Reg No.:_____ Name:_____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

**Course Code: EE368**

**Course Name: SOFT COMPUTING (EE)**

Max. Marks: 100 Duration: 3 Hours

## PART A

***Answer all questions, each carries 5 marks.*** Marks

1 What is an activation function? Give any three examples for activation functions. (5)

2 The two fuzzy sets representing an apple and an orange are: (5)

$$Apple = \left\{\frac{0.2}{orange} + \frac{0.5}{chair} + \frac{0.3}{table} + \frac{0.8}{apple} + \frac{0.1}{plate}\right\}$$

$$Orange = \left\{\frac{1}{orange} + \frac{0.2}{chair} + \frac{0.4}{table} + \frac{0.5}{apple} + \frac{0.2}{plate}\right\}$$

Find the following:
(i) Apple ∪ Orange (ii) Apple ∩ Orange (iii) $\overline{\text{Apple} \cap \text{Orange}}$ (iv) Apple ∪ $\overline{\text{Apple}}$ (v) Orange ∩ $\overline{\text{Orange}}$

3 What is unsupervised learning in ANN? Explain. (5)

4 What are the common distance measures used in clustering algorithms. (5)

5 With a neat block diagram, explain the fuzzy inference system. (5)

6 How is genetic diversity implemented in Genetic Algorithm? What is the range of probability selected for this process? (5)

7 List the applications of Support Vector Machines. (5)

8 What is a linearly non-separable problem? Give one example. (5)

## PART B

***Answer any two full questions, each carries 10 marks.***

9 a) Discuss the various constituents of soft computing. (5)

b) Explain Radial Basis Function Network. (5)

10 Draw a multilayer feedforward neural network. Explain any training algorithm that can be used for training the network. (10)

11 What are the different steps involved in the design of Fuzzy Logic Controller? Explain with a typical example. (10)

## PART C

***Answer any two full questions, each carries 10 marks.***

| | | | |
|---|---|---|---|
| 12 | | Explain the architecture of ANFIS for two input Sugeno fuzzy model with two rules. | (10) |
| 13 | | Briefly explain any one clustering algorithm with example. | (10) |
| 14 | | Write short notes on (i) CANFIS (ii) Neuro-fuzzy control (iii) Classification and Regression (iv)Fuzzy Expert systems. | (10) |

## PART D

***Answer any two full questions, each carries 10 marks.***

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|---|---|---|---|
| 15 | a) | Explain with the help of flow chart how GA can be used in optimisation problems. | (7) |
| | b) | What is the concept of machine learning approach to knowledge acquisition? | (3) |
| 16 | a) | How are neural networks utilised in machine learning? Explain. | (5) |
| | b) | What is the major advantage of Support Vector Machines when used for classification? Explain with examples. | (5) |
| 17 | | Write short notes on: (i) Applications of GA (ii) Support Vector Classification (iii) Linear Learning machines (iv) Machine Learning techniques (iv) SVM based Regression. | (10) |

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