15274

B. Tech 7th Semester Examination

Neural Network & Fuzzy Logic (OS)

EC-7011/CS-7011

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question each from section A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) Describe the McCulloch-Pitts Model of Neuron and its limitation. (10)

   (b) Describe major problems that can arise from using a neural network with:

   (i) too few hidden units.

   (ii) too many hidden units. (10)

2. Describe various application domains where ANN can be successfully used. (20)

SECTION - B

3. Consider using an artificial neural network (without hidden units) to learn, using the delta rule, the following examples:

Input			Output
0	1	1	1
1	1	0	0
1	1	1	1
1	0	1	0

[P.T.O.]

Draw the network after processing (once) each of the above four (4) training examples. Use a linear threshold unit as the output and initialize its threshold to 0 (assume the node is "active" if it equals or exceeds its threshold). Also assume all weights are initially 0 and that $\eta = 0.25$.

What output does your final network give for the input "0 0 1"? (20)

4. Describe K-mean clustering algorithm with the help of an example. (20)

SECTION - C

5. Describe main features of the Radial Basis Function network. Discuss commonly used Radial Basis Functions. Compare RBF network and multilayer perceptron (MLP) network. (20)

6. Describe recurrent neural network. Explain how RNN can be used in speech recognition. (20)

SECTION - D

7. Compare Fuzzy sets and crisp sets. Describe the significance of linguistic variables in fuzzy logic. (20)

8. Describe various defuzzification techniques. Compare them on the basis of continuity, number operations, design suitability and application domain. (20)

SECTION - E

9. Write short notes on:

   (a) Neural network characteristics.

   (b) Hebbs rule.

   (c) CMAC network.

   (d) Basic fuzzy inference algorithm.

   (e) Membership function in fuzzy logic. (4×5=20)