Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 70045

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2025
Third Semester
VLSI Design
P23VDE17 - SOFT COMPUTING
(Regulation 2023)

Time: Three Hours Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Why is the McCulloch-Pitts neuron model widely used in logic functions?	2	K1	CO1
2.	Define Intelligent System.	2	K1	CO1
3.	Define an empty Fuzzy set and height of a Fuzzy set.	2	K1	CO2
4.	Interpret the Centre of gravity method for defuzzification.	2	K2	CO2
5.	Name any two search techniques used for solving optimization problem.	2	K1	CO3
6.	List the applications of Optimization technique.	2	K1	CO3
7.	Why Hopfield network is called as recurrent neural network?	2	K1	CO4
8.	Define cooperative Neuro-Fuzzy System.	2	K1	CO4
9.	Classify types of encoding applied in Genetic algorithm.	2	K2	CO5
10.	List the various types of cross-over and mutation techniques.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

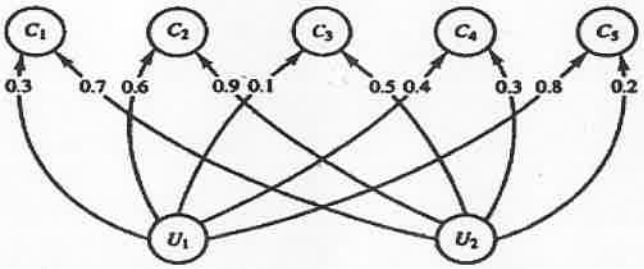
Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the training algorithm and testing algorithm of Adaline Network with a neat architecture.	13	K2	CO1

		(OR)			
	b)	Illustrate OR function with binary inputs and bipolar targets using perceptron training algorithm upto 2 Epochs.	13	K2	CO1
12.	a)	Describe in detail the methods employed for converting fuzzy form into crisp form.	13	K1	CO2
		(OR)			
	b)	The discretized membership functions for a transistor and a resistor are given below: uT={ 0/0 + 0.2/1 + 0.7/2 + 0.8/3 + 0.9/4 + 1/5} uR={ 0/0 + 0.1/1 + 0.3/2 + 0.2/3 + 0.4/4 +0.5/5} Find the following a) Algebraic sum b) Algebraic product c) Bounded sum d) Bounded difference	(4+3+ 3+ 3)	K1	CO2
13.	a)	Explain the steepest descent algorithm in detail. Compare steepest descent algorithm with Newton's algorithm.	13	K2	CO3
		(OR)			
	b)	i. Compare genetic algorithm with simulated annealing. ii. Explain random search & downhill search algorithm.	(7+6=13)	K2	CO3
14.	a)	i. Infer the Characteristics of Neuro-fuzzy Hybrid System. ii. How does a Neuro-fuzzy system learn?	13	K2	CO4
		(OR)			
	b)	Explain Fuzzy C-means clustering and K-means algorithm in detail.	13	K2	CO4
15.	a)	Explain the Traveling Salesman Problem using Genetic algorithm approach.	13	K4	CO5
		(OR)			
	b)	Summarize the sequential procedures involved in the cross over and reproduction phase of GA with typical examples.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Given a Kohonen self-organizing map with weights shown in the following diagram, i. Use the square of the Euclidean distance to find the cluster unit CJ that is closest to the Input vector (0.5, 0.2). ii. Using a learning rate of 0.2, find the new weights for unit Cj. iii. If units CJ-1 and CJ+1 are also allowed to learn the input pattern, find their new weights.	(5+5+ 5) =15	K5	CO1



(OR)

b) Design a GA which can be used for classification problem? How to choose inputs, GA parameters and fitness function? 15 K6 CO5