Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech (CSE)/SEM-2/CSEM-205A/2010

2010
SOFT COMPUTING

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Objective Type Questions)

1. Answer all the following : 10 × 1 = 10

A. Choose the correct alternatives for the following :

i) In GA chromosome represents

a) Solution b) Crossover

c) Parameter d) Can't say.

ii) Adopting very small population size of GA makes it

a) Robust

b) Inefficient exploration of search space

c) Efficient

d) None of these.

iii) Which one of the following can be adopted as a crossover probability ?

a) 100% b) 80-85%

c) 0% d) 5-20%.

iv) Elitism is a technique adopted in GA for

a) faster covergence

b) for preserving good solutions

c) inducing mutation

d) none of these.

v) For the Travelling Salesman Problem in GA encoding which can be adopted is

a) Binary encoding

b) Permutation encoding

c) Value encoding

d) Tree encoding.

vi) In GA our objective is

a) efficient exploration of search space

b) partial exploration of search space

c) problem specific exploration of search space

d) none of these.

vii) For optimisation problem which of the techniques can be adopted ?

a) Genetic algorithm

b) Artificial neural network

c) Fuzzy logic

d) None of these.

viii) Mutation rate in GA should be

a) high b) low

c) problem Specific d) can't say.

B. State *True* or *False* for the following :

ix) Fuzzy logic is same as probabilistic logic.

x) In artificial neural network number, of hidden layers and number of nodes in each layer before its construction is same.

GROUP – B

(Short Answer Type Questions)

Answer any *four* of the following. 4 × 5 = 20

2. Explain clearly the difference between fuzzy logic and probability.

3. State the difference between fuzzy set and crisp set. Also give the definition of fuzzy membership function.

4. Discuss about the parameters of genetic algorithm (crossover probability, population size, mutation rate).

5. Discuss two important techniques adopted for selection procedure in GAs (i.e. roulette wheel selection and rank selection).

6. Why do we adopt elitist model in GAs ?

7. Explain the binary encoding with the help of knapsack problem.

GROUP – C

(Long Answer Type Questions)

Answer any *two* of the following. 2 × 20 = 40

8. Explain the perceptron model for the artificial neural network. Explain the role of GA in the configuration of artificial neural network.

9. Give the basic outline of genetic algorithm. Explain the various types of encodings. Also show the crossover and mutation for various types of encoding.

10. Briefly explain the travelling salesman problem as an application of genetic algorithm.

11. Write a note on the various types of operations that can be performed on the fuzzy sets. Also write the membership function for each case.