Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(Emb Sys) EL-II (2016 & Onwards) (Sem.–2)

SOFT COMPUTING

Subject Code : MTED-209

Paper ID : [74275]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT Questions.**
2. **Each question carries TWENTY marks.**

Q1. a) List and explain various features of Genetic Algorithms (GA). Briefly explain the steps involved in a genetic algorithm with an example.

b) Consider the following real variables from everyday life :

a. Income measured in Rupees.

b. Speed measured in meters per second.

c. A T.V. show measured in how much you are interested watching it.

d. A meal measured in how much you like to eat it.

e. A traffic light measured in what colour is on.

In each case, suggest a fuzzy variable corresponding to these real variables. For which of these five variables the use of a fuzzy; variable is not really necessary? Why?

Q2. a) What is the role of a fuzzy inference system? Discuss the features of Mamdani fuzzy inference system.

b) What do you mean by travelling salesman problem (TSP)? How genetic algorithm helps to solve this problem?

Q3. Differentiate between following with the help of suitable examples :

a) Widrow & Hoff's Delta Rule and the Perceptron Learning Rule.

b) Full and Forward-only counter-propagation network.

Q4. a) Discuss the role of hashing in CMAC network. Explain the hashing algorithm of CMAC network.

b) Can Support Vector Machine be used as a regression method? Explain.

Q5. a) How soft computing is different from hard computing techniques? Categorize each of the following computational problem under soft computing or hard computing.

a. Parking a car on a narrow parking space.

b. Calculations on a scientific calculator.

c. Recognition of handwritten characters.

d. Sudoku puzzle problem solver.

b) The K-Means algorithm has some issues that can cause poor or incorrect results. What are these issues? What data preprocessing can we use to either detect or avoid each issue?

Q6. Explain the working of recurrent network. Take suitable example.

Q7. a) Solve XOR problem using McCulloch Pitt model and explain the concept of linear separability.

b) List and explain any TWO applications of neural networks.

Q8. Write short notes on the following :

a) Membership function.

b) ART Networks.

c) Support Vector Classification.

d) Reinforcement Learning.