M.E. Sem. II (CBGS) IT

Soft Computing

28/11/16

QP Code : 63046

(Time: 3 Hrs) **Marks: 80**

N.B. : 1. Question no. 1 is **compulsory.**
2. Solve any **Three** questions out of remaining **Five** questions.

Qu-1 a) Distinguish between ANN and BNN. **5**

b) Compare and contrast Supervised Learning and Unsupervised Learning. **5**

c) Explain membership functions of fuzzy sets in detail. **5**

d) State and justify the role of vigilance parameter in ART network. **5**

Qu-2 a) Explain the significance of hidden layer. How it is useful in character recognition? **10**

b) Two fuzzy relations are given by **10**

$$R = \begin{array}{c} \\ x_1 \\ x_2 \end{array} \begin{array}{c} \begin{array}{cc} y_1 & y_2 \end{array} \\ \begin{bmatrix} 0.6 & 0.3 \\ 0.2 & 0.9 \end{bmatrix} \end{array}$$

$$S = \begin{array}{c} \\ y_1 \\ y_2 \end{array} \begin{array}{c} \begin{array}{ccc} z_1 & z_2 & z_3 \end{array} \\ \begin{bmatrix} 1 & 0.5 & 0.3 \\ 0.8 & 0.4 & 0.7 \end{bmatrix} \end{array}$$

Obtain fuzzy relation T as a max-min composition and max-product composition between the fuzzy relations.

Qu-3 a) Explain in detail the Genetic Algorithm based backpropagation network. **10**

b) Explain Perceptron learning with the help of an example. **10**

Qu-4 a) Design a fuzzy logic controller for a domestic washing machine with 2 inputs dirtiness of load and weight of the laundry and output as amount of detergent used. Use five descriptors for each linguistic variable. Generate a set of rules for control action and defuzzification. **10**

b) Explain in detail the backpropagation algorithm. **10**

Qu-5 a) Explain MLP problem with linear activation function. **10**

b) Explain the architecture of ANFIS with the help of a diagram **10**

Qu-6 a) Write short note on Competitive Learning. **5**

b) Write short note on Hybrid Systems. **5**

c) Explain Iterative Clustering in brief. **5**

d) Explain in short applications of Neural Network **5**
