COURSE CODE: 11B1WMA832

COURSE NAME: Linear programming and Applications

COURSE CREDITS: 03

MAX. MARKS: 15

MAX. TIME: 1 hour

Note: All questions are compulsory. Marks are indicated in square bracket against each question.

Q1.Solve the linear programming problem graphically   [3]

$$Min\ Z = 3x_1 + 5x_2$$

s/t $-3x_1 + 4x_2 \leq 12, 2x_1 - x_2 \geq -2, 2x_1 + 3x_2 \geq 12, x_1 \leq 4, x_2 \geq 2\ and\ x_1, x_2 \geq 0$

Q2.Food X contains 6 units of vitamin A per gram and 7 units of vitamin B per gram and costs Rs 12 per gram.Food Y contains 8 units of vitamin A per gram and 12 units of vitamin B per gram and costs Rs 20 per gram.The daily minimum requirements of vitamins A and B are 100 units and 120 units respectively.Find the minimum cost of product mix using any method other then graphical method.   [5]

Q3.Solve the linear programming problem using simplex method   [4]

$$Max\ Z = 5x_1 + 3x_2$$

s/t $x_1 + x_2 \leq 2, 5x_1 + 2x_2 \leq 10, 3x_1 + 8x_2 \leq 12\ and\ x_1, x_2 \geq 0$

Q4.Find all possible basic solutions and basic feasible solutions of   [3]

$$Max\ Z = x_1 + 2x_2 + 4x_3$$

s/t $2x_1 + x_2 + 4x_3 = 11, 3x_1 + x_2 + 5x_3 = 14\ and\ x_1, x_2, x_3 \geq 0$