(Pages : 2) **9151**

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 :

   $Z = 6x_1 + 8x_2$

   Subj : $5x_1 + 10x_2 \leq 60$

   $4x_1 + 42 \leq 40$

   $(x_1, x_2) \geq 40$ **10**

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

   Max $Z = x_1 + x_2$

   Sub to $3x_1 + 2x_2 \leq 5$

   $x_2 \leq 2$

   $(x_1, x_2) \geq 0$ x_1 is an integer. **10**

3. Use dual simplex method to solve

   Max $Z = -3x_1 - x_2$

   Sub to $x_1 + x_2 \geq 1$

   $2x_1 + 3x_2 \geq 2$

   $(x_1, x_2) \geq 0$ **10**

P.T.O.

Module – 2

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

   b) Use Kuhn Tucker conditions to solve

   Maximize $Z = 2x_1 - x_1^2 + x_2$

   Sub to $2x_1 + 3x_2 \leq 6$

   $2x_1 + x_2 \leq 4$

   $(x_1, x_2) \geq 0$ 6

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 $\sum = 0.01$. 10

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

   Maximise $Z = 4x_1 + 6x_2 - 2x_1^2 - 2x_1x_2 + 2x_2^2$

   Subject to $x_1 + 2x_2 \leq 2$ $(x_1, x_2) \geq 0$ 10

Module – 3

7. Solve the following linear programming problem by dynamic

   Max $Z = 2x_1 + 5x_2$ Subject to $2x_1 + x_2 \leq 43$, $2x_2 \leq 46$ $(x_1, x_2) \geq 0$. 10

8. Briefly explain (1) dynamic game (2) normal form game. 10

9. Distinguish preview of cooperate and non-cooperate game. 10
