PAPER ID-311787

Subject Code: KOE036

Roll No: | | | | | | | | | | | | | |

BTECH

(SEM III) THEORY EXAMINATION 2024-25

INTRODUCTION TO SOFT COMPUTING

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	How many layers are there in Hopfield network?	1	K2
b.	What are the limitations of artificial neural network?	1	K2
c.	What is fuzzy logic how it is used for decision-making under uncertainty?	2	K2
d.	How is fuzzy logic different from traditional control methods?	2	K2
e.	Define the role of fuzzy logic in our daily life.	3	K4
f.	Differentiate between crisp and fuzzy logic.	3	K4
g.	What is the role of fitness function in genetic algorithm?	4	K2
h.	Which GA operation is computationally most expensive?	4	K2
i.	How can a genetic algorithm be controlled by fuzzy logic?	5	K5
j.	What is the use of genetic algorithm in soft computing?	5	K5

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a.	What is supervised learning and Unsupervised Learning? Explain both with Diagrams and Examples.	1	K1
b.	What are different attributes of predicate logic? Using inference in predicate logic prove following statement (i) All men are mortal (ii) Socrates is a man Prove: Socrates is mortal	2	K2
c.	How is a decision tree used for classification and regression? Explain in detail.	3	K4
d.	Implement a MADALINE network to solve the XOR problem.	4	K2
e.	Write a program for implementing genetic algorithm-based internet search technique.	5	K5

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	What are the applications of Kohonen self-organizing network? Which neighbourhood function is used in self-organizing maps?	1	K1
b.	How hidden layer computation is done in back propagation learning? Explain in detail.	1	K2

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Let A and B be two fuzzy sets given by A : {(x1, 0.2), (x2,0.5), (x3, 0.6)};B : {(x1, 0.1), (x2, 0.4), (x3,0.5)}.Find $(A-B)^2$	2	K2
b.	Explain the real-life applications of fuzzy set?	2	K2

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5. Attempt any *one* part of the following: 10 x 1 = 10

a.	Describe any one clustering algorithm which is computationally efficient for large datasets?	3	K4
b.	How does a neuro-fuzzy system learn?	3	K4

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain rank selection in a genetic algorithm? Also explain the limitations of soft computing?	4	K2
b.	What is the difference between mutation and crossover in genetic algorithm?	4	K3

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	How travelling salesman problem uses the genetic algorithm? Explain in detail.	5	K5
b.	What is MATLAB? Also Explain modules of MATLAB System.	5	K5