

CAT Games & Tournaments

Practice Set: 15 Original Questions with Full Solutions

This practice set covers four core formats tested in CAT DILR — Round-Robin Leagues, Knockout Tournaments, Points-Table Completion, and Hybrid Group + Knockout structures. Every question is original and built to reinforce the frameworks and shortcuts explained in the companion article.

How to use this set: Attempt all 15 questions first without checking the answer key. Time yourself — aim for under 25 minutes for the full set. Then compare your working against the step-by-step solutions starting on the answer key page.

Section 1: Round-Robin League Questions

- Q1.** Six teams play a round-robin football tournament (every team plays every other team exactly once). A win earns 3 points, a draw earns 1 point each, and a loss earns 0 points. If exactly 3 of the matches ended in a draw, what is the total number of points distributed across all teams?
- Q2.** Five teams play a round-robin tournament where a win earns 3 points and a loss earns 0 (no draws are allowed). What is the maximum number of points any single team can score?
- Q3.** Seven teams play a round-robin chess tournament, where every team plays every other team exactly once. How many total matches are played?
- Q4.** Four teams play a round-robin tournament (win = 3 points, draw = 1 point each, loss = 0). If every single match in the tournament ends in a draw, what is the total number of points distributed?

Section 2: Knockout Tournament Questions

- Q5.** A knockout tennis tournament has 32 players and no byes. How many total matches are played to determine the champion?
- Q6.** A knockout tournament has 24 players. Due to an odd distribution, 8 players are given a bye in the first round (they skip directly to Round 2). How many total matches are played in the entire tournament?
- Q7.** A knockout tournament is designed so that the champion is decided after exactly 6 rounds, with no byes at any stage. What is the minimum number of players required for the tournament to naturally conclude in exactly 6 rounds?
- Q8.** A knockout tournament has 10 teams. To balance the bracket, 6 teams are given a bye in the first round, while the remaining teams play each other. How many matches are played in the first round, and how many matches are played in total across the entire tournament?

Section 3: Points-Table Completion Questions

- Q9.** Six teams play a round-robin football league (win = 3 points, draw = 1 point each, loss = 0). If exactly 4 of the matches end in a draw, what is the total number of points distributed across all teams?
- Q10.** In a round-robin tournament of n teams where a win earns 2 points and a tie earns 1 point to each team (no other outcomes possible), express the total number of points distributed across the tournament in terms of n , and explain why the number of ties does not affect this total.
- Q11.** Five teams play a round-robin tournament (win = 3 points, loss = 0, no draws). What are the minimum and maximum possible points a single team can score?
- Q12.** In a round-robin league (win = 3 points, draw = 1 point each, loss = 0 points), Team X played 4 matches, winning 2, drawing 1, and losing 1. What is Team X's total points?

Section 4: Hybrid Group + Knockout Questions

Q13. Sixteen teams are divided into 4 groups of 4 for a round-robin group stage. Only the winner of each group advances to a knockout stage (semifinals followed by a final). How many total matches are played across the entire tournament?

Q14. Twelve teams are divided into 2 groups of 6 for a round-robin group stage. The top 2 teams from each group (4 teams total) advance to a knockout stage. How many total matches are played across the entire tournament?

Q15. Nine teams are divided into 3 groups of 3 for a round-robin group stage. The 3 group winners then play a round-robin final among themselves to decide the champion. How many total matches are played across the entire tournament?

Answer Key with Step-by-Step Solutions

Round-Robin League

A1. Total matches = $6C2 = 15$. Decisive matches = $15 - 3 = 12$, distributing 3 points each = 36. Draws = 3 matches, distributing 2 points each = 6. Total = $36 + 6 = 42$ points.

A2. Each team plays $(5 - 1) = 4$ matches. Winning all 4 gives $4 \times 3 = 12$ points.

A3. Total matches = $7C2 = 21/1 = 21$ matches.

A4. Total matches = $4C2 = 6$. Every match is a draw, distributing $1 + 1 = 2$ points each. Total = $6 \times 2 = 12$ points.

Knockout Tournament

A5. In any single-elimination knockout, exactly one player is eliminated per match. To leave 1 champion from 32 players, 31 players must be eliminated. Total = **31 matches**.

A6. Byes don't change the elimination count — every match still eliminates exactly one player, and 23 players must be eliminated to leave 1 champion from 24. Total = **23 matches**, regardless of how byes are distributed.

A7. A knockout tournament with no byes concluding in exactly r rounds requires 2^r players. For $r = 6$, players = $2^6 = 64$ players.

A8. Non-bye teams = $10 - 6 = 4$ teams, which pair into $4 \div 2 = 2$ matches in Round 1. Using the elimination shortcut, total matches (regardless of bye structure) = $10 - 1 = 9$ matches overall.

Points-Table Completion

A9. Total matches = $6C2 = 15$. Decisive matches = $15 - 4 = 11$, distributing 3 points each = 33. Draws = 4 matches, distributing 2 points each = 8. Total = $33 + 8 = 41$ points.

A10. Total matches = $n(n-1)/2$. A decisive match distributes 2 points (win = 2, loss = 0) and a tied match also distributes 2 points ($1 + 1$). Since both outcomes distribute exactly 2 points per match regardless of result, total points = $2 \times n(n-1)/2 = n(n-1)$, independent of how many matches are tied.

A11. Each team plays 4 matches. Minimum points (losing all) = 0. Maximum points (winning all) = $4 \times 3 = 12$.

A12. Points = $(2 \text{ wins} \times 3) + (1 \text{ draw} \times 1) + (1 \text{ loss} \times 0) = 6 + 1 + 0 = 7$ points.

Hybrid Group + Knockout

A13. Group stage: $4C2 = 6$ matches per group $\times 4$ groups = 24 matches. Knockout stage: 4 group winners advance, and by the elimination shortcut, $4 - 1 = 3$ matches (2 semifinals + 1 final). Total = $24 + 3 = 27$ matches.

A14. Group stage: $6C2 = 15$ matches per group $\times 2$ groups = 30 matches. Knockout stage: 4 teams advance, requiring $4 - 1 = 3$ matches. Total = $30 + 3 = 33$ matches.

A15. Group stage: $3C2 = 3$ matches per group $\times$ 3 groups = 9 matches. Final stage: 3 group winners play a round-robin final = $3C2 = 3$ matches. Total = $9 + 3 = \mathbf{12}$ matches.

Want the full framework behind these shortcuts, plus more solved examples? Read the companion guide: **CAT Games and Tournaments Questions — Patterns, Practice Sets & Solving Strategy** on the CatMock blog. For daily DILR practice across every topic, explore DILR Bhandara at catmock.com/blog.