

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: B. TECH.
BRANCH: PIE**

**SEMESTER : VI
SESSION : SP/2025**

SUBJECT: PE338 PRODUCTION ECONOMICS & FINANCIAL MANAGEMENT

TIME: 3 HOURS

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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|--|-------|----|
| Q.1(a) Two mechanics are employed in a casting process for 20 jobs, each weighing 5 kg, in a shift of 8 hours. They are paid at the rate of Rs 120 and Rs 100 per day. The forged material costs Rs. 4.50 per kg. If the factory and administrative on costs put together are thrice the labor cost, find the cost of production per unit. | [2] 1 | 4 |
| Q.1(b) A product is manufactured in batches of 500. The direct material cost is Rs 15,000, the direct labour cost is Rs 20,000, and factory overheads are 40 per cent of the prime cost. If the selling expenses are 30 per cent of the factory cost, what would be the selling price of each product so that the profit is 20 per cent of the total cost? | [3] 1 | 4 |
| Q.1(c) The fixed costs for the financial year 2011-12 are ₹ 40,000. The sales for this period are of ₹ 1,00,000. The variable cost per unit is ₹ 2. The selling price of each product is ₹ 10, and the number of units involved coincides with the expected volume of output. Construct the Breakeven chart and determine:
i) Break-even point.
ii) How many minimum products should be sold to earn profit?
iii) Profit earned at a turnover of ₹ 80,000.
iv) Margin of safety.
v) Angle of incidence. | [5] 1 | 4 |
| Q.2(a) How much will be in a high-yield account at the National Bank of Arizona 12 years from now if you deposit \$5000 now and \$7000 five years from now? The account earns interest at a rate of 10% per year, compounded quarterly. | [2] 2 | 4 |
| Q.2(b) Polypropylene wall caps, used for covering exterior vents for kitchen cooktops, bathroom fans, dryers, and other building air exhausts, can be made by two different methods. Method X will have a first cost of \$75,000, an operating cost of \$32,000 per year, and a \$9000 salvage value after 4 years. Method Y will have a first cost of \$140,000, an operating cost of \$24,000 per year, and a \$19,000 salvage value after its 4-year life. At an interest rate of 10% per year, which method should be used on the basis of an annual worth analysis? | [3] 2 | 4 |
| Q.2(c) Two processes can be used for producing a polymer that reduces friction loss in engines. Process T will have a first cost of \$750,000, an operating cost of \$60,000 per year, and a salvage value of \$80,000 after its 2-year life. Process W will have a first cost of \$1,350,000, an operating cost of \$25,000 per year, and a \$120,000 salvage value after its 4-year life. Process W will also require updating at the end of year 2 at a cost of \$90,000. Which process should be selected on the basis of a future worth analysis at an interest rate of 10% per year? | [5] 2 | 4 |
| Q.3(a) What is the difference between mutually exclusive alternatives and independent projects? | [2] 3 | 1 |
| Q.3(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 10% per year, how much money must be donated each time? | [3] 3 | 4 |

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- Q.3(c) 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] 3 4
- Q.4(a) Briefly explain the revaluation method of depreciation. [2] 4 1
- Q.4(b) A device was purchased for Rs 80,000. After the SL method was used to calculate depreciation for a total life of 12 years, the equipment's expected salvage value is Rs 2000. What would be the difference between the equipment's book value (after 8 years) and the book value that would have resulted if the DB method at the rate of 12 per cent applied for 8 years had been used? [3] 4 4
- Q.4(c) Management is considering the replacement of existing equipment. The data for the analysis of the challenger are initial investment = Rs 1,00,000; there is no annual maintenance cost for the first four years, but in years 5 and 6, it will be Rs 25,000 and Rs 28,000, respectively, and in year 7, it will increase by Rs 5,000 and each year thereafter. The salvage value is always zero, and MARR is 10 per cent per year. What is the economic life of the equipment? [5] 4 4
- Q.5(a) What is accounting? Briefly discuss its various steps. [5] 5 1
- Q.5(b) The following Trading and Profit and Loss Account has been prepared by a junior accountant of a firm. Criticize it and redraft it correctly. [5] 5 4

TRADING AND PROFIT & LOSS ACCOUNT

for the year ended 31.12.2021

Particulars	Amount (Rs)	Particulars	Amount (Rs)
Purchases	4,75,000	Sales	5,80,000
Opening Stock	45,000	Closing Stock	50,000
Wages	38,000	Discount Received	4,500
Salaries	26,000	Commission Received	12,000
Rent and Taxes	9,500	Interest on Capital	5,000
Y's Drawings	15,000		
Depreciation	6,800		
Bad Debts	7,700		
Freight on Purchases	12,000		
Insurance	3,500		
Net Profit transferred to Capital A/c	38,000		
Total	6,76,500	Total	6,76,500

:::28/04/2025:::