Department of Artificial Intelligence and Machine Learning

Date: 07/11/2025	Test – I		Max. Marks: 50 + 10
Semester: VII	UG		Duration: 2 hours
Course Title: Explainable Artificial Intelligence			Course Code: AI374TFB

Part – A

Q. No.	Question	Marks	BT	CO
1.1	Why do we need explanations for AI? Mention any two characteristics of a good explanation.	2	L1	CO1
1.2	Differentiate interpretability and explainability.	2	L1	CO1
1.3	Model predicts House Price (in ₹ thousands) using: Feature 1: Income (I) Feature 2: Credit Score (C) Model outputs: None: $\{\emptyset\}$:100, $\{I\}$: 130, $\{C\}$: 120, $\{I,C\}$:160 Compute the Shapley Values for I and C.	2	L2	CO1
1.4	Identify the hidden rule to transform the given input string into the output. **Input String** **Output** CAT3 D15 DOG4 E20 PEN2 Q10	2	L2	CO1
1.5	What are Saliency Maps? Give their purpose in AI.	2	L1	CO2

Part – B

Q. No.	Question	Marks	BT	CO
2.	AI primarily involves conditional probability, and the reliability of the outputs you obtain depends on the thresholds established for your specific application, many of which are likely to be determined by machines in the future. Justify this statement by considering any of the following domains: Healthcare, Autonomous Vehicles, and E-commerce.	10	L3	CO3
3.	List and discuss FIVE challenges in explainability.	10	L2	CO1
4.	Give the illustrative examples to prove the following statements. 1. Pure explanations are often unsatisfactory 2. Counterfactual explanation gives the context or alternative. 3. Causal Explanations are Logical but not always true 4. Interpretability depends on the model architecture 5. Explainability is computationally intensive	10	L3	CO2
5	a. Define the Premodeling Explainability technique and Comment on the advantages and limitations of this technique. b. Identify which type of explainability is suitable for the following cases and why?	5 + 5	L3	CO3

		Loan Approval, Medical diagnostic Support, Detecting cracks in ships, Student grade prediction, Predictive maintenance of equipment's			
6		a. Discuss the concept of Permutation feature importance used in explaining the tabular data. b. Discuss the tools available for visualizing the local and global feature attributions in the case of tabular data.	5 + 5	L2	CO2