

# CUET Mathematics Test

## Chapter: 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. A person wants to receive a fixed amount of 1500 at the end of every year forever. If the rate of interest is 6% per annum, the present value of this perpetuity is:
  - (A) 20000
  - (B) 25000
  - (C) 15000
  - (D) 30000
2. An investor invests in a growing perpetuity that pays 1000 at the end of the first year. The payments grow at a constant rate of 4% per year. If the discount rate is 9%, the present value is:
  - (A) 20000
  - (B) 25000
  - (C) 11111.11
  - (D) 10000
3. A company sets up a sinking fund to accumulate 500000 for replacing machinery in 5 years. If the fund earns interest at 10% per annum compounded annually, the annual payment required is: (Given  $(1.1)^5 = 1.61051$ )
  - (A) 81898.74
  - (B) 100000
  - (C) 75000
  - (D) 85000.50
4. Which of the following formulas is used to calculate the present value of a perpetuity due (payment made at the beginning of each period)?
  - (A)  $R/i$
  - (B)  $R + R/i$
  - (C)  $R/(i - g)$
  - (D)  $R(1 + i)/i^2$
5. A machine costs 80000 and has a scrap value of 10000 at the end of 7 years. Using the linear method of depreciation, the annual depreciation charge is:
  - (A) 11428.57
  - (B) 10000
  - (C) 8000
  - (D) 70000
6. The compound annual growth rate (CAGR) of an investment that grows from 100 to 144 in 2 years is:
  - (A) 20%
  - (B) 22%
  - (C) 44%
  - (D) 12%
7. If a loan of 200000 is to be repaid in 60 equal monthly installments at an interest rate of 12% per annum compounded monthly, the value of  $i$  used in the EMI formula is:
  - (A) 0.12
  - (B) 0.01
  - (C) 0.06
  - (D) 1.12
8. Under the linear method of depreciation, the book value of an asset at the end of  $t$  years is given by:
  - (A)  $C(1 - rt)$

- (B)  $C - Dt$   
 (C)  $C/(1 + i)^t$   
 (D)  $S + Dt$
9. The effective rate of return on an investment is 15.5%. If the inflation rate is 5%, the real rate of return is approximately:  
 (A) 20.5%  
 (B) 10.5%  
 (C) 10%  
 (D) 7.5%
10. A sinking fund is created to redeem debentures worth 100000. If the annual payment is 18000 and the fund grows to 100000 in 5 years, the total interest earned by the fund is:  
 (A) 10000  
 (B) 80000  
 (C) 90000  
 (D) 100000
11. The present value of a perpetuity of 500 payable at the end of every quarter at 8% per annum compounded quarterly is:  
 (A) 6250  
 (B) 25000  
 (C) 12500  
 (D) 50000
12. For an EMI calculation using the Reducing Balance Method, if  $P$  is the principal,  $i$  is the periodic interest rate and  $n$  is the number of periods, the EMI is:  
 (A)  $P \times i \times \frac{(1+i)^n}{(1+i)^n - 1}$   
 (B)  $\frac{P \times i \times n}{100}$   
 (C)  $P \times \frac{1}{(1+i)^n}$   
 (D)  $\frac{P(1+i)^n}{n}$
13. An asset was purchased for 50000. Its useful life is 10 years and annual depreciation is 4500. The scrap value is:  
 (A) 5000  
 (B) 4500  
 (C) 1000  
 (D) 500
14. An investment of 10000 amounts to 13310 in 3 years. The CAGR is:  
 (A) 10%  
 (B) 11%  
 (C) 33.1%  
 (D) 3.31%
15. In a sinking fund, the payments are usually made at the:  
 (A) End of each period  
 (B) Beginning of each period  
 (C) End of the total tenure only  
 (D) Random intervals
16. The value of a perpetuity that pays 600 every 6 months at an interest rate of 10% per annum compounded semi-annually is:  
 (A) 6000

- (B) 12000  
(C) 6600  
(D) 10000
17. If the EMI for a loan is 5000 and the interest component in the first month is 1200, the principal repayment in the first month is:  
(A) 6200  
(B) 3800  
(C) 5000  
(D) 1200
18. Which of the following increases the CAGR of an investment?  
(A) Increasing the final value  
(B) Increasing the initial investment  
(C) Increasing the time period for the same growth  
(D) Decreasing the frequency of compounding
19. A machine depreciates at a constant amount of 2500 per year. If it was bought for 30000 and its scrap value is 5000, what is its useful life?  
(A) 10 years  
(B) 12 years  
(C) 8 years  
(D) 15 years
20. A person wants to create an endowment fund for a prize of 2000 every year. If the fund earns 5% per annum, how much should be invested now?  
(A) 40000  
(B) 20000  
(C) 100000  
(D) 50000

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