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: $X_1 + X_2 \leq 6$,

   $2X_1 + 3X_2 \leq 12$

   $X_1 \leq 3$,

   $X_2 \leq 3$ 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_1, M_2 and M_3 in order M_1, M_2 and M_3 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	M_3
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			
		I	II	III	IV
	I	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.