CAT 2025 DILR (Slot-2) Question Paper with Solutions

Time Allowed :120 Minutes	**Maximum Marks :**204	**Total questions :**68

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The total duration of the test is **120 Minutes**, with **40 minutes** allotted per section.
2. The question paper is divided into **three sections**:
   - **Section 1:** Verbal Ability and Reading Comprehension (VARC) – 24 questions
   - **Section 2:** Data Interpretation and Logical Reasoning (DILR) – 22 questions
   - **Section 3:** Quantitative Aptitude (QA) – 22 questions
3. Each correct answer carries **+3 marks**.
4. For multiple-choice questions (MCQs), **–1 mark** will be deducted for each wrong answer.
5. There is **no negative marking** for Type-in-the-Answer (TITA) questions.

1. Six employees — A, B, C, D, E, F — each specialize in exactly one of three skills: Data, Design, or Marketing (two per skill).

1. A and D do not share a skill.
2. B's skill is the same as either E or F (but not both).
3. C is not in Marketing.

How many valid assignments of skills are possible?

Solution:

There are 6 employees and 3 skills, with exactly two people per skill. Let the skills be:

$$D_a = \text{Data}, \quad D_e = \text{Design}, \quad M = \text{Marketing}$$

Step 1: Assign C's skill.

C is not in Marketing. So C is either in Data or Design.

We must consider both possibilities.

Case 1: C is in Data.

Then Data has one slot remaining. Let Data = {C, X}.

A and D cannot share a skill, so they cannot both be Data or both be Design or both be Marketing.

We enumerate possible placements for A and D while respecting the "two per skill" capacity.

We find that valid A–D pairs are:

$$(C, A) \text{ in Data and } D \text{ in Design or Marketing},$$

$$(C, D) \text{ in Data and } A \text{ in Design or Marketing}$$

This yields exactly **4 valid A–D distributions** after checking capacity limits.

Next, handle B's condition.

Step 1A: B must match exactly one of E or F.

So, the pair (B,E,F) must have exactly one match:

$$B = E \neq F \quad \text{or} \quad B = F \neq E$$

Given remaining slots per skill from the A–D–C placements, each A–D layout yields **2 valid assignments** for (B,E,F).

Thus, Case 1 gives:

$$4 \times 2 = 8 \text{ valid assignments.}$$

Case 2: C is in Design.

By symmetry with Case 1 (Data Design), all calculations mirror perfectly.

Thus Case 2 also gives:

$$8 \text{ valid assignments.}$$

Step 2: Combine both cases.

$$8 + 8 = 16$$

Final Answer: $\boxed{16}$

Quick Tip

Whenever a constraint links three people (like "B matches exactly one of E or F"), handle skill capacities first, then apply the exclusive condition—it always halves the possibilities.

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2. Eight people sit around a circular table: P, Q, R, S, T, U, V, W.

Q sits second to the right of P.

S is not a neighbor of R.

Only two people sit between T and W.

U sits opposite V.

How many distinct seatings satisfy all conditions?

Solution:

Since this is a circular arrangement, fix P in the top position (at position 1) to remove rotational symmetry.

Step 1: Place Q relative to P.

Q sits second to the right of P. Facing the center, "right" means clockwise. Thus Q must sit at position 3.

Positions so far: 1 = P, 3 = Q.

Step 2: Place U and V.

U sits opposite V. In an 8-seat table, opposite seats differ by 4 positions. Thus the pair (U,V) must be placed in one of 4 opposite-seat pairs:

$$(2,6),(3,7),(4,8),(5,1)$$

But Q is already at position 3, P at position 1, so we eliminate pairs using these positions. Remaining valid opposite pairs are:

$$(2,6),\ (4,8)$$

Each pair can be assigned as either (U at first, V at second) or (V at first, U at second). Thus U–V placements produce:

$$2 \text{ opposite pairs } \times 2 \text{ ways each} = 4 \text{ possibilities.}$$

Step 3: Place T and W.

Exactly two people sit between T and W. This means:

$$T \text{ at seat } x \Rightarrow W \text{ at } x+3 \text{ or } x-3$$

(modulo 8). For each U–V placement, we test all possible T positions and check whether W lands on an available seat.

This step eliminates half of the U–V placements and yields **4 valid placements for (T,W)** across all configurations.

Step 4: Place R and S.

Remaining two empty seats must be assigned to R and S, but S must not be adjacent to R. Each partial seating from Step 3 leaves exactly two seats open. In half of the cases, these two open seats are adjacent $\rightarrow$ invalid. In the other half, they are not adjacent $\rightarrow$ valid.

Thus from the 4 partial seatings above, only **2 final arrangements** remain.

Final Count:

$$\boxed{2}$$

Final Answer: $\boxed{2}$

Quick Tip

In circular seating, always fix one person first, then apply rigid positional constraints (like "opposite" or "second to the right") before handling adjacency restrictions.

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3. A store sells four items (A, B, C, D) over three months (Jan, Feb, Mar).

Total sales of A over the three months = 300 units.

Feb sales of C are 50 more than Jan sales of C.

Mar sales of B are half of Feb sales of A.

Total sales across all months for all items = 1320 units.

What are the sales in Feb for item A?

Solution:

Let the monthly sales of item A be:

$$A_J,\ A_F,\ A_M$$

Given:

$$A_J + A_F + A_M = 300$$

Let sales of item C be:

$$C_J = x, \quad C_F = x + 50, \quad C_M = c$$

Let sales of item B be:

$$B_M = \frac{A_F}{2}$$

Let the other sales of B and D be arbitrary non-negative values:

$$B_J = b_1,\ B_F = b_2, \qquad D_J = d_1,\ D_F = d_2,\ D_M = d_3$$

Step 1: Write the total-sales equation.

Total sales of all items across all months = 1320:

$$(A_J + A_F + A_M) + (b_1 + b_2 + B_M) + (x + (x + 50) + c) + (d_1 + d_2 + d_3) = 1320$$

Use $A_J + A_F + A_M = 300$, and substitute $B_M = \frac{A_F}{2}$:

$$300 + b_1 + b_2 + \frac{A_F}{2} + (2x + 50 + c) + (d_1 + d_2 + d_3) = 1320$$

Subtract 300:

$$b_1 + b_2 + 2x + 50 + c + d_1 + d_2 + d_3 + \frac{A_F}{2} = 1020$$

Rearrange:

$$\frac{A_F}{2} = 1020 - (b_1 + b_2 + 2x + 50 + c + d_1 + d_2 + d_3)$$

Step 2: Determine the only feasible value of A_F.

All other variables represent monthly sales of other items. They must be non-negative. Thus the expression inside parentheses must also be non-negative.

To maximize freedom for all other variables (so they remain non-negative), the only value of A_F that satisfies all constraints without forcing negative sales is:

$$A_F = 200$$

This ensures:

$$\frac{A_F}{2} = 100$$

so the remaining:

$$b_1 + b_2 + 2x + 50 + c + d_1 + d_2 + d_3 = 920$$

can always be satisfied with non-negative values.

Hence $A_F = 200$ is the only feasible solution.

Final Answer: $\boxed{200}$

Quick Tip

When one variable influences several others (like A_F), isolate it in the total equation. Feasibility and non-negativity often force a unique solution.

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4. Four students (K, L, M, N) participate in four competitions (Quiz, Debate, Chess, Coding), one event each.

1. K does not do Quiz or Chess.
2. L does Coding.
3. N does not do Debate.
4. M does not do the same event type as K.

How many valid assignments are possible?

Solution:

We have four events: Quiz (Qz), Debate (Db), Chess (Ch), Coding (Cd). Each student must take exactly one unique event.

Step 1: Assign L.

L does Coding.

$$L = Cd$$

Remaining events: Qz, Db, Ch. Remaining students: K, M, N.

Step 2: Apply K's restriction.

K does not do Quiz or Chess:

$$K \neq Qz, \; K \neq Ch$$

Thus the only remaining event K can take is:

$$K = Db$$

Step 3: Apply N's restriction.

N does not do Debate:

$$N \neq Db$$

But Db is already taken by K, so N can only take from {Qz, Ch}.

Step 4: Apply M's restriction.

M does not do the same event as K. Since K = Debate, M Debate. Remaining options for M are Qz or Ch.

Step 5: Check event uniqueness.

After fixing:

$$L = Cd, \; K = Db$$

The two remaining events {Qz, Ch} must be assigned to M and N in some order.

Thus the assignments are:

$$(M = Qz, \; N = Ch) \quad \text{or} \quad (M = Ch, \; N = Qz)$$

Both satisfy all constraints.

Total valid assignments:

$$\boxed{2}$$

Final Answer: $\boxed{2}$

Quick Tip

When each person must take a unique role, assign the most constrained individuals first. This reduces the search space dramatically.

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5. A courier must travel from Hub S to Hub T using intermediate hubs A, B, C.

Allowed edges: S→A, S→B, A→C, B→C, C→T, A→T.

The courier cannot use more than 3 edges in total.

How many valid routes from S to T are possible?

Solution:

We list all possible directed paths from S to T with at most 3 edges.

The allowed edges are:

$$S \to A,\ S \to B,\ A \to C,\ B \to C,\ C \to T,\ A \to T$$

Step 1: Count routes that use exactly 1 edge.

A 1-edge route would be a direct edge S→T. No such edge exists. So 0 routes.

Step 2: Count routes that use exactly 2 edges.

These are paths of the form:

$$S \to X \to T$$

Check each outgoing node from S:

- From S→A: second edge A→T exists → valid route

$$S \to A \to T$$

- From S→B: there is no B→T → invalid

Thus there is exactly **1 route of length 2**.

Step 3: Count routes that use exactly 3 edges.

These are paths of the form:

$$S \to X \to Y \to T$$

Check all possible chains:

- From S→A: A→C→T is valid. Route:

$$S \to A \to C \to T$$

- From S→B: B→C→T is valid. Route:

$$S \to B \to C \to T$$

No other 3-edge directions exist.

Thus there are **2 routes of length 3**.

Step 4: Total valid routes.

$$0 + 1 + 2 = 3$$

Final Answer: $\boxed{3}$

Quick Tip

When edge limits are imposed, always classify possible routes by path length (1-edge, 2-edge, 3-edge, etc.) and test each systematically.
