Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech. (CSE Engg.)OE (2019 Batch) (Sem.–3)

OPERATIONS RESEARCH

Subject Code : MTOE303-18

M.Code : 76514

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. What do you understand by term sensitivity analysis ? Explain how input-output coefficient can affect a problem's optimal solution ?

2. Use the Simplex Method to solve the following LP problem. Maximize

   $Z=6X_1+10X_2+8X_3$

   Subject to the constraints :

   a) $2X_1+3X_2 \leq 8$,

   b) $2X_2+5X_3 \leq 10$,

   c) $3X_1+2X_2+4X_3 \leq 15$ and $X_1, X_2, X_3 \geq 0$

3. A factory, requires 1, 500 units of an item per month, each costing Rs. 27 per unit. The cost per order is Rs. 150 and the inventory carrying charges works out to 20 percent of the average inventory. Find the economic order quantity and the number of orders per year. Would you accept a 2 percent price discount on a minimum supply of 1,200 units? Compare the total costs in both the cases.

4. What is concept of duality? How do you solve a linear problem in dual programming?

5. Explain Kuhn-Tucker conditions with the help of a suitable example.

6. A project data is given below :

   a) Construct a precedence diagram,

   b) On the diagram, compute the four schedule dates (ESD, EFD, LSD, LFD)

   c) the floats (TF, FF, and IDF) for each activity, and the lag for each link,

   d) Identify the critical path.

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No	ACT	DUR	PREDECESSORS
5	B	5	-
10	M	4	B
15	N	9	B
20	Q	15	B
25	A	1	M,N
30	F	4	N,Q
35	X	9	Q
40	C	9	Q
45	Y	9	A,F,X
50	S	6	F
55	J	5	X,F
60	T	10	C
65	V	5	Y,S
70	U	10	V,T,J

7. A manufacturing company processes 6 different jobs on two machines A and B. Number of units each job and its processing times on machines A and B are given in the following table. Find the optimum sequence, the total minimum elapsed time and the idle time for each machine.

Job No.	No. of units of each job	Machine Time (hours)	
		Machine A	Machine B
1	3	6	8
2	4	17	7
3	2	6	11
4	5	4	5
5	2	8	7
6	3	6	14

8. Write short notes on the following :

   a) Geometric Programming

   b) Probabilistic Inventory Control Models

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.

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