

SOLUTIONS

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DETAILED SOLUTIONS: COMPOUND INTEREST

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

Section A: Multiple Choice Questions

1. (b) 4. Compounded half-yearly for 2 years: $n = 2 \times 2 = 4$.
2. (b) **Rs 210**. $A = 1000(1 + 0.10)^2 = 1210$. $CI = 1210 - 1000 = 210$.
3. (c) $r/2$. Half-yearly rate is the annual rate divided by 2.
4. (c) **Rs 0**. For the first year, $SI = CI$.
5. (a) **Rs 2000**. $2420 = P(1.1)^2 \implies P = 2420/1.21 = 2000$.
6. (b) **Number of conversion periods**.
7. (c) 4. Quarterly compounding divides the year into 4 parts.
8. (c) **Greater than**. Interest on interest increases the total.

Section B: Very Short Answer Questions

1. $P = 8000, r = 2.5\%(5/2), n = 2$. $A = 8000(1 + 0.025)^2 = 8000(1.025)^2 = \mathbf{Rs\ 8405}$.
2. $A = 5000(1.1)^2 = 5000 \times 1.21 = \mathbf{Rs\ 6050}$.
3. $A = 12000(1.1)^{1.5}$ is not standard for Class 9; using step-method: Year 1 Int: 1200. New $P = 13200$. Year 0.5 Int: $\frac{13200 \times 10 \times 0.5}{100} = 660$. Total $CI = 1200 + 660 = \mathbf{Rs\ 1860}$.
4. $CI - SI = P(r/100)^2 \implies 25 = P(5/100)^2 \implies 25 = P/400 \implies P = \mathbf{Rs\ 10000}$.

Section C: Short Answer Questions

1. Interest on 1st year's interest = $432 - 400 = 32$. Rate = $(32/400) \times 100 = \mathbf{8\%}$.
Since $400 = (P \times 8 \times 1)/100 \implies P = \mathbf{Rs\ 5000}$.
2. $4410 = 4000(1 + r/100)^2 \implies 1.1025 = (1 + r/100)^2 \implies 1.05 = 1 + r/100 \implies \mathbf{r = 5\%}$.
3. $6160 = P(1.10)(1.12) \implies 6160 = P(1.232) \implies P = 6160/1.232 = \mathbf{Rs\ 5000}$.

Section D: Long Answer Questions

1. (a) $11000 = 10000(1 + r/100) \implies \mathbf{r = 10\%}$.
(b) $A_2 = 11000(1.1) = \mathbf{Rs\ 12100}$.
(c) $Total\ CI = 12100 - 10000 = \mathbf{Rs\ 2100}$.
(d) $SI = (10000 \times 10 \times 2)/100 = 2000$. $Diff = 2100 - 2000 = \mathbf{Rs\ 100}$.
2. **A**: $A = 20000(1.12)^1 + SI$ for 0.5 yr on 22400. $Int = 2400 + 1344 = 3744$.
B: $r = 6\%, n = 3$. $A = 20000(1.06)^3 = 20000 \times 1.191016 = 23820.32$. $Int = 3820.32$.
B receives more by $3820.32 - 3744 = \mathbf{Rs\ 76.32}$.

Case Study Solutions

1. (b) $V = 25000 \times (0.90)^n$. (Standard depreciation formula).
2. (b) Standard "step-by-step" method where interest becomes principal.
3. (c) $n = 3 \times 2 = 6$ periods, Rate = $r/2$.
4. (c) Revenue at end of Year 1 becomes the base for Year 2 growth.
5. (c) More frequent compounding increases total interest.

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