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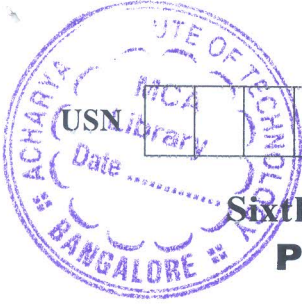### Sixth Semester B.E. Degree Examination, June/July 2024
Production and Operations Management

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1   a.   Discuss the three major functional areas of business organizations and describe how they interrelate. **(10 Marks)**

    b.   List some factors that affect productivity and some ways that productivity can be improved. **(06 Marks)**

    c.   Calculate the multifactor productivity for an eight-hour day, in which the output is 300units, produced by three workers who use 600kg of material. The workers are paid wages of Rs.50 and material cost is Rs.10 per kg. Overhead is 1.5 times labour cost. **(04 Marks)**

OR

2   a.   Describe the following :
         i)   Decision making characteristics
         ii) Break Even Point (BEP). **(10 Marks)**

    b.   A furniture company produces inexpensive tables and chairs. Each table takes 4 hours of carpentry and 2 hours in the painting department. Each chair requires 3 hours of carpentry and 1 hours in the painting department. During the current production period, 240 hours of carpentry time is available and 100 hours in painting is available. Each table sold yields a profit of Rs.7; each chair produced is sold for a profit of Rs.5. Find the best combination of tables and chairs to manufacture in order to reach maximum profit. Use LPP (Linear programming) method. **(10 Marks)**

Module-2

3   a.   Discuss qualitative forecast and its types. **(10 Marks)**

    b.   Given the following data :

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

Prepare a forecast for period 6 using each of these approaches :
i)   The appropriate naïve approach
ii) A three-period moving average
iii) A weighted average using weights of 0.50(most recent), 0.30 and 0.20
iv) Exponential smoothing with a smoothing constant of 0.40. **(10 Marks)**

OR

4   a.   Discuss the sources of idea for new design and services. **(10 Marks)**

    b.   Explain the 3R's with respect to sustain ability in product design. **(10 Marks)**

Module-3

5 a. Discuss the determinants for effective capacity. (10 Marks)
   b. A small firm produces and sells automotive items in a five-state area. The firm expects to consolidate assembly of its battery charger line in a single location. Currently operations are in three widely scattered locations. The leading candidate for location will have a monthly fixed cost of Rs.42,000 and variable costs of Rs.3 per charger. Charger sell for Rs.7 each. 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 breakeven point? (10 Marks)

OR

6 a. Discuss the primary regional factors involved in identifying a region during location decision. (10 Marks)
   b. Use the information contained in the table shown :

Task	a	b	c	d	e	f	g	h
Immediate predecessor	–	a	–	c	b	d, e	f	g
Task taken, min	0.2	0.2	0.8	0.6	0.3	1	0.4	0.3

Do each of the following :
i)   Draw a precedence diagram
ii) Assuming an eight – hour workday, compute the cycle time needed to obtain an output of 400units per day
iii) Determine the minimum number of workstations required
iv) Assign tasks to workstations according to the greatest number of following tasks. Compute the resulting percent idle time and efficiency of the system. (10 Marks)

Module-4

7 a. Explain briefly the strategies used in aggregate planning. (10 Marks)
   b. Company manufacturing several models of bicycles are about to prepare a aggregate plan that will cover six periods. They have assembled the following information :

Period	1	2	3	4	5	6	Total
Forecast	200	200	300	400	500	200	1800

Output : Regular time = Rs.200 per bicycle
         Inventory   = Rs.100 per bicycle per period an average
         Back orders = Rs.50per bicycle per period
The firm wants to evaluate a plan that calls for a steady rate of regular–time output. Prepare an aggregate plan and determine the total cost. Assume a level output rate of 300 units. (10 Marks)

OR

8 a. Discuss master scheduling process with the help of a flow chart. (10 Marks)
   b. A manufacturing plant is in the process of updating its Master Production Schedule (MPS) for its products. The plant produces a product as a produce to stock basis. The table below shown hours the estimates of demand for the product for the next six weeks.

Type of demand	Week					
	1	2	3	4	5	6
Customers (forecasts) and orders	700	1200	700	500	400	1200
Warehouses	100	100	400	500	200	100
Market research	–	50	–	–	10	–
Production Research	10	–	–	–	–	–

The safety stock level, minimum lot sizes and beginning inventory level for the product are :

Minimum lot size	Safety stock	Beginning inventory
2000	500	1500

Prepare a six week detailed MPS for the product and determine the production run periods.
  (10 Marks)

Module-5

9 a. With a flow chart, discuss inputs to and outputs from MRP system. (10 Marks)
   b. Compute the material requirement plan for an item shown in below. This item has an independent demand and a safety lock of 40 is desired :

Order quantity = 70 Lead time = 4 weeks safety lock = 40	Week											
	1	2	3	4	5	6	7	8	9	10	11	12
Projected requirement	20	20	25	20	20	25	20	20	30	25	25	25
Receipts		70										
Available on hand /65												
Planned order release												

  (10 Marks)

OR

10 a. Discuss the concepts of tenders and explain its types. (10 Marks)
    b. Give a comparison between the two approaches to supply management. (10 Marks)

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