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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (S,FE) Examinations June 2026 (2019 Scheme)

Course Code: MRT307
Course Name: SOFT COMPUTING TECHNIQUES

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	State extension principle with example.	3
2	Define the following terms: a) Core b) Support c) Fuzzy Singleton	3
3	Explain method of steepest descent	3
4	Explain in detail about gradient descent method	3
5	Draw the diagram which represents various units of perceptron network	3
6	Explain the term: a) Encoding Schemes b) Fitness evaluation c) Selection	3
7	Define Extension of Moody Darken's RBFN	3
8	What are the conditions for equivalence of RBFN with FIS?	3
9	Elaborate about the neuro fuzzy spectrum	3
10	Draw the architecture of ANFIS.	3

PART B

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

Module -1

11 a) Consider the following fuzzy sets given below: 14

$A = \{ \frac{0.4}{x1} + \frac{0.7}{x2} + \frac{1}{x3} + \frac{0.8}{x4} + \frac{0.6}{x5} \}$, $B = \{ \frac{0.2}{x1} + \frac{0.6}{x2} + \frac{0.1}{x3} + \frac{0.9}{x4} + \frac{0.7}{x5} \}$ and

$C = \{ \frac{0.4}{v1} + \frac{1}{v2} + \frac{0.8}{v3} \}$

Find:

a) R= A x B

b) P= B x C

c) Max min composition R.P

12		Discuss in detail about different fuzzy reasoning methods.	14

Module -2

13		Distinguish among different types of defuzzification schemes for obtaining a crisp output	14
14		Explain about Mamdani fuzzy inference system and Tsukamoto fuzzy inference system	14

Module -3

15	a)	Write a note on steps used in downhill simplex search	7
15	b)	Explain Back propogation multilayer perceptron	7
16		Design travelling salesman problem using simulated annealing	14

Module -4

17		Explain in detail about Hebbian learning	14
18	a)	Explain in detail about Kohenen self organizing networks	10
	b)	List the application of Kohenen self organizing networks	4

Module -5

19		Explain in detail about printed character recognition design using ANFIS.	14
20		Explain the term hybrid learning algorithms	14

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