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12MBA32

**Third Semester MBA Degree Examination, Dec. 2013 / Jan. 2014**  
**Operations Management**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any THREE questions, from Part A.**  
**2. Part B and Part C are compulsory.**

**PART - A**

- 1 a. Define Operations Management. (03 Marks)  
 b. Explain the Managerial uses and limitations of Break Even Analysis. (07 Marks)  
 c. A manufacturer of critical components for Two – Wheelers in the automotive sector is interested in forecasting the trend of demand during the next year as a key input to its annual planning exercise. The past sales for the last three years are given below :

PERIOD	ACTUAL DEMAND	PERIOD	ACTUAL DEMAND
Year 1 : Q1	260	Year 2 : Q3	387
Year 1 : Q2	438	Year 2 : Q4	464
Year 1 : Q3	359	Year 3 : Q1	505
Year 1 : Q4	406	Year 3 : Q2	618
Year 2 : Q1	393	Year 3 : Q3	443
Year 2 : Q2	465	Year 3 : Q4	540

Extract the trend component of the time series data using linear regression and use it for predicting the future demand of year 4. (10 Marks)

- 2 a. Write a brief note on forecasting as a planning tool. (03 Marks)  
 b. Describe the various types of plant layout. (07 Marks)  
 c. Calculate the standard time per article produced from the following data obtained by a work sampling study : Total No. of observations = 2500 ; No. of working observations = 2100 ; No. of units produced in 100 hours duration = 6000 units ; Proportion of manual labour = 2/3 ; Proportion of machine time = 1/3 ; Observed rating factor = 115 % ; Total allowance = 12% of normal time. (10 Marks)
- 3 a. Mention the variables affecting labour productivity. (03 Marks)  
 b. Discuss the 'CHASE' and 'LEVEL' strategies of aggregate production planning. (07 Marks)  
 c. Calculate the vendor rating for the following. The item under consideration is the same from all suppliers.

DATA	A	B	C
Quantity Supplied	15	10	1
Quantity Accepted	12	9	1
Price of each item	Rs 15	Rs 19	Rs 21
Delivery promised	6 weeks	6 weeks	6 weeks
Actual deliveries made	8 weeks	6 weeks	7 weeks

Weightage for quality = 70% . Price = 20% , Delivery = 10%.

- 4 a. What is Lead Time?

- b. Enumerate the descriptive characteristics of service operations. (07 Marks)
- c. Mention and explain the elements of operations strategy. (10 Marks)
- 5 a. State any three factors affecting facility location decision. (03 Marks)
- b. Differentiate between products and services. (07 Marks)
- c. Compute the Composite Break Even Point (quantity) for multi product situations and the Individual Break Even Point. (10 Marks)

DATA	PRODUCTS			
	A	B	C	D
Selling price per unit (Rs)	10	20	15	10
Variable cost per unit (Rs)	6	15	9	6
Sales volume (units)	1000	2000	1000	1000

The Total Fixed cost is Rs 4800.

- 6 a. What is Material Requirements Planning? (03 Marks)
- b. Comment on the factors involved in the delivery of services. (07 Marks)
- c. A manufacturer of farm equipment is considering 3 locations – A, B and C for a new plant. Cost structure shows that the variable cost at the sites are Rs 100 per unit, Rs 90 per unit and Rs 95 per unit respectively. If the plant is designed to have an effective capacity of 2500 units per year and is expected to operate at 80% efficiency, which is the most important location on the basis of actual output. Assume the fixed costs per year at the sites are Rs 240000, Rs 270000 and Rs 250000 respectively. Also determine the range of annual volume of production for which each of the locations A, B and C would be most economical. (10 Marks)

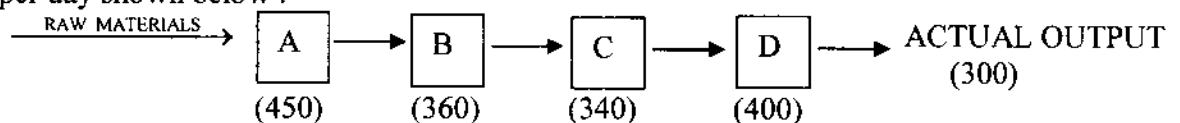
### PART B

- 7 a. The manager of a Commercial Bank must decide the number of ATM machines to be installed in an ATM counter. Each machine can process 100 customers per day. One machine will result in a fixed cost of Rs 2000 per day while two machines will result in a fixed cost of Rs 3800 per day. Variable costs will be Rs 20 per customer and revenue will be Rs 45 per customer.
- i) Determine the Break Even Point for each range.
- ii) If estimated demand is 90 to 120 customers per day, how many machines should be purchased? (05 Marks)
- b. The table shows the monthly demand over 6 months period for a product.

Month	1	2	3	4	5	6
Demand (units)	120	130	110	140	110	130

Determine the forecast of demand for the 7 month using 3 month simple moving average method. (05 Marks)

- c. A work sampling study is to be made of a typist pool. It is felt that typists are idle 30% of the time. How many observations should be made in order to have 95.5% confidence so that the accuracy is within  $\pm 4\%$ ? (Given  $C = 2$  for 95.5% confidence level). (05 Marks)
- d. A firm has four work centres – A, B, C and D in series with individual capacities in units per day shown below :



- i) Identify the bottle neck centre.
- ii) What is the system capacity?
- iii) What is the system efficiency? (05 Marks)

PART – C

- 8 a. A two wheeler component manufacturing unit uses large quantities of a component made of steel. The annual demand for the component is 2500 boxes. The company procures the item from a supplier at the rate of Rs 750 per box. The company estimates the cost of carrying inventory to be 18% per unit per annum and the cost of ordering as Rs 1080 per order. The company works for 250 days in a year. Design and inventory control system for
- This item by calculating the economic order quantity and number of orders to be placed. (05 Marks)
  - What is the overall cost of the plan, when you focus on the cost of economic order quantity? (05 Marks)
  - The supplier is willing to offer a discount of 2% on the unit price for 400 boxes. Should the discount offer be accepted? Give reasons. (05 Marks)
- b. Write a note on ABC analysis. (05 Marks)

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