

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-VIII/VI Semester (ECE)

COURSE CODE(CREDITS):18B1WEC851/24B1WEC631(3)

MAX. MARKS: 15

COURSE NAME: SOFT COMPUTING TECHNIQUES

COURSE INSTRUCTORS: MUNISH SOOD

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is required to make suitable numeric assumptions wherever required for solving problems

Q1) Suppose we have a simple fuzzy inference system to determine the wash time of a domestic dish washer. Using Mamdani's approach design a controller to determine the wash time of a domestic dish washer. Assume the input as dirt and grease on utensils. Use three descriptors for input variables and five for output variable. Find out the wash time for 20% dirt and 60% grease.

[5]CO-2

Q2) Compare two sensors based on their error levels and gain settings.

[3]CO-1

Gain Setting	Error level of Sensor 1	Error level of sensor 2
0	0	0
10	0.7	0.9
20	0.4	0.7
30	0.3	0.4
40	0.2	0.3
50	0.1	0.1

Q3) Consider two fuzzy sets $\tilde{A} = \left\{ \frac{0.2}{x_1} + \frac{0.3}{x_1} + \frac{0.4}{x_1} \right\}$, $\tilde{B} = \left\{ \frac{0.1}{x_1} + \frac{0.2}{x_1} + \frac{0.2}{x_1} \right\}$ Find the [4] C0-2

- Algebraic sum
- Bounded difference

Q4) Given a fuzzy relations $\tilde{R} = \begin{bmatrix} 0.5 & 0.3 \\ 0.4 & 0.2 \end{bmatrix}$ between two fuzzy sets \tilde{X} and \tilde{Y} . Similarly

$\tilde{S} = \begin{bmatrix} 1 & 0.3 & 0.4 \\ 0.7 & 0.5 & 0.8 \end{bmatrix}$ between two fuzzy sets \tilde{Y} and \tilde{Z} . Obtain fuzzy relation T as a composition between fuzzy relations using Max-Min composition.

[3] CO-1