K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2025
,B. Tech Program: Information Technology Scheme: III
Regular Examination: TY Semester: V
Course Code: ITDLC5041 and Course Name: Explainable Data Science
Date of Exam: 1-12-2025 Duration: 02.5 Hours Max. Marks: 60

Instructions:
(1)All questions are compulsory.
(2)Draw neat diagrams wherever applicable.
(3)Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	Explain the role of Power Query in data preparation and transformation in Excel. How does it help in cleaning and shaping large datasets before analysis?		CO2	U
b)	Differentiate between calculated columns and measures with suitable examples.		CO3	U
c)	Explain the difference between dimensions and measures in Tableau. How are calculated fields used to enhance data analysis?		CO4	U
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Explain any two model-agnostic methods used for interpreting machine learning models.		CO5	U
b)	Define bias and fairness in the context of Artificial Intelligence. Give one example of each in real-world applications.		CO6	U
c)	Compare the key principles of the DPDP Act 2025 (India) and the GDPR (EU) in terms of data processing, user rights, and compliance requirements. Explain with suitable examples.		CO6	U
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Explain the role of Data Science and Artificial Intelligence in solving real-world problems. Discuss any two practical applications where AI and Data Science are used together, highlighting how they differ in their approach and contribution.		CO1	U
b)	You are given a sales dataset containing fields like Date, Region, Product, Quantity Sold, and Revenue. Perform the following tasks in Excel and explain the steps involved: a) Use Pivot Tables to summarize total revenue per region. b) Apply Conditional Formatting to highlight regions with revenue above average.		CO2	An

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	c) Draw a chart to visualize regional performance. d) Use Forecasting or What-If Analysis to estimate future revenue trends.			
c)	Design a Sales Performance Dashboard in Power BI for a retail organization. Explain the steps involved in: a) Building a data model by creating relationships among the Sales, Products, and Region tables. b) Developing calculated KPIs such as Total Sales, Profit Margin, and Year-to-Date (YTD) Growth using DAX formulas. c) Creating an interactive dashboard using slicers, filters, and analytical visuals such as forecasting chart, decomposition tree, and key influencer visual for sales trend analysis.		CO3	C
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Design a supervised learning model to predict house prices using input parameters such as location, size, number of rooms, and age of the property. Discuss the type of algorithm suitable and the metrics used for model performance.		CO4	C
b)	Explain how example-based explanations such as counterfactual or prototype examples help in understanding the predictions of AI models. Demonstrate with a suitable example from a business or healthcare domain.		CO5	A
c)	A hospital wants to implement a disease prediction dashboard using Explainable AI (XAI) to detect chronic illnesses such as diabetes or heart disease. Describe how data, model predictions, and explainability outputs can be combined in a single dashboard to make the system interpretable and user-friendly for healthcare professionals.		CO6	U

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