CHAPTER TEST: COMPOUND INTEREST (HOTS)

Mathematics | Class IX | (2026/CI-HOTS/09/001)

Time: 1.5 Hours   **Max. Marks: 30**

GENERAL INSTRUCTIONS

– This paper is designed for Advanced Learners (ICSE/CBSE).

– Section A: 6 MCQs (1 mark each).

– Section B: 5 Short Answer Questions (2 marks each).

– Section C: 3 Long Answer Questions (3 marks each).

– Section D: 1 Case Study / Multi-concept Questions (5 marks each).

Section A: Multiple Choice Questions (1 Mark Each)

1. The compound interest on a certain sum for 2 years at 10% p.a. is Rs. 525. The simple interest on the same sum for double the time at half the rate percent per annum is:
   (a) Rs. 400   (b) Rs. 500   (c) Rs. 600   (d) Rs. 800

2. If the difference between C.I. and S.I. on a certain sum for 2 years at 5% p.a. is Rs. 1.50, then the sum is:
   (a) Rs. 600   (b) Rs. 500   (c) Rs. 400   (d) Rs. 300

3. A sum of money at compound interest amounts to thrice itself in 3 years. In how many years will it be 9 times itself?
   (a) 9 years   (b) 6 years   (c) 12 years   (d) 27 years

4. (Exemplar) If the interest is compounded quarterly, then the effective annual rate of interest corresponding to a nominal rate of 4% per annum is:
   (a) 4%   (b) 4.06%   (c) 4.10%   (d) 4.16%

5. A sum of Rs. 25,000 is borrowed at C.I. at the rate of 3% for 1st year, 4% for 2nd year and 5% for 3rd year. The amount to be paid after 3 years is:
   (a) Rs. 28,119   (b) Rs. 28,125   (c) Rs. 28,150   (d) Rs. 28,200

6. The population of a city increases by $r\%$ in the first year and decreases by $r\%$ in the second year. If the population at the end of the second year is P, the original population was:
   (a) $P(1 - \frac{r^2}{10000})$ (b) $\frac{P}{(1 - \frac{r^2}{10000})}$ (c) $P(1 + \frac{r^2}{10000})$ (d) $\frac{P}{(1 + \frac{r^2}{10000})}$

Section B: Short Answer Questions (2 Marks Each)

7. Find the sum which amounts to Rs. 9,261 in 3 years at 5% per annum compound interest.

8. At what rate percent per annum will a sum of Rs. 3,200 yield a compound interest of Rs. 504.40 in 9 months, interest being compounded quarterly?

9. The difference between the C.I. (compounded annually) and the S.I. on a certain sum for 3 years at 10% p.a. is Rs. 93. Find the sum.

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10. A certain sum of money amounts to Rs. 6,655 in 3 years and Rs. 7,320.50 in 4 years at compound interest. Find the rate of interest.

11. The value of a car depreciates at a certain rate for the first year and at 10% for the second year. If the total depreciation over two years is 23.5%, find the rate of depreciation for the first year.

Section C: Long Answer Questions (3 Marks Each)

12. A man lent Rs. 12,500 at 12% per annum, compounded semi-annually. Another man lent the same amount at the same rate but compounded annually. What is the difference in the interest received by them at the end of one year?

13. Divide Rs. 13,010 into two parts such that their amounts at C.I. at 4% p.a. are equal; the first part being lent for 7 years and the second for 9 years.

14. The population of a town was 1,60,000 three years ago. If it increased by 3%, 2.5% and 5% respectively in the last three years, find its present population.

Section D: Case Study / HOTS Questions (5 Marks)

Case Study:

ohan is a young entrepreneur who decided to install a high-capacity solar power plant in his village to support local farmers. To fund this eco-friendly project, he secured a capital loan of Rs. 2,00,000 from a rural development bank. The bank offered him a competitive interest rate of 10% per annum, but with a unique clause: the interest would be compounded semi-annually. While his investment in the solar panels is expected to appreciate at a steady rate of 5% every year due to rising energy demands, the specialized inverter system he purchased for Rs. 50,000 is subject to wear and tear. Consequently, the value of the inverter depreciates at a rate of 10% per annum. Rohan must now carefully calculate his future liabilities and asset values to ensure his venture remains profitable over three years.

Multiple Choice Questions

1. If Rohan calculates the interest for the first year using the successive simple interest method instead of the formula, what will be the principal amount used to calculate interest for the second six-month period?

   (a) Rs. 2,00,000
   (b) Rs. 2,10,000
   (c) Rs. 2,05,000
   (d) Rs. 2,20,500

2. Since the bank compounds the interest semi-annually, what are the effective values of the rate (r) and the number of periods (n) to be used in the standard formula for a total duration of 2 years?

   (a) $r = 10\%$, $n = 2$

   (b) $r = 5\%$, $n = 4$

   (c) $r = 20\%$, $n = 1$

   (d) $r = 2.5\%$, $n = 8$

3. What will be the estimated value of the inverter system at the end of 2 years considering its annual depreciation rate?

   (a) Rs. 40,500

   (b) Rs. 40,000

   (c) Rs. 45,000

   (d) Rs. 35,500

4. For the solar panels' appreciation, if the value at the start of a year is V, which expression correctly represents the value at the end of that year?

   (a) $V \times (0.95)$

   (b) $V + (V \times 0.5)$

   (c) $V \times (1.05)$

   (d) $V \times (1.5)$

5. Which of the following statements is mathematically true regarding Rohan's financial situation?

   (a) The Compound Interest on the loan will be less than the Simple Interest if calculated for the same period.

   (b) Compounding semi-annually results in a higher total amount compared to annual compounding.

   (c) Depreciation increases the book value of the asset over time.

   (d) The principal remains constant throughout the duration of a Compound Interest loan.