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Total No. of Pages : 02

Total No. of Questions : 08

**M.Tech.(ECE) (2016 Batch) (Sem.-1)**  
**NEURAL NETWORKS & FUZZY LOGIC**  
**Subject Code : MTEC-104**  
**Paper ID : [74149]**

Time : 3 Hrs.

Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carry TWENTY marks.

Q1 a) Compare the performance of biological neural network and artificial neural network.

b) Explain with diagram the operation of biological neural network.

Q2 a) Use the Hebb rule, find the weights required to perform the following :

Classifications : vectors (1111) and (-1 1 -1 -1) are members of class (with target value 1);  
vectors (1 1 1 -1) and (1 -1 -1 1) are not members of class (with target value -1).

b) Using each of the training X vectors as input test the response of the net.

Q3 a) What is competitive learning? How is winner take all process executed by competitive learning?

b) Explain the Reinforcement learning with diagram and supportive mathematical derivation.

Q4 Write note on :

a) RBF networks

b) ART networks

Q5 A Kohonen Self organizing map is shown in figure :

a) Using the square of the Euclidean distance find the cluster unit  $C_j$  that is closest to the input vector (0.3, 0.4).

b) Using a learning rate of 0.3, find the new weights for the unit  $C_j$ .

c) Find new weights for  $C_{j-1}$  and  $C_{j+1}$ , if they are allowed.

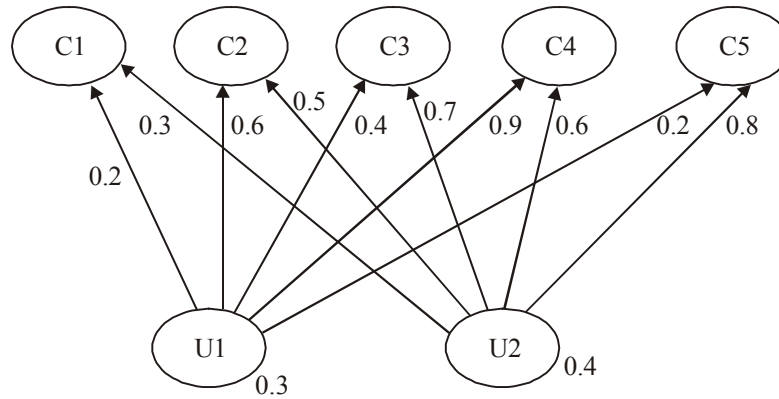


Fig.1

Q6 Discuss in detail applications of Neural networks:

- a) Optimization
- b) Associative Memory

Q7 a) Write the Fuzzy inference algorithm. Explain with example.

b) Why linguistic variables are used in Fuzzy logic? Give some examples.

Q8 a) What is the need of Fuzzy IF-THEN rules, write one algorithm using this rule.

b) What is defuzzification? What are different techniques of defuzzification?