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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

**(AUTONOMOUS)**

**MBA I Year II Semester Regular Examinations November-2021**

**OPERATIONS RESEARCH**

Time: 3 hours

Max. Marks: 60

**SECTION – A**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

- 1 What is operations research and explain briefly its applications in industrial organizations? **L1 10M**

**OR**

- 2 A company manufactures two products A and B. Both the products pass through two machines M1 and M2. The time require to process each unit of products A and B on each machine and available capacity of each machine is given below **L4 10M**

Product	Machine M1 (processing time)	Machine M2 (processing times)
A	6	2
B	4	4
Available capacity	3600	2000

The availability of materials is sufficient to produce 500 units of A and 400 units of B. Each unit of product A gives a profit of rupees 25 and each unit of product B gives a profit of rupees 20. Construct a linear programming model to determine the quantity of each product to be manufactured to maximize profit.

**UNIT-II**

- 3 What is Degeneracy in transportation and unbalanced transportation problem? **L1 10M**

**OR**

- 4 Find Assignment cost for the below problem through by using travelling salesmen. **L4 10M**

	1	2	3	4
A	10	12	9	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

**UNIT-III**

- 5 What are the methods of games without saddle points? **L1 10M**

**OR**

- 6 Calculate the value of the game and find the best strategies for player A and Player B, **L4 10M**

	B		
A	1	3	6
	2	1	3
	6	2	1

**UNIT-IV**

7 Define Project. What are the steps involved in CPM?

L1 10M

OR

8 Draw the network and identify the critical path for the following problem.

L5 10M

Activity	Duration
1-2	7
1-3	7
2-3	8
2-4	6
3-6	9
4-5	3
5-6	5

**UNIT-V**

9 Define replacement models? Explain the replacement model types in detail.

L1 10M

OR

10 Find the sequence of jobs and elapsed time, idle times of 1 and 2 machines.

L4 10M

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

**SECTION – B**  
(Compulsory Question)

11

1 x 10 = 10 Marks

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

Find the sequence of the jobs and elapsed time.

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