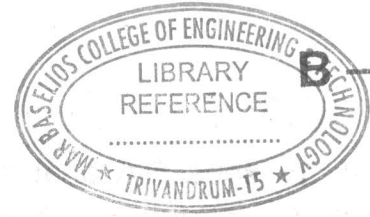




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B-2905

Reg. No. :

Name :

**Second Semester M.Tech. Degree Examination, December 2016
(2013 Scheme)
ELECTRICAL ENGINEERING
EDE2007 : Optimization Techniques for Power Control**

Time : 3 Hours

Max. Marks : 60

Answer **any two full** questions from **each** Module. **Each** question carry **10** marks :

MODULE - I

1. Find solution of the following Linear Programming Problem (LPP) using simplex method.

$$\text{Minimise } f = -3x_1 - 2x_2$$

Subject to

$$x_1 - x_2 \leq 1$$

$$3x_1 - 2x_2 \leq 6$$

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

10

2. a) Prove that any local minimum of a convex function $f(X)$ is a global minimum. 4
b) Discuss the primal-dual relationship in an LPP. Obtain the dual of the following linear programming problem.

$$\text{Maximize } f = 30x_1 + 40x_2$$

Subject to

$$3x_1 + 4x_2 \leq 250$$

$$9x_1 + 7x_2 \leq 140$$

$$7x_1 + 12x_2 \leq 280$$

$$x_2 \leq 46$$

where

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

6

P.T.O.



3. Discuss the sensitivity analysis in linear programming. Explain the effect of changes in the right-hand-side constants on the optimal solution. 10

MODULE – II

4. Using Newton's method, minimize the function $f(x_1, x_2) = (x_1 + x_2)^2 + x_1^2 + x_1 - x_2$ starting from the point $X_1 = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$. 10

5. Solve the following integer programming problem using Gomory's method :

$$\text{Minimize } f = -3x_1 - 4x_2$$

Subject to

$$3x_1 - x_2 + x_3 = 12$$

$$3x_1 + 11x_2 + x_4 = 66$$

$$x_i \geq 0, \quad i = 1 \text{ to } 4$$

all x_i are integers.

6. Discuss in detail the computational procedure involved in DFP method. 10

MODULE – III

7. Explain with the help of a flowchart various steps involved in the Genetic Algorithm. 10

8. Explain the computational procedure of dynamic programming in detail. 10

9. Find the solution of the following problem using the Lagrange multiplier method.

$$\text{Minimize } f(x, y) = kx^{-1} y^{-2}$$

Subjected to

$$g(x, y) = x^2 + y^2 - a^2 = 0.$$

10

