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

**MBA I Year II Semester Supplementary Examinations May-2022  
OPERATIONS RESEARCH**

Time: 3 hours

Max. Marks: 60

**SECTION – A**

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

**UNIT-I**

- 1 What are the major applications of Operations Research **L1 10M**

**OR**

- 2 Maximize  $Z = 100x_1 + 125x_2$  **L4 10M**

Constraints  $4x_1 + 6x_2 \leq 24$

$4x_1 + 2x_2 \leq 16$

$x_1 \geq 0, x_2 \geq 0$

Solve the above liner programming problem by using graphical method.

**UNIT-II**

- 3 Write the procedure of solving assignment problem by Hungarian method. **L1 10M**

**OR**

- 4 Solve the following assignment problem? **L4 10M**

Operation /task	I	II	III	IV	V
A	20	15	18	20	25
B	18	20	12	14	15
C	21	23	25	27	25
D	17	18	21	23	20
E	18	18	16	19	20

**UNIT-III**

- 5 Define Game theory. Explain pure strategies and mixed strategies. **L1 10M**

**OR**

- 6 For the game given below determine optimal strategies for A **L3 10M**

**B**

	3	1
A	2	7
	1	11

**UNIT-IV**

- 7 Write short notes on **L1 10M**

i) Steps in PERT

ii) Cost slope

ii) Project crashing

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 a Why should manufacturers go for replacement?

L1 5M

b What is the importance of time value of money in replacement?

L1 5M

OR

10 There are nine jobs, each of which must go through two machines P and Q in the order PQ, the processing times (in hours) are given below:

L4 10M

Machine	Job(s)								
	A	B	C	D	E	F	G	H	I
P	2	5	4	9	6	8	7	5	4
Q	6	8	7	4	3	9	3	8	11

Find the sequence that minimizes the total elapsed time T. Also calculate the total idle time for the machines in this period.

**SECTION – B**

(Compulsory Question)

11

1 x 10 = 10 Marks

Apply project crashing for the below project and calculate the cost of the project

Activity	Time		Cost	
	Normal	Crash	Normal	Crash
1-2	8	4	3000	6000
1-3	5	3	4000	8000
2-4	9	6	4000	5500
3-5	7	5	2000	3200
2-5	5	1	8000	12000
4-6	3	2	10000	11200
5-6	6	2	4000	6800
6-7	10	7	6000	8700
5-7	9	5	4200	9000

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