Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2181710 **Date: 15/11/2018**

Subject Name: Soft Computing In Control

Time: 02:30 PM TO 05:00 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 various operations that can be performed on fuzzy sets.	03
	(b)	Describe the concept of a fuzzy set in your own words.	04
	(c)	Explain the difference between randomness and fuzziness.	07
Q.2	(a)	What is meant by fuzzy decision making process?	03
	(b)	How is the polling concept adopted in rank ordering method to define the membership values?	04
	(c)	Explain Mamdani method in detail.	07
		OR	
	(c)	With the help of block diagram explain working of fuzzy logic control system	07
Q.3	(a)	What is the necessity to convert the fuzzy quantities into crisp quantities?	03
	(b)	Discuss about the Demorgan's law for the fuzzy sets. Say whether it is similar to that of classical sets	04
	(c)	State and explain various methods of de-fuzzification.	07
		OR	
Q.3	(a)	Define fuzzy inference system. Draw its working diagram.	03
	(b)	Illustrate fuzzy logic on distributed process control systems.	04
	(c)	Describe the application of fuzzy logic for washing machine control.	07
Q.4	(a)	Define the Cartesian product of two fuzzy sets with the help of an example.	03
	(b)	What is artificial neural network? Draw the architecture of basic neural network.	04
	(c)	Explain in detail optimization of Water treatment system using fuzzy logic.	07
		OR	
Q.4	(a)	What is the significance of initial weights and learning rate in the training of artificial neural network?	03
	(b)	Explain the concept of learning and state various modes of learning.	04
	(c)	Explain in detail application of fuzzy control for optimal operation of Complex Chilling Systems.	07
Q.5	(a)	State the features of membership functions.	03
	(b)	What is membership function of a fuzzy set? Explain different types of membership functions used in fuzzy system.	04
	(c)	Explain in detail implementation of fuzzy logic control in control of AC induction motor.	07
		OR	

Q.5	**(a)**	How is the excluded middle law different for the fuzzy set and the classical set?	**03**
	(b)	What is the role of membership function in the design of fuzzy logic control?	**04**
	(c)	Explain in detail implementation of fuzzy logic control in control of Power Plant.	**07**

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