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TEST – 2, OCTOBER 2019

MTech 1st Semester Structural Engineering

Course Code: 11M1WCE114

Max. Marks: 25

Course Name: Modelling, Simulation and Computer Applications

Max. Time: 1.5hr.

Course Credits: 03

Note: All questions are compulsory. Marks are indicated against the questions. Carrying of mobile phone is strictly prohibited and will be treated as case of unfair means.

Q.1 Write the basic formulation of revised simplex method. Also Explain all the salient steps involved in Revised Simplex method ? [5]

Q.2 Prove that following LPP has infinite number of solutions

$$\text{Minimize } Z = -40x_1 - 100x_2$$

subject to

$$10x_1 + 5x_2 \leq 2500$$

$$4x_1 + 10x_2 \leq 2000$$

$$2x_1 + 3x_2 \leq 900$$

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

[6]

Q.3 Solve via Two phase simplex method:

$$\text{Minimize } z = -3x_1 + x_2 - 2x_3$$

subject to

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

$$2x_1 - x_2 + x_3 \geq 2$$

$$4x_1 + 3x_2 - 2x_3 = 5$$

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

[7]

Q.4 A transport company has two types of trucks, Type A and Type B. Type A has a refrigerated capacity of 20 m³ and a non-refrigerated capacity of 40 m³ while Type B has the same overall volume with equal sections for refrigerated and non-refrigerated stock. A grocer needs to hire trucks for the transport of 3,000 m³ of refrigerated stock and 4,000 m³ of non-refrigerated stock. The cost per kilometre of a Type A is ₹30, and ₹40 for Type B. How many trucks of each type should the grocer rent to achieve the minimum total cost? Use Big M method of simplex method if needed. [7]