

Total No. of Questions : 8]

SEAT No. :

P2164

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[Total No. of Pages : 2

B.E.(Electronics&Telecommunication)

SOFT COMPUTING

(2012 Pattern)(End Semester)(Semester-II) (404191)(Elective-III)

Time :2½Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2,Q3 or Q4,Q5 or Q6 , Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of calculator is allowed.
- 5) Assume suitable data, if necessary.

Q1) a) Using Mc-Culloch Pitts neuron, implement a bipolar AND function. Assume initial weights to be [1 1]. **[8]**

b) Explain unsupervised learning mechanism in contrast with a supervised learning mechanism. **[6]**

c) State the algorithm and essential processes in a Self Organized Feature Map network. **[6]**

OR

Q2) a) State the perceptron learning rule. Also explain its limitation and solution for the same. **[8]**

b) State and explain the popular topologies of neural networks. **[6]**

c) Explain the RBF network and state its learning mechanism. **[6]**

Q3) a) Explain any one fuzzy membership function with its transfer characteristics. Describe the possible use of the same with a suitable example. **[8]**

b) Using max-min composition find relation between R and S. **[8]**

$$R = \begin{matrix} & \begin{matrix} y_1 & y_2 & y_3 \end{matrix} \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \end{matrix}, \quad S = \begin{matrix} & \begin{matrix} z_1 & z_2 \end{matrix} \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{bmatrix} 0 & 1 \\ 1 & 0 \\ 1 & 1 \end{bmatrix} \end{matrix}$$

OR

P.T.O.

- Q4)** a) State the Characteristics of Neuro-fuzzy and soft computing. [8]
 b) Consider two fuzzy sets A and B, calculate $A \cap \bar{B}$ and $B \cap \bar{A}$. [8]

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

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

- Q5)** a) Explain the procedure for designing a simple fuzzy control system. [8]
 b) Draw and explain the architecture of a typical FLC. [8]

OR

- Q6)** a) State the fuzzy compositional rules used for fuzzy relationship computation. [8]
 b) Give a rule: IF x is A, THEN y is B, where

$$A = \left\{ \frac{0.2}{1}, \frac{0.5}{2}, \frac{0.7}{3} \right\} \text{ and } B = \left\{ \frac{0.6}{5}, \frac{0.8}{7}, \frac{0.4}{9} \right\}$$

Infer B' for another rule: IF x is A' , THEN y is B' , where

$$A' = \left\{ \frac{0.5}{1}, \frac{0.9}{2}, \frac{0.3}{3} \right\} \text{ using Zadeh implication rule. [8]}$$

- Q7)** a) Draw and explain the architecture of a typical FLC. [10]
 b) State the Architecture of ANFIS. [8]

OR

- Q8)** a) State the various applications of FLC. [10]
 b) Write a short note on "Hybrid Learning Algorithm employed in ANFIS" [8]

