

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B.TECH
BRANCH: CHEMICAL ENGINEERING

SEMESTER : V/ADD
SESSION : MO/2025

SUBJECT: CL327 PROJECT ENGINEERING & ECONOMICS

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)	Write a brief note on Working capital within five sentences.	[2]	1 2
Q.1(b)	Price of a tray distillation column handling 750 kg/h feed is \$25,000 in the year 1976. What will be the cost of a similar tray distillation column handling 400 kg/h feed in the year 1988. Marshall and Swift cost index values in 1976 and 1988 are 479 and 870, respectively.	[3]	1 4
Q.2(a)	A process plant making 2000 tons per year of a product selling for \$0.80 per lb has annual direct production costs of \$2 million at 100 percent capacity and other fixed costs of \$700,000. What is the fixed cost per pound at the break-even point? If the selling price of the product is increased by 10 percent, what is the dollar increase in net profit at full capacity if the income tax rate is 34 percent of gross earnings?	[5]	1 3
Q.3(a)	What will be the total amount available 10 years from now if \$2000 is deposited at the present time with nominal interest at the rate of 6 percent compounded semiannually?	[2]	2 3
Q.3(b)	A concern borrows \$50,000 at an annual, effective, compound-interest rate of 10 percent. The concern wishes to pay off the debt in 5 years by making equal payments at the end of each year. How much will each payment have to be?	[3]	2 3
Q.4(a)	What is annuity? What are the different types of annuity?	[2]	2 2
Q.4(b)	A shell and tube heat exchanger costs INR 5,00,000 with zero salvage value. The service life of the heat exchanger is 8 years. The annual rate of interest is 6.5%. Determine the capitalized cost factor.	[3]	2 3
Q.5(a)	Define service life and Salvage value of a property.	[2]	3 2
Q.5(b)	A reactor is purchased at INR 3,00,000. The salvage value of the reactor is INR 50,000. The service life of the reactor is 10 years. Find out the book value of the reactor after 4 years of installing by declining balance method.	[3]	3 3

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