

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013****Subject code: 730103****Date: 28-11-2013****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) Explain Rosenblatt's Perceptron model. **07**
 (b) Write backpropagation algorithm. **07**
Q.2 (a) Write application of associative memory. **07**
 (b) Explain architecture of ART1. **07**

OR

- (b) What are variations of standard backpropagation algorithm? **07**
Q.3 (a) Write fuzzy rule base for air condition control. **07**
 (b) Consider following population of binary string for a maximization problem. **07**
- | String | fitness |
|--------|---------|
| 01101 | 5 |
| 11000 | 2 |
| 10110 | 1 |
| 00111 | 10 |
| 10101 | 3 |
| 00010 | 100 |

Find out expected number of copies of the best string in above population of the mating pool under.

- (i) Roulette wheel selection.
- (ii) Tournament selection.

OR

- Q.3** (a) Find out solution of above Q.3 (b) using: Elitism. **07**
 (b) Write different defuzzification method. **07**
Q.4 (a) Minimize the function $f(X_1, X_2) = (X_1^2 + X_2 - 1)^2 + (X_1 + X_2^2 - 7)$ in the interval $0 \leq X_1, X_2 \leq 6$. **07**
 Use bitwise operator and show at least two generations.
 (b) Explain convergence of Genetic Algorithm. **07**

OR

- Q.4** (a) Explain various parent selection method in GA. **07**
Q.4 (b) Explain fuzzy backpropagation architecture. **07**
Q.5 (a) Explain single point, two point, multi point and uniform cross over with suitable example. Perform uniform cross over using mask on given pair of chromosomes. **07**
 $P1 = 10100011101$ $P2 = 01010100110$
 Mask = 10010111001.
 (b) Write applications of GA. **07**

OR

- Q.5** (a) Explain GA based backpropagation network. **07**
 (b) Explain fuzzy ARTMAP architecture. **07**
