

COURSE CODE: 11B1WMA832

MAX. MARKS: 15

COURSE NAME: Linear Programming and Applications

COURSE CREDITS: 03

MAX. TIME: 1HR

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

Q1. Find all basic solution and basic feasible solution for the system of equations (CO1)[5]

$$8x_1 + 6x_2 + 13x_3 + x_4 + x_5 = 6$$

$$9x_1 + x_2 + 2x_3 + 6x_4 + 10x_5 = 11$$

Q2. A small manufacturer employs 5 skilled men and 10 semi-skilled men and makes the article in two qualities, a deluxe model and an ordinary model. The making of a deluxe model requires 2 hours work by a skilled man and 2 hours work by a semi-skilled man. The ordinary model requires 1 hour work by a skilled man and 3 hours work by a semi skilled man. By union rules no man can work more than 8 hours per day. The profit on deluxe model is Rs.10 and of the ordinary model is Rs.8. Formulate the problem as linear programming problem in order to maximize the profit. Solve the problem graphically. (CO1)[5]

Q3. Solve the linear programming problem (CO2)[5]

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

$$\text{s/t } x_1 + x_2 + x_3 \leq 9$$

$$2x_1 + 3x_2 + 5x_3 \leq 30$$

$$2x_1 - x_2 - x_3 \leq 8$$

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