

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

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|------------|-----|---|-----------|
| 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?
- (b) What is the role of membership function in the design of fuzzy logic control?
- (c) Explain in detail implementation of fuzzy logic control in control of Power Plant.

03

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04

07

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