Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code: 2182605 **Date:09/05/2019**

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)	What do you mean by Design? Give examples of optimization in rubber industries.	**04**
	(c)	Minimize the function of $f(X) = X^3 – X + 1$ by using Newton's method.	**07**
Q.2	**(a)**	Write the structure of black box principle.	**03**
	(b)	Write the scope of Simulation.	**04**
	(c)	Define the term:-Optimization. How the Simulation differs from optimization?	**07**
		OR	
	(c)	Discuss the procedure for solving the optimization problems.	**07**
Q.3	**(a)**	Explain feasible region in context of optimization.	**03**
	(b)	Analysis of functions for continuity. Are the following functions continuous? **(A)** $F(x) = 1/x^2$ **(B)** $F(x) = \ln x$. in each case specify the range of x for which f(x) and f'(x) are continuous.	**04**
	(c)	Maximize the function of $f(x) = x^2 - 3x + 2$ 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)	Explain the concept of Fitting models to Data.	**07**
Q.4	**(a)**	Write any three basic components of FEA.	**03**
	(b)	Discuss the effect of mutation probability on performance of GA.	**04**
	(c)	Based On Least Square Method Fit the Model $y=\beta_{0+} \beta_1 x$ to the following data. Where y is the measured response and x is the dependent variable.	**07**

x	0	2	3	4	5	6
y	0	4	6	8	10	12

OR

Q.4	**(a)**	Discuss effect of population size, number of generations, Cross over probability and mutation probability on performance of GA.	**03**
	(b)	Discuss the effect of Rank selection in GA.	**04**
	(c)	Explain the theory and working of FEA and discuss basics of FEA for Rubber product design.	**07**

Q.5	**(a)**	Write any three Disadvantages of ANN method.	**03**
	(b)	Write the method of deciding the concavity or convexity of a function.	**04**
	(c)	If the optimization problem is to minimize objective function $y = 4x_1 - 3x_2$ subject to the constraints $x_1 - 3x_2 \leq 4$ $2x_1 + 4x_2 \leq 15$ $-x_1 + x_2 \leq 6$ $x_1, x_2 \geq 0$ Find the optimum values of x_1 , x_2 and y	**07**

OR

Q.5	**(a)**	Define the Terms:- (1)Execute (2) Analysis (3) FEA	**03**
	(b)	Discuss the Network Modes of training in ANN.	**04**
	(c)	Maximize $y=x_1+x_2-x_3$, Subject to $x_1+x_2-x_3=4$, $2x_1+x_2 \leq 5$ Find the optimum values of x_1, x_2, x_3 and y	**07**

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