B. TECH.
THEORY EXAMINATION (SEM–VI) 2016-17
OPTIMIZATION TECHNIQUES IN ENGINEERING

Time : 3 Hours   *Max. Marks : 100*
Note : *Be precise in your answer.*

SECTION A

1   Attempt all parts: **(10X2=20)**
   a.   Why optimization is required?
   b.   Explain Heuristic approach.
   c.   What is multivariable function? Explain with example.
   d.   Explain a complex variable with example.
   e.   What do you mean by on-line real-time optimization? Explain.
   f.   Define genetic algorithm with example.
   g.   Explain least square optimization.
   h.   What is Newton Algorithm? Explain.
   i.   Define cutting plane methods.
   j.   Define unconstrained optimization.

SECTION B

2   Attempt any FIVE parts: **(10X5=50)**
   a.   What do you mean by local minimum and maximum? Explain with an example.
   b.   Write a note on sequential quadratics programming with an example.
   c.   In Gomary's Cutting plane method, mention the main considerations to be taken while selecting the additional constraints.
   d.   What do you mean by Integer Programming? Illustrate it with an example.
   e.   Define a random variable. Differentiate between discrete and continuous random variables.
   f.   Discuss the Runga-Kutta method for ordinary differential equations with example.
   g.   Write a note on non-linear programming with example.
   h.   What do you mean by direct search method? Explain with an example.

SECTION C

Attempt any TWO questions: **(15X2=30)**
3.   Discuss the concept of Dynamic programming. Also illustrate the use of Dynamic Programming in optimization with suitable example from engineering.

4.   State the various methods available for solving a multivariable optimization problem with equality constraints with example.

5.   A design problem is solved by using Genetic Algorithm (GA). During reproduction process, fitness values at total 4 design points have been calculated. These are 20, 20, 50 and 10. Find out the expected number of copies of 4th design point.