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Total No. of Pages : 02

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## M.Tech. (CSE) (2018 Batch) (Sem.-3) OPERATIONS RESEARCH Subject Code : MTOE-303-18 M.Code : 76514 Date of Examination : 16-12-22

Time: 3 Hrs.

Max. Marks : 60

## INSTRUCTIONS TO CANDIDATES : 1.Attempt any FIVE questions out of EIGHT questions. 2.Each question carries TWELVE marks.

1. Use Simplex Method to solve the following LP problem:

Maximize  $Z = 5X_1 + 3 X_2$ 

Subject to:  $X_1 + X_2 \le 6$ ,

 $2X_1+3X_2 \leq 12$ 

 $X_1 \leq 3$ ,

 $X_2 \leq 3$  and  $X_1, X_2, \geq 0$ 

- 2. Explain the different types of models used in Operations Research. Briefly explain the general methods of solving these Operations Research models.
- 3. a) Define dynamic programming. How is it different from linear programming?
  - b) Explain deterministic and probabilistic dynamic programming.
- 4. a) What do you understand by the term duality in LP problem? State and illustrate the various rules of converting primal into dual.
  - b) Explain economic interpretation of dual variables.

5. Six jobs have to processed on machines M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub> in order M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub> Time taken (in minutes) by each job on these machines is given below. Determine the sequence so as to minimize the processing time.

Job	$M_1$	$M_2$	<b>M</b> <sub>3</sub>
1	12	7	3
2	8	10	4
3	7	9	2
4	11	6	5
5	10	10	3
6	5	5	4

6. Solve the following game by using the rule of dominance:

Player B								
		Ι	II	III	IV			
	Ι	3	2	4	0			
Player A	II	3	4	2	4			
	III	4	2	4	0			
	IV	0	4	0	8			

- 7. a) What is critical path analysis? Describe with illustration its utility in project planning and control.
  - b) Explain the role of sensitivity analysis in Linear Programming.
- 8. a) What are the types of analysis under parametric programming? Explain these in brief.
  - b) Explain Kuhn-Tucker conditions with the help of a suitable example.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.