Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)

END SEMESTER MAKE UP EXAMINATIONS, November/December 2017

SUBJECT: Soft Computing Paradigms [CSE 4031]

REVISED CREDIT SYSTEM
(28/12/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL FIVE** questions.
- Missing data may be suitable assumed.

1A. What are differences between artificial neuron and biological neuron? Explain. **3M**

1B. How do you perceive Boltzman's Learning? Show the steps using Stochastic Model of Neuron. **4M**

1C. What are salient features of NARX Model? Explain. **3M**

2A. Given inputs X2=1, X3=1 and bias value theta=1. The weight parameter from x2 to output neuron o1 is -3. Similarly weight parameter from x3 to output neuron o1 is 2. Calculate o1, using binary activation function , if target output t1=1. Perform all iterations using single layer perceptron. **5M**

2B. Consider , bipolar inputs given by a combination of 1, -1 and -1 and also a combination of -1, 1 and -1 and also a combination of -1, -1 and 1. Perform a Hopfield network computation , to find convergence in terms of stable inputs. Which is the topology used for the above? **3M**

2C. How are Kohonen networks useful in Soft Computing? Explain. **2M**

3A. A Grocery shop has two goods X and Y. X has features , x1 which is available with a probability of 20 %, it's membership function value is 0.2, x2 which is available with a probability of 70 %, it's membership function value is 0.7, x3 which is available with a probability of 40 %, it's membership function value is 0.4. Y has features, y1, with a probability of 50 %, it's membership function value is 0.5, y2 with a probability of 60 %, it's membership function value is 0.6. Find fuzzy relation R= X * Y. **5M**

3B. What is fuzzification and defuzzification? Explain using membership function. **3M**

3C. Explain character recognition for classifying ‘ A ‘ as a character, using fuzzy features. **2M**

4A. Give predicate logic statement for **4M**
‘ X’ likes all kinds of food.
‘Y’ likes anything which ‘ X’ likes.
‘Z’ likes those which ‘ Y’ and ‘ X ‘ both like.
‘ M’ likes some of which ‘ X ‘ likes.

.

4B. Apply fuzzy Modus Ponens rule to deduce Rotation is quiet slow, given, **4M**
(i) If Temperature is high, then rotation is slow.
(ii) The temperature is very high.
Let H (high), VH (very high), S (slow), QS (quiet slow), indicate the fuzzy sets as follows:
H= { (70, 1), (80,1), (90, 0.3)}
VH= { (90,0.9), (100,1) }
QS= { (10,1), (20,0.8) }
S= { (30.0.8), (40,1), (50,0.6) }
for
X= { 30, 40, 50,60,70,80,90, 100 }
Y={ 10, 20, 30, 40, 50, 60 }

4C. What are Hybrid Systems ? Explain. **2M**

5A. Explain the procedure of genetic algorithm in detail. How it is useful for classification? **4M**

5B. How genetic programming is applied in pattern recognition? Explain. **4M**

5C. Explain three Neural Network architectures? **2M**