Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: EE368

Course Name: SOFT COMPUTING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries5 marks. Marks

1 What is the role of activation function in neural network? Give one example (5)

2 What is a perceptron? Explain the training of perceptron. (5)

3 Draw the block diagram of a fuzzy logic Controller (5)

4 Which are the two tasks involved in CART-ANFIS based fuzzy modelling (5)

5 A genetic algorithm uses chromosomes of the form x = abcd. the genes a,b,c,d can take values from 1 to 4.The fitness of individual x be calculated as: $f(x)=(a^2-b^2)-(c-d)$. Let the initial population consist of four individuals with the following chromosomes: (5)

x1 = 1234

x2 = 2341

x3 = 3412

x4 = 4123. Evaluate the fitness of each individual and select the best individual.

6 What is the role of 'mutation' in GA based optimisation process. What is the usual range of probability value given for mutation process? (5)

7 With an example, explain 'Linear Separable problem'. (5)

8 What is regression? (5)

PART B

Answer any two full questions, each carries10 marks.

9 With the help of block diagrams or equations explain back propagation algorithm in training output and hidden layers of a feed forward network. (10)

10 With block diagram, explain the fundamental concepts and updating of data in ART-1 network. (10)

11 a) What is temporal instability problem? (2)

b) Compare supervised and unsupervised training methods (2)

c) With the help of a membership function sketches, Show that AUA'≠ Universal set, where A is a fuzzy set. (6)

PART C

Answer any two full questions, each carries10 marks.

12 Draw the structure of an Adaptive Neuro Fuzzy Inference System (ANFIS) model for the following fuzzy rules. (10)

1. IF x IS SMALL AND y IS TALL THEN z IS a_1x+b_1y
2. IF x IS SMALL AND y IS SHORT THE z IS a_2x+b_2y
3. IF x IS BIG AND y IS TALL THEN z IS a_3x+b_3y
4. IF x IS BIG AND y IS SHORT THEN z IS a_4x+b_4y

where x and y are input variables and z is the output function.

13 Explain k-mean data clustering algorithm with flow chart. Give one simple example and illustrate the same. (10)

14 Sketch the structure of MANFIS and CANFIS and explain the features. (10)

PART D

Answer any two full questions, each carries 10 marks.

15 a) Write short notes on the following related to genetic algorithm. (6)

1. Premature Convergence
2. Roulette wheel Selection
3. Search space

b) Mention different types of crossover operations and compare them. (4)

16 a) Briefly explain how the neural networks are utilised in machine learning? (5)

b) With an example explain the concepts of Support Vector Machines .What is the major advantage of SVM, when used for classification? (5)

17 Describe the steps involved in solving an optimisation problem using simple Genetic Algorithm. Illustrate the steps with a suitable simple example. (10)

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