Printed Pages-1 **Roll No.** | | | | | | | | | | | **NOE041**

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 $5.5x + 2y^2 - 18 \leq 0$, $0 \leq x, y \geq 5$.