Exam.Code:0971
Sub. Code: 34573

2124

M.E. (Electronics and Communication Engineering)
Third Semester
ECE-1301: Neural Network and Fuzzy Logic
(For UIET Only)

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 Part.***

x-x-x

1. Answer in brief and to the point:

a). List and define the commonly used activation functions.
b). Explain why the activation function in Back-propagation network has to be differentiable?
c). Explain why asynchronous update is used in Hopfield network?
d). Discuss the concept of generalization in ANN.
e). Define linguistic variable and discuss the role of membership function. 2x5

PART A

2. (a) Discuss the working of an artificial neuron and explain which part of this is responsible for storage of learning. 4

(b) Give the architecture of 3-layer neural network and explain its training algorithm. 6

3. (a) Define linear separability and discuss its physical significance. 4

(b) How a 3-layer neural network can be used for function approximation? Explain. 6

4. (a) Define and discuss classification, clustering and generalization in context of ANN. 5

(b) Write short technical note on 'RBF neural network'. 5

PART B

5. (a) Consider two membership functions for fuzzy sets A and B as follows:

$\mu_A(x) = \frac{|(60-x)|}{8} + 1$; $\mu_B(x) = \frac{|(40-x)|}{8} + 1$

Find: i) AUB ii) A∩B iii) A\B

iv) $\overline{AUB}$ v) $\overline{B} \cap B$ 5

(b) Draw simplified architecture of Hamming Network and explain its working. 5

6. (a) Discuss the design procedure of a fuzzy logic controller to simulate a temperature control system for a room. 5

(b) Give architecture of ART1 network and discuss under what conditions a new cluster is created. 5

7. Write technical notes on:

(a) Brain-state-in-a-box network 5

(b) SOFM algorithm. 5

x-x-x