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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
MID TERM EXAMINATION - NOV 2023**

**Semester :** Semester V - 2021

**Course Code :** CIV3038

**Course Name :** Sem V - CIV3038 - Construction Economics and Finance

**Program :** B. TECH

**Date :** 3-NOV-2023

**Time :** 11:30AM - 1:00PM

**Max Marks :** 50

**Weightage :** 25%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

**PART A**

**ANSWER ALL THE QUESTIONS**

**(2 X 5 = 10M)**

1. Define Arithmetic Gradient and Geometric gradient with the help of an example?  
(CO1) [Knowledge]
2. What is the balance in an account at the end of 10 years if ₹2500 is deposited today and the account earns 4% interest, compounded quarterly and semi- annually?  
(CO2) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(2 X 10 = 20M)**

3. A rate of return(RoR) is a net gain or loss of an investment over a specified time period. RoR can be differentiated as Nominal RoR and Real RoR. In the above context, solve the numericals:
  - (i) Mr. Narang has kept \$300,000 in a bank. The bank promises to pay 6% rate of return at the end of the year. The inflation rate is 3% during the year. Determine the real rate of return.
  - (ii) If you have purchased 100 shares that cost \$20 each. After exactly one year, the share price of each stock is \$25. Assuming there are no dividends and trading costs, what is the nominal rate of return?  
(CO1) [Comprehension]
4. The cash flow associated with a strip mining maintenance operation is expected to be \$10000 in year 1, \$10,500 in year 2, and amounts increasing by \$500 through year 10. At an interest rate of 8% per year, determine the present worth and annual equivalent of the equipment  
(CO2) [Comprehension]

**PART C**

**ANSWER ALL THE QUESTIONS**

**(1 X 20 = 20M)**

5. An excavator fitted with 200hp motor used in lifting and digging operation has a purchase price of \$300000. The estimated salvage value for the equipment is \$30000 after its expected useful life of 5years. The interests assumed for Borrowing money is 9%, Risk is 5% and Tax, insurance and storage is 3%. During its operating cycle of 30 sec, the engine is operated at full power while filling the bucket in tough ground, requiring 6sec. During the balance of the cycle, the engine is operated at 50% of its rated power and the shovel is operated only for 45 min per hour. The capacity of crankcase is 7 gallons and the oil has to be changed every 150 hours. Assuming that the engine consumes diesel fuel of approximately 0.04 gallons for each hp developed, determine
- (i) MARR value
  - (ii) Annual Ownership cost,
  - (iii) Operating cost of the fuel and
  - (iv) Operating Cost of lubricating oil

(CO2) [Application]