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Question Paper Code	13390
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Eighth Semester

Electrical and Electronics Engineering

20EEL804 - SOFT COMPUTING TECHNIQUES FOR ELECTRICAL ENGINEERING

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	Marks	K – Level	CO
1. What is auto-association task in neural networks? (a) find relation between 2 consecutive inputs (b) related to storage & recall task (c) predicting the future inputs (d) none of the mentioned	1	K1	CO1
2. What is the purpose of Axon? (a) receptors (b) transmitter (c) transmission (d) none of the mentioned	1	K1	CO1
3. How many types of random variables are there in Fuzzy logic? (a) 2 (b) 4 (c) 1 (d) 3	1	K1	CO2
4. Uncertainty can be represented by _____ (a) Entropy (b) Fuzzy logic (c) Probability (d) All of the above	1	K1	CO2
5. How the CPN provides practical approach for implementing? (a) patter approximation (b) pattern classification (c) pattern mapping (d) pattern clustering	1	K1	CO3
6. What consist of a basic counter propagation network? (a) a feedforward network only (b) a feedforward network with hidden layer (c) two feedforward networks with hidden layer (d) none of the mentioned	1	K1	CO3
7. Show where the Genetic Algorithm widely used? (a) Robotics (b) Machine Learning (c) Artificial Intelligence (d) All of the above	1	K1	CO4
8. Which of the following is a key component of Genetic Algorithm? (a) Sorting (b) Crossover (c) Compiling (d) Indexing	1	K1	CO4
9. What does ANFIS stand for? (a) Adaptive Network-Based Fuzzy Inference System (b) Artificial Neural Fuzzy Intelligence System (c) Automated Neuro-Fuzzy Integrated System (d) Advanced Neural Fuzzy Information Structure	1	K1	CO5
10. Why is the defuzzification process necessary in fuzzy systems? (a) To convert fuzzy values into crisp numerical outputs (b) To remove unnecessary rules (c) To simplify fuzzy logic operations (d) To avoid using neural networks	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Define neural network.	2	K1	CO1
12. Differentiate Supervised and unsupervised learning.	2	K2	CO1
13. Show the implementation of ANDNOT function using McCulloch pitts model.	2	K1	CO1
14. Differentiate Crisp and fuzzy sets.	2	K2	CO2
15. What is Fuzzy Logic modelling and control?	2	K1	CO2

16. Compare different defuzzification techniques.	2	K2	CO2
17. What is learning rate?	2	K1	CO3
18. Define the euclidean distance.	2	K1	CO3
19. Show the basic operators used in Genetic Algorithm.	2	K1	CO4
20. Explain how fuzzy logic helps in dealing with non-linearity in dynamic systems.	2	K2	CO4
21. What is Hybrid Control Scheme?	2	K1	CO5
22. Define Fuzzy Logic.	2	K1	CO5

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23. a) Apply the concept of artificial neuron and explain its model with a neat sketch.	11	K3	CO1
OR			
b) Build the architecture of Perceptron and write the step-by-step procedure for training the perceptron with necessary flowchart.	11	K3	CO1
24. a) Explain the steps involved in designing a FLC with example.	11	K2	CO2
OR			
b) Illustrate the concept of Fuzzy Decision making with real time examples.	11	K2	CO2
25. a) Explain in detail about associative memory.	11	K2	CO3
OR			
b) Demonstrate the architecture of CPN and write the step-by-step procedure for training the CPN with necessary flowchart.	11	K2	CO3
26. a) Explain the concept of Membership Functions and their importance in Fuzzy Logic.	11	K2	CO4
OR			
b) Explain the working principle of Genetic Algorithm (GA).	11	K2	CO4
27. a) Illustrate how Genetic Algorithm is used to optimize fuzzy logic-based control systems.	11	K2	CO5
OR			
b) Explain the concept of Hybrid Control Schemes and their applications.	11	K2	CO5
28. a) (i) Illustrate the role of Fuzzy Logic in control systems with real-life applications.	6	K2	CO4
(ii) Compare Artificial Neural Networks (ANN) and Fuzzy Logic Control (FLC).	5	K2	CO5
OR			
b) (i) Compare Genetic Algorithm with traditional optimization methods.	6	K2	CO4
(ii) Summarize the importance of optimization techniques in hybrid control systems.	5	K2	CO5