Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA – SEMESTER -II– EXAMINATION – WINTER 2021

Subject Code: 4529205   **Date: 25-02-2022**
Subject Name: Production & Operations Management
Time:02:30 PM TO 05:30 PM   **Total Marks: 70**

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

Q. No.	Question Text and Description	Marks
Q.1	Definitions / terms / explanations / short questions based on concepts of theory/practical	**14**

    (a) Critical Path
    (b) Economic Order Quantity
    (c) Line Balancing
    (d) Six Sigma
    (e) Fixed Position Layout
    (f) Just in Time
    (g) Robust Design

Q.2   **(a)** What is Plant layout? List the various types of Plant layout. Differentiate product layout and process layout. **07**

       (b) Define various types of manufacturing system. Explain continuous production system with merits and demerits of it. **07**

OR

       (b) Seven jobs are performed first on machine A and then on machine B. The time taken (in hours) by each machine is given below : **07**

Job	1	2	3	4	5	6	7
Time on m/c A	5	3	2	10	12	6	8
Time on m/c B	3	2	5	11	10	7	3

Determine optimum sequence of jobs that minimize total elapsed time to complete the jobs. Also complete minimum time

Q.3   **(a)** Discuss the basic strategies of aggregate planning. **07**
       (b) Annual demand of a chemical is 40000 kg. The factory works for 50 weeks for a year. Ordering cost is Rs 800 per order. Price of chemical is Rs 10 per kg. Inventory carrying cost is 10% of price. Find out EOQ. **07**
The company's lead time purchasing is 3 weeks. Company has decided safety stock as 10% of EOQ. Find out safety stock, re-order level, minimum level and maximum level.

OR

Q.3　**(a)**　Explain various rules of sequencing.　　　　　　　**07**

　　　(b)　A milk plant distributes its products by trucks loaded at the　**07**
　　　　　loading dock. The data available is:
　　　　　Average arrival rate of trucks at the dock = 3 per hour
　　　　　Average loading of truck = 4 per hour
　　　　　Find
　　　　　　　a)　The probability that truck has to wait as the loading is
　　　　　　　　busy
　　　　　　　b)　The waiting line of the truck before being loaded
　　　　　　　c)　The average length for all the queues.

Q.4　**(a)**　What is Quality? Explain various dimensions of quality.　　**07**

　　　(b)　The metropolitan transit system uses the number of complaint　**07**
　　　　　per day as a measure of service quality. For 10 days, the numbers
　　　　　of complaints were as following.

No of Days	1	2	3	4	5	6	7	8	9	10
No of Complaints	4	8	2	0	3	9	10	0	6	4

　　　　　Find the control limits of C chart taking 3 standard deviation
　　　　　as confidence level. Construction of chart is not required.

OR

Q.4　**(a)**　Short Note : Industrial Safety　　　　　　　　　**07**

　　　(b)　From the following　　　　　　　　　　　　**07**
　　　　　　　1)　Draw network diagram and find out critical path.
　　　　　　　2)　Calculate EST, LST, EFT, LFT.

Activity	Predecessor	Duration
A	-	3
B	-	2
C	-	2
D	A	4
E	B	4
F	B	7
G	C	4
H	D	2
I	E	5
J	G, F	6
K	H, I	3

Q.5　　A company use a special bracket in the manufacturing of its　**14**
　　　　product from outside supplier. Demand is 2000 brackets per
　　　　year. Ordering cost is Rs 20 per order, inventory carrying cost is
　　　　20% of bracket price and the price of bracket is Rs 10.
　　　　The following discount is offered by company:
　　　　2% discount if order quantity is 400 – 799
　　　　4% discount if order quantity is 800 – 1599
　　　　5% discount if order quantity 1600 and more
　　　　Find best inventory policy.

OR

Q.5   A project consists of seven activities as given below :   **14**

Activity	Optimistic Time	Most likely Time	Pessimistic Time
1-2	1	1	7
1-3	1	4	7
1-4	2	4	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Draw the project network. What is expected duration of project? What is the probability that the project will be completed in 14 weeks?

Z :   0.5   0.67   1   1.33   2
P : 0.1915   0.2486   0.3413   0.4082   0.4772

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