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Name:	
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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)

Choose the correct alternatives for the following:

- 1. Answer all 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%.

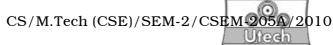
30415 (M.TECH)

[Turn over

 $10 \times 1 = 10$

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- 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.

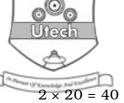
 $4 \times 5 = 20$

- 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.



- 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.

30415 (M.TECH)