Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – MARCH 2026

Date: 10 – 03- 2026 **Time:** 02:00pm – 03:30pm

School: SOCSE	**Program:** B.TECH	
Course Code : CSI2505	**Course Name:** Soft Computing	
Semester: VI	**Max Marks**: 50	**Weightage**: 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**24**			

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	What is chromosome in Genetic Algorithm.	**2 Marks**	**L1**	**CO1**
2	Define MLP (multilayer perceptron).	**2 Marks**	**L1**	**CO1**
3	Define fuzzy sets.	**2 Marks**	**L1**	**CO1**
4	Given fuzzy relations ***R*** and ***S*** $from\ X = \{x_1, x_2\}$ to $Y = \{y_1, y_2\}$: $R = \begin{bmatrix} 0.1 & 0.7 \\ 0.4 & 0.8 \end{bmatrix}, S = \begin{bmatrix} 0.5 & 0.5 \\ 0.1 & 0.9 \end{bmatrix}$ Find R ∪ S	**2 Marks**	**L3**	**CO2**
5	Given fuzzy relations R $R = \begin{bmatrix} 0.5 & 0.5 \\ 0.1 & 0.9 \end{bmatrix}$ Find complement of R	**2 Marks**	**L3**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	Differentiate soft computing and hard computing.	**10 Marks**	**L2**	**CO1**

	b.	Let the universal set $$\boldsymbol{U = \{x_1, x_2, x_3, x_4\}}$$ Two fuzzy sets A and B are given as: $$\boldsymbol{A = \{(x_1, 0.2), (x_2, 0.6), (x_3, 0.8), (x_4, 0.4)\}}$$ $$\boldsymbol{B = \{(x_1, 0.5), (x_2, 0.3), (x_3, 0.7), (x_4, 0.9)\}}$$ Find: $\boldsymbol{A \cup B}$ $\boldsymbol{A \cap B}$ $\boldsymbol{A^c}$	**10 Marks**	**L3**	**CO1**
		Or			
7.	**a.**	With the help of diagram explain biological neuron model	**10 Marks**	**L2**	**CO1**
	b.	Given: $$\boldsymbol{A = \{(x_1, 0.2), (x_2, 0.6), (x_3, 0.8), (x_4, 0.4)\}}$$ $$\boldsymbol{B = \{(x_1, 0.5), (x_2, 0.3), (x_3, 0.7), (x_4, 0.9)\}}$$ Draw the line graph of $$\boldsymbol{(A \cup B)^c}$$ $$\boldsymbol{(A \cap B)^c}$$	**10 Marks**	**L3**	**CO1**

8.	**a.**	Explain the types of membership functions.	**10 Marks**	**L1**	**CO2**
	b.	Let: $$\boldsymbol{Truth\ value\ of\ A = 0.5, \quad Truth\ value\ of\ B = 0.9}$$ Find the truth value of "IF A THEN B" using: Mamdani implication Zadeh implication	**10 Marks**	**L3**	**CO2**
		Or			
9.	**a.**	What are the basic components of a fuzzy logic system? Explain each of them in detail.	**10 Marks**	**L1**	**CO2**
	b.	Let $$\boldsymbol{X = \{x_1, x_2, x_3\}, Y = \{y_1, y_2\}, Z = \{z_1, z_2\}}$$ The fuzzy relation R from $\boldsymbol{X}$ to $\boldsymbol{Y}$ is given by: $$\boldsymbol{R = \begin{bmatrix} 0.2 & 0.7 \\ 0.8 & 0.4 \\ 0.5 & 0.6 \end{bmatrix}}$$ The fuzzy relation S from $\boldsymbol{Y}$ to $\boldsymbol{Z}$ is given by: $$\boldsymbol{S = \begin{bmatrix} 0.6 & 0.3 \\ 0.4 & 0.9 \end{bmatrix}}$$ Find the fuzzy relation $\boldsymbol{T = R \circ S}$ using max–min composition.	**10 Marks**	**L3**	**CO2**