

CHAPTER 2: PROBLEM-SOLVING

SSC CGL Reasoning - Complete Chapter Guide

Analytical Thinking | Logical Reasoning | Step-by-Step Solutions | SSC CGL Exam Focus

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Chapter Overview: This chapter covers systematic problem-solving approaches, analytical thinking methods, and logical reasoning techniques essential for SSC CGL examination. Master step-by-step solution methodologies.

2.1 UNDERSTANDING PROBLEM-SOLVING

What is Problem-Solving in Reasoning?

Definition: Problem-solving is the systematic process of working through details of a problem to reach a solution. It involves analyzing the problem, developing strategies, implementing solutions, and evaluating outcomes.

Key Insight: Effective problem-solving requires both analytical thinking (breaking down problems) and synthetic thinking (combining elements to form solutions).

Problem-Solving Process

- 1 **Understand** - Comprehend the problem statement
- 2 **Analyze** - Break down into smaller components
- 3 **Plan** - Develop solution strategy
- 4 **Execute** - Implement the solution
- 5 **Verify** - Check the solution
- 6 **Reflect** - Learn from the process

2.2 PROBLEM-SOLVING STRATEGIES

Systematic Approaches

Algorithmic Approach

- Step-by-step procedure
- Guaranteed solution
- Mathematical problems
- Formula-based solutions
- Systematic execution

Heuristic Approach

- Rule-of-thumb methods
- Experience-based
- Quick solutions
- Pattern recognition
- Educated guesses

Trial & Error

- Testing possibilities
- Learning from mistakes
- Systematic testing
- Elimination method
- Incremental improvement

Thinking Techniques

Lateral Thinking Methods:

- **Reverse Thinking** - Start from desired outcome
- **Analogical Thinking** - Use similar problems
- **Divide & Conquer** - Break into sub-problems
- **Pattern Recognition** - Identify recurring themes
- **Assumption Challenging** - Question basic premises

2.3 MATHEMATICAL PROBLEM-SOLVING

Age Problems

Key Formulas for Age Problems:

- Present Age: P
- Years ago: $P - n$
- Years later: $P + n$
- Ratio: $P_1/P_2 = r_1/r_2$
- Difference: Always constant

Example: A is twice as old as B. After 5 years, A will be 1.5 times as old as B. Find current ages.

Solution:

Let B's present age = x

A's present age = $2x$

After 5 years: $A = 2x + 5$, $B = x + 5$

Given: $2x + 5 = 1.5(x + 5)$

$2x + 5 = 1.5x + 7.5$

$0.5x = 2.5 \Rightarrow x = 5$

B's age = 5 years, A's age = 10 years

Time & Work Problems

Work Formulas:

- Work = Rate $\times$ Time
- Combined work: $1/T = 1/T_1 + 1/T_2$
- Efficiency ratio: $E_1/E_2 = W_1/W_2$
- Work done = (Work rate) $\times$ (Time)

Example: A can complete work in 6 days, B in 12 days. Together in how many days?

Solution:

A's 1 day work = $1/6$

B's 1 day work = $1/12$

Together 1 day work = $1/6 + 1/12 = 1/4$

Time together = 4 days

2.4 LOGICAL PROBLEM-SOLVING

Sequence Problems

Number Sequences

- Arithmetic progression
- Geometric progression
- Fibonacci sequence
- Prime numbers
- Square/Cube patterns

Letter Sequences

- Alphabet position
- Reverse alphabet
- Vowel-consonant patterns
- Skipping patterns
- Group patterns

Mixed Sequences

- Number-letter alternation
- Symbol patterns
- Color sequences
- Shape progressions
- Direction sequences

Example: Find next term: 2, 6, 18, 54, ?

Solution Analysis:

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

Pattern: Multiply by 3 each time

$$\text{Next term: } 54 \times 3 = 162$$

Arrangement Problems

Arrangement Strategy:

1. Identify fixed positions first
2. Use elimination method
3. Create possibility tables
4. Look for direct relationships
5. Use negative information effectively
6. Verify all conditions

2.5 ANALYTICAL REASONING

Deductive Reasoning

Syllogism Problems:

- All A are B + All B are C = All A are C
- Some A are B + All B are C = Some A are C
- No A are B + All B are C = No conclusion

Example: Statements: All dogs are animals. Some animals are pets. **Conclusion?**

Solution:

From given statements:

All dogs are animals (Given)

Some animals are pets (Given)

Conclusion: Some dogs may be pets (Possible but not definite)

No definite conclusion can be drawn

Critical Thinking

Critical Analysis Steps:

- Identify assumptions
- Evaluate evidence
- Recognize biases
- Consider alternatives
- Draw logical conclusions
- Verify reasoning process

2.6 PRACTICE QUESTIONS WITH SOLUTIONS

Mathematical Problems

Q1. The ratio of ages of A and B is 3:4. After 5 years, the ratio becomes 4:5. Find current ages.

- A) 15, 20
- B) 12, 16
- C) 18, 24
- D) 21, 28

Answer: A) 15, 20

Solution: Let ages be $3x$ and $4x$. After 5 years: $(3x+5)/(4x+5) = 4/5$

$$15x + 25 = 16x + 20 \Rightarrow x = 5$$

Ages: 15 and 20 years

Q2. A and B together can complete work in 12 days. A alone takes 20 days. How long for B alone?

- A) 25 days
- B) 28 days
- C) 30 days
- D) 32 days

Answer: C) 30 days

Solution: $1/A + 1/B = 1/12$, $1/A = 1/20$

$$1/B = 1/12 - 1/20 = (5-3)/60 = 2/60 = 1/30$$

B alone takes 30 days

Logical Problems

Q3. Find next term: 1, 4, 9, 16, 25, ?

- A) 36
- B) 49
- C) 64
- D) 81

Answer: A) 36

Solution: Pattern is squares: $1^2, 2^2, 3^2, 4^2, 5^2$, next is $6^2 = 36$

Q4. In a row of trees, one tree is 7th from left and 11th from right. How many trees?

- A) 17
- B) 18
- C) 19
- D) 20

Answer: A) 17

Solution: Total = Left position + Right position - 1 = $7 + 11 - 1 = 17$

2.7 SSC CGL EXAM STRATEGY

Time Management & Approach

Exam Strategy for Problem-Solving:

1. **Quick Assessment** - Identify problem type in 15 seconds
2. **Strategy Selection** - Choose appropriate method
3. **Step Execution** - Work systematically
4. **Time Allocation** - 60-90 seconds per question
5. **Verification** - Quick check of answer
6. **Move On** - Don't get stuck on one problem
7. **Review** - Return to difficult questions

Common SSC CGL Problem Types:

- Age problems with ratios
- Work-time efficiency
- Number/letter sequences
- Arrangement puzzles
- Direction and distance
- Blood relations
- Coding patterns

Common Mistakes to Avoid

Critical Errors in Problem-Solving:

- Rushing without understanding the problem
- Using wrong formulas or methods
- Calculation errors in simple arithmetic
- Misinterpreting question requirements
- Overlooking key information
- Not verifying answers
- Getting stuck on one approach
- Poor time management

2.8 REVISION & PRACTICE PLAN

Daily Practice Routine

4-Week Preparation Plan:

Week 1: Basic Concepts & Mathematical Problems (10 questions/day)
Week 2: Logical Sequences & Patterns (15 questions/day)
Week 3: Analytical Reasoning & Puzzles (15 questions/day)
Week 4: Mixed Practice & Speed Tests (20 questions/day)

Effective Problem-Solving Habits:

- Practice different problem types daily
- Time yourself for speed improvement
- Maintain error log for weak areas
- Learn multiple solution methods
- Understand concepts rather than memorizing
- Take regular mock tests
- Review and analyze mistakes

Key Formulas & Methods to Master

Problem Type	Key Formulas/Methods
Age Problems	Ratio method, Equation method, Difference concept
Work & Time	Work rate formula, LCM method, Efficiency ratio
Sequences	AP/GP formulas, Pattern recognition, Position analysis
Arrangements	Possibility tables, Elimination method, Logical deduction
Analytical Reasoning	Syllogism rules, Venn diagrams, Logical deduction