

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME- SEMESTER II- EXAMINATION – SUMMER 2015**

**Subject Code: 2720719****Date: 01/06/2015****Subject Name: Artificial Intelligent Applications to Power System****Time: 2:30 PM – 5:00 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) Explain Fuzzy IF-THEN rule along with fuzzy inference system. **07**  
(b) What is Artificial Intelligence? Briefly describe characteristics and advantages of it. **07**
- Q.2** (a) How ANN will be useful for load forecasting? Explain with suitable example. **07**  
(b) Represent vector and Matrix notation of 3 neurons in input layer, 3 neurons in hidden layer and 3 neurons in the output layer. **07**
- OR**
- (b) Discuss various genetic operators and their role in genetic programming. **07**
- Q.3** (a) Discuss basic structure of ANN. **07**  
(b) Differentiate between Crisp logic and Fuzzy logic. Also explain Fuzzy operators like Union, Intersection and complement with suitable example. **07**
- OR**
- Q.3** (a) Define following terms: **07**  
(1) -cut (2) Linguistic variable (3) Membership Function (4) Fuzzy singleton (5) Fuzzification (6) Cross-over (7) Mutation  
(b) Explain evolutionary programming. How it differs from genetic programming? **07**
- Q.4** (a) Suggest neural network based design for power system security assessment. **07**  
(b) List out various transfer functions in case of ANN. Define and draw various continuous transfer functions as applied to ANN. **07**
- OR**
- Q.4** (a) Compare various defuzzification methods. **07**  
(b) How neural network can be useful for dealing issues related to voltage stability in power system? **07**
- Q.5** (a) How Fuzzy logic can be useful for load balancing of electric power three phase distribution system. **07**  
(b) What are the evolution steps of Genetic Algorithm? Draw Flowchart. Explain selection methods applied to Genetic Algorithm. **07**
- OR**
- Q.5** (a) Discuss in brief various types of learning methods in neural network. **07**  
(b) Explain the following genetic representations with appropriate illustrations. **07**  
(a) Octal (b) Binary (c) Hexadecimal

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