

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM**IV B. Tech I Semester Advanced Supplementary Examinations March 2025****SOFT COMPUTING TECHNIQUES**

(Open Elective)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Distinguish between soft computing and traditional computing? [7M]
b) Describe the concept of fuzzy logic and how it differs from traditional binary logic? [7M]
(OR)
2. a) Explain the structure and working principle of a typical neural network. [7M]
b) Discuss the architecture and components that make up an expert system [7M]

UNIT-II

3. a) Illustrate the back propagation algorithm with an example? [7M]
b) Explain the structure and function of the Hamming neural network. [7M]
(OR)
4. a) Discuss the process of training a Kohonen neural network and how it maps high-dimensional data. [7M]
b) Compare and contrast the Adaline (Adaptive Linear Neuron) and Madaline (Multiple Adaptive Linear Neurons) networks. [7M]

UNIT-III

5. a) Evaluate the properties of fuzzy relations and give examples? [7M]
b) Describe the structure and operation of a fuzzy inference system (FIS)? [7M]
(OR)
6. a) Summarize the basic operations on fuzzy sets, such as union, intersection, and complement? [7M]
b) Discuss some of the challenges and limitations associated with fuzzy logic systems. [7M]

UNIT-IV

7. a) Explain How Genetic Algorithms can be applied to solve the Traveling Salesman Problem. [7M]
b) Discuss the challenges and benefits of using Genetic Algorithms for this combinatorial optimization problem. [7M]
(OR)
8. a) Illustrate the working principle of Genetic Algorithms? [7M]
b) Discuss the working principle of Genetic Algorithm-based Machine Learning Classifier Systems. [7M]

UNIT-V

9. a) Discuss the key steps involved in the Cuckoo Search algorithm. [7M]
b) Describe the core principles behind the Artificial Bee Colony algorithm? [7M]
(OR)
10. a) Explain the concept of emergent behaviour in swarm intelligence systems. [7M]
b) Discuss the wide range of applications of swarm intelligence algorithms in various fields. [7M]
