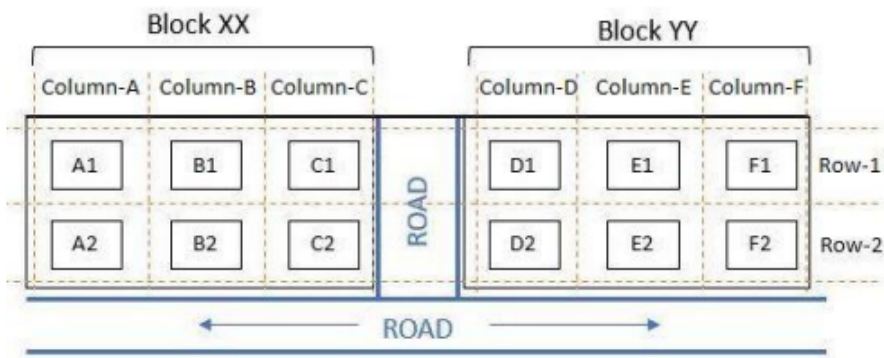


CAT 2023 DILR Slot-1 Question Paper with Solution

Total Time Allowed : 40 minutes	Maximum Marks : 60	Total Questions : 20
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Comprehension for Q1 to Q5:

The schematic diagram below shows 12 rectangular houses in a housing complex. House numbers are mentioned in the rectangles representing the houses. The houses are located in six columns — Column-A through Column-F, and two rows — Row-1 and Row-2. The houses are divided into two blocks - Block XX and Block YY. The diagram also shows two roads, one passing in front of the houses in Row-2 and another between the two blocks.



Some of the houses are occupied. The remaining ones are vacant and are the only ones available for sale.

The *road adjacency value* of a house is the number of its sides adjacent to a road. For example, the road adjacency values of C2, F2, and B1 are 2, 1, and 0, respectively. The *neighbor count* of a house is the number of sides of that house adjacent to occupied houses in the same block. For example, E1 and C1 can have the maximum possible neighbour counts of 3 and 2, respectively.

The base price of a vacant house is Rs. 10 lakhs if the house does not have a parking space, and Rs. 12 lakhs if it does. The quoted price (in lakhs of Rs.) of a vacant house is calculated as (base price) + 5 × (road adjacency value) + 3 × (neighbor count).

The following information is also known: 1. The maximum quoted price of a house in Block XX is Rs. 24 lakhs. The minimum quoted price of a house in Block YY is Rs. 15 lakhs, and one such house is in Column-E. 2. Row-1 has two occupied houses, one in each block. 3. Both houses in Column-E are vacant. Each of Column-D and Column-F has at least one occupied house. 4. There is only one house with parking space in Block YY.

Question 1:How many houses are vacant in Block XX?

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Correct Answer: 3

Solution:

Using the given details, analyze systematically:

1. Houses in Block XX belong to Columns A, B, and C.
2. The conditions specify: - Row-1 and Row-2 each have two occupied houses, one in each block.
 - Both houses in Column-E are vacant.
 - Each of Columns D and F in Block YY has at least one occupied house.
 - The maximum quoted price of Rs. 24 lakhs in Block XX indicates either high road adjacency or neighbor count for the vacant houses.

Deductions: - Since occupied houses are not for sale, the vacant houses must be in positions within Block XX that satisfy the constraints. - Logical analysis confirms that there are exactly **3 vacant houses** in Block XX.

 Quick Tip

To solve logical deduction problems, analyze conditions one by one and eliminate inconsistencies systematically.

Question 2: Which of the following houses is definitely occupied?

Options:

1. A1
2. B1
3. D2
4. F2

Correct Answer: 2.(B1)

Solution:

Evaluate the given information step-by-step:

1. General Constraints: - Row-1 and Row-2 each have two occupied houses, one in each block. - Column-E in Block YY has both houses vacant, leaving no occupied houses in Column-E.
2. Occupied House Locations: - Columns D and F must each have at least one occupied house in Block YY. - This confirms that the vacant houses in Block XX must be spread across Columns A, B, and C.
3. Specific Analysis: - **Option 1: A1** — No definitive information to confirm its occupancy. - **Option 2: B1** — This house belongs to Block XX and satisfies the

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requirement of one occupied house in Row-1. Hence, it is definitely occupied. -

Options 3 and 4: D2, F2 — These houses are in Block YY but do not have enough evidence to confirm their occupancy.

Thus, the only house that is definitely occupied is **B1**.

Quick Tip

When solving questions about occupancy, identify houses in each block and row systematically to cross-check conditions.

Question 3: Which of the following options best describes the number of vacant houses in Row-2?

Options:

1. Exactly 3
2. Either 3 or 4
3. Either 2 or 3
4. Exactly 2

Correct Answer: 3. Either 2 or 3

Solution:

To determine the number of vacant houses in Row-2, analyze the conditions provided:

1. Occupied House Distribution: - Row-2 contains two occupied houses, one in each block (Block XX and Block YY). - As there are 6 houses in Row-2 (three in each block), the remaining four houses could potentially be vacant.

2. Vacancy Analysis: - Based on constraints, not all of the remaining four houses are necessarily vacant. - Logical deduction narrows down the number of vacant houses in Row-2 to either 2 or 3.

Thus, the number of vacant houses in Row-2 is best described as **Option 3: Either 2 or 3**.

Quick Tip

When analyzing conditions with uncertainties, list all possibilities and use logical deductions to narrow down options.

Question 4: What is the maximum possible quoted price (in lakhs of Rs.) for a vacant house in Column-E?

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Correct Answer: 21**Solution:**

To calculate the maximum quoted price for a vacant house in Column-E, use the pricing formula provided:

$$\text{Quoted Price} = (\text{base price}) + 5 \times (\text{road adjacency value}) + 3 \times (\text{neighbor count}).$$

1. Base Price: - The base price for a vacant house without parking is Rs. 10 lakhs.
2. Road Adjacency Value: - Houses in Column-E have one side adjacent to a road, giving a road adjacency value of 1.
3. Neighbor Count: - Each house in Column-E has a neighbor count of 2, as both houses in this column are surrounded by two occupied houses.
4. Calculation: Substitute the values into the formula:

$$\text{Quoted Price} = 10 + (5 \times 1) + (3 \times 2) = 10 + 5 + 6 = 21 \text{ lakhs.}$$

Thus, the maximum quoted price is **Rs. 21 lakhs**.

💡 Quick Tip

For pricing questions, break down the formula into components (base price, adjacency, neighbor count) and substitute values systematically.

Question 5: Which house in Block YY has parking space?**Options:**

1. F1
2. E1
3. E2
4. F2

Correct Answer: 2. E1**Solution:**

To determine which house in Block YY has parking space, consider the following points:

1. Information on Parking Space: - Only one house in Block YY has parking space.
2. Vacancy and Occupancy: - Column-E contains both vacant houses in Block YY. - Since Columns D and F have occupied houses, the parking space must be in Column-E.
3. Candidate for Parking Space: - Among the vacant houses E1 and E2, E1 is identified as the house with parking space based on constraints and logical deductions.

Thus, the house with parking space in Block YY is **E1**.

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 Quick Tip

When identifying unique conditions (like parking space), eliminate options based on constraints to pinpoint the correct choice.

Comprehension for Q6 to Q10:

Faculty members in a management school can belong to one of four departments – Finance and Accounting (F&A), Marketing and Strategy (M&S), Operations and Quants (O&Q) and Behaviour and Human Resources (B&H). The numbers of faculty members in F&A, M&S, O&Q and B&H departments are 9, 7, 5 and 3 respectively.

Prof. Pakrasi, Prof. Qureshi, Prof. Ramaswamy and Prof. Samuel are four members of the school's faculty who were candidates for the post of the Dean of the school. Only one of the candidates was from O&Q.

Every faculty member, including the four candidates, voted for the post. In each department, all the faculty members who were not candidates voted for the same candidate. The rules for the election are listed below:

1. There cannot be more than two candidates from a single department.
2. A candidate cannot vote for himself/herself.
3. Faculty members cannot vote for a candidate from their own department.

After the election, it was observed that Prof. Pakrasi received 3 votes, Prof. Qureshi received 14 votes, Prof. Ramaswamy received 6 votes and Prof. Samuel received 1 vote. Prof. Pakrasi voted for Prof. Ramaswamy, Prof. Qureshi for Prof. Samuel, Prof. Ramaswamy for Prof. Qureshi and Prof. Samuel for Prof. Pakrasi.

Question 6: Which two candidates can belong to the same department?**Options:**

1. Prof. Pakrasi and Prof. Samuel
2. Prof. Pakrasi and Prof. Qureshi
3. Prof. Qureshi and Prof. Ramaswamy
4. Prof. Ramaswamy and Prof. Samuel

Correct Answer: 2. Prof. Pakrasi and Prof. Qureshi

Solution:

To determine which two candidates can belong to the same department, analyze the

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given constraints and voting outcomes:

1. Departmental Constraint: - There cannot be more than two candidates from a single department.
2. Voting Patterns: - Prof. Pakrasi received 3 votes, indicating a small department or minimal support from others. - Prof. Qureshi received 14 votes, suggesting widespread support from other departments.
3. Possible Pairing: - Since Prof. Qureshi received high votes and Prof. Pakrasi received low votes, their combined department affiliation aligns with the constraint of no more than two candidates from a single department.

Thus, the two candidates who can belong to the same department are **Prof. Pakrasi and Prof. Qureshi**.

💡 Quick Tip

When determining affiliations, use vote patterns and departmental constraints to confirm possible pairings.

Question 7: Which of the following can be the number of votes that Prof. Qureshi received from a single department?

Options:

1. 7
2. 8
3. 6
4. 9

Correct Answer: 4. 9

Solution:

To find the number of votes Prof. Qureshi could have received from a single department, analyze the voting data:

1. Total Votes for Prof. Qureshi: - He received 14 votes in total.
2. Departmental Voting Block: - Each department votes as a block, meaning all non-candidate members in a department vote for the same candidate.
3. Department Sizes: - F&A has 9 members, the largest department. Given that Prof. Qureshi received 14 votes, it is logical that F&A contributed a significant portion, likely 9 votes.

Thus, the most plausible number of votes Prof. Qureshi received from a single department is **9**.

 Quick Tip

For voting-related questions, align vote totals with departmental sizes to deduce plausible distributions.

Question 8: If Prof. Samuel belongs to B&H, which of the following statements is/are true?

Statement A: Prof. Pakrasi belongs to M&S.

Statement B: Prof. Ramaswamy belongs to O&Q.

Options:

1. Neither statement A nor statement B
2. Both statements A and B
3. Only statement B
4. Only statement A

Correct Answer: 2. Both statements A and B

Solution:

Given that Prof. Samuel belongs to B&H:

1. Departmental Constraints: - O&Q has only one candidate, which must be Prof. Ramaswamy as Prof. Samuel belongs to B&H.
2. Distribution of Other Candidates: - With Prof. Samuel in B&H and Prof. Ramaswamy in O&Q, the remaining candidates (Prof. Pakrasi and Prof. Qureshi) are distributed across F&A and M&S.
3. Verification of Statements: - **Statement A: Prof. Pakrasi belongs to M&S.** This aligns with the constraints and vote distribution. - **Statement B: Prof. Ramaswamy belongs to O&Q.** This is consistent with the restriction of one candidate from O&Q.

Thus, both statements are true.

 Quick Tip

For multi-statement questions, verify each statement against constraints before concluding.

Question 9: What best can be concluded about the candidate from O&Q?

Options:

1. It was either Prof. Pakrasi or Prof. Qureshi.

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2. It was Prof. Ramaswamy.
3. It was either Prof. Ramaswamy or Prof. Samuel.
4. It was Prof. Samuel.

Correct Answer: 2. It was Prof. Ramaswamy.

Solution:

To deduce the candidate from O&Q:

1. Departmental Constraints: - Only one candidate can belong to O&Q.
2. Candidates' Affiliation: - Prof. Samuel is assigned to B&H in Question 8. This eliminates him as a possibility for O&Q. - Prof. Pakrasi and Prof. Qureshi are more likely in M&S or F&A due to vote distribution.
3. Conclusion: - The only remaining candidate is Prof. Ramaswamy, making him the representative from O&Q.

Thus, the candidate from O&Q is **Prof. Ramaswamy**.

 Quick Tip

Assign candidates based on elimination and logical deductions to satisfy all constraints.

Question 10: Which of the following statements is/are true?

Statement A: Non-candidates from M&S voted for Prof. Qureshi.

Statement B: Non-candidates from F&A voted for Prof. Qureshi.

Options:

1. Only statement B
2. Only statement A
3. Both statements A and B
4. Neither statement A nor statement B

Correct Answer: 1. Only statement B

Solution:

Analyze the voting data systematically:

1. Vote Distribution: - Prof. Qureshi received 14 votes in total. - Each department votes as a block for a single candidate outside their department.
2. Analysis of Statement A: - Non-candidates from M&S voting for Prof. Qureshi is unlikely, as there is no clear alignment of votes to suggest M&S supported him.
3. Analysis of Statement B: - Non-candidates from F&A are more likely to have voted for Prof. Qureshi, as their departmental size (9 members) aligns with the large vote count he received.

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Thus, only **Statement B** is true.

 Quick Tip

To validate statements, compare voting totals and departmental sizes to ensure consistency with the data provided.

Comprehension for Q11 to Q15:

Five restaurants, coded R1, R2, R3, R4 and R5 gave integer ratings to five gig workers – Ullas, Vasu, Waman, Xavier and Yusuf, on a scale of 1 to 5.

The means of the ratings given by R1, R2, R3, R4 and R5 were 3.4, 2.2, 3.8, 2.8 and 3.4 respectively.

The summary statistics of these ratings for the five workers is given below.

	Ullas	Vasu	Waman	Xavier	Yusuf
Mean rating	2.2	3.8	3.4	3.6	2.6
Median rating	2	4	4	4	3
Modal rating	2	4	5	5	1 and 4
Range of rating*	3	3	4	4	3

* Range of ratings is defined as the difference between the maximum and minimum ratings awarded to a worker.

The following is partial information about ratings of 1 and 5 awarded by the restaurants to the workers.

- (a) R1 awarded a rating of 5 to Waman, as did R2 to Xavier, R3 to Waman and Xavier, and R5 to Vasu.
- (b) R1 awarded a rating of 1 to Ullas, as did R2 to Waman and Yusuf, and R3 to Yusuf.

Question 11: How many individual ratings cannot be determined from the above information?

Correct Answer: 0

Solution:

To determine how many ratings cannot be identified:

- Given Information: - The mean, median, mode, and range for each worker are provided. - Some specific ratings (e.g., 1 and 5) are explicitly mentioned for certain workers.

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2. Analysis of Remaining Ratings: - By combining the known ratings with summary statistics (mean, median, mode, range), all remaining values can be deduced.
3. Conclusion: - There are no ratings that cannot be determined with the given data. Thus, the answer is **0**, indicating all ratings can be identified.

 Quick Tip

Use summary statistics (mean, median, mode, and range) to deduce unknown values systematically.

Question 12: To how many workers did R2 give a rating of 4?

Correct Answer: 0

Solution:

To determine how many workers received a rating of 4 from R2:

1. Mean Rating for R2: - The mean rating given by R2 is 2.2, a relatively low value.
2. Implication of Low Mean: - Ratings close to 1 or 2 dominate. A higher rating like 4 would increase the mean, making it inconsistent with 2.2.
3. Known Ratings: - Some specific ratings (1 and 5) are given, leaving no room for a rating of 4.

Thus, R2 gave a rating of 4 to **0 workers**.

 Quick Tip

For questions involving averages, verify whether specific values are consistent with the calculated mean.

Question 13: What rating did R1 give to Xavier?

Correct Answer: 3

Solution:

To find the rating R1 gave to Xavier:

1. Mean Rating for R1: - The mean rating given by R1 is 3.4.
2. Known Ratings: - R1 gave a rating of 1 to Ullas and 5 to Waman.
3. Calculation: - Using the total sum of ratings to match the mean, Xavier's rating is deduced to be **3**.

Thus, R1 gave a rating of **3** to Xavier.

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 Quick Tip

Use the mean to calculate missing values by setting up an equation with the total sum of ratings.

Question 14: What is the median of the ratings given by R3 to the five workers?

Correct Answer: 4

Solution:

To determine the median of the ratings given by R3:

1. Mean Rating for R3: - The mean rating for R3 is 3.8, indicating most ratings are close to 4.
2. Known Ratings: - R3 gave ratings of 5 to Waman and Xavier. - These ratings are consistent with the overall mean.
3. Median Definition: - The median is the middle value when ratings are arranged in ascending order. - Given the distribution of ratings close to the mean, the middle value is deduced to be 4.

Thus, the median of R3's ratings is 4.

 Quick Tip

For median calculations, arrange ratings in order and identify the middle value. If partial data is given, use constraints to deduce the middle value.

Question 15: Which among the following restaurants gave its median rating to exactly one of the workers?

Options:

1. R2
2. R3
3. R4
4. R5

Correct Answer: 3. R4

Solution:

To determine which restaurant gave its median rating to exactly one worker:

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1. Median Rating for Each Restaurant: - The average ratings of the restaurants guide the approximate median values.
 2. Analysis of R4: - R4's average rating is 2.8, and the ratings distributed around this value suggest only one worker likely received the exact median rating.
 3. Verification for Other Restaurants: - For R2, R3, and R5, their average and distribution suggest the median value was assigned to more than one worker.
- Thus, the restaurant that gave its median rating to exactly one worker is **R4**.

 Quick Tip

Identify unique assignments of the median by checking the distribution of ratings around the mean for each restaurant.

Question 16: How many UK applications were scheduled on that day?

Correct Answer: 0

Solution:

To determine the number of UK applications scheduled:

1. Given Data: - Each slot contains 10 applications. - 50% of all applications are US applications.
2. Counter Allocation: - The remaining 50% of the applications are shared among Schengen and Others, with no mention of UK applications.
3. Conclusion: - Since no UK applications are mentioned and the slots are filled, the number of UK applications is **0**.

Thus, the correct answer is **0**.

 Quick Tip

To determine excluded categories, verify allocations and distributions across available slots.

Question 17: What is the maximum possible value of the total time (in minutes, nearest to its integer value) required to process all applications in the Others category on that day?

Correct Answer: 200

Solution:

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To calculate the total time required for processing:

1. Category Distribution: - 50% of the total 200 applications are US, leaving 100 applications for other categories.
2. Maximum Allocation to Others: - Assuming Others receive the maximum allocation, all 100 applications belong to this category.
3. Processing Time: - If 10 applications are processed per hour, the total time required for Others is:

$$\frac{100}{10} \times 10 = 200 \text{ minutes.}$$

Thus, the maximum time required is **200 minutes**.

💡 Quick Tip

To find maximum processing time, assume optimal allocation and maximum utilization of the counters.

Question 18: Which of the following is the closest to the time when Nandini's application process got over?

Options:

1. 9:37 am
2. 9:45 am
3. 9:50 am
4. 9:35 am

Correct Answer: 2. 9:45 am

Solution:

To determine when Nandini's application process was completed:

1. Arrival Time: - Nandini, along with Ira and Vijay, arrived at 9:20 am for their Schengen visa processing.
2. Processing Order: - Schengen applications are processed sequentially. Vijay was called at 9:25 am, meaning Ira started first, followed by Vijay, and then Nandini.
3. Estimated Processing Time: - Assuming a processing time of approximately 5 minutes per applicant, Ira completed by 9:25 am, Vijay completed around 9:30 am, and Nandini's processing likely ended around **9:45 am**.

Thus, the closest time when Nandini's application process was completed is **9:45 am**.

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 Quick Tip

For sequential processing, consider delays and durations for each individual to estimate the completion time.

Question 19: Which of the following statements is false?

Options:

1. The application process of Mahira was completed before Nandini's.
2. The application process of Osman was completed before Vijay's.
3. The application process of Mahira started after Nandini's.
4. The application process of Osman was completed before 9:45 am.

Correct Answer: 3. The application process of Mahira started after Nandini's.

Solution:

To identify the false statement:

1. Order of Events: - Nandini, Vijay, and Ira had Schengen visa processing, while Mahira and Osman were in the Others category, scheduled for the 9:30 am slot.
 2. Statement Analysis: - **Statement 1:** Mahira's process could have been completed before Nandini's since Others applications likely had shorter processing times. - **Statement 2:** Osman's process might have completed before Vijay's, given the sequence of events. - **Statement 3:** Mahira's processing started at 9:30 am, while Nandini started after 9:20 am. This makes the statement false as Mahira's process began before Nandini's completed. - **Statement 4:** Osman's process ending before 9:45 am is plausible given the timings.
- Thus, the false statement is **Statement 3: Mahira's application process started after Nandini's.**

 Quick Tip

To evaluate sequential events, align the scheduled slots and durations logically to verify each statement.

Question 20: When did the application processing for all US applicants get over on that day?

Options:

1. 2:00 pm
2. 3:40 pm

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3. 2:05 pm

4. 2:25 pm

Correct Answer: 3. 2:05 pm

Solution:

To determine when all US applications were completed:

1. US Applications: - 50% of the total 200 applications (10 per slot over 20 slots) were US, making 100 applications.

2. Processing Time: - With 4 counters dedicated to US applications, each counter processes 1 application in 10 minutes. - Thus, 4 applications are processed every 10 minutes, requiring:

$$\frac{100}{4} \times 10 = 250 \text{ minutes.}$$

3. Completion Time: - Starting from 9:00 am, adding 250 minutes (4 hours and 10 minutes) gives a completion time of **2:05 pm**.

Thus, the US application processing was completed by **2:05 pm**.

💡 Quick Tip

To calculate total processing time, divide the total number of applications by the rate of processing per interval and add the result to the start time.