JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

M.Tech-II Semester (ECE)

COURSE CODE (CREDITS): 22M11CI211 (3) MAX. MARKS: 15

COURSE NAME: SOFT COMPUTING

COURSE INSTRUCTORS: Munish Sood MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Using Mamdani's approach, design a controller to determine the fuel consumption in liters of a petrol car engine. Assume the input as accelerator and gear shift. Use three descriptors for input variables and five for output variable. Find out the fuel consumption for 80% acceleration and 20% gear shifts.	2	4
Q2	Consider two fuzzy sets $$A_{\sim} = \left\{ \frac{0.7}{3.0} + \frac{0.65}{5.0} + \frac{0.25}{7.0} + \frac{0.45}{9.0} + \frac{0.5}{11.0} \right\}$$ $$B_{\sim} = \left\{ \frac{0.3}{3.0} + \frac{0.85}{5.0} + \frac{0.5}{7.0} + \frac{0.75}{9.0} + \frac{0.7}{11.0} \right\}$$ Calculate (i) $\overline{A_{\sim} \cup B_{\sim}}$ (ii) $A_{\sim} \cap \overline{A_{\sim}}$	1	4
Q3	Find the membership value assignment for an isosceles right angle triangle given by $\mu = \{70, 60, 50\}$ in degrees.	1	4
Q4	Consider two fuzzy sets $$A_{\sim} = \left\{ \frac{0.2}{50} + \frac{0.45}{70} + \frac{0.5}{90} + \frac{1}{110} \right\}$$ $$B_{\sim} = \left\{ \frac{0.4}{50} + \frac{0.9}{70} + \frac{0.2}{90} + \frac{0.65}{110} \right\}$$ Using lambda cut method of de-fuzzification, find (i) $\overline{A_{\sim}} \cap \overline{B_{\sim}}$ (ii) $\overline{A_{\sim} \cap B_{\sim}}$ For $\lambda = 0.4$	1	3