

(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

- What is simple artificial neuron?
- How are neural network different from normal computers?
- What Learning Rate Should Be Used For Back propagation error?
- What is the use of hidden layer in a neural network?
- Why fuzzy sets are better in comparison to normal sets?
- What is the role of linguistic hedges in fuzzy logic?
- 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 $\alpha=0.6$?
- Explain Gaussian membership function of fuzzification with its equation and graph.
- What are the basic components of genetic algorithms?
- What is k-point crossover operator?

SECTION B

2. Attempt any three of the following:

7x3=21

- How human brain works? And how the working of artificial intelligence is related to human brain working?
- Explain the following Neural Network Architecture in Details:
(i) Rosenblatt's Perceptron Model (ii) McCulloch- Pitts Model
- 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-
 - Height of both fuzzy sets
 - $\tilde{A} \vee \tilde{I}$
 - $\tilde{A} \wedge \tilde{I}$
 - Complement of both fuzzy sets
- Explain different membership functions? What are the methods of membership value assignment?
- Explain working principle and flow chart of genetic algorithm.

SECTION C

3. Attempt any one part of the following:

7x1=7

- What is the difference between auto associative and hetro associative memory?
- 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

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

- 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.
- Explain the properties of fuzzy sets.

6. Attempt any one part of the following:

7x1=7

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

- Explain rank selection and Roulette wheel selection methods.
- What are Genetic bitwise operators? Explain.