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Examination: Odd Semester Examination 2022

Paper Name: Soft Computing
Time: 3 Hours

Paper Code: BTCSEAI DE12
Maximum Marks: 75

*Note: Mobile Phones or programmable calculator or any equipment with memory are not allowed.
Follow proper numbering for answering the questions.*

Section- A (7 x 5 = 35)

Attempt all the questions. Each question carries 5 marks

Q. No.	Question	CO	BL
1	Define support, core, crossover points, normality and convex fuzzy sets with the help of examples.	CO2	BL4
2	Explain the steps involved in solving a problem using fuzzy logic concept.	CO2	BL1
3	What is the role of bias and activation function in ANN?	CO3	BL2
4	Differentiate between soft computing and hard computing.	CO1	BL2
5	Differentiate between supervised and unsupervised learning technique. Give one example of each type in ANN.	CO3	BL1
6	Explain single point and multi point crossover with the help of an example.	CO5	BL5
7	Differentiate between multi-layer perceptron model and Radial Basis Function Network.	CO4	BL2

Section-B (4 x 10 = 40)

Attempt any FOUR. Each question is of 10 marks

Q. No.	Question	CO	BL
1	Implement OR logical operation using perceptron's. Show the steps for 2 iterations.	CO3	BL2

2	Consider a fuzzy set A defined on the interval $x = [0, 10]$ of integers by the membership function. $\mu_A(x) = x^2/(x+2)$. What will be the α cut corresponding to $\alpha = 0.4$?	CO2	BL2
3	Let A(x) and B(x) be two fuzzy sets as given below: $A(x) = \{(x_1, 0.4), (x_2, 0.3), (x_3, 0.9), (x_4, 0.1)\}$ $B(x) = \{(x_1, 0.2), (x_2, 0.5), (x_3, 0.6), (x_4, 0.4)\}$ Find the Union, Intersection and Compliment of these sets and show their graphical representation	CO2	BL3
4	Implement OR function with bipolar inputs and targets using ADALINE network. Show the working for 2 iterations.	CO3	BL4
5	Suppose we want to minimize the function $(x^2-1)/4$. $0 \leq x \leq 15$ Take a randomly generated initial population of 4 chromosomes and show the working of roulette wheel selection.	CO5	BL5
6	Consider the following problem. We are required to create Discrete Hopfield Network with bipolar representation of input vector as $[1 \ -1 \ 1 \ 1]$ or $[1 \ 0 \ 1 \ 1]$ (in case of binary representation) is stored in the network. Test the Hopfield network with missing entries in the first and fourth component of the stored vector (i.e. $[0 \ 0 \ 1 \ 0]$)	CO4	BL6