EX/FTBE /HS/B/T/412/2024 (S)

B.FTBE----4 th YEAR-----1 st SEMESTER (SUPPLEMENTARY) EXAMINATION ----2024

PROJECT PLANNING LAYOUT & ECONOMICS

Time : Three hours Full Marks : 100

(50 Marks for each Part)

Use separate answer script for each Part

PART – I (50 Marks)

Answer Question No 1 which is compulsory , and Any THREE from the rest.

1. Answer the followings to the point and briefly within not more than two simple sentences: (7 *2 = 14)

A. What is the importance of depreciation in project economics ?

B. Whether a salvage value is equal to a depreciable value ?

C. Differentiate between present worth and discount ?

D. What is the significance of the term---Perpetuity ?

E. How do you calculate the value of an annuity ?

F. Differentiate between Sum of the Years Digit Method and Sinking Fund Method ?

G. How does Break Even Point influence the criteria of a plant production system ?

2. a) Following information relates to a fixed asset :

Original cost of the asset : Rs 8000000

Scrap value at the end of service life : Rs 80000

The asset value at the end of the third year 3580000

Calculate using the sum of the years digit method ,

I) the service life of the asset, and

Ii) depreciation over the useful life of the asset .

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b) Determine the relation among the following terms :

K = Capitalized costs,

Cv = Original cost of the equipment,

CR = Replacement value after n years of service life,

i = Nominal interest rate compounding annually,

3. A biscuit manufacturing plant produces biscuit boxes at the rate of M units per day. The variable costs per box have been found to be Rs. 98.56 + 0.1 P^1.2 . The total daily fixed charges are Rs. 4750 , and all other expenses are constant at Rs.9867 per day. If the selling price per box is Rs 237. Determine

a) The daily profit at a production schedule giving the minimum cost per box,
b) The daily profit at a production schedule giving the maximum daily profit,
c) The production schedule at the break even point.

4 An existing plant has been operating in such a way that a large amount of heat is being lost in the waste gases. It has been proposed to save money by recovering the heat that is now being lost. Four different heat exchangers have been designed to recover the heat, and all prices, costs, and savings have been calculated for each of the designs. The results calculations are presented in the following :

Design	No 1	No2	No3	No4
Total initial installed cost :	20000	32000	40000	52000
Operating cost :	200	200	200	200
Fixed charges % of initial cost per yr	30	30	30	30
Value of heat per year	8200	1200	1380	1770

The company in charge of the plant demands at least a 20 % annual return based on the initial investment for any unnecessary investment. Only one of the four designs can be accepted. Neglecting effects of taxes and time value of money , which of the four designs should be recommended ?

5. The total fixed costs of a company are Rs. 549000 per year, variable cost per unit is Rs. 35. The company sells products at Rs. 65 each. Calculate the units of sales and amount of sales at which the company will yield Break Even Point .

6. List out the parameters and the objective function for determining the optimum operating cost of a heat exchanger.

7. How would you apply the linear programming method for determining the optimum cost of a blended fruit juice product derived from three basic ingredients --- Apple juice of Rs 98 per Kg, Guava juice of Rs 57 per kg, and water without any cost. The blended product should be the minimum quantity of 80 % Apple juice and the water may be of any quantity.

Ref. No.: Ex/FTBE/HS/B/T/412/2024(S)

B.E. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING FOURTH YEAR FIRST SEMESTER SUPPLEMENTARY EXAM 2024

Subject- PROJECT PLANNING, LAYOUT AND ECONOMICS

FM-100 **Time-3 hrs**

PART II (50 Marks)

Answer Question no 4 and any two form the following

1. What is the most common application of a pilot plant? What are the different factors that influence the layout? Define Systematic layout planning? 7+8+5=20
2. Discuss process layout with one schematic diagram. If you want to set a dairy industry, where should you established it in West Bengal? -Explain. 10+10=20
3. What do you mean by PERT and CPM and what are the difference between them? Draw a symbol used for the following operation in food industry-
   Globe Valve, Gate valve, Rotary pump, Shell and tube heat exchanger, Packed column. 15+5=20
4. Draw a layout (not in scale) of a milk processing plant dealing with only liquid milk. Major Plant functions are cream separation, homogenizing, pasteurization and packaging etc. 10