

B.TECH.**THEORY EXAMINATION (SEM-IV) 2016-17****INTRODUCTION TO SOFT COMPUTING (NEURAL NETWORK, FUZZY LOGIC & GENETIC ALGORITHM)***Time : 3 Hours**Max. Marks : 100**Note : Be precise in your answer.***SECTION – A**

1. **Attempt the following:** **(10x2=20)**
- a) Artificial Intelligence can be used in Neural Network or not. Justify your answer.
 - b) Write different applications of neural networks.
 - c) What is Reinforcement Learning?
 - d) What do you mean by convergence of GA?
 - e) What is the significance of fuzzy Quantifier?
 - f) Define the fuzzy inference.
 - g) What is the Mutation?
 - h) Use the Hebb rule to store the vector [1 1 1 -1] in an auto-associative neural network
 - i) What is FLC?
 - j) Write the benefit of GA.

SECTION – B

2. **Attempt any 5 parts from the following 8 parts:** **(5x10=50)**
- a) Define an artificial neural network. State the characteristics of an artificial neural network.
 - b) Discuss the factors affecting the training of back propagation neural network.
 - c) Explain the different types of Operation used in Fuzzy Set with suitable examples
 - d) Discuss the selection of Various parameter in BPN.
 - e) What is Genetic Algorithm? Draw the general flow diagram of genetic algorithm.
 - f) Differentiate between Roulette-wheel based on fitness and Roulette wheel based on ran with suitable example
 - g) Find the weights required to perform the following classification using perceptron network. The vectors (1,1,1,1) and (-1,1,-1,-1) are belonging to the class (so have target 1), vectors (1,1,1,-1) and (1,-1,-1,1) are not belonging to the class (so have target value -1). Assume learning rate is 1 and weights is 0.
 - h) What are different attributes of predicate logic? Using inference in predicate logic prove following statement
 - (i) All men are mortal
 - (ii) Socrates is a man
 Prove: Socrates is mortal

SECTION – C

- Attempt any 2 parts from the following:** **(2x15=30)**
3. Explain the following Neural Network Architecture in Details:
 - (i) Rosenblatt's Perceptron Model
 - (ii) McCulloch- Pitts Model
 4. Explain the Greg Voit's Fuzzy Cruise Controller
 5. Use GA to solve the following non-linear programming problem:
Minimize $(x - 2.5)^2 + (y - 5)^2$ subject to $5.5x + 2y^2 - 18 \leq 0, 0 \leq x, y \leq 5$.