

GUJARAT TECHNOLOGICAL UNIVERSITY**MBA - SEMESTER– II EXAMINATION – WINTER 2019****Subject Code: 4529205****Date: 2-01-2020****Subject Name: Production & Operations Management****Time: 2.30 PM to 5.30 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 Answer the following questions with suitable examples: 14

1. Gantt Chart
2. Kaizen
3. Kanban visual system
4. Lean Manufacturing
5. Pipeline stock
6. Make to Order
7. SQC

Q.2 [A] Explain the Factors affecting Facility Location Planning. 07

[B] Explain general structure of queuing system. 07

OR

[B] What are the routing, dispatching, prioritization and expediting? Explain 07

Q.3 [A] You are given the following data regarding the processing times of some jobs on three machines I, II and III. The order of processing is I-II-III. Determine the sequence that minimizes the total elapsed time (T) required for completing the jobs. Also evaluate T and idle time of II and III. 07

	Processing Time (Hours)		
JOB	M I	M II	M III
A	3	4	6
B	8	3	7
C	7	2	5
D	4	5	11
E	9	1	5
F	8	4	6
G	7	3	12

[B] What is Aggregate Production Planning? Discuss the strategies in aggregate planning to manage demand & supply. 07

OR

- Q.3 [A] Describe Product layout and Process layout. Give the example of the same where each would be more applicable than the other. 07
- [B] The Polycab company produces slip ring bearings. Employees have taken 10 samples (during a 10 days period) of five slip ring bearings and measured the diameter of the bearings. If $\sigma = 0.08$, develop a mean chart with 3-sigma limits to monitor the process in the future. 07

	Observations (Slip – Ring Diameter, cm) n				
Sample K	1	2	3	4	5
1	5.02	5.01	4.94	4.99	4.96
2	5.01	5.03	5.07	4.95	4.96
3	4.99	5.00	4.93	4.92	4.99
4	5.03	4.91	5.01	4.98	4.89
5	4.95	4.92	5.03	5.05	5.01
6	4.97	5.06	5.06	4.96	5.03
7	5.05	5.01	5.10	4.96	4.99
8	5.09	5.10	5.00	4.99	5.08
9	5.14	5.10	4.99	5.08	5.09
10	5.01	4.98	5.08	5.07	4.99

- Q.4 [A] Explain concept of six-sigma. Describe the steps of six sigma breakthrough strategy for quality improvement. 07
- [B] The following table shows, for each activity of a project, the normal and crash times as also the normal and crash costs. The contract includes a penalty clause of Rs 200 /day in excess of 19 days. The overhead cost Rs 400/day. 07

	Time (Days)		Cost (Rs)	
Activity	Normal	Crash	Normal	Crash
1-2	6	4	600	1000
1-3	4	2	600	1400
2-4	5	3	500	1500
2-5	3	1	450	650
3-4	6	4	900	2000
4-6	8	4	800	3000
5-6	4	2	400	1000
6-7	3	2	450	800

Draw the project n/w and determine critical path. Crash the project activities and determine the optimal duration of the project and the cost involved for same.

OR

- Q.4 [A] Differentiate between intermittent and continuous production system. 07
- [B] The owner of a chain of fast food restaurants is considering a new computer system for accounting and inventory control. A computer company sent the following information about the system installation: 07

Activity	Immediate Predecessors	Optimistic Time	Most Likely Time	Pessimistic Time
A	-	4	6	8
B	A	5	7	15
C	A	4	8	12
D	B	15	20	25
E	B	10	18	26
F	C	8	9	16
G	E	4	8	12
H	D,F	1	2	3
I	G,H	6	7	8

Construct an arrow diagram for this problem and determine the critical path, expected project completion time and variance of the project length.

Q.5 For a special component outsourced to a vendor and used in textile machinery manufactured by Amar Machine tool works, we have the following situation: 14

Yearly Demand: 3,00,000 units

Purchase Quantity: 1,00,000 units

Safety Stock: 50,000 units

The ordering cost, independent of purchase quantity, is Rs 1500 each purchase. The price of the component is Rs 75/unit. Annual holding cost is 20% of the value of the component (inventory interest rate 20%). Assuming 230 working days per year. Calculate

(I) Average Inventory Level (Including Safety Stock)

(II) Total inventory costs per year and total inventory costs per working day with purchase quantity 1,00,000 units

OR

Q.5 (I) Economic Order Quantity (EOQ) 14

(II) Total inventory costs per year and total inventory costs per working day with EOQ and with a safety stock decreased to 5000 units.
