QP Code:RM21BTECH483 | Reg. No | | | | | | | | | | | AY 21

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Sixth Semester Regular) Examinations, May – 2024

21BMEPC36003 – Production and Operations Management

(Mechanical)

Time: 3 hrs | Maximum: 70 Marks

(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.	Write down the names of different process technologies.	CO1	K1
b.	Write two important objectives of a production manager.	CO1	K1
c.	What is the difference between product layout and process layout?	CO2	K2
d.	What are the relevant costs of inventory system?	CO3	K1
e.	Distinguish between PERT and CPM.	CO4	K2

PART – B **(15 x 4=60 Marks)**

Answer ***ALL*** 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.	10	CO1	K3
b.	What is multiple activity chart? Illustrate it with an example.	5	CO1	K2
	(OR)			
c.	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	K3

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

d.	Discuss the steps in production planning.	5	CO1	K2
3.a.	The super Snow paint shop has recorded the demand for a particular colour during the past 6 weeks as shown below.	8	CO2	K3

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

(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.

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

(OR)

c. Potential locations A, B and C have the cost structure shown below for manufacturing a product expected to sell for Rs. 270 per unit. Find the most economical location for an expected volume of 2000 units per year and also determine the optimum volume range for each location. 10 CO2 K3

Site	Fixed cost /year (Rs.)	Variable cost/ unit (Rs.)
A	65000	120
B	75000	56
C	55000	425

d. Write a short note on "delphi technique". 5 CO2 K2

4.a. If a product is to be manufactured within the company, the details are as follows annual demand is 24000unit, 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. What is Material Requirement Planning. State its objective and function. 8 CO3 K2

d. Discuss about the different strategies considered during aggregate planning. 8 CO3 K2

5.a. Consider the following 3 machines and 5 jobs flow shop problem. Find the optimal sequence and the total completion time. 10 CO4 K3

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

b. Write short notes on TQM. 5 CO4 K2

(OR)

c. A project is having in the following activities and their time estimates.

Activity	Predecessor	Time days		
		Optimistic(t_0)	Most likely(t_m)	Pessimistic(t_p)
A		2	4	6
B	A	8	12	16
C	A	14	16	2
D	B	4	10	16
E	C,B	6	12	18
F	E	6	8	22
G	D	18	18	30
H	F,G	8	14	32

10 CO4 K3

(i) Draw the network diagram and find the critical path and duration. Find also the Total float, free float and independent float for each activity.

(ii) What is the probability that the project will require at least 75 days?

d. Write short notes on JIT. 5 CO4 K2