Reg. No.												

Question Paper Code	11625

11 JAN 2023

M.E. - DEGREE EXAMINATIONS, NOV/DEC 2022

Third Semester

M.E. - Communication Systems

20PCOEL308 - SOFT COMPUTING TECHNIQUES

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What is supervised learning? Mention its techniques.	2,K1,CO1
2.	List the characteristics of soft computing.	2,K1,CO1
3.	State the advantages of genetic algorithms.	2,K1,CO2
4.	Compute the crossover output of two individuals x1 = [6 5 4 1 3 5 3 2] and x2 = [8 7 1 2 6 6 0 1].	2,K1,CO2
5.	Differentiate between genetic algorithm and genetic programming.	2,K1,CO3
6.	What is feature selection?	2,K1,CO3
7.	What is a neural network?	2,K1,CO4
8.	State the activation functions used in back propagation MLPs and its formula.	2,K1,CO4
9.	Enumerate the if-then rules for a first-order Sugeno fuzzy model.	2,K1,CO6
10.	Define: Decision tree.	2,K1,CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the basics of machine learning and its applications in detail.	13,K2,CO1
		OR	
	b)	Write short notes on the following:	
		(i) Evolutionary computing	5,K2,CO1
		(ii) Fuzzy set theory	4,K2,CO1
		(iii) Neural networks	4,K2,CO1
12.	a)	Explain the basic concepts and working principle of genetic algorithms with relevant diagrams.	13,K2,CO2
		OR	
	b)	Explain the GA cycle with relevant diagrams and a flow chart.	13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Elaborate the process to design texture filters with the help of genetic algorithms. *13,K2,CO3*

OR

b) Describe the process of designing a knowledge acquisition system in image processing applications using machine learning. *13,K2,CO3*

14. a) Discuss back propagation for feed-forward networks in detail. *13,K2,CO4*

OR

b) What are adaptive resonance networks? Explain ART1 in detail. *13,K2,CO4*

15. a) Explain the ANFIS architecture with a neat diagram for Tsukamoto model in detail. *13,K2,CO6*

OR

b) Explain how the CART algorithm is used for structure identification in ANFIS in detail. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Consider two fuzzy sets: *15,K2,CO5*
A = {0. 2/1 + 0. 3/2 + 0. 4/5 + 0. 5/4}
B = {1/1 + 0. 2/2 + 0. 2/3 + 1/4}.
Compute the algebraic sum, algebraic product, bounded sum, and bounded difference of the given fuzzy sets.

OR

b) (i) Explain Fuzzy max-min composition and Fuzzy max-product composition in detail. *8,K2,CO5*
(ii) Discuss the classical equivalence relation and fuzzy equivalence relation in detail. *7,K2,CO5*