**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) List the objective of Soft Computing. Briefly mention the application area of soft Computing.
b) What is the difference between competitive learning and supervised Learning?
c) Discuss the relationship between bias and variance dilemma.
d) What is the importance of population? Which operator is applied first to the population?
e) Write the difference between feed forward and feedback network.
f) What should be the crossover rate and mutation rate for the optimization problem?
g) List the types of hybrid system and its application domain where hybrid system are used.

**(7x4)**

**2.**

a) Write the important role of learning rate. How can the training of neural network be improved?
b) How genetic algorithms perform better result as compared to traditional approaches?
c) How can Neuro-Fuzzy modeling approach be applied to any optimization problem?

**(6+6+6)**

**3.**

a) How can genetic algorithm be controlled by Fuzzy Logic?
b) What is learning? Differentiate inverse learning and simple learning.
c) List out at least four application domains of Neuro-Fuzzy Hybrid system.

**(6+6+6)**

**4.**

a) Define optimization and optimized solution. Briefly discuss derivative Based Optimization.
b) Describe Reinforcement Learning with respect to neuro-Fuzzy Control System.
c) Draw the architecture of fuzzy back Propagation network for neural network.

**(6+6+6)**

**5.**

a) What are the constituents of Soft Computing? Explain in detail.
b) What are the termination criteria for any optimization techniques of soft computing?
c) Is it possible to solve Travelling Sales Man Problem using Genetic Algorithm? How? Write the steps in brief.

**(6+6+6)**

**6.**

a) Is back propagation required in Neural Network? How does Back Propagation give the performance through Time?
b) Justify: “Inversion and deletion can’t improve the performance”.
c) How does specialized learning improve the learning process of Hybrid approach?
d) “Genetic Algorithm always gives better result” Justify.

**(4+4+6+4)**

**7.**

a) What is differential cryptanalysis attack? How is it different from linear cryptanalysis attack?
b) For optimization problem write hybridization steps of “Genetic-Fuzzy-Neural Network”.
c) Justify: “Neural Network always learns faster than other Classifier”.

**(6+6+6)**