

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER – II(New)• EXAMINATION – SUMMER - 2020**

**Subject Code:3720217****Date: 27/10/2020****Subject Name: Soft Computing****Time: 02:30 PM To 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) Explain with examples where soft computing and hard computing is needed. **07**  
 (b) Compare and contrast biological neuron and artificial neuron. **07**
- Q.2** (a) Explain different fuzzy membership function. **07**  
 (b) Define Expert system. How is a fuzzy expert system formed? State its importance. **07**
- OR**
- (b) Implement XOR function using McCulloch Pitts neuron (take binary data). **07**
- Q.3** (a) Explain RBF neural network. Explain with example training of RBF network. **07**  
 (b) Explain Neuro Fuzzy Systems. **07**
- OR**
- Q.3** (a) Construct the Hamming network to cluster four vectors. Given the exemplar vectors,  
 $e(1)=[1 \ -1 \ -1 \ -1]$ ,  $e(2)=[-1 \ -1 \ -1 \ 1]$  and the bipolar input vectors are,  
 $X_1 = [-1 \ -1 \ 1 \ -1]$ ,  $X_2 = [-1 \ -1 \ 1 \ 1]$ ,  $X_3 = [-1 \ -1 \ -1 \ 1]$ ,  $X_4 = [1 \ 1 \ -1 \ -1]$  **07**  
 (b) Write short note on **07**  
 (i) Roulette Wheel Selection (ii) Boltzmann Selection
- Q.4** (a) Explain Defuzzification in detail. **07**  
 (b) Mention the role of fitness function in GA and what are the requirements of GA **07**  
 What are the parameters of GA?
- OR**
- Q.4** (a) What are the various types of crossover in GA? Explain in detail. **07**  
 (b) Explain Steepest Descent method. **07**
- Q.5** (a) Define and explain the meaning of term “Artificial Intelligence” and Differentiate AI problems Vs Conventional problems? **07**  
 (b) Explain Backpropagation Training Algorithm in brief. **07**
- OR**
- Q.5** (a) Explain the fuzzy inference with suitable Example. **07**  
 (b) State the application of Genetic Algorithm in Machine learning. **07**

\*\*\*\*\*