

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289398

Roll No.

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B.TECH

Regular Theory Examination (Odd Sem -III), 2016-17

INTRODUCTION TO SOFT COMPUTING (NEURAL NETWORKS, FUZZY LOGIC AND GENETIC ALGORITHM)

Time : 3 Hours

Max. Marks : 100

Note : Attempt all Sections. If require any missing data; then choose suitably.

SECTION - A

1. Attempt all questions in brief. (10×2=20)

- Compare soft computing vs. hard computing.
- Define supervised and unsupervised learning in artificial neural network.
- What do you mean by Neural Network architecture?
- What are the disadvantages of fuzzy systems?
- What is the difference between crispest and fuzzy set?
- Define mutation.

- g) What is leaky learning?
- h) Name some application of competitive learning network.
- i) Define a Fuzzy Cartesian product.
- j) Define genetic algorithm and write down the advantages of GA.

SECTION - B

2. Attempt any three of the following : (3×10=30)

- a) Write the algorithm for back propagation for back propagation training and explain about the updation of weight.
- b) Can a two input Adeline compute the XOR function? How will you solve the same by using Madeline?
- c) Draw the block diagram of a Fuzzy logic system, and define membership function?
- d) What are the advantages and disadvantages of hybrid fuzzy controller in soft computing?
- e) Explain two point crossover and uniform crossover in genetic algorithm

SECTION - C

3. Attempt any one part of the following : (1×10=10)

- a) Draw an artificial neural network. Explain supervised & unsupervised learning in artificial neural network.

- b) Write short notes on recurrent auto associative memory & explain its pros & cons.

4. Attempt any one part of the following : (1×10=10)

- a) Differentiate single layer perceptron method & multilayer perceptron method.
- b) Describe briefly the architecture of Hopfield Network.

5. Attempt any one part of the following : (1×10=10)

- a) For an air conditioner what will be the input and output in a Fuzzy controller?
- b) Given a conditional and qualified Fuzzy proposition 'P' of the form. P: If x is A, then y is B is S where 'S' is fuzzy truth qualifier and a fact is in the form "x is A". We want to make an inference in the form "y is B". Develop a method based on the truth-value restrictions for getting the inference.

6. Attempt any one part of the following : (1×10=10)

- a) Explain the industrial applications of fuzzy logic.
- b) Use the Hebb rule of discrete BAM, find the weight matrix to store the following (binary) input output pattern pairs.

$$S(1) = (1, 1, 0) \quad t(1) = (1, 0)$$

$$S(2) = (0, 1, 0) \quad t(2) = (0, 1)$$

7. Attempt any one part of the following : ($1 \times 10 = 10$)

- a) Explain optimization of travelling salesman problem using genetic algorithm and give a suitable example too.
- b) Draw a flowchart of GA & explain the working principle.

