Sub Code:KOE036

Paper Id: 199360 Roll No:

B TECH
(SEM-III) THEORY EXAMINATION 2019-20
INTRODUCTION TO SOFT COMPUTING

Time: 3 Hours *Total Marks: 100*

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

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	What is artificial intelligence.	2	5
b.	Define mutation	2	3
c.	Define fuzzy interference	2	2
d.	Mention some application of fuzzy logic.	2	2
e.	State the difference between supervised learning & unsupervised learning.	2	4
f.	Differentiate between fuzzy sets and crisp sets.	2	1
g.	What is an activation function?	2	4
h.	Define genetic algorithm & write down the its advantage.	2	3
i.	If the net input to an output neuron is 0.64 calculate its output when the activation function is binary sigmoidal.	2	4
j.	Let A & b be the two fuzzy sets with $\mu_A(x)=0.2$ & $\mu_B(x)=0.1$ for the rule : If A or B then C, what is fuzzy membership of C ?	2	1

SECTION B

2. Attempt any *three* of the following: **3 x 10 = 30**

Qno.	Question	Marks	CO
a.	(i)Explain the Rosenblatt's Perceptron model. (ii)Compute the hidden layer (O_{HP}) of Multilayer ANN	10	4
b.	Name and explain the different membership function with a diagram.	10	1
c.	Let A and B be two fuzzy sets given by A : {(x_1, 0.2), (x_2,0.5), (x_3, 0.6)};B : {(x_1, 0.1), (x_2, 0.4), (x_3,0.5)}.Find $(A-B)^2$	10	2
d.	Write a program using genetic algorithm to solve a travelling salesman problem	10	5
e.	Differentiate between Roulette - wheel based on fitness and Roulette - wheel based on rank with a suitable example..	10	3

SECTION C

3. Attempt any *one* part of the following: **1 x 10 = 10**

Qno.	Question	Marks	CO
a.	What do you mean by Fuzzification? Compare & contrast between Fuzzification & Defuzzification.	10	1
b.	Explain the framework of a fuzzy expert system with a diagram.	10	1

4. Attempt any *one* part of the following: **1 x 10 = 10**

Qno.	Question	Marks	CO
a.	Consider fuzzy sets $\tilde{A}$ and $\tilde{I}$ defined on the interval X=[0,5] of real number, by the membership grade functions $\mu_A(X) = X/X+1$, $\mu_I(x)= 2^{-x}$ Determine the mathematical formulae and graphs of the membership grade functions for following set: i) A^c, B^cb) AUB ii) AΠ B	10	2

b.	What are different attributes of predicate logic? Using inference in predicate logic prove following statement (i) All men are mortal (ii) Socrates is a man Prove: Socrates is mortal	10	2

5. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	How can Fitness functions be found for any optimization problem? Explain in detail, Fitness Function in Genetic algorithm.	10	3
b.	What are Genetic Algorithms? Draw the general flow diagram of genetic algorithm.	10	3

6. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	Explain the different types of artificial neural networks	10	4
b.	Implement a MADALINE network to solve the XOR problem.	10	4

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

Qno.	Question	Marks	CO
a.	Write a program for implementing genetic algorithm based internet search technique	10	5
b.	Soft computing techniques gives best solution to complex problems. justify.	10	5