Exam.Code:0930
Sub. Code: 7020

1019
B.E. (Electronics and Communication Engineering)
Sixth Semester
EC-614: Neural Networks and Fuzzy Logic
Time allowed: 3 Hours
Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

a) When neural network should be preferred over Fuzzy Logic?

b) What is the significance of Linear Separability.

c) List different Activation Functions used in BPN.

d) Which part of biological neuron is responsible for learning?

e) Differentiate between NN memory and computer memory.

f) What is vector quantization?

g) On the basis of application differentiate ART1 from ART 2.

h) Define Competitive Learning.

i) What is linguistic Variable? Give an example.

j) List different defuzzification techniques.

UNIT – I

II. Give the main features of multilayer feed-forward ANN and draw flow-chart of its training algorithm. Also derive the expression for calculation of weight change at the only hidden layer. (10)

III. a) Draw the diagram of fully recurrent Discrete Hopfield network with 3 output units and describe the steps involved in its training and recall.

b) Explain the working of biological neuron and derive artificial neuron from it. (5,5)

IV. Draw the properly labeled architecture of BAM. Encode the following three vector associations in a BAM system:

A1 = (1 0 0 1 0)   B1 = (0 0 1)

A2 = (1 1 0 0 0)   B2= (0 1 1)

A3 = (01 1 1 0)   B3 = (1 1 1)

Then apply the probe vector A = (0 0 0 0 0) and comment if the recalled vector is the same what was expected? (10)

UNIT – II

V. a) Describe training procedure of Kohonen self-organization map.
b) Develop a reasonable membership function for the following fuzzy sets based upon height measured in inches.

   i)"Tall"   ii) "Short"   iii) "Net short"   (5,5)

VI. a) Explain the Maxican hat network and discuss its salient features.
b) What is the basic problem associated with competitive network? How this problem can be addressed by ART network. Explain?   (5,5)

VII. Discuss and design a Fuzzy Logic Controller for a cruise having two input variables namely 'Height of water waves' and 'Acceleration', and one output variable namely 'Speed'. Explain your design by taking some appropriate value of input variables.
                                                                                  (10)

x-x-x