

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2023

COURSE CODE(CREDITS): 18B1WEC851(3)

MAX. MARKS: 15

COURSE NAME: SOFT COMPUTING TECHNIQUES

COURSE INSTRUCTORS: Er.Munish Sood

MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1) Using Mamdani approach design a controller to determine the wash time of a domestic washing machine. Assume the input as dirt and grease on cloths. Use three descriptors for input variables and five for output variable. Find out the wash time for high dirt and high grease.

CO-2(4)

Q2) Consider two fuzzy sets

CO-1(4)

$$A_{\sim} = \left\{ \frac{1}{3.0} + \frac{0.65}{5.0} + \frac{0.5}{7.0} + \frac{0.35}{9.0} + \frac{0}{11.0} \right\}$$

$$B_{\sim} = \left\{ \frac{0}{3.0} + \frac{0.35}{5.0} + \frac{0.5}{7.0} + \frac{0.65}{9.0} + \frac{1}{11.0} \right\}$$

Calculate (i) $\overline{A_{\sim} \cup B_{\sim}}$

(ii) $A_{\sim} \cap \overline{A_{\sim}}$

Q3) Find the membership value assignment for an isosceles right angle triangle given by

$$\mu = \{80, 65, 35\} \text{ in degrees.}$$

CO-1(4)

Q4) Consider two fuzzy sets

CO-1(3)

$$A_{\sim} = \left\{ \frac{1}{50} + \frac{0.65}{70} + \frac{0.5}{90} + \frac{0.35}{110} \right\}$$

$$B_{\sim} = \left\{ \frac{0}{50} + \frac{0.7}{70} + \frac{0.4}{90} + \frac{0.35}{110} \right\}$$

Using lambda cut method of de-fuzzification, find

(i) $\overline{A_{\sim} \cap B_{\sim}}$

(ii) $\overline{\overline{A_{\sim} \cap B_{\sim}}}$

For $\lambda=0.2$