Eighth Semester B.E. Degree Examination, June/July 2015
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. Explain 'Scientific Management' and its origin. **(05 Marks)**

　b. What is 'Operations Management'? **(05 Marks)**

　c. What is 'Productivity'? Mention how it can be improved. **(05 Marks)**

　d. Suppose a company produced 300 standard book cases last week using 8 workers and it produced 240 standard book cases this week using 6 workers. In which week was productivity higher? **(05 Marks)**

2　a. Explain what 'Uncertainty' is and how this can be overcome in operations management. **(08 Marks)**

　b. Explain 'Bayes Theorem' with notations. A study of old buses shows the probability of an accident by over speeding is 0.8, and the probability of over speeding alone is 0.3. The probability of an accident occurring due to non overspeeding reduces to 0.1. Recently an accident occurred. What is the probability that the bus was overspeeding? **(06 Marks)**

　c. Maximize $3x_1 + 5x_2$, given $x_1 + 2x_2 \geq 2000$, $x_1 + x_2 \geq 1500$, $x_2 \geq 600$ by graphical method. **(06 Marks)**

3　a. Explain the 'Moving Average' and 'Simple Exponential Smoothing' methods of forecasting. **(08 Marks)**

　b. Explain 'Linear Regression' method for trend analysis by least squares. Explain any simplification possible. **(06 Marks)**

　c. The data given below refers to past sales for last eleven years. Using least squares estimate sales forecast for the next two years. Also use 'Moving Average' for 3 years and compare the forecasts. **(06 Marks)**

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Sales Rs. $\times 1000$	35	50	48	47	50	55	65	77	92	86	100

4　a. How do you define 'capacity' and how do you measure it? A factory wishes to acquire stamping machines to produce 30,000 T shirts per month. They operate 200 hours per month but the machines will be used of 75% of the time only and output is 5% defective. A stamping operation takes one minute per T-shirt. Assuming 95% efficiency, how many machines are required? **(12 Marks)**

　b. Define 'Plant Layout'. Mention the main types of 'Processing Layouts'. **(08 Marks)**

PART – B

5　a. Define 'Aggregate Planning'. Define 'Master Scheduling'. What are the differences, if any? **(04 Marks)**

　b. Mention the strategies for 'Aggregate Planning'. **(06 Marks)**

c. Big Mart maintain a constant work force which can produce 3000 tables per quarter. The annual demand is 12000 units and is distributed seasonally in accordance with quarterly indexes $Q_1 = 0.80$, $Q_2 = 1.40$, $Q_3 = 1.00$, $Q_4 = 0.80$. Inventories are accumulated when demand is less than capacity and are used up during periods of strong demand. To supply the total demand i) How many tables must be accumulated each quarter? ii) What inventory must be on hand at the beginning of the first quarter? **(10 Marks)**

6 a. Define ABC analysis, EOQ, ordering cycle. **(06 Marks)**
  b. Calculate the economic lot size with uniform rate of demand and instantaneous replacement. Give total costs and total annual costs. **(06 Marks)**
  c. A stockiest has to supply 800 units per week of a product to his customers. He gets the product at RS.75 per unit from the manufacturer. The cost of ordering and transportation from the manufacturer is Rs.100 per order. The cost of carrying is 10% per year of the cost of the product. Calculate the economic lot size, time to produce the economic lot size and total optimum cost per week. **(08 Marks)**

7 a. What is MRP and give the inputs required? **(04 Marks)**
  b. What is ERP? **(04 Marks)**
  c. A work centre operates 6 days a week on a two shifts per day basis (8 hours per shift). It has four machines with the same capacity. If the machines are utilized 75% of the time at a system efficiency of 90%, what is the rated output in standard hours per week? **(06 Marks)**
  d. Given the structure tree shown, compute the net requirements of A, B, C, D, E, F to produce 10 units of end item X. No stock is on hand. **(06 Marks)**
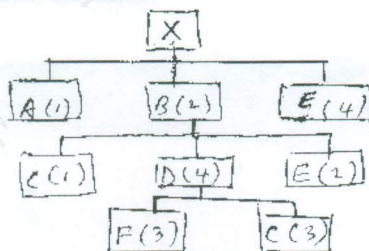

Fig.Q.7(d)

8 a. Explain the importance of purchase and supply management. **(06 Marks)**
  b. Explain the concept of tenders and logistics management. **(06 Marks)**
  c. Micro-Brush requires a new component for their laptop cleaning machines. The company must decide whether to make or buy them. If it decides to make them, should it use process A or process B? Use a Break-Even analysis to advise them if the following data is given:

	Make A	Make B	Buy
Annual volume	10,000	10,000	10,000
Fixed cost/year	Rs.150,000	Rs.2,00,000	
Variable cost/unit	Rs.100	Rs.50	Rs.200

  i) Should Micro make using process A or B or buy?
  ii) At what annual volumes should Micro switch from each make/buy decision to the other? **(08 Marks)**

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