

**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.

		<b>MARKS</b>
<b>Q.1</b>	(a) Explain various operations that can be performed on fuzzy sets.	<b>03</b>
	(b) Describe the concept of a fuzzy set in your own words.	<b>04</b>
	(c) Explain the difference between randomness and fuzziness.	<b>07</b>
<b>Q.2</b>	(a) What is meant by fuzzy decision making process?	<b>03</b>
	(b) How is the polling concept adopted in rank ordering method to define the membership values?	<b>04</b>
	(c) Explain Mamdani method in detail.	<b>07</b>
<b>OR</b>		
	(c) With the help of block diagram explain working of fuzzy logic control system	<b>07</b>
<b>Q.3</b>	(a) What is the necessity to convert the fuzzy quantities into crisp quantities?	<b>03</b>
	(b) Discuss about the Demorgan's law for the fuzzy sets. Say whether it is similar to that of classical sets	<b>04</b>
	(c) State and explain various methods of de-fuzzification.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Define fuzzy inference system. Draw its working diagram.	<b>03</b>
	(b) Illustrate fuzzy logic on distributed process control systems.	<b>04</b>
	(c) Describe the application of fuzzy logic for washing machine control.	<b>07</b>
<b>Q.4</b>	(a) Define the Cartesian product of two fuzzy sets with the help of an example.	<b>03</b>
	(b) What is artificial neural network? Draw the architecture of basic neural network.	<b>04</b>
	(c) Explain in detail optimization of Water treatment system using fuzzy logic.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) What is the significance of initial weights and learning rate in the training of artificial neural network?	<b>03</b>
	(b) Explain the concept of learning and state various modes of learning.	<b>04</b>
	(c) Explain in detail application of fuzzy control for optimal operation of Complex Chilling Systems.	<b>07</b>
<b>Q.5</b>	(a) State the features of membership functions.	<b>03</b>
	(b) What is membership function of a fuzzy set? Explain different types of membership functions used in fuzzy system.	<b>04</b>
	(c) Explain in detail implementation of fuzzy logic control in control of AC induction motor.	<b>07</b>

**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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