Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER-1 (NEW) EXAMINATION – WINTER 2016

Subject Code: 2714607 **Date:06/01/2017**

Subject Name: Advance Production and Operation Management

Time: 2:30 pm to 5:00 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)** Explain the system aspect of Production and Operation Management with block diagram. Compare production of goods with production of services. **07**

(b) What are the steps of design of New Product Development? Explain each stage briefly. **07**

Q.2 **(a)** Attempt following questions. **07**

(i) Explain simplification of product design?

(ii) Explain the criteria for make or buy.

(iii) What are the aims of Value Engineering?

(b) An Item has yearly demand of 1000 units. The different costs with regard to make or buy option are as follows. **07**

	Buy	Make
Product cost / unit (Rs.)	75	60
Procurement cost/order (Rs.)	240	-
Setup cost / setup (Rs.)	-	500
Annual carrying cost/ product/ year (Rs.)	20	15
Production rate /year (Rs.)		7500 products

1

OR

(b) List and explain the steps of process design. **07**

Q.3 **(a)** Explain Shortest Processing Time (SPT) rule to minimize flow time for single machine scheduling. What is its effect on in-process inventory and mean flow time? Calculate mean flow time for 3 jobs (a,b & c) having processing time 7, 2 and 4 hrs accordingly. **07**

(b) Consider the following single machine scheduling problem with weights. **07**

Job (j)	1	2	3	4	5	6
Processing time (t_j)	10	8	4	16	6	12
Weights (w_j)	1	2	1	2	3	1

Determine the sequence which will minimize the weighted mean flow time. Also find the weighted mean flow time Fw.

OR

Q.3 **(a)** Solve the following single machine scheduling problem using EDD rule. **07**

Job (j)	1	2	3	4	5	6
Processing time (t_j)	10	6	9	8	8	14
Due Date (d_j)	15	12	8	16	20	28

Determine: (i) the sequence which will minimize the maximum lateness ($L_{max.}$), (ii) $L_{max.}$ with respect to the optimal sequence, (iii) Idle time of machine 2.

(b) Consider the following 2 machines and 6 jobs flow shop scheduling problem. Using Johnson's algorithm, obtain the optimal sequence which will minimize the make span. Calculate total make span time and idle time of machine 2. **07**

Job (i)	Machine 1	Machine 2
1	5	7
2	10	8
3	8	14
4	9	7
5	6	11
6	12	10

Q.4 **(a)** What are the operational service strategies in service management? Which parameters are focused in this? Explain with example. **07**

(b) Briefly explain 7 wastes of production system. **07**

OR

Q.4 **(a)** Explain operational classification of services. Compare high and low contact system. **07**

(b) Enlist the seven elements of Just in Time. Explain any two **07**

Q.5 **(a)** Briefly explain: Job enlargement, Job enrichment and Job rotation. **07**

(b) What is Lean Manufacturing? Briefly explain the steps of implementing Lean Manufacturing. **07**

OR

Q.5 **(a)** What is specialization in production system? What are the advantages and disadvantages of specialization to the management? **07**

(b) Define Business Process Reengineering (BPR)? What is the role of information technology in BPR? **07**

****