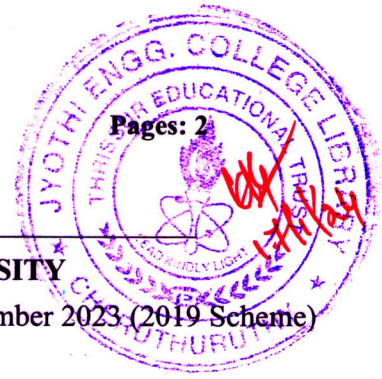


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2023 (2019 Scheme)

Course Code: MRT 307

Course Name: SOFT COMPUTING TECHNIQUES

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	What are the features of membership function?	3
2	Explain the theoretic operations over fuzzy set?	3
3	Illustrate the block diagram of FIS?	3
4	Discuss about gradient descent method?	3
5	Explain the Widrow-Hoff learning rule used for supervised learning in neural network	3
6	Define the basic terminologies used in Genetic algorithm?	3
7	What is competitive learning in unsupervised learning?	3
8	Explain about Hybrid learning algorithm?	3
9	Describe about RBFN concept used in soft computing.	3
10	Differentiate between two kinematics problems.	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

- 11 a) Define fuzzy set and membership function. Explain any 5 membership functions? 9
b) Consider two given fuzzy sets 5

$$A = \left\{ \frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8} \right\}$$

$$B = \left\{ \frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8} \right\}$$

Perform Union, Intersection, Difference and Complement over fuzzy set A and B.

- 12 a) List out the methods of membership value assignments? Explain any two methods in detail? 7
b) Write a note on fuzzy if then rules 7

Module -2

- 13 What is Defuzzification? Explain Defuzzification methods given below : 14
- Max-membership principle
 - Centroid method
 - Weighted average method
 - Mean-max membership
 - Center of sums
 - Center of largest area
- 14 Explain in detail about Mamdani and Sugeno fuzzy inference system? 14

Module -3

- 15 Illustrate the perceptron network with perceptron training algorithm? 14
16 Define selection in genetic algorithm? Explain the various types of selection methods? 14

Module -4

- 17 a) Discuss about Hebbian learning algorithm? 7
b) Describe about Learning Vector Quantisation? 7
18 a) Elaborate about kohonen self-organizing feature map? 7
b) Explain about Radial basis function with its architecture? 7

Module -5

- 19 Explain Adaptive Neuro-Fuzzy inference system with its architecture? 14
20 What is colour recipe prediction? Explain how color recipe prediction can be done using soft computing? 14
