

ELEX SEM:V SUB:-(NNFL) R-2019-20 'C' SCHEME

DATE:- 13.06.25

Duration 3 Hours

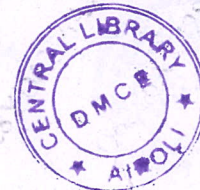
[Maximum Marks 80]

NOTE: 1) Question 1 is compulsory

2) Solve any three from the remaining five questions

3) Assume suitable data if necessary.

4) Figures to the right indicate full marks



Q.1. Attempt any four

20

- Differentiate between crisp sets and fuzzy sets. How do they relate to each other in the context of fuzzy logic?
- Explain the phases involved in training, testing, and validating neural networks. What role does each phase play in the network's development?
- What is unsupervised learning? Provide suitable examples to explain the concept.
- Describe the process of weight updates in Hopfield networks in brief.
- List and explain various types of activation functions commonly used in neural networks

Q.2. a) Explain the concept of associative memory in neural networks. How does a hetero-associative memory network store and retrieve information? 10

b) What is the role of the activation function in a perceptron? Describe how it influences the output of the perceptron. 10

Q.3. a) Define a fuzzy controller. What are the key characteristics that distinguish a fuzzy controller from traditional control systems? 10

b) Find the Cartesian product of following two fuzzy sets
 $A(x) = \{(x1, 0.2), (x2, 0.4), (x3, 0.6), (x4, 0.8), (x5, 1.0)\}$ and
 $B(y) = \{(y1, 0.3), (y2, 0.5), (y3, 0.7)\}$ 10

Q.4. a) Describe the role of the neighborhood function in a Self-Organizing Map (SOM). How does it influence the learning process of SOM? 10

b) Explain different methods of defuzzification? 10

Q.5. a) List the key steps involved in building an ANN-based system for recognizing Handwritten characters. 10

b) What are the different architectures of neural networks? Explain in detail. 10

Q.6. a) Explain how ART 1 maintains stability and plasticity during learning. 10

b) How does the backpropagation algorithm adjust the weights of a neural network during training? 10