Total No. of Questions : 8]

SEAT No : ____

P 2289

[Total No. of Pages :2

[5333]-3003

M.Sc.

COMPUTER SCIENCE

CS - 303 : Soft Computing
(2013 Pattern) (Semester-III)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***Attempt any five questions from given eight questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of simple calculator is allowed.***

Q1) a) What is neural network. Explain any two applications. **[4]**

b) For the given 2 fuzzy sets find union and intersection **[4]**

$$\underset{\sim}{A} = \left\{ \frac{0.15}{1} + \frac{0.25}{2} + \frac{0.6}{3} + \frac{0.9}{4} \right\} \quad \underset{\sim}{B} = \left[\frac{0.2}{1} + \frac{0.3}{2} + \frac{0.5}{3} + \frac{0.8}{4} \right]$$

c) Define support of a membership function. **[2]**

Q2) a) Explain properties of TLNS. **[4]**

b) For the following Fuzzy Relation Matrix R, determine λ - cut relations for λ- values on R, λ_1, $\lambda_{0.8}$, $\lambda_{0.6}$, $\lambda_{0.3}$ **[4]**

$$R = \begin{bmatrix} 1 & 0.8 & 0.3 & 0.7 \\ 0.8 & 1 & 0.9 & 1 \\ 0.3 & 0.9 & 1 & 0.6 \\ 0.7 & 0.1 & 0.6 & 1 \end{bmatrix}$$

c) Write advantages of GA. **[2]**

P.T.O.

Q3) a) What is GA ? Explain crossover and mutation operation with example. **[4]**

b) Explain concept of Fuzzy set and Fuzzy numbers with example. **[4]**

c) Explain Error correction rule? **[2]**

Q4) a) Determine 'If P then R' for given Fuzzy sets **[4]**

$$\underset{\sim}{P} = \left\{\frac{0.1}{a} + \frac{0.9}{b} + \frac{0.0}{C}\right\} \quad \underset{\sim}{R} = \left\{\frac{0}{d} + \frac{1}{e} + \frac{0}{h}\right\}$$

b) Explain multilayered network architectures. **[4]**

c) What is Intensification. **[2]**

Q5) a) Consider Fuzzy sets **[4]**

$$\underset{\sim}{A} = \left\{\frac{1}{a} + \frac{0.5}{b} + \frac{0.2}{c}\right\}, \quad \underset{\sim}{B} = \left\{\frac{0}{d} + \frac{0.5}{e} + \frac{0.3}{f}\right\}, \quad \underset{\sim}{C} = \left\{\frac{0.1}{g} + \frac{0.6}{h} + \frac{1}{i}\right\}$$

Find the following :

i) R = A X B ii) S = B X C iii) T = RoS using max-min composition.

b) Define GA, Application of GA. **[4]**

c) What is centroid Method. **[2]**

Q6) a) The perceptron Learning algorithm works well for linearly separable sets but does not guarantee for linearly non-separable sets. Explain. **[4]**

b) Write short note on Zadeh's extension principle. **[4]**

c) Write Sigmoidal function. **[2]**

Q7) a) List components of ANN and explain. **[5]**

b) Explain Methods of Defuzzification. **[5]**

Q8) a) Write strengths and Limitations of GA. **[5]**

b) Write features of membership functions of Fuzzy sets with examples. **[5]**

✠✠✠✠✠