Question Paper Code	12725

M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Second Semester

M.E. - Power Electronics and Drives

20PPEEL202 - SOFT COMPUTING TECHNIQUE

Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	Compare soft computing vs. hard computing.	2	K2	CO1
2.	Draw the basic model of Adaline network and Madaline network.	2	K1	CO1
3.	Name some applications of competitive learning network.	2	K1	CO2
4.	Justify why Artificial Neural Network is called adaptive system during training.	2	K1	CO2
5.	State fuzzy inference system.	2	K1	CO3
6.	Mention the three properties for matrix relations that define fuzzy equivalence relation	2	K1	CO3
7.	Specify the role of fitness function in Genetic Algorithm.	2	K1	CO4
8.	In what way if-then rules are used for multiobjective optimization?	2	K1	CO4
9.	Differentiate between Perceptron and SVM.	2	K2	CO5
10.	List few applications of hybrid fuzzy Genetic algorithm systems.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11.	a)	Explain with a neat diagram the neural network architecture of multilayer feed forward network.	13	K2	CO1

OR

	b)	Illustrate the architecture of Perceptron and write the step by step procedure for training the perceptron with necessary flowchart.	13	K2	CO1

12.	a) i)	Describe the steps involved to solve any one of the optimization problems using Hopfield neural network	7	K4	CO2
	ii)	Draw and explain the structure of Boltzmann machine	6	K2	CO2

OR

	b)	Explain the training algorithm used in ART network.	13	K4	CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Calculate (i) Complement (ii) Union (iii) Intersection (iv) Difference (v) De Morgan's Principles for the two given fuzzy sets.   *13   K2   CO3*

$$\underline{A} = \left\{\frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8}\right\} \quad \underline{B} = \left\{\frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8}\right\}$$

OR

   b) Explain with neat sketch the Architecture of fuzzy logic controller.   *13   K2   CO3*

14. a) Summarize with suitable examples the various types of crossover techniques used in the genetic algorithm process   *13   K2   CO4*

OR

   b) i) Describe the basic steps of Genetic Algorithm used for solving optimization techniques   *7   K2   CO4*

     ii) Compare the features of Genetic Algorithm with other optimization techniques.   *6   K2   CO4*

15. a) With suitable block diagram, explain the principle involved in a liquid level controller using neuro fuzzy technique.   *13   K2   CO5*

OR

   b) With a neat flowchart, explain the algorithm of particle swarm optimization.   *13   K2   CO5*

PART - C (1× 15 = 15 Marks)

16. a) Demonstrate in detail about Roulette-Wheel selection and random selection.   *15   K3   CO4*

OR

   b) For choice of your application, design and train the SVM network with different kernels and classify them.   *15   K3   CO5*