

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII EXAMINATION – SUMMER 2016****Subject Code:173101****Date:18/05/2016****Subject Name:Soft Computing****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.

- Q.1** (a) How single layer network works? Why the perceptron training algorithms are required? **07**
- (b) Define Soft Computing. Explain its importance. How is Soft Computing different from Hard Computing? **07**
- Q.2** (a) What is unsupervised learning? Discuss Kohonen's self organizing networks in detail. **07**
- (b) Explain the Hebbian Learning Rule. **07**
- OR**
- (b) What is traveling salesperson problem? Explain cross-over operation for the solution of the same problem using genetic algorithm. **07**
- Q.3** (a) Explain the various learning steps of back propagation network **07**
- (b) What is membership function? With suitable block diagram, explain the working principle of FIS. **07**
- OR**
- Q.3** (a) What is Linear Separability? Define Perceptron. Why the perceptron cannot be used to implement the EXCLUSIVE-OR function? **07**
- (b) What do you mean by hybrid system? What is the need of such system(s), explain in brief. Also enlist and explain types of hybrid system. **07**
- Q.4** (a) Explain the genetic algorithm with diagram. What is the importance of fitness function in genetic algorithm? **07**
- (b) Explain the working of artificial neuron and explain how it differs from biological neuron. **07**
- OR**
- Q.4** (a) Write the need of defuzzification in fuzzy set theory. Enlist and explain different of defuzzification in brief. **07**
- (b) Define rough set, upper approximation, and lower approximation. Explain with example. **07**
- Q.5** (a) Explain explanation based learning and learning from analogy with example. **07**
- (b) Discuss 'Speech recognition' as an application of Neuro-Fuzzy modeling. Also discuss concept formation in machine learning briefly. **07**
- OR**
- Q.5** (a) Discuss Color recipe prediction as an application of computational intelligence in soft computing. **07**
- (b) Discuss Sequence Prediction in machine learning. **07**

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