CHAPTER TEST: COMPOUND INTEREST

Mathematics | Class IX (2026/COMINT/09/002)

Time: 1.5 Hours **Max. Marks: 40**

General Instructions:

- All questions are compulsory.
- Section A contains 8 MCQs of 1 mark each.
- Section B contains 4 questions of 2 marks each.
- Section C contains 3 questions of 3 marks each.
- Section D contains 2 questions of 5 marks each.
- Use of calculators is strictly prohibited.

Section A (Multiple Choice Questions - 8 Marks)

1. If the interest is compounded half-yearly, the number of conversion periods in 2.5 years is:
   (a) 2
   (b) 4
   (c) 5
   (d) 10
2. The compound interest on Rs 1000 at 10% per annum for 2 years is:
   (a) Rs 200
   (b) Rs 210
   (c) Rs 1210
   (d) Rs 1100
3. If the principal P is compounded annually at a rate r for n years, the interest for the second year is:
   (a) $P(1 + r/100)$
   (b) $Pr/100$
   (c) $(Pr/100)(1 + r/100)$
   (d) $P(1 + r/100)^2$
4. In the first year of compound interest, if the interest is compounded annually, the CI is:
   (a) Greater than Simple Interest

(b) Equal to Simple Interest

(c) Less than Simple Interest

(d) Half of Simple Interest

5. If the rate of interest for the first year is $r_1\%$ and for the second year is $r_2\%$, the Amount A after 2 years is:

   (a) $P(1 + r_1/100) + P(1 + r_2/100)$

   (b) $P(1 + r_1/100)(1 + r_2/100)$

   (c) $P(1 + (r_1 + r_2)/100)$

   (d) $P(r_1/100)(r_2/100)$

6. The difference between CI and SI on a certain sum for 1 year at 10% per annum compounded half-yearly is Rs 25. The sum is:

   (a) Rs 10,000

   (b) Rs 5,000

   (c) Rs 2,500

   (d) Rs 1,000

7. A sum of money at compound interest doubles itself in 4 years. It will amount to eight times itself at the same rate in:

   (a) 8 years

   (b) 12 years

   (c) 16 years

   (d) 24 years

8. If interest is compounded quarterly, the effective rate for a nominal rate of 20% per annum is:

   (a) 5% per period

   (b) 10% per period

   (c) 20% per period

   (d) 2.5% per period

Section B (Very Short Answer - 8 Marks)

1. Calculate the amount and compound interest on Rs 8,000 for 1 year at 10% per annum compounded half-yearly.

2. At what rate percent per annum will a sum of Rs 4,000 yield a compound interest of Rs 410 in 2 years?

3. Find the difference between Simple Interest and Compound Interest on Rs 5,000 for 2 years at 6% per annum.

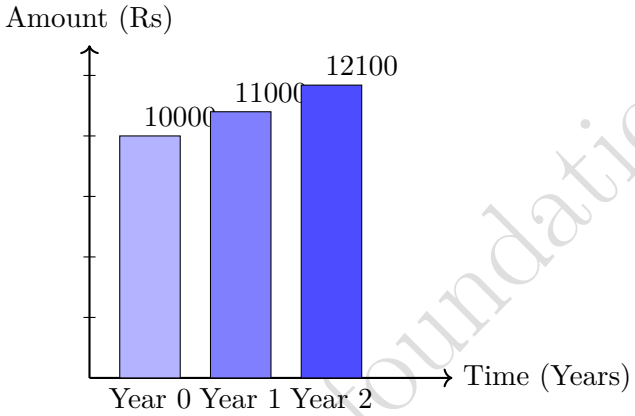
4. A man lends Rs 12,500 at 12% for the first year and 15% for the second year, compounded annually. Find the amount at the end of 2 years.

Section C (Short Answer - 9 Marks)

1. The compound interest on a certain sum of money for 2 years at 5% per annum is Rs 246. Calculate the Simple Interest on the same sum for 3 years at 6% per annum.

2. A sum of money is lent out at compound interest for two years at 10% per annum, the interest being compounded annually. If the same sum were lent out at compound interest with half-yearly compounding, the interest would be Rs 220 more. Find the sum.

3. Observe the growth of an investment over 3 years as shown in the bar chart below. If the initial principal was Rs 10,000 and it follows a fixed compound interest rate compounded annually, identify the rate of interest and calculate the projected amount for Year 4.



Section D (Long Answer - 10 Marks)

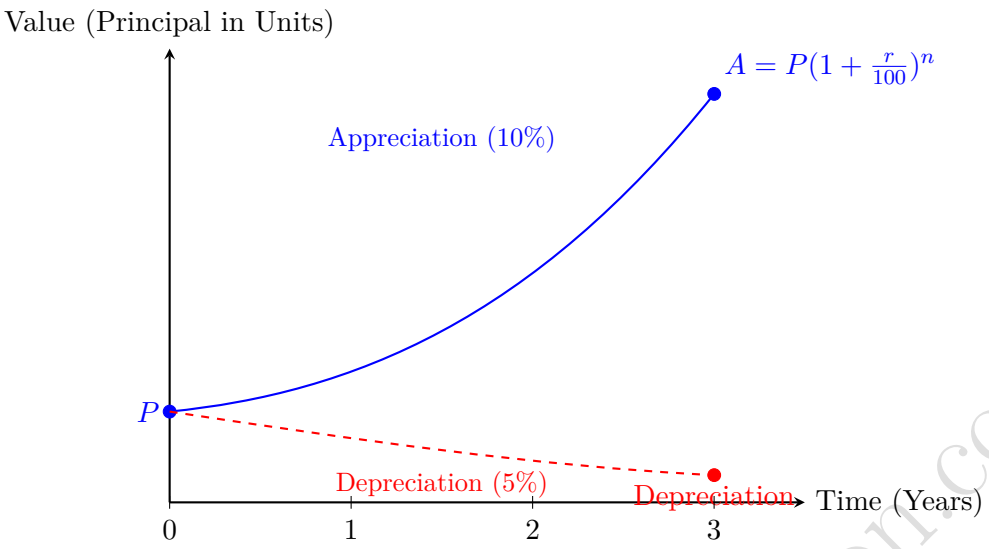
1. A man borrowed Rs 20,000 at 10% per annum compound interest, interest being compounded annually. He repaid Rs 8,000 at the end of the first year and Rs 9,000 at the end of the second year. Find the amount he must pay at the end of the third year to clear his debt.

2. The difference between Simple Interest and Compound Interest (compounded annually) on a certain sum of money for 3 years at 10% per annum is Rs 93. Find the sum. Compare this with a scenario where the interest is compounded half-yearly for the same period and state (without full calculation) whether the difference would increase or decrease.

Section E

Case Study

In the year 2024, the Green-Tech Corporation launched an ambitious environmental project aimed at restoring the local ecosystem. They initially invested a substantial principal amount of $ 500,000 into a specialized carbon-sequestration facility. Due to the high efficiency of the new technology, the value of the machinery appreciates at a steady annual rate of 10%. Simultaneously, the company established a reforestation fund that earns compound interest calculated half-yearly to maximize long-term returns for future expansions. However, the operational efficiency of older hardware faces a standard depreciation of 5% per annum, affecting the overall net asset valuation. To maintain financial stability, the treasury department must calculate the precise growth of their capital over three years. Understanding how the principal grows in successive steps is crucial for the board of directors to decide on further quarterly investment strategies.



Multiple Choice Questions

1. If the Green-Tech Corporation's reforestation fund is compounded half-yearly, what adjustment must be made to the annual rate () and the time period () in the formula ?

   A) Rate is doubled, Time is halved.

   B) Rate is halved, Time is doubled.

   C) Rate is halved, Time is quadrupled.

   D) Both Rate and Time remain unchanged.

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2. For the machinery worth \$500,000 appreciating at 10% per annum, what will be the new principal for the second year if calculated using the successive simple interest method?

   A) \$510,000

   B) \$550,000

   C) \$605,000

   D) \$505,000

3. Which of the following equations correctly represents the value of the hardware after n years, considering a depreciation rate of 5%?

   A) $A = P(1 + \frac{5}{100})^n$

   B) $A = P(1 - \frac{5}{200})^{2n}$

   C) $A = P(1 - \frac{5}{100})^n$

   D) $A = P(1 + \frac{5}{100})^{-n}$

4. If the corporation decides to switch to quarterly compounding for their fund, how many conversion periods will occur in a total duration of 3 years?

   A) 6 periods

   B) 4 periods

   C) 12 periods

D) 3 periods

5. Comparing Simple Interest (S.I.) and Compound Interest (C.I.) on the same initial investment of \$500,000 at 10% per annum, which statement is true after the first year (assuming annual compounding)?

   A) C.I. is greater than S.I.

   B) S.I. is greater than C.I.

   C) C.I. and S.I. are exactly equal.

   D) The relationship depends on the total number of years.

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