

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023****Subject Code:3154201****Date:05-12-2023****Subject Name: 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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) List out application of optimization in Engineering	03
	(b) Explain Constraint surface in detail.	04
	(c) Explain and differentiate Global and Local optima.	07
Q.2	(a) Give difference of Single variable and Multi variable optimization.	03
	(b) What is convex programming and problem of it? Explain with example.	04
	(c) What is difference between Multivariable Optimization with Equality Constraints and Multivariable Optimization with Inequality? Give example.	07
	OR	
	(c) Explain Single-Variable Optimization and Multivariable Optimization with example.	07
Q.3	(a) What is the duality of linear programming?	03
	(b) Explain non-linear optimization and illustrated with practical implementation examples.	04
	(c) Explain unrestricted search and Exhaustive search with example.	07
	OR	
Q.3	(a) What is linear programming with example?	03
	(b) Differentiate linear and non-linear programming with example.	04
	(c) Explain Interval halving method and direct root methods with example	07
Q.4	(a) Explain basic difference between Unconstrained and constrained Optimization Techniques.	03
	(b) Explain Hookes and Jeeves' method and Powell's method in Unconstrained Optimization Techniques	04
	(c) Explain Steepest descent method and Fletcher-Reeves method in Unconstrained Optimization Techniques	07
	OR	
Q.4	(a) What are random search methods in Unconstrained Optimization Techniques? Give example.	03
	(b) Explain Sequential linear programming as direct method of Constrained Optimization Techniques	04
	(c) Explain Basic Approach of Penalty function method in Constrained Optimization Techniques with appropriate example	07

- Q.5** (a) What are Fuzzy optimization techniques? **03**
(b) Explain Newton's method of Unconstrained Optimization Techniques with Example **04**
(c) Explain Genetic Algorithms and Simulated Annealing as Modern methods of Optimization with example **07**

OR

- Q.5** (a) What are the grid search method used for and list out the advantages of it. **03**
(b) Give details about Transformation techniques of Constrained Optimization Techniques **04**
(c) Explain in detail Ant colony optimization as Modern methods of Optimization **07**
