Dr. Neelkanth

Roll No.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Test-1 Examination-September 2016

B.Tech. VII Semester (All Branches)

Course Code: 10B1WMA731 Max. Marks: 15

Course Name: Optimization Techniques

Course Credit: 3 Max. Time: 1 Hr

Note: All questions are compulsory; carrying of mobile phones will be treated as the case of unfair means.

Q1.A person requires minimum quantity of 10, 12 and 12 units of chemicals A,B and C respectively for his garden. The liquid product contains 5 units, 2 units and 1 unit of A,B and C respectively per jar. The dry product contains 1 unit, 2 unit and 4 units of A ,B and C per jar. If the liquid product sells for Rs 3 per Jar and dry product sells for Rs 2 per jar, how many of each should be purchased to minimize the cost and meet the requirements.Solve it by using graphical method. [5]

Q2. Solve the linear programming problem by Big M method. [5]

$$Max\ Z = 4x_1 + 5x_2 - 3x_3$$

$$\text{s/t}\ \ x_1 + x_2 + x_3 = 10$$

$$x_1 - x_2 \geq 1$$

$$2x_1 + 3x_2 + x_3 \leq 40$$

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

Q3.(a) Write the dual of the following linear programming problem and find the solution of dual from the given primal problem. [4]

$$Max\ Z = 5x + 20y$$

$$\text{s/t}\quad 5x + 2y \leq 20$$

$$x + 2y \leq 8$$

$$x + 6y \leq 12$$

$$x, y \geq 0$$

(b) For the above problem given in part (a) show that dual of the dual is primal. [1]