

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Supplementary Examination, Dec 2021

Course: Fuzzy Logic and Application
Program: M.Tech
Course Code: CSAI 7004P

Semester: I
Time: 03 hrs.
Max. Marks: 100

Instructions: Attempt all Questions

SECTION A (20 Marks)

S. No.		Marks	CO
Q1	With the help of diagram, show the difference between a crisp number and set and a fuzzy number.	4	CO2
Q2	Define crispness and fuzziness.	4	CO1
Q3	For the given two intervals A[3,5] and B[-2, 7] find out the value for A(.)B.	4	CO2
Q4	Find the α -cut of numbers A[2,3] and B[3,4] when $\alpha = 0.5$.	4	CO2
Q5	What are fuzzy graphs? Write down some of the applications of fuzzy graphs.	1+3	CO4

SECTION B (40 Marks)

Q 6	Write down the properties of Max-Min composition.	10	CO3
Q 7	Discuss about the criteria for selecting appropriate aggregation operators.	10	CO1
Q 8	<p>Find union, intersection and complement between</p> $\bar{R} = \begin{matrix} & y_1 & y_2 & y_3 & y_4 \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{bmatrix} 0.8 & 0.1 & 0.1 & 0.7 \\ 0.0 & 0.8 & 0.0 & 0.0 \\ 0.9 & 1.0 & 0.7 & 0.8 \end{bmatrix} \end{matrix}$ <p>and</p> $\bar{S} = \begin{matrix} & y_1 & y_2 & y_3 & y_4 \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{bmatrix} 0.4 & 0.0 & 0.9 & 0.6 \\ 0.9 & 0.4 & 0.5 & 0.7 \\ 0.3 & 0.0 & 0.8 & 0.5 \end{bmatrix} \end{matrix}$ <p>Or</p> <p>Write a detailed note on special fuzzy relations.</p>	10	CO3

Q 9	Explain the utility of fuzzy sets in job-shop scheduling.	10	CO5
SECTION-C (40 Marks)			
Q 10	<p>Differentiate between algorithmic approach and knowledge-based approach for decision making in fuzzy environments.</p> <p style="text-align: center;">Or</p> <p>Explain in details the process of fuzzy decision making for driving a car. Include the necessary fuzzy rules at yellow light.</p>	20	CO4
Q11	Consider two fuzzy numbers $A=\{(2,1), (3,0.5)\}$ and $B=\{(3,1),(4,0.5)\}$. Find out the possible values of $A+B$ and $A-B$, with proper membership grades.	20	CO2