SEAT No. :

P4194

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[4960]-55

M.E. (Civil Engg. Structures)
OPTIMIZATION TECHNIQUES
(2008 Pattern) (Elective - IV)

Time : 4 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1) *Answer any two questions from section - I and two questions from section - II.*
2) *Figures to the right indicate full marks.*

SECTION - I

Q1) a) State the broad classification of optimization problems and techniques. **[13]**

b) Elaborate single variable optimization and multivariable optimization with equality and inequality constraints. **[12]**

Q2) a) Explain revised simplex method with suitable examples. **[13]**

b) Elaborate Decomposition principle, and Post-optimality analysis in Linear Programming. **[12]**

Q3) Draw the flowchart and algorithm of following: **[25]**
Non-Linear Programming Problem.
a) Fibonacci Method.
b) Golden Section Method.
c) Quadratic Interpolation Method.
d) Cubic Interpolation Method.
e) Direct Root Method.

SECTION - II

Q4) a) What is unconstrained optimization and what are the engineering applications? **[10]**

b) Explain : **[15]**
i) Indirect search method and Direct search method.
ii) Random search method and Steepest Descent (Cauchy) method.
iii) Univariate and pattern search method.

P.T.O.

Q5) a) What is constrained optimization and what are the engineering applications? **[10]**

b) Explain : **[15]**

   i) Interior Penalty function method.

   ii) Convex Programming.

   iii) Reduced Gradient method.

Q6) a) Develop the Artificial Neural Network Model for Civil Engineering Application. **[13]**

b) Explain with suitable sketch and examples selection operator, crossover operator and mutation operator in genetic algorithm. **[12]**

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