Printed Pages:01 **Sub Code: ROE041**

Paper Id: 199263 **Roll No.**

B. TECH.

(SEM IV) THEORY EXAMINATION 2018-19

INTRODUCTION OF SOFT COMPUTING

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. What is simple artificial neuron?

b. How are neural network different from normal computers?

c. What Learning Rate Should Be Used For Back propagation error?

d. What is the use of hidden layer in a neural network?

e. Why fuzzy sets are better in comparison to normal sets?

f. What is the role of linguistic hedges in fuzzy logic?

g. Suppose a fuzzy set $\tilde{A}$= {(1, 0.2) (2, 0.4) (3, 0.6) (4, 0.9)} is given then what will be the result of strong alpha cut if α=0.6?

h. Explain Gaussian membership function of fuzzification with its equation and graph.

i. What are the basic components of genetic algorithms?

j. What is k-point crossover operator?

SECTION B

2. Attempt any *three* of the following: 7x3=21

a. How human brain works? And how the working of artificial intelligence is related to human brain working?

b. Explain the following Neural Network Architecture in Details:
(i) Rosenblatt's Perceptron Model (ii) McCulloch- Pitts Model

c. Suppose two fuzzy sets are given-
$\tilde{A}$={(1,0.2) (2,0.5) (3,0.8) (4,1)} and $\tilde{I}$= {(1,0.3) (2,0.6) (3,0.9) (4,1)}
Then find-
   i. Height of both fuzzy sets
   ii. $\tilde{A} \vee \tilde{I}$
   iii. $\tilde{A} \wedge \tilde{I}$
   iv. Complement of both fuzzy sets

d. Explain different membership functions? What are the methods of membership value assignment?

e. Explain working principle and flow chart of genetic algorithm.

SECTION C

3. Attempt any *one* part of the following: 7x1=7

a. What is the difference between auto associative and hetro associative memory?

b. What is recurrent network and also give its example? What are the applications of artificial neural networks?

4. Attempt any *one* part of the following: 7x1=7

a. Explain supervised, unsupervised and reinforcement learning in detail.

b. Generate OR function (x_1, x_2) using McCulloch Pitts Neuron Model. The threshold value is 3.

5. Attempt any *one* part of the following: 7x1=7

a. If $\tilde{I}$={(F,0.4) (E,0.3) (X,0.1) (Y,0.1) (K,0.9) (T,0.8)}and $\tilde{N}$= {(F,0.99) (E,0.8) (X,0.1) (Y,0.2) (K,0.5) (T,0.5)}, then verify Demorgan's Law using these given fuzzy sets.

b. Explain the properties of fuzzy sets.

6. Attempt any *one* part of the following: 7x1=7

a. Explain fuzzification and defuzzification process for air conditioner controller.

b. What is defuzzification and why is it required? Explain mean of maxima and center of sum method.

7. Attempt any *one* part of the following: 7x1=7

a. Explain rank selection and Roulette wheel selection methods.

b. What are Genetic bitwise operators? Explain.