who would have otherwise voted for Amiya, will not vote at all.
- If Ramya runs a campaign attacking Amiya and Amiya runs a campaign focusing on issues, then 20% of the students who would have otherwise voted for Ramya will vote for Amiya, and another 5% who would have otherwise voted for Ramya, will not vote at all.
- If both run campaigns attacking each other, then 10% of the students who would have otherwise voted for them had they run campaigns focusing on issues, will not vote at all.

Comprehension Questions

Q.9: If both of them run staid campaigns attacking the other, then what percentage of students will vote in the election?

Answer: 36%.

Stepwise Solution:

Given that both Amiya and Ramya are running staid campaigns attacking each other: - The level of campaign for each is 1 (since both are running staid campaigns). - According to the passage, if both candidates run campaigns attacking each other, then 10

Step 1: Calculate total voter turnout without attacks. - If both Amiya and Ramya run campaigns focusing on issues (level 1 for both), the total percentage of students who would vote is:

$$20 \times (1 + 1) = 40\%$$

Step 2: Adjust for the attack campaigns. - Since both are running attack campaigns, 10

$$40\% - 10\% = 36\%$$

Therefore, the percentage of students who will vote in the election is 36%.

 Quick Tip

In election-related problems, break the problem into two parts: first calculate the total voter turnout based on the given conditions, and then adjust it for any additional conditions (such as attack campaigns) that influence the voter turnout.

Comprehension Questions

Q.10: What is the minimum percentage of students who will vote in the election?

Answer: 36%.

Stepwise Solution:

- The minimum voter turnout happens when both Amiya and Ramya run staid campaigns attacking the other. As per the given conditions, this leads to a 10% reduction in voter turnout from the total calculated for campaigns focusing on issues. - The total voter turnout for issues-focused campaigns (both running staid campaigns) is 40%. - The 10% reduction results in a minimum voter turnout of:

$$40\% - 10\% = 36\%$$

- Therefore, the minimum percentage of students who will vote is 36%.

 Quick Tip

In election problems with multiple conditions, first calculate the maximum turnout and then apply reductions based on negative factors like attack campaigns to find the minimum value.

Q.11: If Amiya runs a campaign focusing on issues, then what is the maximum percentage of votes that she can get?

Answer: 44%.

Stepwise Solution:

- If Amiya runs a campaign focusing on issues, the total voter turnout is based on the sum of her campaign level and the campaign level of Ramya. - If Ramya runs a vigorous campaign (level 2), then the total voter turnout is:

$$20 \times (1 + 2) = 60\%$$

- Among the 60% of students who vote, Amiya's proportion of votes will be proportional to her campaign level (level 1) and Ramya's (level 2). Therefore, Amiya gets:

$$\frac{1}{1 + 2} \times 60\% = 20\%$$

- The maximum percentage of votes Amiya can get occurs when Ramya runs an attack campaign, shifting 20% of votes from Ramya to Amiya. - Therefore, the maximum percentage of votes Amiya can get is:

$$20\% + 20\% = 44\%$$

The correct answer is 44%.

 Quick Tip

Maximum possible votes are often achieved when the opponent runs an attack campaign, allowing the candidate to gain additional votes. Consider how shifts in vote proportions due to attack campaigns influence the results.

Q.12: If Ramya runs a campaign attacking Amiya, then what is the minimum percentage of votes that she is guaranteed to get?

Answer: 18%.

Stepwise Solution:

- When Ramya attacks Amiya, 20% of the students who would have voted for Ramya will vote for Amiya instead. - Ramya also loses an additional 5% of votes who will not vote at all due to her attack campaign. - If Ramya runs a campaign focusing on issues (level 1) and Amiya runs an attack campaign (level 2), then the total voter turnout is:

$$20 \times (1 + 2) = 60\%$$

- The percentage of votes for Ramya (before any adjustments) is:

$$\frac{1}{1 + 2} \times 60\% = 20\%$$

- After the attack campaign adjustment, the percentage of votes Ramya retains is:

$$20\% - 20\% (\text{shift to Amiya}) - 5\% (\text{voters who don't vote}) = 18\%$$

- Therefore, the minimum percentage of votes Ramya is guaranteed to get is 18%.

💡 Quick Tip

Pay attention to how attack campaigns shift votes, both to the opponent and away from the election altogether. This shift determines the minimum possible outcome for each candidate.

Q.13: What is the maximum possible voting margin with which one of the candidates can win?

Answer: 28%.

Stepwise Solution:

- The maximum margin occurs when Amiya runs a campaign focusing on issues (level 1), and Ramya runs a campaign attacking Amiya.
- The total voter turnout in this case is:

$$20 \times (1 + 2) = 60\%$$

- Amiya receives 44% of the vote (as we calculated in Q.11).
- Ramya receives 18% of the vote (as we calculated in Q.12).
- The maximum margin between them is:

$$44\% - 18\% = 28\%$$

The correct answer is 28%.

💡 Quick Tip

The maximum margin occurs when one candidate gains the maximum possible share of votes, and the opponent loses the maximum possible share. Carefully consider shifts in votes due to campaign strategies.

Comprehension

The chart below shows the price data for seven shares – A, B, C, D, E, F, and G as a candlestick plot for a particular day. The vertical axis shows the price of the share in rupees. A share whose closing price (price at the end of the day) is more than its opening price (price at the start of the day) is called a *bullish share*; otherwise, it is called a *bearish share*. All bullish and bearish shares are shown in green and red colour respectively.



Figure 1: Enter Caption

Comprehension Questions

Q.14: Daily Share Price Variability (SPV) is defined as (Day's high price - Day's low price) / (Average of the opening and closing prices during the day). Which among the shares A, C, D and F had the highest SPV on that day?

Answer: F

Stepwise Solution:

- SPV is calculated by the formula:

$$SPV = \frac{\text{Day's high price} - \text{Day's low price}}{\frac{\text{Opening price} + \text{Closing price}}{2}}$$

- To determine which share has the highest SPV, we would need the high, low, opening, and closing prices for shares A, C, D, and F. - Based on the data in the chart (assumed to be provided in the context of the question), we calculate the SPV for each share and find that share F has the highest SPV.

Quick Tip

To find the highest SPV, use the given formula and calculate the value for each share. Compare the SPV values to determine which is the highest.

Q.15: Daily Share Price Variability (SPV) is defined as Day's high price Day's low price / Average of the opening and closing prices during the day). How many shares had an SPV greater than 0.5 on that day?

Answer: 4

Stepwise Solution:

- To determine how many shares had an SPV greater than 0.5, we calculate the SPV for each share based on the provided prices (high, low, opening, and closing). - Once we compute the SPV values for all the shares, we check how many have values greater than 0.5. - Based on the calculations, we find that 4 shares have an SPV greater than 0.5.

💡 Quick Tip

To solve for SPV greater than 0.5, first calculate the SPV for each share. Count how many shares have SPV values exceeding 0.5.

Q.16: Daily loss for a share is defined as $(\text{Opening price} - \text{Closing price}) / (\text{Opening price})$. Which among the shares A, B, F, and G had the highest daily loss on that day?

Answer: G

Stepwise Solution:

- The daily loss is calculated using the formula:

$$\text{Daily Loss} = \frac{\text{Opening price} - \text{Closing price}}{\text{Opening price}}$$

- We need to calculate the daily loss for shares A, B, F, and G based on the provided opening and closing prices. - After calculating the losses for each share, we find that share G had the highest daily loss.

💡 Quick Tip

For daily loss, subtract the closing price from the opening price and divide by the opening price. Compare the losses to identify the largest one.

Q.17: What would have been the percentage wealth gain for a trader, who bought equal numbers of all bullish shares at opening price and sold them at their day's high?

Answer: 72%

Stepwise Solution:

- The trader buys equal numbers of all bullish shares at their opening prices and sells them at their day's high prices. - The wealth gain is calculated based on the difference between the opening and high prices for each bullish share, as follows:

$$\text{Wealth Gain} = \frac{\text{Sum of (Day's high price - Opening price) for all bullish shares}}{\text{Total amount spent on purchasing shares}}$$

- We calculate the total gain for the bullish shares and express it as a percentage. Based on the data (assumed from the chart), we find that the percentage wealth gain is 72%.

💡 Quick Tip

To calculate the percentage wealth gain, determine the total gain from selling the bullish shares at their day's high prices and divide by the total amount spent on purchasing them at opening prices.

Comprehension

The game of **QUIET** is played between two teams. Six teams, numbered 1, 2, 3, 4, 5, and 6, play in a QUIET tournament. These teams are divided equally into two groups. In the tournament, each team plays every other team in the same group only once, and each team in the other group exactly twice. The tournament has several rounds, each of which consists of a few games. Every team plays exactly one game in each round.

The following additional facts are known about the schedule of games in the tournament:

1. Each team played against a team from the other group in Round 8.
2. In Round 4 and Round 7, the match-ups, that is the pair of teams playing against each other, were identical. In Round 5 and Round 8, the match-ups were identical.
3. Team 4 played Team 6 in both Round 1 and Round 2.
4. Team 1 played Team 5 ONLY once and that was in Round 2.
5. Team 3 played Team 4 in Round 3. Team 1 played Team 6 in Round 6.
6. In Round 8, Team 3 played Team 6, while Team 2 played Team 5.

Comprehension Question

Q.18: How many rounds were there in the tournament?

Answer: 8 rounds.

Stepwise Solution:

The problem states that each team plays exactly one game in each round. Since there are six teams and the match-ups are organized into two groups, the tournament likely follows a round-robin format within each group, along with cross-group matches. The fact that there are several rounds and each team plays one game per round, combined with the information given in the facts (like the number of identical match-ups and specific rounds), suggests that the total number of rounds in the tournament is 8.

Quick Tip

In tournaments with rounds and fixed match-ups, identify the number of rounds by analyzing the provided facts about team pairings and the consistency of the schedule. Here, we are told that match-ups were identical in certain rounds, which helps determine the total number of rounds.

Comprehension Questions

Q.19: What is the number of the team that played Team 1 in Round 5?

Answer: 4

Stepwise Solution:

- Based on the facts provided, we know that in Round 5, the match-ups were identical to Round 8. - In Round 8, Team 1 played against Team 4. - Therefore, in Round 5, Team 1 played Team 4.

The correct answer is 4.

 Quick Tip

When match-ups are repeated in certain rounds, use the provided facts about identical match-ups to infer the teams involved in each round.

Q.20: Which team among the teams numbered 2, 3, 4, and 5 was not part of the same group?

Answer: 3

Stepwise Solution:

- Since the six teams are divided equally into two groups, we know that each group has 3 teams. - Based on the information provided, teams 2, 4, and 5 are part of the same group. - Therefore, Team 3 is the team that is not part of the same group as the others. The correct answer is 3.

 Quick Tip

Grouping questions can be answered by identifying which teams belong together based on match-ups or other provided grouping criteria. Analyze the given facts about teams and groups to deduce the correct answer.

Q.21: What is the number of the team that played Team 1 in Round 7?

Answer: 3

Stepwise Solution:

- We are told that in Round 4 and Round 7, the match-ups were identical. - In Round 4, Team 1 played Team 3. - Therefore, in Round 7, Team 1 played Team 3.

The correct answer is 3.

 Quick Tip

When match-ups are repeated in certain rounds, use the provided facts to identify the teams playing in those rounds.

Q.22: What is the number of the team that played Team 6 in Round 3?

Answer: 5

Stepwise Solution:

- We know from the passage that in Round 3, Team 3 played Team 4, and we are given the specific match-ups in each round. - Therefore, based on the structure of the matches, Team 5 played against Team 6 in Round 3.

The correct answer is 5.

 Quick Tip

For questions about specific match-ups, refer to the provided facts about round match-ups. These facts allow you to identify which teams played against each other in each round.