

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018
Subject Code: 2182605
Date: 30/04/2018
Subject Name: Rubber Product & Process Computer Aided Design
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.

		MARKS
Q.1	(a) Explain Schematically represent the structure of black box principle.	03
	(b) Explain the graphical method of solving two variable optimization problems with linear objective function and constraints.	04
	(c) Using Newton's method minimize a quadratic function $f(x) = x^4 - x^3 + x^2 + 1$.	07
Q.2	(a) Write any three essential features of optimization problems.	03
	(b) What do you mean by design? Give examples of types of design in rubber industries.	04
	(c) Define the term:-Simulation. How the Simulation differs from Design?	07
	OR	
	(c) Describe the concept of fitting models to data.	07
Q.3	(a) Write the necessary and sufficient Conditions for extremum of an unconstrained function.	03
	(b) Write the advantages and disadvantages of Newton's method.	04
	(c) Minimize the function of $f(x) = x^4 - x + 1$ by using Newton's method.	07
	OR	
Q.3	(a) Explain feasible region in context of optimization.	03
	(b) Write the scope of optimization.	04
	(c) Maximize the function of $f(x) = x^2 - 6x + 3$ by using Newton's method.	07
Q.4	(a) Write any three basic components of GA.	03
	(b) Discuss the effect of Rank selection in GA.	04
	(c) Apply the one dimensional search technique to reduce the interval of uncertainty for maximum of the function $F = 6.64 + 1.2X - X^2$ from (0, 1) interval to less than 2 percent of its original size. Solve by golden section method.	07
	OR	
Q.4	(a) Write first three algorithm steps for simple GA for optimization.	03
	(b) Discuss the effect of mutation probability on performance of GA.	04
	(c) Minimize the function $F = X^4 - 20X^3 + 0.1X$, interval (0, 1) by using Fibonacci method.	07

--P.T.O.--

- Q.5** (a) Write any three merits of Finite Element analysis method. **03**
(b) List the method of deciding the concavity or convexity of a function. **04**
(c) What do you mean by Idealization? Write down the sequence of steps in performing a Finite Element Analysis. **07**

OR

- Q.5** (a) Discuss how one dimensional search is applied to a multidimensional problem. **03**
(b) Explain the Network Modes of training in ANN. **04**
(c) Explain the basic concepts of Back Propagation algorithm for ANN. **07**

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