Printed Pages: 4 **NOE - 031**

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

Paper ID : 2289398 Roll No. | | | | | | | | | | |

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)

a) Compare soft computing vs. hard computing.

b) Define supervised and unsupervised learning in artificial neural network.

c) What do you mean by Neural Network architecture?

d) What are the disadvantages of fuzzy systems?

e) What is the difference between crispest and fuzzy set?

f) 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) t(1) = (1 0)

S(2) = (0, 1, 0) t(2) = (0, 1)

7. **Attempt any one part of the following : (1×10=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.

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