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M.Tech CSE (Part Time) 4th Semester: Even Semester Examination 2023

Paper Name: SOFT COMPUTING
Time: 3 Hours

Paper Code: MTCSEP 401
Maximum Marks: 75

Follow proper numbering for answering the questions. Draw suitable diagram wherever required.

Section- A (Attempt ALL) 7*5M=35M

S.No.	Question	M.M.	C.O.	Bloom Level
1.	Elaborate the difference in Soft Computing and Hard Computing	5	CO2	Understand
2.	Consider a problem where a string w1 is "abc" and string w2 is "abd". Whether w1 is same or similar? Explain.	5	CO2	Analyze
3.	Differentiate between Artificial Intelligence and Soft Computing	5	CO1	Understand
4.	Consider set $A = \{1,3,5,7,9\}$. Determine its cardinality, power set, and cardinality of power set.	5	CO2	Evaluate
5.	Briefly explain Neural Network and their types with help of architectural diagram.	5	CO3	Remember
6.	Mention the merits, demerits of Genetic Algorithms and their application areas.	5	CO4	Understand
7.	Mention the properties of Fuzzy Sets.	5	CO1	Understand

Section-B (Answer any 4 out of 6) 4* 10M=40M

S.No.	Questions	M.M.	C.O.	Bloom Level																					
1.	Explain the fuzzy logic system with the help of diagram.	10	CO2	Remember																					
2.	Consider the following fuzzy sets: $A = \left\{ \frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8} \right\}$ $B = \left\{ \frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8} \right\}$ Perform Union, Intersection, Difference and Complement over Fuzzy sets A and B.	10	CO2	Evaluate																					
3.	Differentiate between ADALINE and MADALINE. Draw the flow chart of ADALINE training process.	10	CO3	Remember																					
4.	It is necessary to compare two sensors based upon their detection levels and gain settings. The table of gain settings and sensor detection levels with a standard item being monitored providing typical membership values to represent the detection level for each sensor is given in Table. <table> <tr> <th>Gain Setting</th> <th>Detection Level of sensor 1</th> <th>Detection level of sensor 2</th> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>10</td> <td>0.2</td> <td>0.35</td> </tr> <tr> <td>20</td> <td>0.35</td> <td>0.25</td> </tr> <tr> <td>30</td> <td>0.65</td> <td>0.8</td> </tr> <tr> <td>40</td> <td>0.85</td> <td>0.95</td> </tr> <tr> <td>50</td> <td>1</td> <td>1</td> </tr> </table> Now given the universe of discourse $X = \{0, 10, 20, 30, 40, 50\}$ and the membership function for the one sensor in discrete form as $D1 = \left\{ \frac{0}{0} + \frac{0.2}{10} + \frac{0.35}{20} + \frac{0.65}{30} + \frac{0.85}{40} + \frac{1}{50} \right\}$ $D2 = \left\{ \frac{0}{0} + \frac{0.35}{10} + \frac{0.25}{20} + \frac{0.8}{30} + \frac{0.95}{40} + \frac{1}{50} \right\}$ Answer the following questions a) $\mu_{D1 \cup D2}$ b) $\mu_{D1 \cap D2}$	Gain Setting	Detection Level of sensor 1	Detection level of sensor 2	0	0	0	10	0.2	0.35	20	0.35	0.25	30	0.65	0.8	40	0.85	0.95	50	1	1	10	CO2	Evaluate
Gain Setting	Detection Level of sensor 1	Detection level of sensor 2																							
0	0	0																							
10	0.2	0.35																							
20	0.35	0.25																							
30	0.65	0.8																							
40	0.85	0.95																							
50	1	1																							
5.	Develop a model for Recommender System using Soft Computing. You can take example of any OTT platforms such Netflix or Amazon Prime to build case scenario.	10	CO5	Create																					
6.	Write short notes on: a) Fuzzification b) Deep Learning	10	CO2	Understand																					