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GIET UNIVERSITY, GUNUPUR – 765022
 B. Tech (Fifth Semester – Regular) Examinations, December – 2022
BPECS5051 – Fuzzy Logic and Applications.
 (CSE)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL Questions**The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)****Q.1. Answer ALL questions**

- | | CO # | PO # |
|---|------|------|
| a. Fuzzy Set theory defines fuzzy operators. Choose the fuzzy operators from the following. | CO1 | PO1 |
| (i) AND | | |
| (ii) OR | | |
| (iii) NOT | | |
| (iv) All of the mentioned | | |
| b. How many outputs Fuzzy Logic produce? | CO1 | PO1 |
| (i) 2 | | |
| (ii) 3 | | |
| (iii) 4 | | |
| (iv) 5 | | |
| c. Each element of X is mapped to a value between 0 and 1. It is called _____. | CO1 | PO2 |
| (i) Membership value | | |
| (ii) degree of membership | | |
| (iii) Crisp value | | |
| (iv) All of the above | | |
| d. The values of the set membership is represented by _____ | CO2 | PO1 |
| (i) Discrete Set | | |
| (ii) Degree of truth | | |
| (iii) Probabilities | | |
| (iv) Both Degree of truth & Probabilities | | |
| e. What is the form of Fuzzy logic? | CO2 | PO1 |
| (i) Two-valued logic | | |
| (ii) Crisp set logic | | |
| (iii) Many-valued logic | | |
| (iv) Binary set logic | | |
| f. There are also other operators, more linguistic in nature, called _____ that can be applied to fuzzy set theory | CO2 | PO1 |
| (i) Hedges | | |
| (ii) Lingual Variable | | |
| (iii) Fuzzy Variable | | |
| (iv) None of the mentioned | | |
| g. _____ is/are the way/s to represent uncertainty. | CO3 | PO1 |
| (i) Fuzzy Logic | | |
| (ii) Probability | | |
| (iii) Entropy | | |
| (iv) All of the mentioned | | |
| h. _____ are algorithms that learn from their more complex environments (hence eco) to generalize, approximate and simplify solution logic. | CO3 | PO2 |
| (i) Fuzzy Relational DB | | |
| (ii) Ecorithms | | |
| (iii) Fuzzy Set | | |
| (iv) None of the mentioned | | |
| i. The truth values of traditional set theory is _____ and that of fuzzy set is _____. | CO4 | PO1 |
| (i) Either 0 or 1, between 0 & 1 | | |
| (ii) Between 0 & 1, either 0 or 1 | | |
| (iii) Between 0 & 1, between 0 & 1 | | |
| (iv) Either 0 or 1, either 0 or 1 | | |
| j. The room temperature is hot. Here the hot (use of linguistic variable is used) can be represented by _____ | CO4 | PO1 |
| (i) Fuzzy Set | | |
| (ii) Crisp Set | | |
| (iii) Fuzzy & Crisp Set | | |
| (iv) None of the mentioned | | |

PART – B: (Short Answer Questions)**(2 x 10 = 20 Marks)**

Q2. Answer ALL questions	CO #	PO #
a. What is the difference between imprecision and uncertainty.	CO1	PO1
b. Highlight the differences between crisp sets and fuzzy sets.	CO1	PO2
c. Mention the types of learning with relevant examples.	CO2	PO2
d. Write a short note on Fuzzy Inference.	CO2	PO2
e. What is a cluster? Give the applications of Clustering.	CO2	PO1
f. What is Cluster analysis?	CO3	PO1
g. Define fuzzy equation with its properties.	CO3	PO2
h. Define Hyperconic clustering.	CO3	PO1
i. Write a short note on Shell clustering.	CO4	PO1
j. Write a short note on Fuzzy Applications.	CO4	PO1

PART – C: (Long Answer Questions)**(10 x 4 = 40 Marks)**Answer ALL questions

	Marks	CO #	PO #
3.a. Explain any two Defuzzification techniques with examples.	5	CO1	PO2
b. Explain Zadeh's Min-Max rule with an example	5	CO1	PO1
(OR)			
c. Draw and explain concept of fuzzy system.	5	CO1	PO2
d. Define lattice of fuzzy numbers, Explain how to find MIN and MAX?	5	CO1	PO2
4.a. Explain the hierarchical methods of classifications	5	CO2	PO1
b. Explain the concept of Multiple Linear Regression with an example.	5	CO2	PO1
(OR)			
c. Explain the K-Means clustering algorithm.	5	CO2	PO1
d. Explain Back Propagation algorithm with an example.	5	CO2	PO2
5.a. Explain in detail about The Gustafson-Kessel algorithm.	5	CO3	PO1
b. Discuss the compatible cluster merging algorithm.	5	CO3	PO1
(OR)			
c. Explain briefly The unsupervised FCSS algorithm.	5	CO3	PO2
d. Discuss The Gath-Geva algorithm with an example.	5	CO3	PO2
6.a. Highlight the main differences between Reductions vs. Ordering.	5	CO4	PO1
b. How do you calculate the Logit Transform and Maximum Likelihood Estimation.	5	CO4	PO2
(OR)			
c. Select a Model by Local Accuracy to Maximize the Fuzzy Integral. What Does This Have to Do with Classifier Combination?	5	CO4	PO2
d. Write a short note on Worthless and Noisy Models with examples.	5	CO4	PO1

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