Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid-Term Examinations – October 2025

Date: 28 / 10/ 2025 **Time:** 02:30Pm – 04:00Pm

School: SOCSE	**Program:** M.Tech CSE Specialization in Data Science & Artificial Intelligence	
Course Code: DSC4013	**Course Name:** Soft Computing Techniques	
Semester: I	**Max Marks:** 50	**Weightage:** 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**36**	**14**			

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	A robot is designed to walk on uneven terrain where exact models are unavailable. Which computing paradigm is likely used, and what feature enables it?	**2 Marks**	**L1**	**CO1**
2	Difference in learning from experience between hard and soft computing?	**2 Marks**	**L1**	**CO1**
3	Role of fuzzy rules in a fuzzy inference system?	**2 Marks**	**L1**	**CO1**
4	Example of a fuzzy set representing a linguistic variable like “temperature”?	**2 Marks**	**L2**	**CO1**
5	Mention one difference between fuzzy logic and probabilistic reasoning.	**2 Marks**	**L2**	**CO2**

Part B

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

<table>
<tr><td>6.</td><td></td><td>Explain the difference between soft computing and hard computing, and discuss why soft computing is essential in real-world data science applications. Provide appropriate examples.</td><td>10 Marks</td><td>L1</td><td>CO 1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>7</td><td></td><td>Explain the difference between classical sets and fuzzy sets with suitable examples.</td><td>10 Marks</td><td>L1</td><td>CO 1</td></tr>
<tr><td>8</td><td></td><td>Explain the working of a fuzzy rule-based temperature control system, where temperature determines heater power. Define suitable fuzzy sets and demonstrate the process for an input of 18°C using any inference method.</td><td>10 Marks</td><td>L2</td><td>CO 1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>9</td><td></td><td>A weather forecasting system predicts tomorrow’s weather using past data and current atmospheric conditions. The system considers:
<table>
<tr><td>Condition</td><td>Possible values</td><td>Data (Today)</td></tr>
<tr><td>Temperature (°C)</td><td>Low, Medium, High</td><td>Medium (22°C)</td></tr>
<tr><td>Humidity (%)</td><td>Low, Medium, High</td><td>High (80%)</td></tr>
<tr><td>Temperature (°C)</td><td>Low, Medium, High</td><td>Medium (22°C)</td></tr>
<tr><td>Humidity (%)</td><td>Low, Medium, High</td><td>High (80%)</td></tr>
</table>
Describe the steps involved in probabilistic reasoning to predict whether tomorrow will be Rainy or Sunny, using the given data.</td><td>10 Marks</td><td>L2</td><td>CO 1</td></tr>
<tr><td>10</td><td></td><td>A financial analyst wants to predict next-day stock prices using the past 60 days of data. Which type of neural network is suitable and why? Explain its working, advantages, and possible challenges.</td><td>10 Marks</td><td>L2</td><td>CO 1</td></tr>
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		Or			
11		Explain the architecture and working of an artificial neural network (ANN). Describe the role of neurons, layers, activation functions, and the learning process.	**10 Marks**	**L2**	**CO 1**

12		Explain the concept of Evolutionary Algorithms. Discuss their main characteristics, working principles, and applications in solving optimization problems.	**10 Marks**	**L2**	**CO 2**
		Or			
13		Explain in detail the various operations performed on fuzzy sets with suitable examples.	**10 Marks**	**L1**	**CO 2**