SSC GD Constable Exam: Computation of Whole Numbers Syllabus Summary

Overview:
The Computation of Whole Numbers is a fundamental topic within the Mathematics section of the SSC GD Constable Exam, typically contributing 4–6 questions (8–12 marks out of 160 total marks) in the Computer-Based Examination (CBE). The syllabus focuses on arithmetic operations involving whole numbers (0, 1, 2, 3, …), including addition, subtraction, multiplication, division, and their applications in problem-solving. Questions test computational skills, speed, and accuracy 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 Computation of Whole Numbers:

1. Basic Arithmetic Operations: Addition, subtraction, multiplication, and division of whole numbers.
2. Properties of Whole Numbers: Commutative, associative, distributive properties, and identity elements.
3. Divisibility and Factors: Divisibility rules, finding factors, and prime factorization.
4. Multiples: Calculating multiples and applications in real-world problems.
5. Simplification: Simplifying expressions using BODMAS rule.
6. Word Problems: Problems involving whole number computations (e.g., age, cost, time, quantity).
7. Squares and Cubes: Calculating squares and cubes of whole numbers and their applications.
8. Number Patterns: Identifying sequences and patterns involving whole numbers.

Important Formula and Theorems:

1. Basic Arithmetic Operations:
   - Addition: $a + b$ = Sum of whole numbers.
   - Subtraction: $a - b$ = Difference (result is a whole number only if $a \geq b$).

- Multiplication: $a \times b$ = Product of whole numbers.
- Division: $a \div b$ = Quotient (result is a whole number only if a is divisible by b; remainder is also a whole number).

2. Properties of Whole Numbers:
- Commutative Property:
  - Addition: $a + b = b + a$.
  - Multiplication: $a \times b = b \times a$.
- Associative Property:
  - Addition: $(a + b) + c = a + (b + c)$.
  - Multiplication: $(a \times b) \times c = a \times (b \times c)$.
- Distributive Property:
  - $a \times (b + c) = a \times b + a \times c$.
  - $a \times (b - c) = a \times b - a \times c$.
- Identity Elements:
  - Addition: $a + 0 = a$ (0 is the additive identity).
  - Multiplication: $a \times 1 = a$ (1 is the multiplicative identity).
- Zero Property: $a \times 0 = 0$.

3. Divisibility Rules:
- Divisible by 2: Last digit is even (0, 2, 4, 6, 8).
- Divisible by 3: Sum of digits is divisible by 3.
- Divisible by 4: Last two digits form a number divisible by 4.
- Divisible by 5: Last digit is 0 or 5.
- Divisible by 6: Number is divisible by both 2 and 3.
- Divisible by 9: Sum of digits is divisible by 9.
- Example: 342 is divisible by 3 ($3 + 4 + 2 = 9$, divisible by 3) and by 2 (last digit 2), hence by 6.

4. Prime Factorization:
- Express a number as a product of prime factors.
- Example: $36 = 2^2 \times 3^2$.

5. BODMAS Rule:

- Order of operations: Bracket, Order (exponents), Division/Multiplication (left to right), Addition/Subtraction (left to right).
- Example: Simplify $2 + 3 \times 4 = 2 + 12 = 14$ (multiply first, then add).

6. Squares and Cubes:
- Square: $n^2 = n \times n$ (e.g., $5^2 = 25$).
- Cube: $n^3 = n \times n \times n$ (e.g., $5^3 = 125$).
- Useful for quick calculations in simplification or pattern questions.

7. Number Patterns:
- Arithmetic Sequence: $a_n = a_1 + (n-1)d$, where d is the common difference.
  - Example: Sequence 2, 5, 8, 11, … has $d = 3$; 5th term $= 2 + (5-1) \times 3 = 14$.
- Square/Cube Patterns: Identify sequences like 1, 4, 9, 16 (squares) or 1, 8, 27, 64 (cubes).

8. Remainder Theorem (for Division):
- For $a \div b$, $a = b \times q + r$, where q is the quotient and r is the remainder ($0 \leq r < b$).
- Example: $17 \div 5$ = quotient 3, remainder 2 ($17 = 5 \times 3 + 2$).

Key Points for SSC GD Preparation:

- Focus Areas: Basic operations, divisibility rules, simplification using BODMAS, and word problems involving whole numbers are frequently tested.
- Question Types: Direct computations (e.g., 123×7), simplification (e.g., $15 + 3 \times 4$), divisibility checks, and word problems (e.g., total cost or age calculations).
- Difficulty Level: 10th-grade level, emphasizing quick calculations and application of properties.
- Practice Tips: Master mental math for quick addition/multiplication, memorize divisibility rules, practice BODMAS-based simplifications, and solve word problems from past SSC GD papers.

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