Dr Neelkanth

COURSE CODE: 10B1WMA731

COURSE NAME: Optimization Techniques

COURSE CREDITS: 03

MAX. MARKS: 15

MAX. TIME: 1 Hour

Note: *All questions are compulsory; Carrying of mobile phone during examination will be treated as case of unfair means. Marks are indicated in square brackets against each question*

Q1.Asian paints produces both interior and exterior paints from two raw materials M1 and M2.The following table provides the basic data of the problem:

	Tons of raw material per ton of exterior paint	Tons of raw material per ton of interior paint	Maximum daily availability(tons)
M1	6	4	24
M2	1	2	6
Profit per ton	Rs.5000	Rs.4000	

A market survey restricts the maximum daily demand of interior paint to 2 tons. Additionally the daily demand for interior paint cannot exceed that of exterior paint by more than 1 ton. Asian paints wants to determine the optimum product mix of interior and exterior paints that maximizes the total daily profit. Solve the problem using graphical method. [5]

Q2. Show that dual of the dual is primal using LPP obtained in above question. [2]

Q3.Find all possible basic solution and basic feasible solutions for the set of equations [2]

$$x_1 + x_2 + 4x_3 + 2x_4 + 3x_5 = 8$$
$$4x_1 + 2x_2 + 2x_3 + x_4 + 6x_5 = 4$$

Q4.Solve the LPP [3]

$$Max\ Z = 5x_1 - 2x_2 + 3x_3$$
$$s/t\ 2x_1 + 2x_2 - x_3 \geq 2$$
$$3x_1 - 4x_2 \leq 3$$
$$x_2 + 3x_3 \leq 5$$
$$x_1, x_2, x_3 \geq 0$$

Q5.Solve the LPP using dual simplex method [3]

$$Min\ Z = 2x_1 + 3x_2$$
$$s/t\ 2x_1 + 2x_2 \leq 30$$
$$x_1 + 2x_2 \geq 10$$
$$x_1, x_2 \geq 0$$