CUET Mathematics Test

Unit VII: Financial Mathematics (Intermediate to Advanced)

SOLUTIONS

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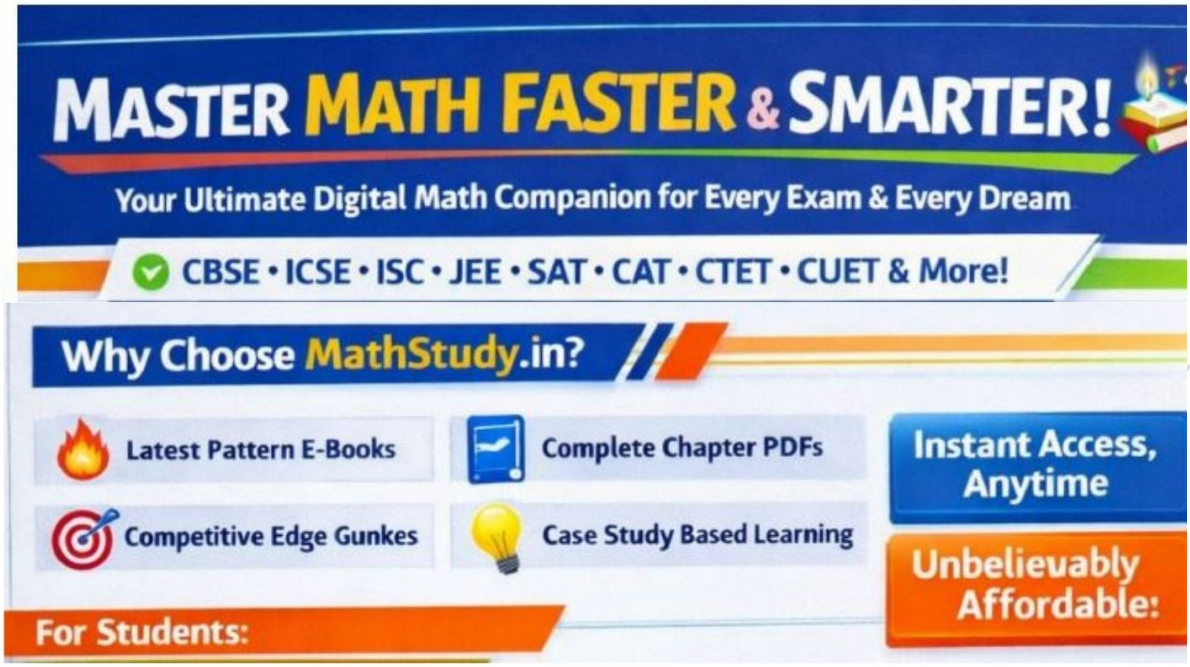

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Solutions

1. **Solution:** $PV = R/i = 10,000/0.08 = 1,25,000$. **Correct Option: (B)**

2. **Solution:** Periodic rate $i = 0.10/2 = 0.05$. $PV = 500/0.05 = 10,000$. **Correct Option: (B)**

3. **Solution:** $R = A \times [i/((1+i)^n - 1)] = 2,00,000 \times [0.12/(1.5735 - 1)] = 2,00,000 \times 0.20887 = 41,775$. Approximated to nearest option: **Correct Option: (A)**

4. **Solution:** The formula $PV = R/(i - g)$ results in a zero denominator when $i = g$, leading to an infinite value mathematically as the sum of a constant/growing series never converges. **Correct Option: (A)**

5. **Solution:** Annual Depreciation $D = (1,50,000 - 30,000)/10 = 12,000$. Book Value after 4 years $= 1,50,000 - (12,000 \times 4) = 1,02,000$. **Correct Option: (A)**

6. **Solution:** $CAGR = (3/1)^{1/5} - 1 = 1.2457 - 1 = 0.2457$ or 24.57%. **Correct Option: (B)**

7. **Solution:** Interest for 1st month $= Principal \times (rate/12) = 5,00,000 \times (0.09/12) = 5,00,000 \times 0.0075 = 3,750$. **Correct Option: (A)**

8. **Solution:** The Linear (Straight-line) method assumes a constant depreciation amount every year. **Correct Option: (C)**

9. **Solution:** $PV(\text{due}) = R + R/i = 1,200 + 1,200/0.06 = 1,200 + 20,000 = 21,200$. **Correct Option: (B)**

10. **Solution:** Growth factor $= (1 + 0.10)^3 = 1.331$. Total percentage increase $= 1.331 - 1 = 0.331$ or 33.1%. **Correct Option: (B)**

11. **Solution:** This is the standard formula to find the periodic payment for a sinking fund (ordinary annuity). **Correct Option: (A)**

12. **Solution:** In the reducing balance method, as the outstanding principal decreases, the interest component decreases; therefore, the principal component of the EMI must increase to keep the EMI constant. **Correct Option: (C)**

13. **Solution:** This is the conceptual definition of IRR. **Correct Option: (B)**

14. **Solution:** $2,00,000 = 10,000/i \implies i = 10,000/2,00,000 = 0.05$ or 5%. **Correct Option: (B)**

15. **Solution:** $n = (C - S)/D = (50,000 - 2,000)/4,000 = 48,000/4,000 = 12$. **Correct Option: (A)**