CUET (UG) – MATHEMATICS

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

General Instructions

1. Total Questions: **20**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

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1. The present value of a perpetuity of 1200 payable at the end of each year, if the rate of interest is 8% per annum, is:
   (A) 15000
   (B) 12000
   (C) 9600
   (D) 18000

2. A sinking fund is a fund created for:
   (A) Paying off a liability at a future date
   (B) Daily business transactions
   (C) Immediate consumption
   (D) Reducing tax liability only

3. An investment of 10000 grows to 13310 in 3 years. The Compound Annual Growth Rate (CAGR) is:
   (A) 8%
   (B) 10%
   (C) 11%
   (D) 12%

4. Under the linear method of depreciation, if the cost of a machine is 50000, scrap value is 5000, and useful life is 10 years, the annual depreciation is:
   (A) 5000
   (B) 4000
   (C) 4500
   (D) 5500

5. The present value of a growing perpetuity with an initial payment of 500, interest rate of 10% and growth rate of 5% is:
   (A) 5000
   (B) 10000
   (C) 7500
   (D) 15000

6. Equated Monthly Installment (EMI) is calculated using which of the following components?
   (A) Principal and interest only
   (B) Principal only
   (C) Interest only
   (D) Principal, rate of interest, and tenure

7. A machine costs 100000. If the annual depreciation is 10% under the linear method, what will be its book value after 6 years?
   (A) 60000
   (B) 40000
   (C) 50000
   (D) 30000

8. The formula for the present value of an ordinary perpetuity is:
   (A) $PV = R \times i$
   (B) $PV = R/i$
   (C) $PV = R(1 + i)$
   (D) $PV = i/R$

9. If the nominal rate of return is 12% and the inflation rate is 4%, the approximate real rate of return is:

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(A) 16%
(B) 3%
(C) 8%
(D) 48%

10. A person wants to accumulate 500000 in 5 years. If the interest rate is 10% compounded annually, the periodic payment to the sinking fund at the end of each year is (Given $(1.1)^5 = 1.61051$):
(A) 81898.70
(B) 100000
(C) 92540.30
(D) 75000.50

11. Effective rate of return is also known as:
(A) Nominal rate
(B) Annualized yield
(C) Simple interest
(D) Scrap value

12. In CAGR calculation, if the final value is V_f, initial value is V_i, and time is t years, the formula is:
(A) $[(V_f/V_i)^t - 1] \times 100$
(B) $[(V_f/V_i)^{1/t} - 1] \times 100$
(C) $[(V_i/V_f)^{1/t} - 1] \times 100$
(D) $(V_f - V_i)/t$

13. For a loan of 100000 at 1% per month interest for 12 months, the EMI is (Given $(1.01)^{12} = 1.1268$):
(A) 8884.80
(B) 8333.33
(C) 9500.20
(D) 8000.00

14. In the linear method of depreciation, the rate of depreciation is calculated as:
(A) (Annual Depreciation/Cost) $\times$ 100
(B) (Cost/Annual Depreciation) $\times$ 100
(C) (Scrap Value/Cost) $\times$ 100
(D) (Cost/Life) $\times$ 100

15. A perpetuity that starts immediately (at $t = 0$) is called:
(A) Ordinary perpetuity
(B) Perpetuity due
(C) Growing perpetuity
(D) Sinking fund

16. An asset was purchased for 20000 and sold for 25000 after 1 year. During the year, it generated an income of 1000. The total rate of return is:
(A) 25%
(B) 30%
(C) 20%
(D) 5%

17. If the periodic payment of a sinking fund is A, the future value S after n periods at rate i per period is:

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(A) $S = A \times \frac{(1+i)^n - 1}{i}$
(B) $S = A \times \frac{1-(1+i)^{-n}}{i}$
(C) $S = A/i$
(D) $S = A \times i \times n$

18. The reduction in the value of intangible assets like patents is called:
(A) Depreciation
(B) Amortization
(C) Depletion
(D) CAGR

19. What happens to the interest component in an EMI over the tenure of the loan?
(A) It remains constant
(B) It increases
(C) It decreases
(D) It fluctuates randomly

20. The present value of a perpetuity of 1000 per month at 12% per annum compounded monthly is:
(A) 100000
(B) 10000
(C) 120000
(D) 83333

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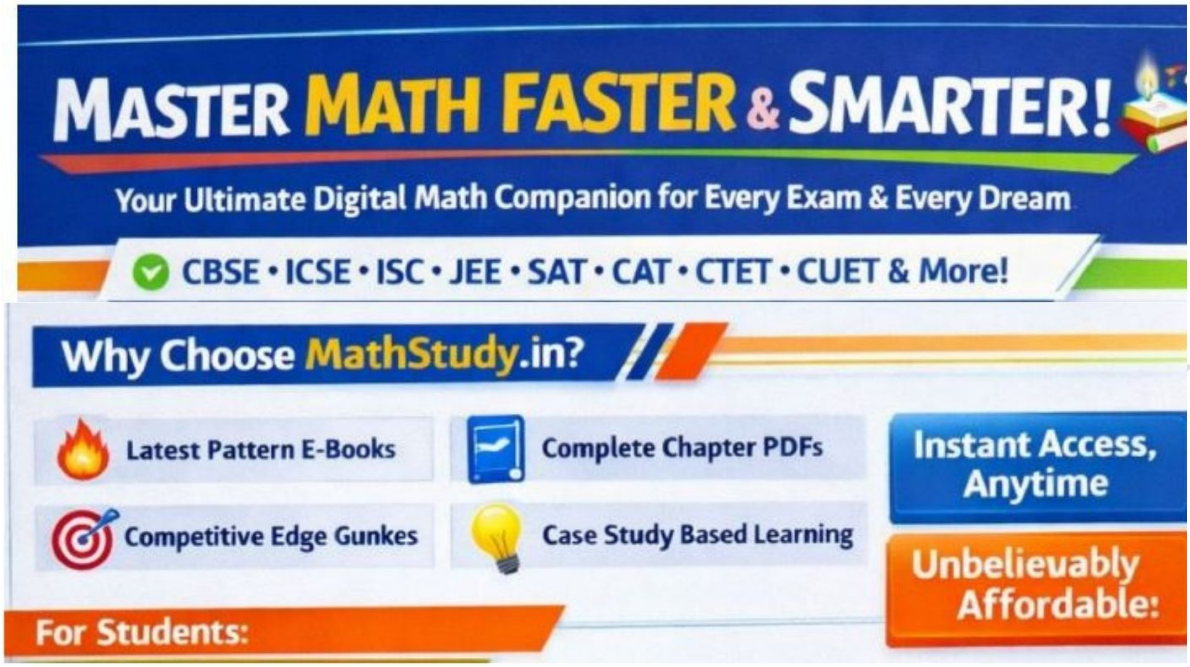

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