CLASS: BTECH/BARCH   SEMESTER: IV
BRANCH: CIVIL/CHEMICAL/CSE/EEE/ECE/IT/MECH/BARCH   SESSION: SP/2023

SUBJECT: PE211 ENGINEERING ECONOMY

TIME: 02 Hours   FULL MARKS: 25

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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Q.1(a)	During a recession, the price of goods and services goes down because of low demand. A company that makes Ethernet adapters is planning to expand its production facility at a cost of $1,000,000 one year from now. However, a contractor who needs work has offered to do the job for $790,000 if the company will do the expansion now instead of 1 year from now. If the interest rate is 15% per year, how much of a discount is the company getting?	[2]	1	3
Q.1(b)	A manufacturer of off-road vehicles is considering the purchase of dual-axis inclinometers for installation in a new line of tractors. The distributor of the inclinometers is temporarily overstocked and is offering them at a 40% discount from the regular cost of $142. If the purchaser gets them now instead of 2 years from now, which is when they will be needed, what is the present worth of the savings per unit? The company would pay the regular price if purchased in 2 years. Assume the interest rate is 10% per year.	[3]	1	3
Q.2	Derive the expression for uniform-gradient-series factor (A/G, i, n) with suitable cash flow diagram.	[5]	1	3
Q.3	An electric switch manufacturing company has to choose one of three different assembly methods. Method A will have a first cost of $40,000, an annual operating cost of $9000, and a service life of 2 years. Method B will cost $80,000 to buy and will have an annual operating cost of $6000 over its 4-year service life. Method C will cost $130,000 initially with an annual operating cost of $4000 over its 8-year life. Methods A and B will have no salvage value, but method C will have some equipment worth an estimated $12,000. Which method should be selected? Use present worth analysis at an interest rate of 10% per year.	[5]	2	3
Q.4(a)	A proposal to reduce traffic congestion on I-5 has a B/C ratio of 1.4. The annual worth of benefits minus disbenefits is $560,000. What is the first cost of the project if the interest rate is 6% per year and the project is expected to have a 20-year life?	[2]	2	3
Q.4(b)	A wealthy businessman wants to start a permanent fund for supporting research directed toward sustainability. The donor plans to give equal amounts of money for each of the next 5 years, plus one now (i.e., six donations) so that $100,000 per year can be withdrawn each year forever, beginning in year 6. If the fund earns interest at a rate of 8% per year, how much money must be donated each time?	[3]	2	3
Q.5(a)	What are the different factors which are responsible to replace the equipment although it may be running?	[2]	3	2
Q.5(b)	An existing piece of equipment has a market value of $10,000, a maintenance cost is $1000 per year, a life of 10 years, and no salvage value. The interest rate is 10%. The proposed equipment has an installed cost of $100,000, a maintenance cost of $800 per year, a life of 50 years, and a salvage value of $15,000. Using a total life average method suggest whether the proposed equipment should be purchased or not.	[3]	3	3

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