Total No. of Questions : 8]

SEAT No. :

P2164

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[5059]-637

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]**

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

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 $A \cap \overline{B}$ *and* $B \cap \overline{A}$. **[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

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

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

$A' = \left\{ \frac{0.5}{1}, \frac{0.9}{2}, \frac{0.3}{3} \right\}$ 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]**