C9-R4: SOFT COMPUTING

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) Distinguish between Fuzzy and probability with example.
b) What is inversion? List out the types of inversion in GA.
c) Draw architecture of fuzzy control system. Also describe its component.
d) What is associative memory? Explain its types.
e) Explain MAXICAN HAT network with diagram.
f) How feed forward network can differ from feedback network?
g) Consider two fuzzy sets A and B find Complement, Union, Intersection and Difference
A = {1/2 + .5/3 + .3/4 + .2/5}
B = {.5/2 + .7/3 + .2/4 + .4/5}

(7x4)

2.

a) What is need of derivative free optimization? List out common characteristics of derivation free optimization techniques.
b) Discuss advantage and disadvantage of genetic algorithm and give a comparison between local optimization and global optimization techniques.

(10+8)

3.

a) What are Evolutionary Algorithms? Explain Simple Genetic Algorithm with the help of a flowchart. Also explain how GA differs from other traditional algorithms.
b) Describe different selection methods for GA.

(10+8)

4.

a) Define the following term with respect to NN: Threshold, Learning rate, Bias, Activation function, Delta rule.
b) Explain the block diagram of Fuzzy Inference System.

(10+8)

5.

a) What are hybrid systems? Discuss advantages, disadvantages and applications of neuro-fuzzy and neuro-genetic hybrid systems.
b) What is Soft Computing? State difference between soft computing & hard computing. List out the soft computing characteristics.

(9+9)

6.

a) How is a set of weights of a neural network encoded in a chromosome? Give an Example.
b) Define the term linguistic information, numerical information and stage adaptive network.
c) What is meant by dilemma between interpretability and precision?

(9+6+3)

7.

a) Explain Travelling Salesman Problem. Also suggest different operators used to solve it using GA.
b) Write a short note on Competitive learning with its limitations.
c) Explain the Simulated annealing with an example

(6+6+6)