

COURSE CODE: 11B1WMA832

MAX. MARKS: 25

COURSE NAME: Linear Programming and Applications

COURSE CREDITS: 03

MAX. TIME: 1.5HR

Note: All questions are compulsory. Carrying mobile phone during examinations will be treated as a case of unfair means.

Q1. Solve the LPP using simplex method

[5](CO-2)

$$\text{Max } Z = 4x_1 + 3x_2 + 5x_3$$

$$\text{s/t } x_1 + 2x_2 + x_3 \leq 480, 2x_1 + x_2 \leq 540, x_1 + 3x_3 \leq 510$$

$$x_1, x_2, x_3 \geq 0$$

Q2. Solve the LPP using big M method.

[5](CO-2)

$$\text{Max } Z = 5x_1 - 2x_2 + 3x_3$$

$$\text{s/t } 2x_1 + 2x_2 - x_3 \geq 2, 3x_1 - 4x_2 \leq 3, x_2 + 3x_3 \leq 5$$

$$x_1, x_2, x_3 \geq 0$$

Q3. Write the dual of $\text{Max } Z = 30x_1 + 23x_2 + 29x_3$

[5](CO-3)

$$\text{s/t } 6x_1 + 5x_2 + 3x_3 \leq 26, 4x_1 + 2x_2 + 5x_3 \leq 7$$

$$x_1, x_2, x_3 \geq 0$$

Also show that dual of the dual is primal problem for the above example.

Q4. Solve the LPP using Dual simplex method

[5](CO-3)

$$\text{Min } Z = 2x_1 + x_2$$

$$\text{s/t } 2x_1 + x_2 \geq 3, 4x_1 + 3x_2 \geq 6, x_1 + 2x_2 \geq 3$$

$$x_1, x_2 \geq 0$$

Q5. Solve the assignment problem

[5](CO-4)

Persons/Jobs	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10