

Roll No.

Total Pages : 03

BT-8/D-24

48316

SOFT COMPUTING

ECO-13A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section.

Section I

1. (a) What is soft computing ? Classify the various types of soft computing techniques. 7
- (b) Differentiate the features of soft computing and hard computing. 8
2. (a) Write the training algorithm and testing algorithm of Adaline Network and with a neat architecture. 7
- (b) Write short notes on the following : 8
 - (i) Artificial Intelligence
 - (ii) Artificial Neural Network

Section II

3. (a) Using McCulloch-Pitts neuron model, design a neural network for 2-input XOR functions. 8

- (b) Explain the single perceptron with its learning algorithm and its separability and convergence property. 7
4. (a) Describe the architectural functions and characteristics of Hopfield Network. 8
- (b) Explain the training algorithm of Kohonen self organizing feature maps and with a neat diagram. 7

Section III

5. (a) Explain with neat block diagram the various components and operation of a fuzzy logic system. 7
- (b) With suitable block diagram, explain the working principle of fuzzy inference system. 8
6. (a) The discretized membership functions for a transistor and a resistor are given below : 8
- $$\mu_T = \{ 0/0 + 0.2/1 + 0.7/2 + 0.8/3 + 0.9/4 + 1/5 \}$$
- $$\mu_R = \{ 0/0 + 0.1/1 + 0.3/2 + 0.2/3 + 0.4/4 + 0.5/5 \}$$
- Find the following :
- (i) Algebraic sum
 - (ii) Algebraic product
 - (iii) Bounded sum
 - (iv) Bounded difference.

- (b) State and explain properties of fuzzy sets with example. How is a fuzzy relation converted into a crisp relation using lamda-cut process ? 7

Section IV

7. (a) Mention the role of fitness function in Genetic Algorithm. What are the advantages of GA over conventional algorithms ? 8
- (b) Mention the role of crossover and mutation in genetic algorithm. Explain the convergence criteria of genetic algorithm. 7
8. (a) Describe the steps involved in unit commitment problem solving using GA application. 7
- (b) List few applications of hybrid fuzzy Genetic algorithm systems. Explain any *two* hybrid control schemes. 8

EXAMKIT