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Examination: Even Semester Examination 2023

Sub: Soft Computing

Sub. Code: MTCFIS – 202 / MTDS - 202

Max. Time: 2½ Hours

Max. Marks: 60

Note: Follow proper numbering for answering the questions.

SECTION – A

*Attempt all questions.**4 x 5 = 20 Marks*

SL. NO	Questions	Marks	CO	BL
1.	What do you mean by Soft Computing? Differentiate it with Hard Computing.	5	CO1	L1 L4
2.	Write some arguments in support of the statement “Genetic Algorithm was discovered as a useful tool for search and optimization problems”.	5	CO4	L5
3.	Write the various python libraries used to implement soft computing programs.	5	CO5	L1
4.	Discuss some trending research topics in the area of soft computing and thus explain the scope of soft computing.	5	CO6	L2

SECTION – B

*Attempt any four out of six questions.**4 x 10 = 40 Marks*

SL. NO	Questions	Marks	CO	BL
1.	Justify the statement “Soft Computing is the fusion of methodologies designed to model and enable solutions to real life problems which are not modeled or too difficult to model mathematically” and thus explain the various applications of soft computing.	10	CO1	L5
2.	Discuss the significance of Fuzzy logic and thus differentiate fuzzy set with a crisp set.	10	CO2	L2 L4
3.	Consider two membership functions as follows: For Fuzzy Set A: $\mu_A(x) = \frac{ (60-x) }{8} + 1$ For Fuzzy Set B: $\mu_B(x) = \frac{ (40-x) }{8} + 1$ Find the following: i. $A \cup B$ ii. $A \cap B$ iii. $\sim A$ iv. $\sim B$ v. $\sim (A \cap B)$	10	CO2	L3
4.	Implement XOR function using Madaline network.	10	CO3	L3

5.	Using back-propagation network, find the new weights for the given network presented with [1,0] input pattern and target output 1. Use learning rate of $\alpha = 0.4$ and binary sigmoidal activation function.	10	CO3	L3
6.	Write a short note on the following: - Artificial Neural Network - Fuzzy Inference System - Biological Background of Genetic Algorithm	10	CO2 CO3 CO4	L2

BL – Bloom’s Taxonomy Levels (1 – Remembering, 2 – Understanding, 3 – Applying, 4 – Analyzing, 5 – Evaluating, 6 – Creating)
