13UMACE6003   UMA/CE/6003

B.Sc. Degree Examinations - Even Semester 2021
III Year VI Semester

Operations Research

Max. Marks:25

Answer any FIVE Questions (5*5=25)

1. Solve Graphically

Max Z = $3X_1 + 2X_2$

Subject to

$$-2X_1 + X_2 \le 1$$
$$X_1 \le 2$$
$$X_1 + X_2 \le 3$$
$$X_1, X_2 \ge 0$$

2. Find the solution by using simplex method for the following LPP

Max Z = $4X_1 + 10X_2$

Subject to

$$2X_1 + X_2 \le 50$$
$$2X_1 + 5X_2 \le 100$$
$$2X_1 + 3X_2 \le 90$$
$$X_1, X_2 \ge 0$$

3. Solve the following transportation problem and compute its optimal Solution.

DESTINATION

ORIGIN	D_1	D_2	D_3	D_4	SUPPLY
O_1	21	16	25	13	11
O_2	17	18	14	23	13
O_3	32	27	18	41	19
DEMAND	6	10	12	15	

4. Apply assignment method to solve the following problem.

	1	2	3	4
A	5	7	11	6
B	8	5	9	6
C	4	7	10	7
D	10	4	8	3

5. Determine the sequence that minimizes the total elapsed time required to complete the following M_1, M_2 and M_3 in the order $M_1 M_2 M_3$.

Task	A	B	C	D	E	F
M_1	8	3	7	2	5	1
M_2	3	4	5	2	1	6
M_3	8	7	6	9	10	9

6. .Evaluate the Critical Path, Project duration and total for each activity by drawing a network diagram

	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
Activity :										
Duration (days):	8	7	12	4	10	3	5	10	7	4

7. Construct the Network for the Project whose activities and the three time estimates of these activities (in weeks) are given below .
   (i) Draw a network

   (ii) Evaluate the expected duration of each activity

   (iii) Deduce the expected Variance of each activity

ACTIVITY	OPTIMISTIC	MOST LIKELY	PESSIMISTIC
1-2	3	6	15
2-3	2	5	14
1-4	6	12	30
2-5	2	5	8
2-6	5	11	17
3-6	3	6	15
4-7	3	9	27
5-7	1	4	7
6-7	2	5	8