Reg. No. : .....

Name : .....

First Semester M.Tech. Degree Examination, March 2014
(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*** *questions from* ***each*** *Part.* ***All*** *questions carry* ***equal*** *marks.*

PART – I

1. A production company has two bottling machines A and B. A is designed for 2 litre bottle and B for 4 litre bottle. The following data is available.

Machine	2 litre bottle	4 litre bottle
A	100/minute	40/minute
B	60/minute	75/minute

The machine can be run 8-hour per day, 5 days per week. Profit on 2 litre bottle is 15 paise and 4 litre bottle is 25 paise. Weekly production of the drink to be filled in the bottle do not exceed 30,000 litres. The market can absorb 2500 two litre bottles and 700, four litre bottles in one week. The company wishes to maximise the profit. Formulate the linear programming problem so as to maximize the profit.

2. Maximize $Z = x_1 + x_2$ subject to the constraints $2x_1 + x_2 \leq 6$, $4x_1 + 5x_2 \leq 20$, $(x_1, x_2) \geq 0$ and are integers.

3. Solve the linear programming problem. Maximize $Z = 2x_1 + x_2$, subject to the constraints $4x_1 + 3x_2 \leq 12$, $4x_1 + x_2 \leq 8$, $4x_1 - x_2 \leq 8$, $(x_1, x_2) \geq 0$.

P.T.O.

PART – II

4. Minimize $Z = 2x_1^2 - 6x_1 - 2x_1x_2 + 2x_2^2$ subject to the constraints $x_1 + x_2 \leq 2$, $(x_1, x_2) \geq 0$ using Wolfe's method.

5. Explain Generalized Reduced Gradient method used for the optimization of constrained non-linear problems.

6. Use Hooke and Jeeve's method to Minimize $Z = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ starting from the point $X_1 = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$. Take $\Delta x_1 = \Delta x_2 = 0.8$ and $\varepsilon = 0.1$.

PART – III

7. Explain the features of a non-co-operative game with the help of Prisoner's dilemma model.

8. Use dynamic programming method to Maximize $(Y_1\ Y_2\ Y_3)$ subject to the constraints $Y_1 + Y_2 + Y_3 = 5$, $(Y_1, Y_2, Y_3) \geq 0$.

9. Solve the game by simplex method. The pay off matrix of A is given as

		B's strategies		
		I	II	III
A's strategies	I	2	–2	3
	II	–3	5	–1