QPC: RN20BTECH687 AR 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2023

BPECH7030 - Industrial Engineering

(Chemical Engineering)

Time: 3 hrs Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions	[CO#]	[PO#]
a. A ____ is based on film analysis	CO1	PO1
(i) SIMO chart (ii) Flow process chart		
(iii) String diagram (iv) Operation flow chart		
b. ---------- precedes examine step of the method study.	CO1	PO1
(i) Develop (ii) Install		
(iii) Record (iv) Maintain		
c. The range of smoothing constant in exponential smoothing method is _____	CO2	PO1
(i) 1 to 3 (ii) 0.1 to 0.3		
(iii) 0.01 to 0.03 (iv) None of these		
d. The ship building industry commonly employs _____ layout.	CO2	PO1
(i) Process (ii) Product		
(iii) Fixed position (iv) GT		
e. Which of the following models is used to calculate the timing of the inventory order?	CO3	PO1
(i) Economic order quantity model (ii) Fixed order quantity model		
(iii) Reorder point model (iv) Fixed order inventory model		
f. The time period between placing an order its receipt in stock is known as	CO3	PO1
(i) lead time (ii) carrying time		
(iii) shortage time (iv) over time		
g. Which one of the following standards is associated with the "Quality Assurance in Production and Installation"?	CO4	PO1
(i) ISO 9001 (ii) ISO 9002		
(iii) ISO 9003 (iv) ISO 9004		
h. PERT analysis is based upon	CO4	PO1
(i) Optimistic Time (ii) Pessimistic Time		
(iii) Most likely Time (iv) All of the above		
i. What is the functional subsystem of Organizations?	CO1	PO1
(i) Marketing. (ii) Productions.		
(iii) Finance. (iv) All the above.		
j. In _____, an attempt will be made to reduce the project completion time earlier than the project completion time.	CO4	PO1
(i) CPM (ii) PERT		
(iii) Project crashing (iv) Resource allocation		

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions	[CO#]	[PO#]
a. Write down the names of different process technologies.	CO1	PO1
b. What is SIMO chart?	CO1	PO1
c. What is plant layout and mention the different types.	CO2	PO1
d. In which ways is the simple exponential smoothing method better than the simple moving average method?	CO2	PO1
e. What is ABC classification?	CO3	PO1
f. What is the importance of economic order quantity?	CO3	PO1
g. What do you mean by ISO?	CO4	PO1
h. What is scheduling? What is its objective?	CO4	PO1
i. Define quality and productivity.	CO1	PO1
j. What are the types of demand pattern? Explain them with proper sketches.	CO2	PO1

PART – C: (Long Answer Questions) **(10 x 4 = 40 Marks)**

Answer ***ALL*** questions	Marks	[CO#]	[PO#]
3. 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.	10	CO1	PO2
(OR)			
b. A job consisting of three work elements and all are performed by the same operator. An analyst conducted work sampling to determine the standard time for the job. The duration of the study is one shift with 400 min. of effective time. The details of observations are summarized in the following table. The total number of acceptable units produced during the study period is 150 units. Determine the standard time by assuming allowance of 10%.	10	CO1	PO2

Work element number	Frequency of performance	Performance rating
1	70	80%
2	80	120%
3	50	110%

4. a.	What are the factors influencing the plant and warehouse locations selection?	5	CO2	PO1
b.	Discuss various types of layouts and also write merits and demerits of the layouts.	5	CO2	PO1
	(OR)			
c.	Discuss the merits and demerits of process layout and product layout.	5	CO2	PO1
d.	List and explain the types of forecasting in decision Making.	5	CO2	PO1
5. a.	Alpha industries estimate that it will sell 12,000 units of its products for the following year. The ordering cost is Rs-100 per order and the carrying cost per unit per year is 20 per cent of the purchase price per unit. The purchase price is	10	CO3	PO2

per unit is Rs -50.find(i) Economic order quantity.(ii)No. of order per year, and (iii) Time between successive orders.

(OR)

b. The maintenance department of a large hospital uses about 816 cases of liquid cleaner annually, ordering costs are Rs. 12, carrying costs are Rs. 4 per case a year, and the new price schedule indicates that orders of less than 50 cases will cost Rs. 20 per case, 80 to 99 cases will cost Rs. 17 per case, and larger orders will cost Rs. 16 per case Determine the optimal order quantity and the total cost. 10 CO3 PO2

6. a. Consider the following 3 machines and 5 jobs flow shop problem. Find the optimal sequence and the total completion time. 10 CO4 PO2

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

(OR)

b. 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. 10 CO4 PO2

Activity / Time	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
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

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