APR - 17/BE/Insem - 51
B.E. (E & TC)
SOFT COMPUTING TECHNIQUES
(2012 Pattern)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Answer Q. 1 or Q.2, Q.3 or Q.4, Q.5 or Q.6*

2) *Neat diagrams must be drawn wherever necessary.*

3) *Figures to the right indicate full marks.*

Q1) a) Using Mc-Culloch Pitts neuron, implement XOR function. Assume suitable initial weights. **[6]**

b) Compare and contrast the biological neurons with an artificial neuron model. **[4]**

OR

Q2) a) Explain with suitable diagrams, the various learning mechanisms used in ANN. **[6]**

b) State the Hebbian Rule, stating its limitation and the modification to overcome the same. **[4]**

Q3) a) Explain backpropagation algorithm for MLP. State how momentum term can cause faster convergence of algorithm. **[6]**

b) Explain the following terms: **[4]**

i) Learning rate

ii) Weights

OR

Q4) a) State the architecture of Radial basis function networks. **[6]**

b) State the algorithm for self Organized feature Map network. **[4]**

P.T.O

Q5) a) Consider two fuzzy sets A and B, calculate $A \cap \bar{B}$ and $B \cap \bar{A}$ **[6]**

$$A = \left\{ \frac{0.1}{2}, \frac{0.6}{3}, \frac{0.4}{4}, \frac{0.3}{5}, \frac{0.8}{6} \right\}$$

$$B = \left\{ \frac{0.5}{2}, \frac{0.8}{3}, \frac{0.4}{4}, \frac{0.6}{5}, \frac{0.4}{6} \right\}$$

b) State any four properties of Fuzzy sets **[4]**

OR

Q6) a) Explain any one fuzzy membership function with its transfer characteristics. Describe the possible use of the same with a suitable example. **[6]**

b) Consider fuzzy relations: **[4]**

$$R = \begin{array}{c} \\ x_1 \\ x_2 \end{array} \begin{array}{cc} y_1 & y_2 \\ \left[\begin{array}{cc} 0.7 & 0.6 \\ 0.8 & 0.3 \end{array} \right] \end{array} \quad S = \begin{array}{c} \\ y_1 \\ y_2 \end{array} \begin{array}{ccc} z_1 & z_2 & z_3 \\ \left[\begin{array}{ccc} 0.8 & 0.5 & 0.4 \\ 0.1 & 0.6 & 0.7 \end{array} \right] \end{array}$$

Find the relation $T = R \circ S$ using max-product composition

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