

CUET (UG) – MATHEMATICS

Chapter Test - Section B2: Applied Mathematics -Unit VII: Financial Mathematics

SOLUTIONS

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Solutions

- Correct Option: (A).** $PV = R/i = 1200/0.08 = 15000$.
- Correct Option: (A).** A sinking fund is an account used to set aside funds for a specific future debt or asset replacement.
- Correct Option: (B).** $CAGR = [(V_f/V_i)^{1/n} - 1]$. $(13310/10000)^{1/3} - 1 = (1.331)^{1/3} - 1 = 1.1 - 1 = 0.10$ or 10%.
- Correct Option: (C).** Annual Dep. = $(50000 - 5000)/10 = 45000/10 = 4500$.
- Correct Option: (B).** Growing Perpetuity $PV = R/(i - g) = 500/(0.10 - 0.05) = 500/0.05 = 10000$.
- Correct Option: (D).** EMI calculation requires the principal amount, interest rate per period, and total number of periods.
- Correct Option: (B).** Annual Dep. = $100000 \times 0.10 = 10000$. Total dep. for 6 years = 60000. Book Value = $100000 - 60000 = 40000$.
- Correct Option: (B).** For an ordinary perpetuity, PV is simply the payment divided by the interest rate.
- Correct Option: (C).** Fisher equation (approx): Real Rate \approx Nominal Rate - Inflation = $12\% - 4\% = 8\%$.
- Correct Option: (A).** $A = S \times \frac{i}{(1+i)^n - 1} = 500000 \times \frac{0.10}{1.61051 - 1} = 50000/0.61051 \approx 81898.70$.
- Correct Option: (B).** It accounts for compounding within the year, providing the actual annualized yield.
- Correct Option: (B).** CAGR represents the geometric mean growth rate over a specified period.
- Correct Option: (A).** $EMI = \frac{P \cdot i \cdot (1+i)^n}{(1+i)^n - 1} = \frac{100000 \cdot 0.01 \cdot 1.1268}{1.1268 - 1} = \frac{1126.8}{0.1268} \approx 8886.4 \approx 8884.80$.
- Correct Option: (A).** The rate is the annual depreciation amount expressed as a percentage of the initial cost.
- Correct Option: (B).** Perpetuity due means the first payment is made immediately at the start of the first period.
- Correct Option: (B).** Return = $[(25000 - 20000) + 1000]/20000 = 6000/20000 = 0.30$ or 30%.
- Correct Option: (A).** This is the standard future value of an ordinary annuity formula.
- Correct Option: (B).** Amortization is the process of spreading out the cost of an intangible asset over its useful life.
- Correct Option: (C).** Since the principal decreases with each payment, the interest portion of the EMI decreases while the principal portion increases.
- Correct Option: (A).** $i = 0.12/12 = 0.01$. $PV = 1000/0.01 = 100000$.