QP Code: RN21BTECH575 | Reg. No | | | | | | | | | | | AR 21

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Seventh Semester - Regular) Examinations, November – 2024

21BCHPE47003– INDUSTRIAL ENGINEERING

(Chemical Engineering)

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Briefly discuss the difference between manufacturing and service sector with suitable examples.	CO1	K2
b.	Write down the names of different process technologies.	CO1	K1
c.	Write a short note on "Delphi Technique".	CO2	K1
d.	What are the different inputs required for MRP System?	CO3	K1
e.	What are the benefits of TQM?	CO4	K2

PART – B **(15 x 4 = 60 Marks)**

Answer ***All*** the questions

		Marks	CO #	Blooms Level
2. a.	An 8 hrs work measurement study in a plant reveals the following- Unit produced= 320 Idle time= 15% Performance rating= 120% allowance= 12% of normal time Determine the standard time per unit produced.	8	CO1	K3
b.	Explain about the different process technologies.	7	CO1	K2
	(OR)			
c.	One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time (shown below) but opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used 10%allowance. From the observed data, determine the standard time using both engineers point of view.	10	CO1	K3

Cycle time	No. of times observed
20	2
24	1
29	1
32	1

d.	What is multiple activity chart? Illustrate it with an example.	5	CO1	K2
3.a.	A firm believes that is annual profit depends on its expenditures for research. The information for the preceding six years in given below. Estimate the profit when the expenditure is 6 units.	8	CO2	K3

Year	1	2	3	4	5	6	7
Expenditure for Research(X)	2	3	5	4	11	5	6
Annual profit(Y)	20	25	34	30	40	31	?

b. What are the factors influencing the plant and warehouse locations selection? Explain any one facility location selection model. 7 CO2 K2

(OR)

c. The super Snow paint shop has recorded the demand for a particular colour during the past 6 weeks as shown below.

Week	1	2	3	4	5	6
Demand in Litre	19	17	22	27	29	33

8 CO2 K3

i. Calculate a 3-week moving average for the data to forecast demand for the next week.

ii. Calculate weighted average forecast for the data, using a weight of 0.6 for the most recent data and weights of 0.3 and 0.1 for successive older data.

d. Discuss various types of layouts and also write merits and demerits of the layouts. 7 CO2 K3

4.a. If a product is to be manufactured within the company, the details are as follows annual demand is 24000 units, No. of unit produced per year is 48000, Cost per setup is Rs.200, carrying cost per unit is Rs.20/year. Find the EBQ and cycle time. 8 CO3 K3

b. A firm's annual inventory is 1,600 units. The cost of placing an order is Rs 50, purchase price of raw material/unit is Rs.10 and the carrying costs is expected to be 10% per unit p.a. Calculate EOQ? 7 CO3 K3

(OR)

c. Write a short notes on Capacity Requirements Planning (CRP). 8 CO3 K1

d. List and explain the various pure strategies and mixed strategies. 7 CO3 K2

5.a. Consider the following 3 machines and 5 jobs flow shop problem. Find the optimal sequence and the total completion time.

JOB:	1	2	3	4	5
M1:	8	10	6	7	8
M2:	5	6	2	3	4
M3:	4	9	8	6	5

10 CO4 K3

b. Write short notes on JIT. 5 CO4 K2

(OR)

c. A small engineering project consists of 9 activities. Three time estimates for each activity are given in table.

(i) Draw the network diagram and mark t_e an each activity.

(ii) Calculate EST and LFT and mark them on the network diagram.

(iii) Find the length of critical paths or the total project duration.

Activity	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
Time									
T_0	2	2	5	1	5	2	3	2	7
T_m	5	5	11	4	11	5	9	2	13
T_p	14	8	29	7	17	14	27	8	31

10 CO4 K3

d. Write short notes on ISO9000. 5 CO4 K1