

# CHAPTER TEST: COMPOUND INTEREST

Mathematics | Class IX (2026/COMINT/09/001)

Time: 1.5 Hours

Max. Marks: 40

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## 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 years is:
  - (a) 2
  - (b) 4
  - (c) 1
  - (d) 8
2. The compound interest on Rs 1000 at 10% per annum for 2 years, compounded annually, is:
  - (a) Rs 200
  - (b) Rs 210
  - (c) Rs 1210
  - (d) Rs 100
3. If the rate of interest is  $r\%$  per annum compounded half-yearly, then the rate used in the formula is:
  - (a)  $r$
  - (b)  $2r$
  - (c)  $r/2$
  - (d)  $r/4$
4. The difference between Compound Interest and Simple Interest on a certain sum for 1 year at 10% per annum, interest compounded annually, is:
  - (a) Rs 10

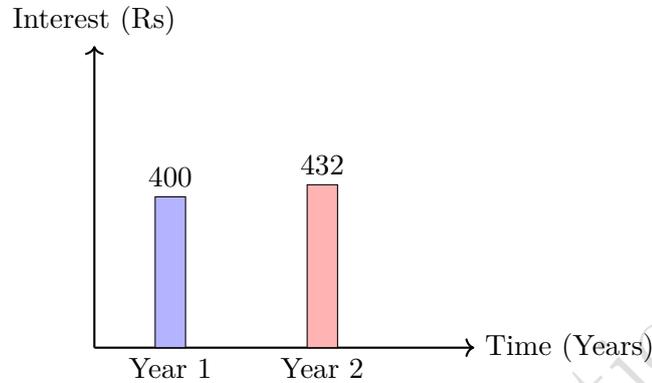
- (b) Rs 1  
(c) Rs 0  
(d) Rs 100
5. The sum of money which amounts to Rs 2420 in 2 years at 10% per annum compound interest is:
- (a) Rs 2000  
(b) Rs 1000  
(c) Rs 2100  
(d) Rs 2200
6. In the formula  $A = P(1 + \frac{r}{100})^n$ , the variable  $n$  represents:
- (a) Number of years only  
(b) Number of conversion periods  
(c) Rate of interest  
(d) Simple Interest
7. If the interest is compounded quarterly, the rate per annum is divided by:
- (a) 2  
(b) 3  
(c) 4  
(d) 12
8. Compound Interest is always \_\_\_\_\_ Simple Interest for a period greater than one year at the same rate and principal.
- (a) Less than  
(b) Equal to  
(c) Greater than  
(d) Half of

**Section B: Very Short Answer Questions (8 Marks)**

1. Calculate the amount on Rs 8000 for 1 year at 5% per annum, interest being compounded half-yearly.
2. A man borrows Rs 5000 at 10% per annum compound interest. Find the amount he has to pay at the end of the second year.
3. Find the Compound Interest on Rs 12000 for 1.5 years at 10% per annum, compounded annually.
4. If the difference between SI and CI on a certain sum for 2 years at 5% p.a. is Rs 25, find the sum.

### Section C: Short Answer Questions (9 Marks)

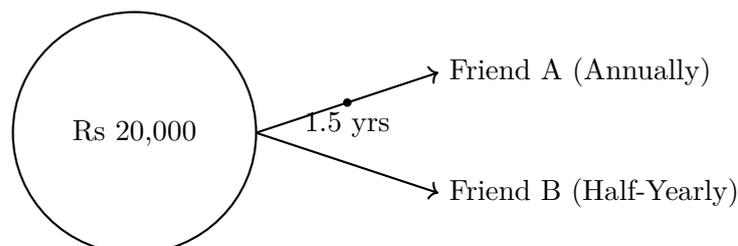
1. The following diagram illustrates the growth of a principal  $P$  over 2 years. If the interest for the first year is Rs 400 and for the second year is Rs 432, calculate the rate of interest and the original principal.



2. At what rate percent per annum will a sum of Rs 4000 yield a compound interest of Rs 410 in 2 years?
3. A sum of money is lent out at compound interest for two years at 10% p.a. and 12% p.a. respectively. If the amount at the end of the second year is Rs 6160, find the sum.

### Section D: Long Answer Questions (10 Marks)

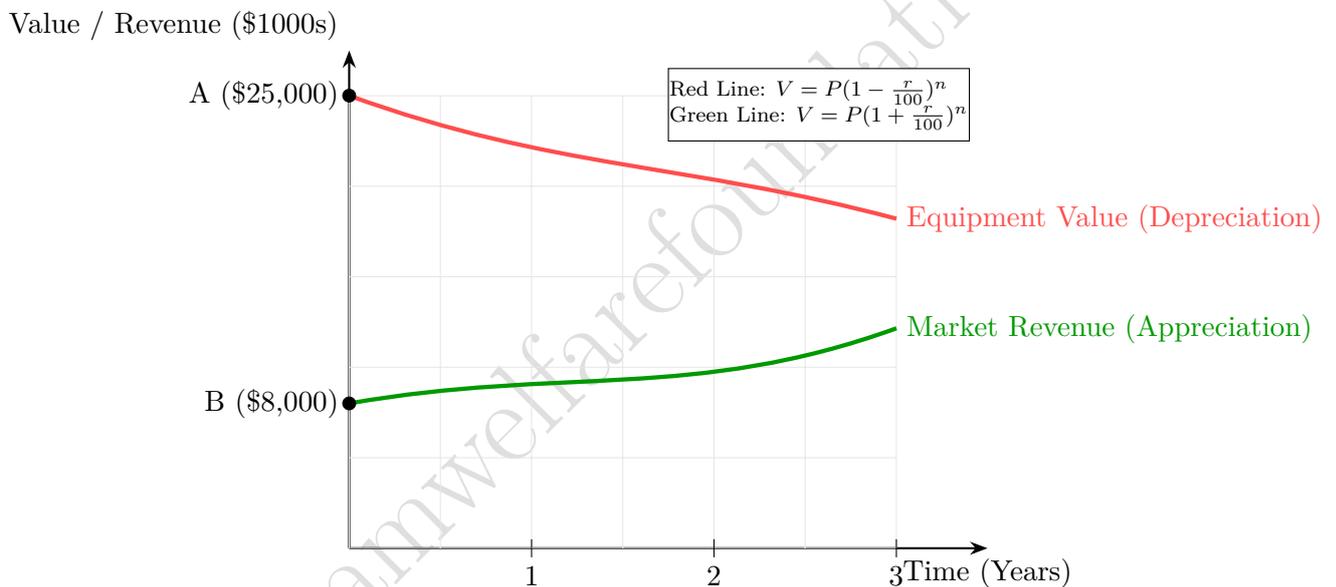
1. A person invests Rs 10000 for 2 years at a certain rate of interest compounded annually. At the end of one year, the sum amounts to Rs 11000. Calculate:
  - (a) The rate of interest per annum.
  - (b) The amount at the end of the second year.
  - (c) The total interest earned over 2 years.
  - (d) The difference between this CI and the SI for the same period.
2. Two friends, A and B, invested Rs 20000 each for 1.5 years at 12% per annum. A's interest is compounded annually while B's interest is compounded half-yearly. Using the growth comparison diagram below as a reference, determine who receives more interest and by how much.



## Section E

### Case Study:

Aarav's family recently invested in a high-tech organic greenhouse project to enhance local crop yields. They started with an initial capital of \$25,000 to purchase specialized hydroponic equipment. According to market trends, the value of this hardware depreciates annually at a fixed rate due to technological wear. Simultaneously, the organic produce market is growing rapidly. Aarav calculates that their annual revenue of \$8,000 will appreciate as more consumers switch to organic food. To fund future expansion, the family deposited a portion of their profits into a recurring investment fund offering interest compounded half-yearly. By analyzing these financial shifts, Aarav applies his knowledge of compound interest to predict the greenhouse's valuation over the next three years. This mathematical modeling helps the family determine when the appreciation of their profits will eventually surpass the depreciation of their machinery.



### Questions

- Q1.** If the hydroponic equipment depreciates at a rate of 10% per annum, which mathematical expression correctly represents its value ( $V$ ) after  $n$  years?
- (a)  $V = 25000 \times (1.10)^n$
  - (b)  $V = 25000 \times (0.90)^n$
  - (c)  $V = 25000 \times (1 - 10n)$
  - (d)  $V = 25000 + \left(1 - \frac{10}{100}\right)^n$
- Q2.** To calculate the Compound Interest manually for the first two years without the direct formula, what is the correct sequence of steps?
- (a) Calculate S.I. for 2 years and add it to the original Principal.
  - (b) Calculate S.I. for Year 1, add it to the Principal to get the new Principal, then calculate S.I. for Year 2.
  - (c) Multiply the Principal by the Rate and the square of Time.

- (d) Subtract the Depreciation value from the Appreciation value and divide by two.
- Q3.** If the family's investment fund offers an interest rate of  $r\%$  compounded half-yearly, how many conversion periods and what effective interest rate per period should be used for a 3-year term?
- (a)  $n = 3$ , rate =  $r$
  - (b)  $n = 12$ , rate =  $r/4$
  - (c)  $n = 6$ , rate =  $r/2$
  - (d)  $n = 3$ , rate =  $r/2$
- Q4.** In the context of the case study, what does the term "Principal" represent when calculating the appreciation of the organic produce revenue for the second year?
- (a) The initial \$8,000 revenue.
  - (b) The total profit after three years.
  - (c) The revenue at the end of the first year including its growth.
  - (d) The difference between equipment cost and market sales.
- Q5.** If the annual appreciation rate of revenue is 15%, but the compounding is changed from annual to quarterly, how will the final amount ( $A$ ) at the end of the year be affected?
- (a) The amount  $A$  will decrease because the time is split.
  - (b) The amount  $A$  will remain exactly the same.
  - (c) The amount  $A$  will increase because interest is calculated more frequently on interest.
  - (d) The amount  $A$  will become four times the original principal.