GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

M.C.A (Fourth Semester) Regular Examinations, April – 2025

MCA 23431 – Soft Computing

(MCA)

Time: 3hrs Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Why sigmoid activation function is one of the most widely used function?	CO1	K2
b. Differentaite between ART1 & ART2 .	CO2	K2
c. Discuss the purpose of defuzzification?	CO3	K1
d. Explain the role of fitness function in genetic algorithm?	CO4	K2
e. What is the difference between supervised & unsupervised learning in neural network?	CO5	K1

PART – B **(10 x5=50 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. Compare & contrast between neural network, fuzzy logic & genetic algorithm.	5	CO1	K2
b. Explain supervised, unsupervised & reinforcement learning with relevant examples.	5	CO1	K1
(OR)			
c. Explain ADALINE & MADALINE architectures with a neat diagram.	5	CO1	K2
d. Explain the basic model of an artificial neuron with the help of a diagram.	5	CO1	K2
3.a. Write a short note on general ART architecture.	5	CO2	K2
b. Differentiate between Autocorrelators (HAM) & Heterocorrelators (BAM).	5	CO2	K2
(OR)			
c. What are the different types of neural networks? Explain briefly.	5	CO1	K2
d. Differentiate between hard computing & soft computing with examples.	5	CO1	K2
4.a. Explain the differences between fuzzy set & crisp set with appropriate examples.	5	CO3	K2
b. Compare Mamdani FIS & Sugeno FIS. Which one is better for real-time applications?	5	CO3	K2
(OR)			
c. Discuss role of membership function in fuzzy set theory.	5	CO3	K2
d. Differentiate between fuzzification & defuzzification.	5	CO3	K2
5.a. Explain the importance of parameter tuning (mutation rate, crossover rate, population size) in genetic algorithm.	5	CO4	K2
b. Compare genetic algorithm & traditional optimization method. What is the importance of maintaining genetic diversity in GA?	5	CO4	K2

(OR)

c.	Explain crossover operators in genetic algorithm. Compare single point, multi point & uniform crossover.	5	CO4	K2
d.	Discuss mutation operator & their impact on the performance of genetic algorithm.	5	CO4	K2
6.a.	Discuss some real-world applications of soft computing. How do hybrid models improve decision making & optimization?	5	CO5	K2
b.	Explain how neural network, fuzzy logic & genetic algorithm work together in hybrid computing?	5	CO5	K2

(OR)

c.	What are the major challenges in implementing hybrid NN-FL-GA system? How do you address these challenges?	5	CO5	K2
d.	Differentiate between traditional AI-based approaches & soft computing-based approaches. In which applications is soft computing preferred?	5	CO5	K2

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