Department of MACS, N.I.T.K.Surathkal

MA 852 – Optimization Techniques – Mid-Sem Exam

Date: 05-12-2020

Time: 90 minutes Answer all questions Max marks:30

1. An electronic firm wants to decide about the most profitable mix for its products. The products manufactured are transistors, resistors and tubes with a profit of (per unit) \$10, \$6 and \$4 respectively. To produce a shipment of transistors containing one unit, it requires one hour of engineering, 10 hrs of direct labor and 2 hrs of administration service. To produce one unit of resistors, requirements are 1 hr., 4 hrs. and 2 hrs. of the above work respectively. To produce one shipment of the tubes, for one unit, it requires 1 hr., 5 hrs. and 6 hrs. of the above mentioned works respectively. There are 100 hrs. of engineering services, 600 hrs. of direct labor and 300 hours of administration available. What is the most profitable mix? (10)

2. Solve the following lpp by artificial variable technique.

$$\text{Minimize} \quad z = 200x_1 + 300x_2$$
$$\text{Subject to} \quad 2x_1 + 3x_2 \geq 1200$$
$$x_1 + x_2 \leq 400$$
$$2x_1 + 3/2\, x_2 \geq 900$$
$$x_1, x_2 \geq 0.$$

(10)

3. Solve the following lpp by dual simplex method

Minimize $z = 6x_1 + 7x_2 + 3x_3 + 5x_4$

Subject to the constraints

$$5x_1 + 6x_2 - 3x_3 + x_4 \geq 12$$
$$x_2 + 5x_3 - 6x_4 \geq 10$$
$$2x_1 + 5x_2 + x_3 + x_4 \geq 8$$
$$x_1, x_2, x_3, x_4 \geq 0.$$

(10)

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