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PRESIDENCY UNIVERSITY

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Bengaluru

Mid Term Examinations - October 2026

Date: 05/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: CIV3038 **Course Name:** Construction Economics and Finance

Semester: Seventh Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	56	34

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	$F = P(1+r)^n$ $2007 = 1500(1+i)^5$ $= 0.06 = 6$percent	2	CO1	BT2
2	1) Lubricants and Oil 2)Maintenance and Repair 3)Wear and High wear items 4)Labour 5)Utility	2	CO2	BT2
3	**Salvage Value** (also known as residual value, scrap value, or disposal value) is the estimated resale or trade-in value of an asset at the end of its useful economic life. It represents the net amount an owner expects to recover from selling, scrapping, or recycling the asset after it is fully depreciated and removed from service. Sinking fund : (A/F, i , n) $= i/(1+1)^n - 1$	2	CO2	BT2
4	A **geometric gradient** is a series of cash flows (such as payments, receipts, or maintenance costs) that increases or decreases by a **constant percentage rate** in each consecutive compounding period. $P_g = A_1\left[\frac{1-(1+g)^n(1+i)^{-n}}{i-g}\right] = \frac{A_1}{i-g}\left[1-\left(\frac{1+g}{1+i}\right)^n\right]$	2	CO1	BT1
5	Nominal Rate of Return = (Present market value- Original Investment value)/Original Investment value 33.33 percent	2	CO1	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT

ANSWER KEY

PTO (Please Turn Over)

6	• **Cost–Benefit Analysis** Compares the expected costs and benefits of different alternatives to determine their economic feasibility. • **Break-Even Analysis** Determines the level of output or sales at which total cost equals total revenue. It helps managers assess the impact of changes in cost, price, and production volume. • **Decision Tree Analysis** Represents different alternatives, possible outcomes, and associated probabilities in a tree-like structure. It is useful when decisions involve uncertainty and risk. • **Linear Programming** Uses mathematical models to determine the optimum allocation of limited resources such as labour, materials, time, and money. • **Inventory Models** Help determine optimum inventory levels, order quantities, and reorder points while minimizing ordering and holding costs. • **Simulation** Uses a model of a real-world system to study the possible outcomes of different decisions without directly experimenting with the actual system. • **Forecasting Techniques** Statistical methods such as moving averages, regression, and trend analysis are used to predict future demand, costs, sales, and other business variables. **Cost–Volume–Profit (CVP) Analysis** Examines the relationship among costs, sales volume, selling price, and profit to support decisions regarding production and pricing.	10	CO1	BT2
7	Equipment A: (A/P, 10%,5) = 0.2638 (A/F, 10%, 5) = 0.1638 AW = -50000(0.2638) +10000(0.1638)-30000 = -Rs. 41,552/- Equipment B: (A/P, 10%,7) = 0.2054 (A/F, 10%, 7) = 0.1054 AW = -60000(0.2054) +12000(0.1054)-20000 = -Rs. 31059/- Equipment B should be collected.	10	CO1	BT3

PART C: Answer Any 1 Following Questions. 15 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
8	MARR = 8+4+3 = 15% **Capital Recovery factor:** (A/P, 15%,5) = 0.298 Annual Ownership cost = Rs. 85, 785 per year **Operating Cost Rate of Fuel:** Engine Load factor: 7/12 Time Efficiency Factor= 3/4 Overall Engine duty factor = 0.4375 Average power developed = 200 X 0.4375 = 87.5hp Operatiing cost rate of Lubricating oil = Crankcase capacity/ Oil change interval; = 0.0467 gallons	15	CO2	BT3

ANSWER KEY

9	**1. Hourly Ownership cost :** Annual depreciation= (500000-50000)/10 = 45000 Average investment = 297500 Average interest cost =297500X10% = 29750 Total Annual Ownership Cost: Annual depreciation +annual interest 45000+29750 = Rs. 74750 Hourly ownership cost : Total annnual ownership cost /Annual operating cost = 74750/2500 = Rs.29.90 per hour **2. Calculation of Hourly Maintenance Cost:** Annual Mintenance cost = 0.08 X500000 = Rs. 40000 Hourly Maintenence cost = Annual maintenance cost /Annual operating hours = 40000/2500 =Rs. 16 per hour	15	CO2	BT3

PARTD: Answer Any 1 Following Questions. 15 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
10	$$P_{\text{total}} = A_1(P/A, i, n) \pm G(P/G, i, n)$$ $$P_G = G\left[\frac{(1+i)^n - in - 1}{i^2(1+i)^n}\right] = G(P/G, i, n)$$ U niform series present worth Factor: (P/A,12%,8) = 4.9676 Gradient presnt worth factor = (P/G, 12%, 8) = 14.47 Total Present worth = 6000(4.9676)+ 800(14.47) = Rs.41382.72 **Equivalent Annual Cost calculation :** (A/G, 12%, 8) = 2.9131 Equivalent Annual Gradient = 800 X2.9131 = Rs. 2330.48 **total Equilant Annual Cost :** Atotal **= 6000+2330.48 = Rs. 8330.48**	15	CO1	BT3
11	Present Worth of Operating & Maintenance: $= 30000/(1.10)^2 + 35000/(1.10)^3 + 40000/(1.10)^4 + 100000/(1.10)^5$ = 140502.08 **Total Present Worth of Machine :** PW Total= 500000+140502.08 = Rs. 640502 **Equivalent Uniform Annual Cost:** (A/P, 10%, 5) = 0.26380 PW X (A/P, 10%, 5) =140502.08 X 0.26380 = Rs. 37064/- **Total Equivalent Uniform Annual Cost:** EW = PW Total X (A/P, 10%, 5) =640502 X 0.26380 = Rs. 168962	15	CO1	BT3

ANSWER KEY