

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1722308****Date: 12/07/2012****Subject Name: Soft Computing****Time: 10:30 am – 13:00 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 GA differs from traditional algorithms? Explain each step of solving any problem using GA. **07**
- (b)** What is ANN? Explain the statement “ANN does not give the exact solution for a nonlinear problem. However it provides possible approximate solution to nonlinear problems.” **07**
- Q.2 (a)** Find the weight matrix in bipolar form for the bidirectional associative memory using outer products rule for the following binary input output vector pairs: **07**
- $s(1) = (1\ 0\ 0\ 0),\ t(1) = (1\ 0)$
 $s(2) = (1\ 0\ 0\ 1),\ t(2) = (1\ 0)$
 $s(3) = (0\ 1\ 0\ 0),\ t(3) = (0\ 1)$
 $s(4) = (0\ 1\ 1\ 0),\ t(4) = (0\ 1)$
- Also test the response of the network for input pattern [1 0 -1 -1].
- (b)** Write short note on: Simulated Annealing method. **07**
- OR**
- (b)** Explain how the training in Back propagation network (BPN) is done? **07**
- Q.3 (a)** What is the significance of crossover and mutation in GA? Explain various forms of crossover and mutation. **07**
- (b)** What is feature mapping? Explain how the architecture of Learning Vector Quantization differs from Kohonen Self-Organizing Feature maps. **07**
- OR**
- Q.3 (a)** Explain the classification of hybrid systems. Explain any one hybrid system. **07**
- (b)** Explain the fundamental architecture of ART network with its fundamental algorithm. **07**
- Q.4 (a)** What do you mean by LR type fuzzy numbers? What are its applications? Explain architecture of fuzzy back propagation network. **07**
- (b)** List the methods of Fuzzy Inference Systems. Explain any one in detail. **07**
- OR**
- Q.4 (a)** List defuzzification methods. Explain any three methods. **07**
- Q.4 (b)** Explain the architecture and operation of Fuzzy Logic Control Systems. **07**
- Q.5 (a)** With a case study example, describe in detail the applications of soft computing. **07**
- (b)** Write short note on: Selection methods in GA. **07**
- OR**
- Q.5 (a)** Explain variations of standard back propagation algorithms. **07**
- (b)** Using your own intuition and definitions of universe of discourse, plot fuzzy membership function for
- (1) Weight of people and,
- (2) Frequency range of receivers. **07**
