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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

Chemical Engineering

CH 431 — PROCESS ECONOMICS AND INDUSTRIAL MANAGEMENT

(Common to Leather Technology, Polymer Technology, Textile Chemistry and Textile Technology)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is principle of planning premises?

2. Define staffing.

3. Define ordering cost.

4. What is meant by performance rating?

5. What are the causes for depreciation?

6. Define process costing.

7. What is inflation?

8. Define P/V ratio.

9. State any two principles of cost accounting.

10. List any two examples of unit operations with multiple variable.

PART B — (5 × 16 = 80 marks)

11. (a) Describe the steps in planning, with an example. (16)

Or

(b) Explain the concepts of basic control process, critical controls and standards. (16)

12. (a) (i) How will you determine standard time? Explain. (8)

(ii) In what way does work measurement techniques useful for oil industry? Explain. (8)

Or

(b) Find out the economic lot size for optimum utilization of a material whose production particulars are as under : (16)

(i) The total sale for a product which is uniformly distributed throughout the year is equivalent to 120 units, (ie) equivalent to 10 units/month.

(ii) The normal manufacturing costs is Rs. 1,500 for all the 120 piece.

(iii) The carrying charges for the same period are estimated at Re. 1% of the normal manufacturing cost of 120 pieces (ie) Rs. 120/6 months. But a unit is expected to remain in stock on an average for half period.

(iv) The setup and order issuing cost is estimated Rs. 800 each time a manufacturing order/lot is issued.

13. (a) The length of industrial filters is a quality characteristic of interest. Thirty samples each of size 5 are chosen from the process. The data yields an average length of 110 mm with the process standard deviation estimated to be 4 mm.

(i) Find the warning limits for a control chart for the average length.(6)

(ii) Find the 3σ control limits. What is the probability of a type I error? (5)

(iii) If the process mean shifts to 112 mm, what are the chances of detecting this shift by the third sample drawn after the shift? (5)

Or

(b) A manufacturing concern purchases 2 similar machines at Rs. 12,000 each. You are required to work out the total rate machine hour for each machine, exclusive of labor and materials used, based on the following data :

The machine will be work Rs. 2,000 each in 10 years time, and the depreciation on the fixed method is to be allowed. The machines will be used for 2,000 hours/year and they will each require 8 units of power/hour at 10 paise a unit, repairs are estimated at Rs. 125 each per annum, the overhead charges for each machine are Rs. 500. The machine together occupy one fifth of the floor space and they are to bear their respective position of rent, rates and water, lighting and heating. The rent, etc, of the works amounts to Rs. 1,000 and the lighting and heating to Rs. 500.

14. (a) (i) Explain the concepts of investment alternative and replacement policy. (8)

(ii) Define forecasting. Explain the various types of forecasting methods. (8)

Or

(b) Write short notes for the following :

(i) Estimation of project profitability (6)

(ii) Sensitivity analysis (6)

(iii) Income statement. (4)

15. (a) Define Balance sheet. Explain the basic steps followed to arrive the balance sheet for any organization. (16)

Or

(b) How liquidity, activity, capital structure and profitability ratios useful for leather based industry? Explain. (16)