

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**MBA I Year II Semester Regular & Supplementary Examinations June/July-2025**  
**OPERATIONS RESEARCH**

**Time: 3 Hours****Max. Marks: 60****SECTION – A**(Answer all Five Units **5 x 10 = 50** Marks)**UNIT-I**

- 1 A company manufactures two products  $P_1$  and  $P_2$ . Each product uses lathe and milling machine. The processing time per unit of  $P_1$  on the lathe is 5 hours and on the milling machine is 4 hours. The processing time per unit of  $P_2$  on the lathe is 10 hours and on the milling machine is 4 hours. The maximum number of hours available per week on the lathe and the milling machine are 60 hours and 40 hours respectively. Also the profit per unit of selling  $P_1$  and  $P_2$  are Rs.6.00 and Rs. 8.00 respectively. Formulate a linear programming model to determine the production volume of each of the products such that the total profit is maximized. **CO1 L6 10M**

**OR**

- 2 What are the major applications of Operations Research in business, commerce and industry. **CO1 L1 10M**

**UNIT-II**

- 3 Determine an initial basic feasible solution to the following transportation problem using Vogel's approximation method. **CO2 L3 10M**

		Warehouses				
		W1	W2	W3	W4	capacity
<b>Factory</b>	<b>F1</b>	10	30	50	10	7
	<b>F2</b>	70	30	40	60	9
	<b>F3</b>	40	8	70	20	18
<b>Requirement</b>		5	8	7	14	

**OR**

- 4 What are the types of Transportation Problem? Explain them with suitable examples. **CO2 L1 10M**

**UNIT-III**

- 5 Discuss the steps involving in game with pure strategies. **CO3 L2 10M**

**OR**

- 6 Consider the following payoff matrix with respect to player A and solve it optimally **CO3 L2 10M**

		Player B				
		1	2	3	4	5
Player A	1	3	0	6	-1	7
	2	-1	5	-2	2	1

**UNIT-IV**

- 7 Find the Critical Path for the following problem

**CO4 L3 10M**

Activity	1-2	1-3	2-4	3-5	4-5
Duration	6	2	4	3	4

**OR**

- 8 Write short notes on

**CO4 L1 10M**

- a) PERT  
b) Project crashing  
c) Cost sloping

**UNIT-V**

- 9 What are the steps involved in the problems with  $n$  jobs through machines  $A$ ,  $B$ ,  $C$ .

**CO5 L2 10M**

**OR**

- 10 There are 5 jobs, each of which must go through the two machines  $A$  and  $B$  in the order  $AB$ . Processing time are given below.

**CO5 L3 10M**

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

Determine the sequence of 5 jobs that will minimize the total elapsed time.

**SECTION – B**

(Compulsory Question)

**1 x 10 = 10 Marks**

- 11 There are five jobs (namely 1,2,3,4 and 5), each of which must go through machines  $A$ ,  $B$  and  $C$  in the order  $ABC$ . Processing Time (in hours) are given below:

Jobs/Machine	1	2	3	4	5
Machine-A	5	7	6	9	5
Machine-B	2	1	4	5	3
Machine-C	3	7	5	6	7

Find the sequence of that will minimize the total elapsed time.

**\*\*\* END \*\*\***