



Reg. No. :

Name :

First Semester M.Tech. Degree Examination, February 2015
(2013 Scheme)
Branch : Electrical and Electronics Engineering
Stream : Control Systems and Guidance and Navigational Control
ECC 1001 : OPTIMIZATION TECHNIQUES

Time : 3 Hours

Max. Marks : 60

Instruction : Answer any two full questions from each Module.

Module – 1

1. Solve the following linear programming problem using simplex method :

$$Z = 6x_1 + 8x_2$$

$$\text{Subj : } 5x_1 + 10x_2 \leq 60$$

$$4x_1 + 42 \leq 40$$

$$(x_1, x_2) \geq 40$$

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2. Solve the following mixed integer problem using Gomory's cutting plane method.

$$\text{Max } Z = x_1 + x_2$$

$$\text{Sub to } 3x_1 + 2x_2 \leq 5$$

$$x_2 \leq 2$$

$$(x_1, x_2) \geq 0 \quad x_1 \text{ is an integer.}$$

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3. Use dual simplex method to solve

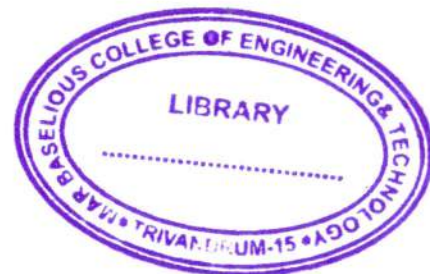
$$\text{Max } Z = -3x_1 - x_2$$

$$\text{Sub to } x_1 + x_2 \geq 1$$

$$2x_1 + 3x_2 \geq 2$$

$$(x_1, x_2) \geq 0$$

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P.T.O.



Module – 2

4. a) What are Kuhn Tucker conditions ? Explain. 4

b) Use Kuhn Tucker conditions to solve

$$\text{Maximize } Z = 2x_1 - x_1^2 + x_2$$

$$\text{Sub to } 2x_1 + 3x_2 \leq 6$$

$$2x_1 + x_2 \leq 4$$

$$(x_1, x_2) \geq 0$$

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5. Solve mini $f(x) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ from starting point $x_1 = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$ using

Powell's method take $\Sigma = 0.01$.

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6. Solve the quadratic programming problem using Wolfes' method.

$$\text{Maximise } Z = 4x_1 + 6x_2 - 2x_1^2 - 2x_1x_2 + 2x_2^2$$

$$\text{Subject to } x_1 + 2x_2 \leq 2 \quad (x_1, x_2) \geq 0$$

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Module – 3

7. Solve the following linear programming problem by dynamic

$$\text{Max } Z = 2x_1 + 5x_2 \text{ Subject to } 2x_1 + x_2 \leq 43, 2x_2 \leq 46 \quad (x_1, x_2) \geq 0.$$

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8. Briefly explain (1) dynamic game (2) normal form game.

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9. Distinguish preview of cooperate and non-cooperate game.

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