Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth semester B.Tech degree examinations, September 2020

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	Describe about the soft computing constituents and conventional artificial intelligence.	(5)
2	Differentiate between derivative-based and derivative-free optimization	(5)
3	Identify the common characteristics of derivative-free optimization methods.	(5)
4	Show the functional equivalence of RBFN and the conditions under which an RBFN and a FIS are functionally equivalent.	(5)
5	Draw equivalent ANFIS architecture for a two-input two-rule Tsukamoto fuzzy model.	(5)
6	Explain the Neuro-fuzzy spectrum.	(5)
7	Write about the modeling of the inverse Kinetics of the two-joint planar robot arm using ANFIS.	(5)
8	Illustrate GA search control by the modified simplex crossover.	(5)

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

9		Define support, core, normality, crossover points and fuzzy singleton.	(10)
10		Distinguish among different types of defuzzification schemes for obtaining a crisp output.	(10)
11		Design travelling salesman problem using simulated annealing.	(10)
12		Set up a Kohonen self-organizing network with 2 inputs and 49 output units and its training.	(10)
13	a)	Assess an expert system.	(5)
	b)	Explain the block diagram of a fuzzy inference system.	(5)
14	a)	Discuss about Adaptive linear element.	(5)
	b)	Examine the Hebbian learning.	(5)

PART C
Answer any two full questions, each carries 15 marks.

15 a) Express equivalent ANFIS architecture for a two-input first-order Sugeno fuzzy model with two rules and explain each layer. (10)

b) Illustrate the Sugeno model reasoning mechanism for the following common rule set with two fuzzy if-then rules. (5)

Rule1: If x is A_1 and y is B_1, then $f_1=p_1x+q_1y+r_1$,

Rule2: If x is A_2 and y is B_2, then $f_2=p_2x+q_2y+r_2$.

16 a) Explain the architecture of CANFIS with five color rules for color recipe prediction. (10)

b) List down the main concerns in color recipe prediction. (5)

17 a) Identify nonlinear rule for neuron functions in Adaptive networks. (7)

b) Outline the architecture of color paint manufacturing intelligence. (8)

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