Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015**

**Subject Code: 2710312** **Date:02/01/2016**

**Subject Name: Intelligent System Control**

**Time:2:30 pm to 5:00 pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain the structure of fuzzy control system in detail. | **07** |
| | **(b)** | List and explain various terminologies or artificial neural network | **07** |
| **Q.2** | **(a)** | What is membership function? Explain fuzzy relations with an suitable example. | **07** |
| | **(b)** | Explain stability of fuzzy control systems in detail. | **07** |
| | | **OR** | |
| | **(b)** | Discuss various methods used for Defuzzification in fuzzy logic. | **07** |
| **Q.3** | **(a)** | Explain in detail various learning methods used in neural network | **07** |
| | **(b)** | Explain Inferences in propositional logic in detail. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain network architecture of neural network in detail | **07** |
| | **(b)** | Explain fuzzy relations. Let $\tilde{A}$= {($x_1$, 0.2), ($x_2$, 0.7), ($x_3$, 0.4)} and $\tilde{B}$= {($y_1$, 0.5), ($y_2$, 0.6)} be the two fuzzy sets defined on the universes of discourse X= {$x_1$, $x_2$, $x_3$} and Y= {$y_1$, $y_2$} respectively. Then find fuzzy relation R. | **07** |
| **Q.4** | **(a)** | Explain adaptive linear neuron (ADALINE) in detail. | **07** |
| | **(b)** | Explain in detail fuzzy PID controller design. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Implement XOR logic function using Multi-layer Perceptron. | **07** |
| | **(b)** | Explain Activation functions in neural network. | **07** |
| **Q.5** | **(a)** | Explain Process reaction curve method used for implementation of FOPDT model | **07** |
| | **(b)** | Discuss any one method for tuning of PID controller. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Discuss On-line identification of FOPDT model using Relay feedback method | **07** |
| | **(b)** | Explain Back Propagation algorithm in detail. | **07** |

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