Subject Code: KOE036

PAPER ID-411534

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM III) THEORY EXAMINATION 2021-22
INTRODUCTION TO SOFT COMPUTING

Time: 3 Hours ***Total Marks: 100***

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

SECTION A

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

Qno	Questions	CO
(a)	How can we count the layers in a neural network?	1
(b)	Why single layer perceptron is used?	1
(c)	Why is fuzzy logic leading to more human intelligent machines?	2
(d)	How can you improve decision making?	2
(e)	How ANFIS works in Matlab?	3
(f)	How does classification and regression tree work?	3
(g)	Which GA operation is computationally most expensive?	4
(h)	How is fitness genetic algorithm calculated?	4
(i)	Which type of searching is used by genetic algorithm?	5
(j)	Which two technologies are combined for neuro-fuzzy hybrid systems?	5

SECTION B

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

Qno	Questions	CO
(a)	Define an artificial neural network. State the characteristics of an artificial neural network.	1
(b)	Explain the different types of Operation used in Fuzzy Set with suitable examples.	2
(c)	Name some application of Kohonen's self-organizing network. What are the properties of adaptive resonance theory?	1
(d)	Explain Travelling salesman Problem using genetic problem with example.	5
(e)	Use GA to solve the following non-linear programming problem: Minimize $(x - 2.5)^2 + (y - 5)^2$ subject to $5.5x + 2y^2 - 18 \leq 0$, $0 \leq x, y \geq 5$.	4

SECTION C

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

Qno	Questions	CO
(a)	Why neural network is also called as parallel distributed processing?	1
(b)	What are the applications of Supervised Machine Learning in Modern Businesses?	1

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

Qno	Questions	CO
(a)	Explain with a neat diagram the neural network architecture of multilayer feed forward network.	2
(b)	Find the algebraic sum of two fuzzy sets A={(3, 0.5) (5,1)(7, 0.6)} and 'B' and B={(3, 1)(5, 0.6)}	2

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

Qno	Questions	CO
(a)	What is the difference between an artificial neural network (ANN) and an adaptive neuro-fuzzy inference system (ANFIS)?	3
(b)	How to implement Neuro Fuzzy Modeling for Regression Test Cases Prioritization?	3

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

Qno	Questions	CO
(a)	What is meant by survival of the fittest and give one specific example?	4
(b)	What are the various types of mutation techniques in soft computing? Also explain their types.	4

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

Qno	Questions	CO
(a)	Show how fuzzy logic control and genetic algorithm based structural optimization can be used for plant control applications	5
(b)	How computational time of the MATLAB Simulation can be calculated?	5