

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER III (NEW) – • EXAMINATION – SUMMER 2016**

**Subject Code: 2730504**

**Date: 03/05/2016**

**Subject Name: INTRODUCTION TO OPTIMIZATION TECHNIQUES**

**Time: 10:30 am to 01:00 pm**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Enlist major applications of Optimization in engineering field. Explain any one application in very brief. **07**  
(b) Explain single variable optimization in detail. **07**
- Q.2** (a) Compare Constrained and Unconstrained optimization in brief. **07**  
(b) Explain the basic features of Lagrange multiplier method for simple problem with two variables and one constraint. **07**
- OR**
- (b) Explain multivariable optimization with inequality constraints. **07**
- Q.3** (a) Explain scalar form and matrix form of linear programming method. **07**  
(b) Explain transportation models and its variants. **07**
- OR**
- Q.3** (a) Explain Duality in linear programming in brief. **07**  
(b) Explain search with fixed step size and search with accelerated step size. **07**
- Q.4** (a) Explain Exhaustive search method in brief. With respect to that method, find the minimum of  $f = x(x-1.5)$  in the interval of (0.0, 1.00) to within 10% exact value. **07**  
(b) Explain the Fibonacci method of nonlinear programming with suitable example. **07**
- OR**
- Q.4** (a) Differentiate between quadratic interpolation method and cubic interpolation method with suitable example. **07**  
(b) Explain Particle swarm optimization method in detail. **07**
- Q.5** (a) Explain characteristics of Unconstrained problem in detail. **07**  
(b) Explain Taguchi's method of optimization in detail. **07**
- OR**
- Q.5** (a) Explain optimization in fuzzy system with suitable example. **07**  
(b) Explain multi-objective optimization technique. **07**

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