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10BT71

Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Economics and Plant Design

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.
2. Rate of Interest Table is to be provided.

PART – A

- 1 a. List and explain the typical design steps for biochemical process. (10 Marks)
b. Explain with example optimum economic design and optimum operation design. (10 Marks)
- 2 a. The plant layout can play an important part in determining construction and manufacturing costs of a plant. What are the factors one should consider to have an effective plant layout? Explain. (10 Marks)
b. Explain different methods of solid waste disposal in bioprocess industries. (10 Marks)
- 3 a. Explain the various fixed capital investments. Give the breakdown of fixed capital investment items for process plant. (10 Marks)
b. Explain the following :
 i) Materials cost
 ii) Labour cost
 iii) Expenses. (10 Marks)
- 4 a. What are different types overheads? Explain with examples. (10 Marks)
b. Find the selling price of 1kg of bio-fertilizer from given data. The total amount of fertilizer produced is 135kg, Labour cost is Rs 200/-, material cost is 160/-, production cost is 35% of prime cost. Administration and selling cost are 20% of the factory cost. Profit is 10% of the total product cost. (10 Marks)

PART – B

- 5 a. Explain the factors affecting investment and production costs. (10 Marks)
b. Two machines have the following cost comparison. If the money is worth 8% per annum which machine is more economical (10 Marks)

	M/C A	M/C B
Initial cost	2,20,000	1,50,000
Uniform end of year maintenance cost	30,000	40,000
Salvage value	15,000	4000
Service life	3 year	2 year

- 6 a. Define Depreciation? Explain any two methods of evaluation of depreciation. (10 Marks)
b. A piece of biochemical equipment having a salvage value of 6000/- and service life of 10 years has an original value of Rs 40,000/-. Find the depreciation charges by straight line method and declining balance method. Find the total depreciable amount at the end of the 6th year by both methods. Find the book value. (10 Marks)

- 7 a. Explain profitability and discuss various methods of probability evaluation. (10 Marks)
 b. A biochemical project is expected to have a cash flow for 5 years as follows. After all expenses and taxes. The initial fixed capital investment is Rs 10,000,000/- and the working capital is taken as 15% of the fixed capital investment.

Time in years	0 – 1	1 – 2	2 – 3	3 – 4	4 – 5
Cash flow (Rs)	2,00,000	2,70,000	3,30,000	4,00,000	4,75,000

Find the rate of return on original investment and payout time. Using straight line depreciation method. (10 Marks)

- 8 a. Explain in detail break – even chart and break even analysis. Mention the assumption made in drawing the break even chart. (08 Marks)
 b. A company has true alternative investments which are being considered because all the three investments are for same type of unit and yields the same service only one of the investment can be selected. If the company incharge, expects 15% on original investment, which one will be best among them. (12 Marks)

Item	I	II	III
Initial cost	1,00,000	1,70,000	2,10,000
Operating cost	10,000	10,000	15,000
Annual cash flow	30,000	52,000	59,000
Annual expenditure	15,000	28,000	21,000

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