M.P. Birla Institute of Management LIBRARY

62216

Reg. No. | | | | | | | | |

II Semester M.B.A. (Day and Evening) Degree Examination,

December - 2022

MANAGEMENT

PRODUCTION AND OPERATIONS RESEARCH

(CBCS Scheme 2019-20 Onwards)

Paper : 2.6

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Calculators and Tables are allowed.

SECTION - A

Answer any **FIVE** questions from the following. Each question carries **5** marks. **(5×5=25)**

1. Briefly explain the Production System.
2. What is Plant Layout? Outline any two types of Plant Layout.
3. Solve the following Linear Programming Problem using Graphical method :

$$360x_1 + 240x_2 \leq 5760$$
$$x_1 + x_2 \leq 20$$
$$x_1, x_2 \geq 0$$

4. Briefly explain the role of Quality Management in production.
5. Summarise Inventory management with suitable examples.
6. Calculate the vendor rating for the following :

The item under consideration is the same from all suppliers :

Suppliers Data	A	B	C
Quantity supplied	90	80	75
Quantity accepted	78	80	70
Price of each item (Rs.)	4	4.2	3.9
Delivery promised (in weeks)	6	6	6
Actual deliveries made (in weeks)	8	6.2	7

Weightage for Quality = 70% ; Price = 2% ; Delivery = 10%.

7. Briefly explain need and errors in Facility Location.

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SECTION - B

Answer any **THREE** questions from the following. Each question carries **10** marks. **(3×10=30)**

8. **"Production and Operation Research"** increases creative and judicious capabilities of a decision maker. Comment.

9. Find the initial basic solution using **Vogel's Approximation Method** and test for optimality using **MODI method :**

		Destination				
		1	**2**	**3**	**4**	**Supply**
Source	**1**	4	2	7	3	250
	2	3	7	5	8	450
	3	9	4	3	1	500
	Demand	200	400	300	300	

10. Write short notes on :
    a) Replacement Models.
    b) Materials Management.

11. Solve the following problems :
    a) **Travelling salesman problem :**

		To City				
		A	**B**	**C**	**D**	**E**
From City	**A**	∞	2	5	7	1
	B	6	∞	3	8	2
	C	8	7	∞	4	7
	D	12	4	6	∞	5
	E	1	3	2	8	∞

What should be the sequence of the Salesmans's visit, so that the cost is minimum?

b) **Job Sequencing Problem :**

Job	**1**	**2**	**3**	**4**	**5**
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine a sequence for the five jobs that will minimize the elapsed time.

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SECTION - C

12. Compulsory Case Study: **(1×15=15)**

For the following network problem :

Activity	Completion Time (in weeks)		
	t_0	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

a) Draw the network diagram and identify critical path.

b) What is the probability that the project will be completed :

i) At least 4 weeks earlier than the expected time?

ii) Not more than 4 weeks later than the expected time?

iii) If the project due date is 19 weeks, what is the probability of not meeting the due date?

iv) What is the probability that the project will be completed within 20 weeks?

v) Find the project duration at 90% probability?