

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Feb 2018

B.Tech VIII Semester

COURSE CODE: 13B1WEC831

MAX. MARKS:15

COURSE NAME: **SOFT COMPUTING TECHNIQUES**

COURSE CREDITS: 3

MAX. TIME: 1:00 Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1 Elaborate Fuzzification and Defuzzification and their inference. [3] [CO1]

Q2. Use Extension principle for a function of two variables x_1 and x_2 , given that

$$A_1 = \left\{ \frac{0.2}{-1}, \frac{0.4}{0}, \frac{0.6}{1} \right\} \text{ and } A_2 = \left\{ \frac{0.8}{-1}, \frac{0.6}{0}, \frac{0.7}{1} \right\} \text{ and } f(x_1, x_2) = x_1 + x_2 \quad [3] \quad [CO2]$$

Q3. Consider two given fuzzy sets [4] [CO2]

$$A = \left\{ \frac{1}{2}, \frac{0.3}{4}, \frac{0.5}{6}, \frac{0.2}{8} \right\} \text{ and } B = \left\{ \frac{0.5}{2}, \frac{0.4}{4}, \frac{0.1}{6}, \frac{1}{8} \right\}$$

Perform (i) $A \cup B$ (ii) $A \cup B'$ (iii) $A \cap B$ (iv) $A' \cap B$

Q4. For a speed control of DC motor, the membership functions of series resistances, armature current and motor speed are given as follows: [5] [CO5]

$$R_s = \left\{ \frac{0.4}{30}, \frac{0.6}{60}, \frac{1.0}{100}, \frac{0.1}{120} \right\} \text{ and } I_a = \left\{ \frac{0.2}{20}, \frac{0.3}{40}, \frac{0.6}{60}, \frac{0.8}{80}, \frac{1}{100}, \frac{0.2}{120} \right\} \quad N = \left\{ \frac{0.35}{500}, \frac{0.67}{1000}, \frac{0.97}{1500}, \frac{0.25}{1800} \right\}$$

Compute relation T for relating series resistance to motor speed using max-min composition.