

GUJARAT TECHNOLOGICAL UNIVERSITY**ME - SEMESTER– 2 • EXAMINATION – WINTER - 2023****Subject Code:3720217****Date: 06 Jan 2024****Subject Name:Soft Computing****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define soft computing, discuss its significance, and outline the differences between soft computing and hard computing. **07**
- (b) Explain different methods of defuzzification in fuzzy logic. Provide examples for each method. **07**
- Q.2** (a) What is the learning by observation and learning by analogy within the domain of Machine Learning? Explain briefly. **07**
- (b) Discuss the issues related to back propagation networks and the types of operations performed on back propagation networks using suitable examples. **07**
- OR**
- (b) Compare supervised learning and unsupervised learning and explain ANN. **07**
- Q.3** (a) Describe how the Traveling Salesman Problem (TSP) can be solved using Genetic Algorithms. **07**
- (b) Describe the structure of the Adaptive Neuro-Fuzzy Inference System (ANFIS). How Fuzzy inference layer plays a pivotal role in ANFIS? **07**
- OR**
- Q.3** (a) Differentiate the classical algorithm and Genetic Algorithms. **07**
- (b) Discuss the importance of fuzzy set and explain types of membership function. **07**
- Q.4** (a) Explain practical significance of Python in the context of soft computing with a real-world example. **07**
- (b) Explain Neural Network Toolbox of Matlab. **07**
- OR**
- Q.4** (a) Explain following terms in MATLAB. **07**
- 1) Arrays and array operation
- 2) Functions and Files
- 3) Fuzzy Logic Toolbox
- (b) Explain (i) feed forward network, and (ii) reinforcement learning. **07**
- Q.5** (a) Give an explanation of different types of cross-over methods used in Genetic Algorithms, accompanied by practical examples. **07**
- (b) Explain how to use machine learning approach for knowledge acquisition, illustrating with a suitable example. **07**
- OR**
- Q.5** (a) Explain key parameters of Genetic Algorithm which influence the algorithm's behavior and performance. **07**
- (b) Discuss some of the recent trends and advancements in classifiers, neural networks, and genetic algorithms. **07**
