

SSC GD Constable Exam : Simplification Syllabus Summary

Overview:

The Simplification topic is a fundamental part of the Mathematics section in the SSC GD Constable Exam, contributing approximately 3–5 questions (6–10 marks out of 160 total marks) in the Computer-Based Examination (CBE). The syllabus focuses on simplifying complex numerical and algebraic expressions using arithmetic operations, fractions, decimals, percentages, and algebraic identities, with an emphasis on applying the BODMAS rule. Questions test computational accuracy, speed, and understanding of basic mathematical operations at a 10th-grade level. The exam includes 80 questions (2 marks each, 0.50 negative marking per wrong answer) to be completed in 60 minutes.

Key Topics in Simplification:

1. BODMAS Rule: Applying the correct order of operations (Bracket, Order, Division/Multiplication, Addition/Subtraction).
2. Arithmetic Operations: Simplifying expressions with fractions, decimals, and percentages.
3. Algebraic Expressions: Simplifying expressions using algebraic identities.
4. Fractions: Adding, subtracting, multiplying, and dividing fractions.
5. Decimals: Performing operations with decimal numbers.
6. Percentage Calculations: Simplifying expressions involving percentages.
7. Word Problems: Simplifying real-world scenarios involving basic arithmetic.
8. Surds and Indices: Simplifying basic expressions involving powers and roots (if included at SSC GD level).

Important Formula and Techniques:

1. BODMAS Rule:
 - Order of operations: Bracket, Order (exponents), Division/Multiplication (left to right), Addition/Subtraction (left to right).
 - Example: Simplify $10 + 2 \times 3 - (4 \div 2) = 10 + 6 - 2 = 14$.

2. Fraction Operations:

- Addition/Subtraction (Like Fractions): Add/subtract numerators, keep denominator same.

- Example: $\frac{2}{5} + \frac{3}{5} = \frac{5}{5} = 1$.

- Addition/Subtraction (Unlike Fractions): Use LCM of denominators.

- Example: $\frac{1}{3} + \frac{1}{4} = \frac{(4 + 3)}{(3 \times 4)} = \frac{7}{12}$ (LCM = 12).

- Multiplication: Multiply numerators and denominators, simplify.

- Example: $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$.

- Division: Multiply by reciprocal.

- Example: $\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3}$.

3. Decimal Operations:

- Addition/Subtraction: Align decimal points, add/subtract as whole numbers.

- Example: $2.34 + 1.6 = 2.34 + 1.60 = 3.94$.

- Multiplication: Multiply as whole numbers, place decimal based on total decimal places.

- Example: $2.5 \times 1.2 = 25 \times 12 = 300$; 2 decimal places $(1 + 1) = 3.00$.

- Division: Shift decimal in divisor to whole number, adjust dividend, then divide.

- Example: $5.76 \div 1.2 = 57.6 \div 12 = 4.8$.

4. Percentage Simplification:

- Percentage to Decimal: Divide by 100.

- Example: $25\% = 25 / 100 = 0.25$.

- Percentage of a Number: $(\text{Percentage} / 100) \times \text{Number}$.

- Example: $20\% \text{ of } 50 = (20 / 100) \times 50 = 10$.

- Example: Simplify $50\% \text{ of } 80 + 25\% \text{ of } 40 = (50/100 \times 80) + (25/100 \times 40) = 40 + 10 = 50$.

5. Algebraic Identities (for Simplification):

- $(a + b)^2 = a^2 + b^2 + 2ab$

- $(a - b)^2 = a^2 + b^2 - 2ab$

- $a^2 - b^2 = (a + b)(a - b)$

- Example: Simplify $(x + 2)^2 - (x - 2)^2 = (x^2 + 4x + 4) - (x^2 - 4x + 4) = 8x$.

6. Surds and Indices (Basic):

- $a^m \times a^n = a^{(m+n)}$
- $a^m \div a^n = a^{(m-n)}$
- $(a^m)^n = a^{(m \times n)}$
- Example: Simplify $2^2 \times 2^3 = 2^{(2+3)} = 2^5 = 32$.

7. Word Problem Applications:

- Example: Simplify the cost of 2 items at ₹50 each and 3 items at ₹20 each = $(2 \times 50) + (3 \times 20) = 100 + 60 = ₹160$.
- Example: Simplify $(\frac{1}{2} + \frac{1}{3}) \times 12 = [(\frac{3}{6} + \frac{2}{6})] \times 12 = (\frac{5}{6}) \times 12 = 10$.

Key Points for SSC GD Preparation:

- Focus Areas: Applying BODMAS, simplifying fractions, decimals, percentages, and algebraic expressions, and solving word problems are frequently tested.
- Question Types: Direct simplifications (e.g., $10 + 2 \times 3$), fraction/decimal operations, percentage calculations, and word problems (e.g., total cost calculations).
- Difficulty Level: 10th-grade level, requiring quick and accurate simplification techniques.
- Practice Tips: Master BODMAS rule, practice fraction and decimal operations, memorize algebraic identities, and solve simplification problems from past SSC GD papers.

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