CBCS SCHEME

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18ME56

Fifth Semester B.E. Degree Examination, Feb./Mar.2022
Operations Management

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1　a. Explain briefly with a schematic model the functions of business organization and operation management within them. **(08 Marks)**

　　b. Define productivity and explain the factors that affect productivity. **(06 Marks)**

　　c. Determine the productivity and multi factor productivity respectively for the cases:
　　　(i)　Four workers installed 720 sq m of carpeting in 8 hours.
　　　(ii)　For the combined input of labour and machine time using the following :
　　　Output : 7040 units
　　　Input : Labour : Rs. 1000.00
　　　　　　　Materials : Rs.520.00
　　　　　　　Overhead : Rs.2000.00 **(06 Marks)**

OR

2　a. What are models? Explain different types of models. **(06 Marks)**

　　b. A firm produces two types of microcomputers. The following data is available:

Profit/Unit	Rs.6000.00	Rs.5000.00
Assembly time per unit	4 hours	10 hours
Inspection time per unit	2 hours	1 hour
Storage space per unit	3 cub ft	3 cub ft

The available resources :

Resource	Amount available
Assembly time	100 hours
Inspection time	22 hours
Storage space	39 cubic feet

Formulate as LPP and solve by graphical method to find quantities of Type 1 and Type 2. **(14 Marks)**

Module-2

3　a. Explain the following forecasting methods :
　　　(i)　Linear regression
　　　(ii)　Exponential smoothing. **(08 Marks)**

　　b. Given the following data:

Period	Number of complaints
1	60
2	65
3	55
4	58
5	64

Prepare a forecast using each of these approaches:
　　　(i)　A three period moving average.
　　　(ii)　A weighted average using weights of 0.5 (most recent), 0.30 and 0.2.
　　　(iii)　Exponential smoothing with a smoothing constant of 0.40. **(12 Marks)**

OR

4 a. Explain the steps in the forecasting process. **(06 Marks)**
   b. What is Delphi method? Brief. **(04 Marks)**
   c. The mobile phone sales for a company over the last 10 weeks are shown in below table. Plot the data and visually check to see if a linear trend line would be appropriate. Then determine the equation of the trend line and predict sales for weeks 11 and 12.

Week	Unit sales	Week	Unit sales
1	700	6	742
2	724	7	756
3	720	8	750
4	726	9	770
5	738	10	780

(10 Marks)

Module-3

5 a. List the factors that determine effective capacity and explain any four. **(06 Marks)**
   b. Explain bottle neck operation with a neat diagram. **(06 Marks)**
   c. A small firm produces and sells automotive items in a five state area. The firm experts to consolidate assembly of its battery chargers line at a single location. Currently operations are in three widely scattered locations. The leading candidate for location will have a monthly fixed cost of Rs.42 lakhs and variable cost of Rs.200/charger. Chargers sell for Rs.700 per charger. Prepare a table that shows total profits, fixed costs variable costs, and revenues for monthly volumes of 10,000, 12,000 and 15,000 units. What is the break even point? Determine the profit when volume equals 22000 units. **(08 Marks)**

OR

6 a. What are factors that affect location decision? Explain. **(10 Marks)**
   b. Fixed and variable costs for four potential plant locations are shown below:

Location	Fixed cost/year	Variable cost/unit
A	Rs.2,50,000.00	Rs.110.00
B	Rs.1,00,000.00	Rs.300.00
C	Rs.1,50,000.00	Rs.200.00
D	Rs.2,00,000.00	Rs.350.00

   (i) Plot the total cost lines for these locations on a single graph.
   (ii) Identify the range of output for which each alternative is superior.
   (iii) If expected output at the selected location is to be 8000 units/year, which location would provide the lowest total cost? **(10 Marks)**

Module-4

7 a. Briefly explain the aggregate planning with the help of a flow chart. **(06 Marks)**
   b. Given the following information setup the problem in a transportation table and solve for the minimum cost plan by least cost method.

	Period		
	1	2	3
Demand	500	700	750
Regular	500	500	500
Capacity over time	50	50	50
Sub contract	120	120	100

Costs : Initial Inventory : 100
   Regular time : Rs. 60/unit
   Sub contracting : Rs. 90/unit
   Inventory carrying cost : Rs.1/unit/month
   Back order cost : Rs.3/unit/month

(14 Marks)

OR

8 a. Explain master scheduling process with the help of a flow chart. **(08 Marks)**

   b. Determine : the projected on hand inventory, the master production schedule and the uncommitted inventory (ATP – Available To Promise) for the following data and production capacity is 70 pumps. Forecast are shown in table.

Beginning Inventory 64	June (weeks)				July (weeks)			
Week	1	2	3	4	5	6	7	8
Forecast	30	30	30	30	40	40	40	40
Customer orders (committed)	33	20	10	4	2	-	-	-

(12 Marks)

Module-5

9 a. Explain with schematic model an overview of MRP. **(10 Marks)**

   b. The Fig.Q9 (b) shows product structure tree for end Item X i.e.Chairs
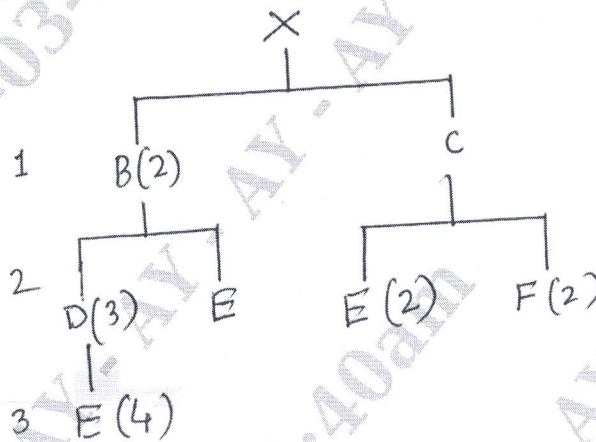

Fig. Q9 (b)

(i) Determine the quantities of B, C, D, E and F needed to assemble one X.

(ii) Determine the quantities of these components that will be required to assemble 10Xs, taking into account the quantities on hand (i.e. an inventory) of various components:

Component	On Hand
B	4
C	10
D	8
E	60

(10 Marks)

OR

10 a. What is supply chain? Explain supply chain management with a schematic model. **(10 Marks)**

   b. Describe Bull whip effect with a diagram. **(05 Marks)**

   c. Briefly explain elements of supply chain management. **(05 Marks)**

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