

(3 Hours)

[Total Marks : 80]

Note: Question No. I is Compulsory**Attempt any 3 Questions from the Remaining Questions.**

- Q. 1 20
- Differentiate the following: Convex and nonconvex fuzzy set.
 - Discuss any two methods of defuzzification.
 - Explain activation functions in ANN.
 - List the application of GA.
- Q. 2
- Design neural networks with only one M-P neuron that implements the three basic logic operations: 10
(i) NOT (x_1); (ii) OR (x_1, x_2); (iii) NAND (x_1, x_2), where x_1 and $x_2 \in \{0, 1\}$.
 - Discuss any two learning techniques in Neural Network in detail. 10
- Q. 3
- List the stages involved in training of back propagation network. 10
 - Write short note on Adaptive Resonance Theory 1. 10
- Q. 4
- Explain architecture of Character Recognition algorithm using ANN 10
 - Explain in detail selection and encoding operators involved in genetic algorithm. 10
- Q. 5
- With a neat flowchart, explain the steps of a simple genetic algorithm. 10
 - Explain FIS in detail. Compare Mamdani FIS and sugeno FIS. 10
- Q. 6
- Draw and explain ANFIS architecture in detail. 10
 - List and explain the advantages of Neuro-Genetic Hybrid systems in detail. 10
