

23070

M. Tech 2nd Semester (CSE) Examination,

May-2015

SOFT COMPUTING

Paper-MTCE-602 A

*Time allowed : 3 hours]*

*[Maximum marks : 100*

*Note : Attempt any five questions.*

1. (a) Write an algorithm for Hebbian Learning Rule with an example. 10
- (b) Explain various applications of artificial neural networks. 10
2. What do you mean by perceptron network ? Give its architecture, training algorithm. Develop a Perceptron for the AND function with bipolar inputs and targets 20
3. (a) Explain in detail the structure of biological neurons relevant to ANN. 5
- (b) Why are human fast in pattern recognition as compared to machine ? 5
- (c) Explain different artificial neuron activation function. 10

23070-P-3-Q-8 (15)

[P.T.O.]

4. What do you mean by Hetro Associative memory network ? Explain its training algorithm and retrieval algorithm. Using Hebb rule to store the following vectors in an Hetro Associative Neural net. 20

<u>INPUT</u>	<u>OUTPUT</u>
S1 = (1100)	T1 = (10)
S2 = (0100)	T2 = (10)
S3 = (0011)	T3 = (01)
S4 = (0010)	T4 = (01)

Also test the net with training input vector.

5. Compute A\*B and A/B of the following fuzzy set

$$\mu_A(x) = \begin{cases} 0 & x \leq 1 \\ \frac{x-1}{2} & 1 < x \leq 3 \\ \frac{-x+6}{3} & 3 < x \leq 6 \\ 0 & x > 6 \end{cases} \quad \mu_B(x) = \begin{cases} 0 & x \leq 2 \\ \frac{x-2}{2} & 2 < x \leq 4 \\ \frac{-x+7}{3} & 4 < x \leq 7 \\ 0 & x > 7 \end{cases}$$

20

6. (a) Design a control system of a fully automatic washing machine using mamdani FIS for the following input and output step by step. 15

Input

- Laundry Softness
- Laundry Quantity

Output

- Washing Cycle

- (b) What are linguistic variables ? Explain with the help of membership function. 5
7. (a) Give axiomatic skeleton for fuzzy t-norm. Also provide its Sugeno class and Yager class with suitable example. 12
- (b) What do you mean by membership function ? Explain its types. <http://www.HaryanaPapers.com>
8. Explain the following : 20
- (a) Linguistic Hedges
- (b) Fuzzy rules and Crisp rule
- (c) Clipping and scaling.

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