

Roll No.

Total Pages : 03

MCA/M-24 24530
SOFT COMPUTING
MCA-20-44(i)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is meta-heuristic ?
(b) Differentiate between fuzzification and defuzzification.
(c) Discuss the structure of a biological neuron.
(d) What do you understand by evolution ? What are the requirements for it ?

Unit I

2. (a) What do you understand by Random Optimization ? Discuss its algorithm.
(b) What is data clustering ? Explain K-means clustering.
3. (a) How is Bee algorithm used for optimization ? Discuss.
(b) What is simulated annealing ? Write the algorithm.

Unit II

4. (a) What is a normal fuzzy set ? Define prototype of the set and convex fuzzy set.
(b) What is cross over points of a membership function and height of a fuzzy set ? Explain.
5. (a) What are the different methods of defuzzification ? Discuss any *one*.
(b) What are the basic elements of a fuzzy logic control system ? Give the structure of of a fuzzy production rule system. What are the assumptions to be made in a fuzzy control system design ?

Unit III

6. (a) What do you understand by Back Propagation Network (BPN) ? Discuss the main steps in back propagation algorithm.
(b) Explain the Kohonen's method of unsupervised learning. Discuss any example as its application.
7. (a) What is continuous Hop field network ? Write the energy function of continuous Hop field network.
(b) Derive expressions for the weight updation involved in counter propagation.

Unit IV

8. (a) What encoding scheme should be used in Genetic Algorithm to solve the problem of Traveling Salesman ? Discuss.
(b) What do you understand by premature convergence to solution ? How is it avoided in Genetic Algorithm ? Discuss.
9. (a) What is crossover ? Discuss the different types of crossover in binary encoding.
(b) What are the advantages and limitations of genetic algorithm over traditional optimization techniques ?