## Eighth Semester B.E. Degree Examination, June/July 2016
# Operations Management

Time: 3 hrs. 　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

**Note:** *Answer any FIVE full questions, selecting*
*atleast TWO questions from each part.*

### PART – A

1　a. Define operation management. Draw the operations management system showing input and output model for an international airport. **(06 Marks)**

　b. Briefly explain how service producers differ from goods producers in important aspects of their operations. **(06 Marks)**

　c. With neat schematic sketch, explain the frame work for managing operations. **(08 Marks)**

2　a. Define decision making. Explain the frame work for decision making. **(06 Marks)**

　b. Two assembly robots X and Y working at the same rate together produce 400 filters per day. During a recent day, 40 filters were found defective. given that the filter is defective, there is 0.40 probability it was produced by robot X (i.e., $P_{X/D} = 0.40$). What is the probability that a filter selected at random is : i) Defective ii) Produced by robot Y iii) Defective and produced by robot X iv) Defective or produced by robot X. **(04 Marks)**

　c. Define BEP. Briefly explain the various methods of lowering the breakeven point. **(10 Marks)**

3　a. Briefly explain the following : i) Time series forecasting ii) Forecasting error and tracking signal. **(10 Marks)**

　b. The following table gives the annual shipment (tons) of welded tube by an aluminum producer to machinery manufacturers :

| Year | 2004 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 2014 |
|------|------|----|----|----|----|----|----|----|----|----|------|
| Shipment (tons) | 2 | 3 | 6 | 10 | 8 | 7 | 12 | 14 | 14 | 18 | 19 |

Use the least square method to develop a linear trend equation for the data given, state the equation and forecast the shipment for 2015. **(10 Marks)**

4　a. Define capacity planning. Explain long-terms and short-term capacity strategies. **(05 Marks)**

　b. The individual component capacities (in units/day) for an assembly line that consists of five activities are shown in the figure below Fig. Q4(b). **(05 Marks)**
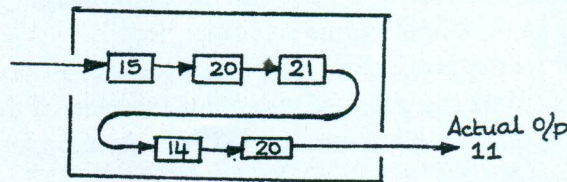


Fig. Q4(b)

　　i) What is the system capacity?
　　ii) What is the efficiency of the system?

　c. Annual demand for a manufacturing organization capacity is expected to be as follow :

| Unit demanded | 8000 | 10000 | 15000 | 20000 |
|---------------|------|-------|-------|-------|
| Probability | 0.5 | 0.2 | 0.2 | 0.1 |

Revenues are ₹35/unit. The existing manufacturing facility has annual fixed cost/operation are ₹2 lakhs. Variable manufacturing cost are ₹7.75/unit, ₹5/unit, ₹5.33/unit & ₹7.42/unit at the 8000, 10000, 15000 and 20000 unit output level respectively. An expanded facility under consideration would require ₹2,50,000 fixed operating cost annually. Variable cost are ₹9.4/unit, ₹5.2/unit, ₹3.8/unit and ₹4.9/unit at the 8000, 10000, 15000, 20000 unit output level receptively. In order to maximize the earnings which size facility should be selected? **(10 Marks)**

## PART – B

5  a. List and explain the aggregating planning strategies. **(06 Marks)**
   b. Demand forecast for a non automatic washing machine is given in the following table for three periods.

| Period | Demand forecast | Limits on sources of capacity | | |
|---|---|---|---|---|
| | | Regular | Overtime | Subcontract |
| 1 | 600 | 975 | 225 | 150 |
| 2 | 1050 | 975 | 225 | 150 |
| 3 | 1600 | 975 | 225 | 150 |

Initial inventory = 0
Ending inventory = 220
Unit production cost (regular) = ₹ 5000/-
Overtime production cost/unit = ₹ 8000
Subcontracting cost/unit = ₹ 12000/-
Back ordering cost = ₹ 400/unit/period
Inventory carrying cost = ₹ 100/unit/period
Formulate the aggregate planning problem by transportation method. **(14 Marks)**

6  a. Define inventory. Enlist the various reasons for maintaining inventories. **(06 Marks)**
   b. Enlist the characteristics of manufacturing model with no shortages. **(04 Marks)**
   c. A company purchases 9000 parts of a machine for its annual requirement, ordering one month's usage at a time. Each part cost ₹ 20/-. The ordering cost per order is ₹ 15/- and the carrying charges are 15% of the average inventory per year. Determine the economical purchasing policy for the company. What advice would you offer and how much would it save the company per year? **(10 Marks)**

7  a. Define MRP. Explain the fundamental concepts of MRP. **(07 Marks)**
   b. Briefly explain MRP – II. **(07 Marks)**
   c. A company makes Q model from components R, S and T component R is made from 2 units of component X and one unit of component Y. Component T is made from one unit of component Y and 3 units of component Z.
      i) Draw the product structure tree for the Q–model
      ii) Calculate the gross requirement for each of the components if the company plans to build 100 units of its Q–model, if 150 units component T and 200 units of component R in inventories. **(06 Marks)**

8  a. Define supply chain. Explain the components of supply chain in detail. **(08 Marks)**
   b. With neat block diagram, explain the various activities of company and supplier. **(08 Marks)**
   c. Bull whip effect in supply chains. Explain. **(04 Marks)**

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