

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2014****Subject code: 730103****Date: 27-11-2014****Subject Name: Soft Computing****Time: 02:30 pm - 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) Answer the following 07
 i. Explain major areas of soft computing
 ii. Application of soft computing
- (b) Answer the following 07
 i. Show the first 3 cycles of genetic evolution for optimizing the function $y = x^3$ in the interval $0 \leq x \leq 2$. Use set $P = \{1100, 1010, 1011, 0011\}$ as the initial population.
 ii. How can you realize crossover probability = 0.7 in the GA program?
- Q.2** (a) Answer the following 07
 Let two fuzzy sets be defined as follows:
 $A = \{0.4/2, 0.6/3, 0.8/4, 1/5, 0.8/6, 0.6/7, 0.4/8\}$.
 $B = \{0.4/2, 0.8/4, 1/5, 0.6/7\}$.
 Determine the intersections of A and B by applying three different T-norms: a. minimum, b. product, c. Lukasiewicz AND (bounded difference).
- (b) Design a fuzzy controller for controlling a distance between two cars traveling on a road. 07
- OR**
- (b) Explain Fuzzy Classification. 07
- Q.3** (a) Explain Backpropagation training algorithm. 07
 (b) Explain Adaptive resonance theory. 07
- OR**
- Q.3** (a) Explain Perceptrons Architecture and Learning rule. 07
 (b) Explain Associative memory. 07
- Q.4** (a) Explain NeuroFuzzy hybrid system. 07
 (b) Explain GA based neural network design. 07
- OR**
- Q.4** (a) Explain Fuzzy Genetic hybrid system. 07
Q.4 (b) Explain neural network based GA fitness function, reproduction and convergence. 07
- Q.5** (a) Explain use of GA in Fuzzy logic controller. 07
 (b) Explain Neural Network based Fuzzy logic inference. 07
- OR**
- Q.5** (a) Explain Fuzzy ARTMAP. 07
 (b) Explain Fuzzy BP Architecture. 07
