# GUJARAT TECHNOLOGICAL UNIVERSITY
## M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

**Subject code: 2714607**                                    **Date: 12-01-2015**
**Subject Name: Advance Production and Operations Management**
**Time: 02:30 pm - 05:00 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)** Define the following terms.(Any three)                                    **07**

(i) Use Value (ii) Value Engineering, (iii) Lateness, (iv) Tardiness

Explain following rules of scheduling.

(i) WSPT (ii) EDD

**(b)** What is Operation Management? Explain operation management for production and service management. Also draw a block diagram.    **07**

**Q.2** **(a)** Enumerate the steps of product development. Explain each step briefly.    **07**

**(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 | 70 |
| Procurement cost/order | (Rs.) | 100 | - |
| Setup cost / setup | (Rs.) | - | 500 |
| Annual carrying cost/ product/ year | (Rs.) | 20 | 16 |
| Production rate /year | (Rs.) |  | 5000 products |

**OR**

**(b)** What are the functions (responsibilities) of Process Planning Engineer?    **07**

**Q.3** **(a)** What is Value Engineering? What are the aims of Value Engineering? What are the steps of implementing Value Engineering?    **07**

**(b)** Consider the following single machine scheduling with independent jobs.    **07**

| Job (j) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Processing time ($t_j$) | 5 | 12 | 8 | 10 | 3 | 15 | 8 | 6 |
| Due date ($d_j$) | 10 | 16 | 11 | 16 | 6 | 25 | 12 | 14 |

Calculate followings.

(i) Obtain the optimal schedule to minimize mean flow time and calculate mean flow time

(ii) Obtain the optimal schedule to minimize the maximum lateness and calculate maximum lateness

**OR**

**Q.3** **(a)** Consider the following single machine scheduling problem. **07**

| Job (j) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Processing time ($t_j$) | 15 | 4 | 5 | 14 | 8 | 6 | 12 | 10 |
| Weights ($w_j$) | 1 | 2 | 1 | 2 | 3 | 1 | 3 | 3 |

Determine the sequence which will minimize the weighted mean flow time and calculate weighted mean flow time.

**(b)** Explain two jobs and M machines scheduling method. Draw graphical representation using following data. **07**

| Job 1 | Sequence | A | B | C | D |
|---|---|---|---|---|---|
| | Time (hrs) | 3 | 4 | 2 | 6 |
| Job 2 | Sequence | B | C | A | D |
| | Time (hrs) | 5 | 4 | 3 | 2 |

**Q.4** **(a)** What do you mean by "Just in Time" production system? Explain following elements of JIT. **07**

    (i) Focused factory network, (ii) Group technology, (iii) Quality at source

**(b)** What are the operational service strategies in service management? Brief the focus and advantage of it? **07**

**OR**

**Q.4** **(a)** Explain working of "Kanban" production control system. **07**

**(b)** Briefly explain operational classification of services. Brief about high and low contact system. **07**

**Q.5** **(a)** What is Lean Manufacturing? Briefly explain steps of implementing Lean Manufacturing. **07**

**(b)** Explain the concepts of Job enlargement, Job enrichment and Job rotation. **07**

**OR**

**Q.5** **(a)** What is Business Process Reengineering (BPR)? Briefly explain steps of BPR. **07**

**(b)** What are different work measurement techniques? Explain work sampling technique. **07**

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