

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – II • EXAMINATION – WINTER 2012****Subject code: 1722308****Date: 02-01-2013****Subject Name: Soft Computing****Time: 10.30 am – 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.

- Q.1 (a)** What is ANN? Explain about solution provided by ANN for nonlinear problems. **07**
- (b)** What is Soft computing? Explain application areas of Soft computing. **07**
- Q.2 (a)** Three Fuzzy sets X, Y, Z are as follows. **07**
- $X = \{(1,0), (2,0.45), (3,0.45), (4,0)\}$
- $Y = \{(3,0), (4,0.8), (5,0.8), (6,0)\}$
- $Z = \{(5,0), (6,1), (7,1), (8,0)\}$
- Find defuzzified output of aggregated fuzzy sets X, Y, Z using centroid method.
- (b)** What is learning in Neural network? Explain single layer perceptron and its learning. **07**
- OR**
- (b)** What is Back Propagation Algorithm? Explain its variations. **07**
- Q.3 (a)** Explain Genetic Algorithm operators. Explain different types of parent selection methods with suitable example. **07**
- (b)** Write short note on : Kohonen Self-Organizing Feature maps. **07**
- OR**
- Q.3 (a)** What is activation function? Explain its type with related mathematics. **07**
- (b)** What is Evolutionary Computing? Explain basic principles of Genetic Algorithm. **07**
- Q.4 (a)** List fuzzification methods. Explain any three methods. **07**
- (b)** What is Fuzzy Logic? Explain the architecture and operation of Fuzzy Logic Control Systems. **07**
- OR**
- Q.4 (a)** What is defuzzification? List its methods. Explain any three methods. **07**
- Q.4 (b)** What are the various methods of Fuzzy Inference Systems? Explain any one method in detail. **07**
- Q.5 (a)** Using your own intuition and definitions of universe of discourse, plot fuzzy membership functions for **07**
- (i) Speed of car in five grades.
- (ii) Frequency range of receivers in three grades.
- (b)** What is Fuzzy Associative memory? Explain the application of FAM for washing machine. **07**
- OR**
- Q.5 (a)** Explain Neuro-Fuzzy systems. What are the different ways of hybridization of Neural Network and Fuzzy Logic? **07**
- (b)** Explain GA based Back Propagation Network with suitable example. **07**
