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Total Number of Pages: 01

B.Tech.
PCIT4401

7th Semester Regular / Back Examination 2017-18

Principles of Soft Computing

BRANCH: IT, CSE, ITE

Time: 3 Hours

Max Marks: 70

Q.CODE: B267

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2x10)

- What is soft computing? What are its components?
- How fuzzy sets and membership functions are related?
- Draw and explain the architecture of an autoassociative network?
- Differentiate between Cartesian product and co-product?
- What is the importance of threshold in perceptron network?
- What are the different activation functions available in NN?
- Justify crisp set is a subset of the fuzzy set?
- List the application of soft computing in various real life problems?
- List various applications of genetic algorithm?
- Differentiate between supervised and unsupervised learning?

Q2

- Discuss analogy between biological and artificial neural network? (5)
- Discuss various methods of defuzzification? (5)

Q3

- Given $A = \{1/2 + 0.5/3 + 0.3/4 + 0.2/5\}$, $B = \{0.5/2 + 0.7/3 + 0.2/4 + 0.4/5\}$ find A' , $A \cup B$, $A \cap B$, $A \setminus B$, $B \setminus A$ (5)
- Discuss back propagation algorithm for a multilayer perceptron? (5)

Q4 Two fuzzy relations are given as : $R1 = \begin{bmatrix} 0.3 & 0.0 & 0.7 & 0.3 \\ 0.0 & 1.0 & 0.2 & 0.0 \end{bmatrix}$ $R2 = \begin{bmatrix} 1.0 & 0.0 & 1.0 \\ 0.0 & 0.5 & 0.4 \\ 0.7 & 0.9 & 0.6 \\ 0.0 & 0.0 & 0.0 \end{bmatrix}$ (10)
Find Max-Prod composition
Find Max-Min composition of two relations?

Q5

- Sketch the architecture for ART1 network and discuss how its training algorithm? (5)
- What is associative memory? Discuss the applications of associative memory for recognition of characters? (5)

Q6

- Define linear separability? Justify –XOR function is non-linearly separable by a single decision boundary line? (5)
- Describe in brief Adaline and Madaline unit? (5)

Q7

- Discuss the role of selection, crossover and mutation in context of Genetic Algorithm? (5)
- What is the fuzzy inference system (FIS)? Formulate a problem that you know to derive inference through fuzzy systems. (5)

Q8 Write short answer on any TWO: (5 x 2)

- Hebb network.
- Tsukamoto Fuzzy Model
- Convergence of Genetic algorithm
- RBFN network