Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-III Regular Examination January 2011

Subject code: 730702

Subject Name: Application of Artificial Intelligence to Power Systems

Date: 10 /01 /2011 **Time: 02.30 pm – 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)**	What do you mean by defuzzification? Explain any two defuzzification methods and comments on them.	**07**
	(b)	Explain the concept and features of intelligence system over conventional programming methods.	**07**
Q.2	**(a)**	What is artificial intelligence? Discuss recent development of AI and its significance in brief.	**07**
	(b)	Find the crisp output 'y_1' and 'y_2' for the following membership functions using COA and MOM methods, assume x_1=4, x_2=4. Also comment on results. $\mu(x_1) = \left\{\frac{0.3}{0}, \frac{0.6}{2}, \frac{1}{4}, \frac{1}{6}, \frac{0.6}{8}, \frac{0.3}{10}\right\}$, $\mu(x_2) = \left\{\frac{0.3}{0}, \frac{0.6}{2}, \frac{0.6}{4}, \frac{0.6}{6}, \frac{0.6}{8}, \frac{0.3}{10}\right\}$	**07**
		OR	
	(b)	Explain general structure of recurrent neural network.	**07**
Q.3	**(a)**	Mention various learning models of the neural network. Discuss the back propagation algorithm in brief.	**07**
	(b)	Suggest suitable strategy of fuzzy logic in voltage control.	**07**
		OR	
Q.3	**(a)**	Compare various fuzzy implication methods. Comment on each of them.	**07**
	(b)	Explain training of feed forward neural network.	**07**
Q.4	**(a)**	Explain methodology of genetic algorithm (GA).	**07**
	(b)	Explain Chromosomes, Crossover and Mutation with reference to GA.	**07**
		OR	
Q.4	**(a)**	Explain the procedure of genetic algorithm.	**07**
	(b)	Explain evolutionary programming. How it differs from genetic programming?	**07**
Q.5	**(a)**	Where AI techniques preferred over conventional methods in power system engineering? Explain with suitable example.	**07**
	(b)	Suggest neural network based design for security assessment.	**07**
		OR	
Q.5	**(a)**	Discuss role of intelligent systems in demand forecasting.	**07**
	(b)	Discuss maintenance schedule of electrical power transmission network using genetic algorithm.	**07**

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