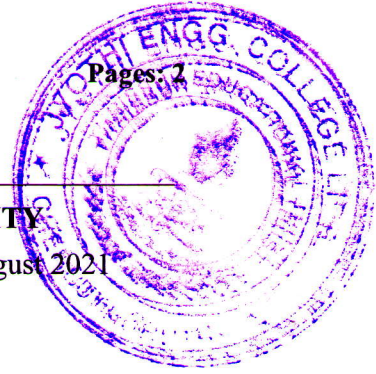


Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Eighth Semester B.Tech Degree Supplementary Examination August 2021

**Course Code: MR402****Course Name: Soft Computing Techniques**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions, each carries 5 marks.*

Marks

- |   |   |     |
|---|---|-----|
| 1 | List down the characteristics of soft computing.  | (5) |
| 2 | Draw and explain the block diagram for a fuzzy inference system.  | (5) |
| 3 | Give the random search algorithm.   | (5) |
| 4 | Evaluate the working of a competitive learning network.   | (5) |
| 5 | Show the ANFIS architecture for the Sugeno fuzzy model, where weight normalization is performed at the very last layer. | (5) |
| 6 | Collect learning methods that cross-fertilize ANFIS and RBFN.   | (5) |
| 7 | Describe the use of ANFIS for nonlinear regression using automobile Miles Per Gallon prediction.                        | (5) |
| 8 | Inspect color paint manufacturing process.  | (5) |

**PART B***Answer any three full questions, each carries 10 marks.*

- |    |   |      |
|----|---|------|
| 9  | a) Define Fuzzy numbers, bandwidth, symmetry, open left and open right.   | (10) |
| 10 | a) Explain the Mamdani fuzzy inference system using product and max for T-norm and T-conorm operators respectively with diagram.  | (10) |
| 11 | a) Elaborate the exclusive-OR problem.  | (10) |
| 12 | a) Set up <ol style="list-style-type: none"> <li>1. Single and double output Radial Basis function network that uses weighted sum,</li> <li>2. Single and double output Radial Basis function network that uses weighted average .</li> </ol> | (10) |
| 13 | a) Evaluate an intelligent system.  | (5)  |
|    | b) Write about the Tsukamoto fuzzy model.   | (5)  |
| 14 | a) Assess a 3-3-2 backpropagation multilayer perceptrons.   | (5)  |

- b) Identify the network representation of learning vector quantization. (5)

**PART C**

*Answer any two full questions, each carries 15 marks.*

- 15 a) Investigate the equivalent ANFIS/CANFIS architecture for a two-input, one output Sugeno fuzzy model. (10)
- b) Draw equivalent ANFIS architecture for a two-input two-rule Tsukamoto fuzzy model. (5)
- 16 a) Explain about printed character recognition using ANFIS. (10)
- b) Illustrate the input-output relation in a typical color recipe prediction system. (5)
- 17 a) Examine hybrid learning algorithm. (7)
- b) Discuss the genetic strategies used in color paint manufacturing intelligence. (8)

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