Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 173101 **Date: 28/05/2012**

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)** Explain the working of artificial neuron and compare it with biological neuron. **07**

(b) (i) Explain different neural network architectures. **04**

(ii) What do you mean by cross over reproduction? **03**

Q.2 **(a)** Discuss various operations of fuzzy sets with example. **07**

(b) Explain the various learning steps of back propagation network. **07**

OR

(b) Explain mamdani Fuzzy Inference System with example. **07**

Q.3 **(a)** What do you mean by Genetic algorithm? How it is different from traditional algorithm? **07**

(b) What is defuzzification? Describe different methods of defuzzification. **07**

OR

Q.3 **(a)** Explain how Genetic algorithm used for weight optimization in neural network. **07**

(b) Define rough set, upper approximation, and lower approximation. Explain with example. **07**

Q.4 **(a)** Explain Adaptive neuro fuzzy inference system in detail. **07**

(b) What do you mean by Hybrid system? Discuss advantages and application of neuro fuzzy hybrid system. **07**

OR

Q.4 **(a)** Explain working of competitive learning. Discuss its limitation. **07**

(b) Describe learning vector quantization with suitable example. **07**

Q.5 **(a)** Let X={a,b,c,d} Y={1,2,3,4}Let A & B are fuzzy sets such as **07**
A={(a,0)(b,0.8)(c,0.6)(d,1)} B={(1,0.2)(2,1)(3,0.8)(4,0)}
Determine the implication relations
IF x is A THEN y is B.

(b) Let R & S be fuzzy relations given below find max-min composition and max prod composition. **07**

$$R = \begin{pmatrix} 0.5 & 0.1 \\ 0.2 & 0.9 \\ 0.8 & 0.6 \end{pmatrix} \qquad S = \begin{pmatrix} 0.6 & 0.4 & 0.7 \\ 0.5 & 0.8 & 0.9 \end{pmatrix}$$

OR

Q.5 **(a)** What are limitations of single layer perception model? How it can be overcome. **07**

(b) i) What do you mean by activation function, bias, and delta rule ? **03**

ii) Describe the different activation functions in neural network. **04**

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