

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME - SEMESTER- 1 EXAMINATION – SUMMER - 2023**

**Subject Code:3710721****Date:15 Jul 2023****Subject Name: AI Techniques****Time:02:30 PM TO 05:00 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) How artificial intelligence is different than conventional intelligence? Briefly describe characteristics and advantages of it. **07**
- (b) Differentiate between Crisp logic and Fuzzy logic. Also explain Fuzzy operators like Union, Intersection and complement with suitable example. **07**
- Q.2** (a) Name and describe the main features/elements/steps of Genetic Algorithms. **07**
- (b) What is defuzzification? Explain any two methods with appropriate examples. **07**
- OR**
- (b) Classify neural network models. Discuss feed forward neural network in brief. **07**
- Q.3** (a) Explain weight updation process in learning of an ANN. **07**
- (b) What is Fuzzy inference system? Explain Mamdani and Sujeno inference system with clearly distinguishing them on application basis. **07**
- OR**
- Q.3** (a) Mention various learning models of the neural network. Discuss the back propagation algorithm in brief. **07**
- (b) Describe the importance of genetic algorithm in optimization. How it's differ from other optimization and search techniques? **07**
- Q.4** (a) Explore construction and working principle and application of Radial Basis Function Networks **07**
- (b) Explain following with reference to GA methodology: (1). Initialization **07**  
(2). Selection (3). Reproduction and (4). Termination
- OR**
- Q.4** (a) Discuss working of GA using flow chart. **07**
- (b) Differentiate Reproduction and Crossover in Genetic Algorithm **07**
- Q.5** (a) Show the application of AI for load forecasting of the power system. **07**
- (b) Discuss maintenance schedule of electrical power transmission network using genetic algorithm. **07**
- OR**
- Q.5** (a) Explain application for Fuzzy logic for voltage control in power system. **07**
- (b) Suggest neural network based design for power system security assessment. **07**

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