Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.B.A -II[nd] SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 820006 Date: 02/06/2012

Subject Name: Production and Operations Management

Time: 10:30 am – 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.**

Q.1 **(a)** Define Operations Management. Where OM stands in the organization? **07**

(b) Explain various product design approaches. **07**

Q.2 **(a)** XYZ television Lt. sources 3000 picture tubes for its TV sets from its supplier. The Ordering cost is Rs. 10 per order and the Carrying cost is Rs. 6 per unit per year. The company has 300 working days per year. Find **07**

1. EOQ
2. number of orders /year
3. total inventory cost
4. duration of an inventory cycle

(b) Describe MRP system in detail. Is MRP-II differing than MRP? Explain. **07**

OR

(b) Define inventory and inventory management. What different cost components to be considered while controlling the inventory? **07**

Q.3 **(a)** Find the sequence that minimizes the total elapsed time required to complete following jobs on Machines M1, M2 and M3 in the order M1M2M3. **07**

Job	M1	M2	M3
A	8	3	8
B	3	4	7
C	7	5	6
D	2	2	9
E	5	1	10
F	1	6	9

(b) A small project is composed of activities whose time estimates are listed in the table below. **07**

1. Draw the project network
2. Find the expected duration
3. What is the probability that the project will be completed at least 4 weeks earlier than expected?

Z:	0.5	0.67	1.00	1.33	2.00
P:	0.1915	0.2486	0.3413	0.4082	0.4772

Activity	To	Tm	Tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

OR

Q.3 **(a)** ABC company is engaged in manufacturing 5 brands of packed snacks. It has five manufacturing setups, each capable of manufacturing any of its bands one at a time. The costs to make a brand on these setups vary according to the following table. **07**

Brands\ setups	S1	S2	S3	S4	S5
B1	4	6	7	5	11
B2	7	3	6	9	5
B3	8	5	4	6	9
B4	9	12	7	11	10
B5	7	5	9	8	11

1. Find the optimum assignment of products on these setups resulting the minimum cost.

(b) The data for a project are given below. Time is in weeks. **07**

Activity	Preceding Activity	Normal Time	Crash Time	Normal Cost	Crash Cost
A	-	3	2	18000	19000
B	-	8	6	600	1000
C	B	6	4	10000	12000
D	B	5	2	4000	10000
E	A	13	10	3000	9000
F	A	4	4	15000	15000
G	F	2	1	1200	1400
H	C,E,G	6	4	3500	4500
I	F	2	1	7000	8000

1. Draw a project network diagram and find the project completion time.
2. If a deadline of 19 weeks is imposed for project completion what would be the additional costs?

Q.4 **(a)** Assume that at a bank teller window the customers arrive at the average rate of 20/hr according to a Poisson distribution. The bank teller spends an average 2 minutes /customer to complete the service, according to exponential distribution. Customers, who arrive from an infinite population, are served on a FCFS basis. **07**

1. What is the expected waiting time in the system?
2. What is the mean number of customers waiting in the system?
3. What is the probability of zero customers in the system?
4. What is the value of the utilization factor?

(b) What is SCM? What are the activities involved in SCM ? **07**

OR

Q.4 **(a)** Explain the basic four supply chain strategies according to Hau Lee. **07**

(b) What is queuing? Explain the general queuing system. **07**

Q.5 **(a)** What is SQC? Explain and differentiate various process control charts. **07**

(b) What is JIT? Explain the benefits of JIT. **07**

OR

Q.5 **(a)** What is TQM? What is the SIX sigma concept for quality management? **07**

(b) Write a note on ISO and its various series applicable to operations management. **07**

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