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Question Paper Code	11777

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Eighth Semester

Electronics and Communication Engineering

CS8086 – SOFT COMPUTING

(Regulations 2017)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Why the McCulloch-Pitts neuron model is widely used in-logic functions?	2,K2,CO1
2.	List advantages of neural networks.	2,K1,CO1
3.	Name some application of Kohonen self-organizing network.	2,K1,CO2
4.	Differentiate between Perceptron and SVM.	2,K2,CO2
5.	Mention the limitations of Fuzzy system.	2,K2,CO3
6.	Distinguish between fuzzy logic and binary logic.	2,K2,CO3
7.	Infer the role of fitness function in Genetic Algorithm.	2,K2,CO4
8.	List the basic components used in all genetic algorithms.	2,K1,CO4
9.	Can genetic algorithms help us in selecting the network architecture?	2,K2,CO5
10.	Why to use Fuzzy Logic in Neural Network?	2,K2,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Discuss in detail the various types of activation function used in neural network with aid of mathematical representation and its output.	13,K3,CO1
		OR	
	b)	Explain the following: (i) Evolutionary Programming. (ii) Fuzzy Systems. (iii) Genetic Algorithm.	13,K3,CO1
12.	a)	Develop and test an LVQ net with five vectors assigned to two classes. The given vectors along with classes are shown in table.	13,K3,CO2

Vector	Class
[0 0 1 1]	1
[1 0 0 0]	2
[0 0 0 1]	2
[1 1 0 0]	1
[0 1 1 0]	1

OR

b) Describe briefly the architecture of Hopfield Network with an algorithm. *13,K3,CO2*

13. a) Consider two fuzzy sets A and B *13,K3,CO3*

$A=\left\{\frac{1}{2}+\frac{0.5}{3}+\frac{0.3}{4}+\frac{0.2}{5}\right\}$ $B=\left\{\frac{0.5}{2}+\frac{0.7}{3}+\frac{0.2}{4}+\frac{0.4}{5}\right\}$

Perform the following operating on fuzzy sets

(i) $A \cup B$

(ii) $A \cap B$

(iii) Component of fuzzy set A.

(iv) Difference $\left(\frac{A}{B}\right)$.

(v) Algebraic sum of given fuzzy sets.

(vi) Bounded sum of the given fuzzy set.

(vii) Algebraic product of the given fizzy sets.

OR

b) Explain the different types of membership function used infuzzification process. *13,K3,CO3*

14. a) Explain the significance of adjustment of free parameters when implementing Genetic Algorithm. *13,K3,CO4*

OR

b) Write short notes on following

(i) Reproduction. *7,K3,CO4*

(ii) Inheritance. *6,K3,CO4*

15. a) Construct the Neuro-fuzzy system for 2 Input and One Output with 6 Rules and 3 Membership function and explain. *13,K3,CO5*

OR

b) With suitable block diagram, explain the principle involved in a liquid level controller using Neuro-fuzzy technique. *13,K3,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Apply simplified Fuzzy ARTMAP to obtain solution of pattern classification/ recognition problems. *15,K4,CO6*

OR

b) With necessary diagrams apply Fuzzy back propagation for earthquake damage evaluation. *15,K4,CO6*