Ex/ChE/T/423/2019

B.Ch.E. Final (2nd Semester) Examination, 2019

Industrial Management

Time: Three hours | Full marks: 100

Answer any **five** questions.

(All Parts of Any One Question Must Be Answered Together)

1.a) Summarize F.W. Taylor's contributions to Scientific Management.

b) What is meant by Process layout? Discuss the same with a suitable diagram.

c) Draw and explain an Organization Chart for Line and Staff Organization Structure. Discuss its advantages and disadvantages. [5+5+10]

2.(a) A project consists of the following activities:

Activity	1–2	1–3	1–4	2–5	2–7	3–6
Duration (days)	2	2	1	5	8	4
Activity	4–7	5–8	6–8	7–9	8–9	
Duration (days)	3	4	1	5	3	

(i) Draw the network and identify the critical path.

(ii) Calculate the Early Start(ES), Early Finish(EF),Late Start(LS) & Late Finish(LF) times of the activities.

(b) Define Reliability. An equipment is to operate for 10000 hrs.; Failure rate is estimated as one in 50000 hrs. Calculate the probability of survival. [14+6]

3.(a) Time taken by M/cs A, B & C to complete jobs 1, 2 & 3 are as below:(in mins.)

M/c \ Job	1	2	3
A	60	50	40
B	40	45	55
C	55	70	60

Complete the assignment so as to minimize the total time, hence calculate the total time.

[Turn over

(b) Each year the Yellowstone Company purchases 18,000 of an item that costs Rs. 16 per unit. The cost of placing an order is Rs. 12, and the cost to hold the item for a year is 30 percent of the unit cost. Determine

i. the economic order quantity
ii. Optimal number of orders per year
iii. The optimal order cycle time
iv. Average inventory level assuming that the minimum inventory level is zero.

Derive the formula of the EOQ you use in part (a). [6+14]

4) Write short notes on (Any four): [5x4=20]

a) SIMO charts
b) JIT
c) Producer's risk Vs Consumer's risk
d) Network Crashing
e) Selective inventory control
f) Bath-tub curve
g) Time & Motion study.
h) PDCA Cycle

5. (a) XYZ company wants to estimate the condition of the process for manufacturing a pin. The following is an example of pin diameter in cm of 5 samples of size 3.

Sample 1	**Sample 2**	**Sample 3**	**Sample 4**	**Sample 5**
11.1	10.1	9.8	11.3	11.2
9.2	11.2	10.2	10.1	9.4
11.3	9.9	9.9	10.1	8.9

Consider A_2: 1.02, $D_3 = 0$ and D_4: 2.57

Draw a suitable control chart and comment on the process.

b) What is the importance of a control chart?

c) Explain quality costs. [10+4+6]

6. (a)The demand for a product in each of the last five months is shown below.

Month	1	2	3	4	5
Demand ('00s)	13	17	19	23	24

(i) Use a two month moving average to generate a forecast for demand in month 6.

(ii) Apply exponential smoothing with a smoothing constant of 0.9 to generate a forecast for demand for demand in month 6.

(iii)Which of these two forecasts do you prefer and why?

b) Explain the Delphi Technique.

c) Explain Cause and Effect Diagram. [10+5+5]

7. a) Consider two different types of food stuffs say F_1 and F_2. Assume that these food stuffs contain vitamin A and B. Minimum daily requirements of vitamin A and Bare 40mg and 50mg respectively. Suppose food stuff F_1 contains 2mg of vitamin A and 5mg of vitamin B while F_2 contains 4mg of vitamin A and 2mg of vitamin B. Cost per unit of F_1 is Rs. 3 and that of F_2 is Rs. 2.5. Formulate the minimum cost diet that would supply the body at least the minimum requirements of each vitamin.

b) Write short notes on "VAM'.

c) Explain different types of quality characteristics. [10+5+5]