Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – March 2026

Date: 13- 03-2026 **Time:**11.45am to 01.15pm

School: SOCSE	**Program:** B. Tech Computer Science and Engineering (CSD&CSG)	
Course Code : ADS1705	**Course Name:** Explainable AI (XAI)	
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. ***SET-A***

Part A

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

1	Describe the steps involved in working process of Explainable AI?	2 Marks	L2	CO1
2	Explain the importance of Explainable AI with its characteristics?	2 Marks	L2	CO1
3	Summarize the differences between white box & black box models in Explainable AI?	2 Marks	L2	CO1
4	Define the aim of linear regression algorithms? Provide regression line equation in terms of SLR?	2 Marks	L2	CO2
5	Describe the below terms with respect to decision tree classifier. a. Entropy b. Gini Index	2 Marks	L2	CO2

Part B

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

<table>
<tr><td>6.</td><td>a.</td><td>A bank uses an AI-based system to decide whether a loan application should be approved or rejected. Since the decision affects customers financially, the bank integrates Explainable AI (XAI) to justify its predictions.

Question:
Explain the complete working process of Explainable AI in this loan approval system. Describe:

1. Data collection and preprocessing

2.Model training

3.Prediction stage

4.Use of an XAI technique

5.How explanations help bank officers ensure fairness and transparency</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>Explain the importance of Explainable Artificial Intelligence (XAI) in modern AI systems. Discuss how XAI enhances transparency, trust, fairness, accountability, and regulatory compliance, with suitable real-world examples?</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td colspan="5">Or</td></tr>
<tr><td>7.</td><td>a.</td><td>Explain the following with respect to Explainable AI in detail with real-time examples?

1.Intrinsic Explainable AI

2.Post-Hoc Explainable AI</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>Describe in detail types of artificial intelligence based on capabilities and functionalities with real-time examples?</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
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<table>
<tr><td>8.</td><td>a.</td><td>For the given below dataset find the best fit line using Simple Linear Regression?

<table><tr><td>x(Hours)</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Y(Marks)</td><td>40</td><td>50</td><td>60</td><td>65</td><td>75</td></tr></table></td><td>10 Marks</td><td>L2</td><td>CO2</td></tr>
<tr><td></td><td>b.</td><td>Explain the working of K-Nearest Neighbbour Algorithm in detail with example? Also provide the algorithm steps?</td><td>10 Marks</td><td>L2</td><td>CO2</td></tr>
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		Or			
9.	a.	Describe in detail the following terms with respect to the ensemble learning technique. 1.Bagging 2.Bossting	10 Marks	L2	CO2
	b.	A dataset is used to predict whether a customer will Buy a Product (Yes / No) based on the attribute Age. **Age Group** | **Yes** | **No** | **Total** Young | 4 | 6 | 10 Middle-aged | 6 | 2 | 8 Old | 3 | 1 | 4 **Total** | **13** | **9** | **22** Tasks: 1. Calculate the Entropy of the entire dataset. 2. Calculate the Entropy for each Age group. 3. Compute the Information Gain for the attribute Age. 4. State whether Age is a good attribute for splitting.	10 Marks	L2	CO2