Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA - SEMESTER - II EXAMINATION - SUMMER 2025

Subject Code: MB02092051 **Date: 10-06-2025**

Subject Name: Production & Operations Management

Time: 10:30 AM TO 01:30 PM **Total Marks: 70**

Instructions

1. Attempt all questions.

2. Make suitable assumptions wherever necessary.

3. Figures to the right indicate full marks.

4. USE of SIMPLE calculators AND non-programmable scientific calculators are permitted.

			Marks
Q.1		Explain the terms and concepts	**14**
	(a)	Give names of some priority rules for n job – 1 machine sequencing	
	(b)	At EOQ which two costs are equal?	
	(c)	Give four industry examples of Fixed Position layout.	
	(d)	What is Job Shop Process?	
	(e)	List different types of Queuing Behavior?	
	(f)	What is Six Sigma quality standard?	
	(g)	What is JIT?	
Q.2	**(a)**	Explain Functions view of an organization.	**07**
	(b)	Explain with practical examples of real businesses, different Product Strategies like MTS, MTO, and ATO.	**07**
		OR	
	(b)	Explain Assembly Line Manufacturing and Continuous Manufacturing processes with merits, demerits and real products examples	**07**
Q.3	**(a)**	Explain Inputs, Processing and Outputs of MRP System.	**07**
	(b)	A manufacturing company uses a component in its assembly line. The following data is given: Annual demand (D): 3,60,000 units Ordering cost per order (S): ₹200 Carrying cost per unit per year (H): ₹25 Calculate a) EOQ b) Average Inventory & Number of Orders per annum c) Total Ordering Cost & Total Carrying Cost d) Total Cost	**07**
		OR	

(a) Which criteria are considered while deciding the location of a new manufacturing units? **07**

(b) A company manufactures metal rods with a target diameter of 20.00 mm. Samples of size 5 are taken hourly, and the sample means and ranges for 6 samples are recorded as follows: **07**

Sample #	1	2	3	4	5	6
Mean ($\bar{X}$)	20	20.14	19.97	20.02	20	19.95
Range (R)	0.03	0.03	0.03	0.04	0.03	0.03

Calculate

a) $\bar{\bar{X}}$ (average of sample means)

b) $\bar{R}$ (average of sample ranges)

c) Control Limits for $\bar{X}$ chart.

d) Control Limit for R chart.

Take Control Chart Constants (n = 5):

A2 = 0.577, D3 = 0, D4 = 2.114

Q.4 **(a)** Explain Cost of Quality. **07**

(b) There are six jobs to be processed on 3 machines for which the time in days is given below. **07**

Job	J1	J2	J3	J4	J5	J6
M1	5	8	6	4	9	7
M2	7	4	9	8	6	5
M3	6	7	5	9	4	8

Find

a) Optimal Job Sequence.

b) Start and End times of each job on all machines and the make span.

OR

(a) Explain with examples different dimensions of quality. **07**

(b) A small coffee kiosk in a business plaza has one serving attendant. Customers arrive at the kiosk randomly at an average rate of 12 customers per hour. Each customer takes an average of 4 minutes to be served. **07**

Calculate

a) Utilization factor (ρ) of the server

b) Average number of customers in the queue (Lq)

c) Average number of customers in the system (Ls)

d) Average waiting time in the queue (Wq)

e) Average time a customer spends in the system (Ws)

Q.5 **Consider the following project:**

Activity	A	B	C	D	E	F	G	H	I
Predecessor(s)	—	A	B	C	A	E	D, F	G	H
Optimistic (O)	2	1	2	3	1	2	2	1	1
Most Likely (M)	4	2	3	5	3	4	3	2	2
Pessimistic (P)	6	4	5	8	4	6	6	3	4

Keeping the PERT project in mind answer

(a) Draw the project network diagram showing activities on arrows (AOA) and all the three times. **07**

(b) Find the expected times and variances of each activity **07**

OR

(a) Find the Critical Path of the project and the Duration of Critical path **07**

(b) Find the Probability to complete the project in 21 days? (Take Area under standard Normal Curve for Z = 0.64 as 0.2389) **07**

***