Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2014

Subject code: 730803 **Date: 27-11-2014**

Subject Name: Soft Computing Methods

Time: 10:30 am - 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)** What is soft computing? Describe: MATLAB ï as soft computing methods tool. **07**

(b) Explain neuro-genetic hybrid system. **07**

Q.2 **(a)** What are software agents? Explain their application in negotiation with an example of Kasbah marketplace. **07**

(b) Explain the following MATLAB commands and variables: **07**

i) plot ii) plot3
iii) semilogx iv) loglog
v) floor vi) NaN
vii) ans

OR

(b) Explain Gauss elimination method with example and write a MATLAB code to solve the same. **07**

Q.3 **(a)** Explain the working of genetic algorithms. **07**

(b) Explain various crossover techniques used in genetic algorithms. **07**

OR

Q.3 **(a)** Illustrate solving any problem using genetic algorithms. Show the working till 2 generations. **07**

(b) i. Explain exploration and exploitation in terms of soft computing. **07**

ii. Explain how genetic algorithms differ from traditional optimization methods.

Q.4 **(a)** Describe Fuzzy Genetic Algorithms. Using an example, explain how GA operators can be applied for tuning membership functions. **07**

(b) Explain various defuzzification methods with example. **07**

OR

Q.4 **(a)** Explain various membership functions for crisp to fuzzy conversions. **07**

(b) Consider two fuzzy sets $\tilde{A}$ and $\tilde{B}$ **07**

$$\tilde{A} = \left\{\frac{0}{0} + \frac{0.2}{1} + \frac{0.7}{2} + \frac{0.8}{3} + \frac{0.9}{4} + \frac{1}{5}\right\}$$

$$\tilde{B} = \left\{\frac{0}{0} + \frac{0.1}{1} + \frac{0.3}{2} + \frac{0.2}{3} + \frac{0.4}{4} + \frac{0.5}{5}\right\}$$

Find: Algebraic sum, Algebraic product, Bounded sum and Bounded difference.

Q.5 **(a)** Explain multi-layer neural network. **07**

(b) Explain classification of learning rules. **07**

OR

Q.5 **(a)** Discuss applications of neural network and explain pattern recognition in detail. **07**

(b) Write a short note on hope field network. **07**

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