SSC GD Constable Exam: Interest Syllabus Summary

Overview:
The Interest topic is a significant part of the Mathematics section in the SSC GD Constable Exam, contributing approximately 2–4 questions (4–8 marks out of 160 total marks) in the Computer-Based Examination (CBE). The syllabus focuses on understanding and calculating simple interest (SI) and compound interest (CI), along with their applications in real-world financial scenarios, such as loans, savings, and investments. Questions test computational accuracy, formula application, and problem-solving skills 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 Interest:

1. Simple Interest: Calculating interest based on principal, rate, and time.
2. Compound Interest: Calculating interest on the principal plus accumulated interest.
3. Difference between Simple and Compound Interest: Comparing SI and CI for the same principal, rate, and time.
4. Word Problems: Applications in loans, savings, investments, and installments.
5. Interest Rate and Time Calculations: Finding rate or time given other variables.
6. Annual and Half-Yearly Compounding: Calculating CI for different compounding frequencies.
7. Applications: Problems involving effective interest rates and total amount payable.

Important Formula and Techniques:

1. Simple Interest (SI):
   - Formula: SI = (Principal × Rate × Time) / 100
     - Principal (P): Initial amount borrowed or invested.
     - Rate (R): Annual interest rate (in %).
     - Time (T): Time period in years.

- Total Amount = Principal + SI = P + (P × R × T) / 100
- Example: For P = ₹1000, R = 5%, T = 2 years, SI = (1000 × 5 × 2) / 100 = ₹100, Amount = 1000 + 100 = ₹1100.

2. Compound Interest (CI):
- Formula: Amount = P × (1 + R/100)^T
  - CI = Amount − Principal = P × [(1 + R/100)^T − 1]
- Example: For P = ₹1000, R = 5%, T = 2 years, Amount = 1000 × (1 + 5/100)^2 = 1000 × (1.05)^2 = 1000 × 1.1025 = ₹1102.5, CI = 1102.5 − 1000 = ₹102.5.

3. Compound Interest for Half-Yearly Compounding:
- Formula: Amount = P × (1 + (R/2)/100)^(2T)
  - CI = Amount − Principal.
- Example: For P = ₹1000, R = 10%, T = 1 year (half-yearly), Amount = 1000 × (1 + 5/100)^2 = 1000 × (1.05)^2 = ₹1102.5, CI = 1102.5 − 1000 = ₹102.5.

4. Difference between CI and SI (for 2 years):
- Formula: Difference = P × (R/100)^2
- Example: For P = ₹1000, R = 10%, T = 2 years, Difference = 1000 × (10/100)^2 = 1000 × 0.01 = ₹10.

5. Finding Rate or Time:
- For SI: R = (SI × 100) / (P × T), T = (SI × 100) / (P × R).
- Example: SI = ₹200, P = ₹1000, T = 2 years, R = (200 × 100) / (1000 × 2) = 10%.
- For CI: Use Amount = P × (1 + R/100)^T and solve for R or T (may require approximation or trial for SSC GD level).

6. Word Problem Applications:
- Loan Repayment: Total amount = P + SI or P × (1 + R/100)^T for SI or CI.
  - Example: Loan of ₹5000 at 4% SI for 3 years, Total = 5000 + (5000 × 4 × 3) / 100 = 5000 + 600 = ₹5600.

- Investment Growth: Use CI formula for growth over time.
  - Example: ₹2000 invested at 5% CI for 2 years, Amount = 2000 × (1.05)^2 = ₹2205.

7. Effective Interest Rate (for CI):
- Effective Rate = [(1 + R/100)^T − 1] × 100 for T years.
- Example: For R = 10%, T = 1 year, Effective Rate = [(1.1)^1 − 1] × 100 = 10%.

Key Points for SSC GD Preparation:

- Focus Areas: Calculating simple and compound interest, finding differences between SI and CI, and solving word problems (e.g., loans, investments) are frequently tested.
- Question Types: Direct SI/CI calculations (e.g., SI for ₹1000 at 5% for 2 years), finding rate/time, difference between SI and CI, and word problems (e.g., total amount after interest).
- Difficulty Level: 10th-grade level, requiring accurate formula application and quick calculations.
- Practice Tips: Memorize SI and CI formulas, practice word problems involving loans and investments, and solve past SSC GD papers to improve speed and accuracy.
