Enrolment No.____ Seat No.: ____ **GUJARAT TECHNOLOGICAL UNIVERSITY** MCA - SEMESTER-VI • EXAMINATION - WINTER 2013 Subject Code: 640009 Date: 13-12-2013 **Subject Name: Soft Computing** 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. Q1 (a) What are the various techniques of soft computing & Discuss its applications of 07 soft computing in detail. **(b)** What is artificial neural network? Explain MC-Culloch & Pitt's model. Difference 07 between Artificial neural network & Human Brain. **Q2** (a) Explain Hopfield network. How it is different from error back propagation network? 07 Can we get stable output from recurrent network? How? **(b)** Differentiate the following: 07 1. Normal and subnormal fuzzy set 2. Convex and non convex fuzzy set **(b)** How Single Layer network works? Why the perceptron training algorithms are 07 required? (a) Compare Mc-Culloch & Pitt's Model 04 $\mathbf{Q3}$ **(b)** Differentiate between mamdani FIS & Sugeno FIS 03 **(c)** What are the limitations with error back-propagation algorithm? Define its 07 characteristics and applications? OR **(a)** Explain the error back propagation algorithm? 07 $\mathbf{Q}3$ **(b)** Differentiate between biological neuron and artificial neuron on the basis of 04 structure and function of a single neuron. **(c)** Describe Mamdani Fuzzy inference system with its advantages 03 (a) Differentiate between biological neuron and artificial neuron on the basis of **O**4 07 structure and function of a single neuron **(b)** Explain the working and applications of Kohonen's self organizing feature map. 07 OR (a) Explain how Boltzmann machine can be overcomes the problems associated with 07 **Q**4 the Hopfield nets? Describe the application of Boltzmann Machine **(b)** Explain binary encoding for knapsack problem in detail. 07 **Q**5 **(a)** Explain cross over operator with its type. 07 **(b)** Explain the features of membership functions and state its importance in fuzzy logic 05 **(c)** Explain: 1. Rank selection 2. Steady state selection 02 OR **Q5** (a) Describe Mamdani Fuzzy inference system with its advantages 07 **(b)** Explain roulette –wheel selection in detail 04 Explain: 1. Segregation 2. Cross over & inversion 3. Mutation rate 03 *****