B. TECH. (FTBE) FINAL EXAMINATION, 2006

(1st Semester)

PROJECT ENGG & PROCESS PLANT COSTING

Time: Three Hours   Full Marks - 100

Use a separate Answer-Script for each Part

PART - I (60 marks)

Answer any **Three** questions

All questions carry equal marks

1.   A company has three alternative investments which are being considered. Because all three investments are for the same type of unit and yield the same service, only one can be accepted. The risk factors are the same for all the three cases. Company policy, based on the current situations, dictate that a minimum annual return on the original investment of 15 percent after tax must be predicted for any unnecessary investment with interest on investment not included as a cost. Company policy also dictate that, where applicable, straight line depreciation is used and for time value of money interpretations, end of year cost and profit analys is is used.

Given below the following data, determine which investment, if any, should be made by alternative-analysis profitability evaluation methods of

i)   Rate of return on initial investment

ii) Minimum pay out period with no interest charge.

[Turn over

Investme No.	Total Initial Capital Invesement	Working Capital Investme	Salvage Value at the end of Service Life	Servic Life	Annual Cash Flow to project after Taxes	Annual Cash Exps. (Coust. for each year
	Rs.	Rs.	Rs.	Year	Rs.	Rs.
1	400,000	40,000	40,000	5	*	176,000
2	680,000	40,000	60,000	7	208,000	112,000
3	840,000	60,000	80,000	8	118,000	84,000

* For invest no. 1, variable annual cash flow to project is :

Year 1 = Rs. 1,20,000

Year 2 = Rs. 1,24,000

Year 3 = Rs. 1,44,000

Year 4 = Rs. 1,60,000

Year 5 = Rs. 1,72,000

2. Write short notes on (any **two)**

    i) The importance of feasibility report before start of particular venture.

    ii) Estimation of total product cost based upon manufacturing costs and general expenses.

    iii) Methods for determining depreciation by various techniques.

3. A scheme for production of soft drinks is given below :

The production target per month of soft drinks is 75,000

bottles each containing 300 mi and soid at the rate of Rs.10/- / bottle.

I.   Non-recurring Expenditure :

a) Land with covered shade including   Rs.   4,000/-
    Store and Office Room (Rented)   on monthly basis

b) Plant and Machineries:

i)	Carbon dioxide — water mixture machine with one filling and sealing unit	1 No.	Rs	60,000/-
ii)	Water-bleaching power mixture poly tub (100 litre capacity)	2 Nos.	Rs.	8000/-
iii)	Water filter (carbon1 adsorption type filter) for water purification.	1No.	Rs.	80,000/-
iv)	Deposit for carbon dioxide Gas cylinder (18 kg capacity)	4 Nos.	Rs.	40,000/-
v)	S. S. Tank syrup filling	1 No.	Rs.	16,000/-
vi)	Bottles with ACL print (300 ml. capacity)	20000Nos. Rs.10/- each pc	Rs.	2,00,000/-
vii)	S. S. Tank for bottle washing	2 Nos.	Rs.	40,000/-
viii)	Wooden crates (capacity 20 bottles per crate)	l000Nos. Rs. 160/- each pc	Rs.	1,60,000/-
ix)	Office furniture and fittings		Rs.	14,000/-

[Turn over

x)	Scooter Van	2 Nos.	Rs.	4,00,000/-
xi)	Electrification charges		Rs.	2,000/-
xii)	S.S. Tank syrup preparation1	1 No.	Rs.	20,000/-
xiii)	Misc. items (Buckets, weighing machine, stove etc.)		Rs.	12,000/-

II. Recurring Expenditure :

a) Raw Materials (Production Analysis per month)

i)	Treated Water	20000 Ltrs.	@ Rs.2/-	Rs.	40,000/-
ii)	Synthetic colour	4 Kgs.	@ Rs.2000/- Kg.	Rs.	8,000/-
iii)	Flavour	5 Ltrs.	@ Rs.800/-	Rs.	4,000/-
iv)	Crown cork	75000 Pcs.	@ Rs. 1/-	Rs.	75,000/-
v)	Carbon dioxide	400 Kgs.	@ Rs.40/- Kg.	Rs.	16,000/-
vi)	Sugar	2000 Kgs	@ Rs.25/- Kg.	Rs.	50,000/-
vii)	Citric acid	5 Kgs.	@ Rs.400/- Kg.	Rs.	2,000/-
viii)	Other Chemical	—	—	Rs.	4,000/-

b) **Salary & Wages**:

i)	Manager-cum-Technologist	1 No.	Rs.	6,000/-
ii)	Accountant	1 No.	Rs.	4,000/-
iii)	Skilled Labour	2 Nos.	Rs.	6,400/-
iv)	Unskilled Labours	4 Nos.	Rs.	8,000/-
v)	Delivery Man	4 Nos.	Rs.	8,000/-
vi)	Salesmen	2 Nos.	Rs.	6,400/-

c) **Other costs** :

i)	Fuel and power cost	Rs-	4,000/-

ii) Delivery and Conveyance Charge	Rs.	12,000/-
iii) Repair, Maintenance, Taxes etc.	Rs.	8,000-
iv) Advertisement	Rs.	40,000/-
v) Office Expenses	Rs.	4,000/-
vi) Distribution cost and Commission on Sales (10% on total sales)	Rs.	75,000/-
vii)Misc. Expenses	Rs.	4,000/-

From above stated statements, calculate -

i)   Total capital investment

ii)   Break even point of the proposed project

iii)   Return of Investment

iv)   Return on sale

v)   Prepare a Profit and Loss Account of the project.

4 i)   What are the decisions are to be taken for determining acceptable returns?   8

   ii)   A company is using a piece of equipment which orginally costs Rs. 1,50,000/-. The equipment has been in use for 5 years and it now has a net realizable value of Rs.30,000/-. At the time of installation service life was estimated to be 10 years and the salvage value at the end of the service life was estimated to be zero. Operating cost amounts Rs. 1,10,000 per year. At the present time, the remaining service life of the equipment is estimated to be 3 years. The present piece of property is available of more advanced design. The proposed equipment will

cost Rs.2,00,000/- and the operating cost would be Rs.75,000/- per year. The service life is estimated to be 10 years with a zero salvage value. Each piece of equipment will perform the same service and all costs other than operations and depreciation will remain constant. Generally the depreciation costs in replacement studies, sinking fund method is used. The company will not make any unnecessary investment in equipments, unless it can obtain an additional annual return on the necessary capital which is to invested again. Do you recommend replacement of the original one with a new one?.

5. The following equation shows the effect of the variables x and y on the total cost for a particular operations

$$C_T = \text{Total cost} = 2.32x + \frac{11900}{xy} + 1\text{-}85y + 10$$

i) Determine the values of x and y which will the least total cost.

ii) Also check the value of x and y to make certain, that the preceding values represent conditions of minimum cost.

iii) Also find the graphical values of x and y by plotting the curve CL versus x by choosing some constant values of y.

PART - II (40 marks)

Answer any **Three** questions

All questions carry equal marks

6. Explain the following :

   i) Application of PERT and CPM in project planning.

   ii) External and Internal factors affecting technology transfer.

   iii) Plant layout should follow certain specific characteristics in Food Processing Unit.

7. A Fruit Processing Unit produces —

   i) Tomato Ketchup — 50,000 kg/month for three months.

   ii) Pineapple juice concentrate — (T.S. 60%) - 50,000 kg/ month for next three months.

   iii) Capacity utilization of the plant is considered to be 70%.

   iv) Two shifts per day and 180 working days / year.

   v) Water charges @ Rs.4.50 per kilolitre.

   vi) Assume other data as prevailing in the market — Discuss Financial Analysis of the project.

8. Discuss Total Quality Management in Food Processing Industries in relation to

   i) Basic Concepts

   ii) Purpose and

   iii) Benefits.

9.   Write short notes on:

    i)   Concepts of ISO 14000 series standard.

    ii)   Customer satisfaction model

    iii) Working capital in Food Processing Unit.