B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E.
Branch: Artificial Intelligence and Machine Learning
Course Code: 23AM5AEDVA
Course: DATA VISUALIZATION AND ANALYSIS

Semester: V
Duration: 3 hrs.
Max Marks: 100

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

<div style="writing-mode: vertical">**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.</div>

			UNIT - I	CO	PO	Marks
1	a)		Define Data visualization. Provide the reasons for employing data visualization techniques.	CO1	PO1	4
	b)		Illustrate the role of Gestalt principles in designing effective data visualizations, particularly in terms of proximity and similarity.	CO2	PO1	10
	c)		Outline the key features and applications of statistical charts such as Bar Chart and Scatter Plot in visualizing diverse types of data.	CO3	PO2	6
			OR			
2	a)		Define information overload. Explain how it can affect decision-making. Discuss strategies to avoid information overload when using visualizations.	CO3	PO2	6
	b)		Compare the Following Charts: Bar Chart, Histogram, and Pie Chart with suitable example for each	CO3	PO2	8
	c)		How do principles such as proximity, similarity, and continuity enhance the clarity and effectiveness of statistical charts such as stacked bar charts and line charts?	CO3	PO2	6
			UNIT - II			
3	a)		Describe the different types of Visual Mapping techniques.	CO1	PO1	4
	b)		Illustrate how the Visualization Reference Model is used to choose different visualization tools and describe the process of generating a graphical representation.	CO2	PO2	10
	c)		Elucidate the procedures for creating the visual representations of abstract data.	CO2	PO2	6
			OR			
4	a)	i.	How does visual analytics support decision-making in data-driven environments?	CO2	PO2	10
		ii.	Discuss the design principles for creating effective visualization applications, considering aspects such as user interaction, clarity, and accessibility.			

		b)	A data analyst for an e-commerce company, wants to understand the correlation between the time customers spend browsing the website and their likelihood of making a purchase. The data available includes: • **Time Spent Browsing** (in minutes) • **Purchase Status** (whether a purchase was made: Yes/No) • **Customer Demographics** (age, gender, location) • **Product Categories** (categories browsed during the session) Based on the dataset answer the following: i. what visual mapping techniques would you use to represent the time spent browsing and the likelihood of purchase? ii. How would you visually distinguish between customers who made a purchase and those who did not?	*CO2*	*PO2*	**10**
			UNIT - III			
5	a)		Explain the concept of Text Visualization and Tag clouds.	*CO1*	*PO1*	**6**
	b)		A marketing team has given a task to create a visualization and to represent the success of a recent product launch. How would the team assess the visualization to identify potential misleading elements, and what changes are incorporated to ensure accuracy and transparency?	*CO3*	*PO3*	**10**
	c)		Describe the use of interaction and visualization techniques w.r.t., different dimensions of data.	*CO3*	*PO1*	**4**
			OR			
6	a)		In the context of data visualization, how does the approach differ when representing Two-dimensional and Four-dimensional datasets, and what considerations should be taken into account for each scenario to ensure clarity and accuracy?	*CO3*	*PO2*	**10**
	b)		When a Data Engineer is conveying business outcomes, what factors or aspects that may lead to misunderstanding or misinterpretations should be taken into account in the presentation of these results?	*CO3*	*PO2*	**10**
			UNIT - IV			
7	a)		Illustrate the different visualization techniques used in representing groups and trees. Elaborate the impact of these techniques on data interpretation.	*CO3*	*PO2*	**10**
	b)		Explain the process of mapping data to familiar concepts in metaphorical visualization and provide examples of how this approach enhances the understanding of complex information.	*CO2*	*PO1*	**10**
			OR			

	8	a)	Illustrate how interactive data visualization is used in news reporting to present diverse perspectives on a controversial topic, fostering more comprehensive understanding among the audience.	*CO3*	*PO2*	**10**
		b)	Illustrate various visualization techniques designed for representing graphs and clusters in the analysis of data.	*CO3*	*PO2*	**10**
			UNIT - V			
	9	a)	Differentiate Topographic maps from Thematic maps. Provide an example to illustrate the distinct characteristics and applications of each.	*CO3*	*PO2*	**6**
		b)	Illustrate the key steps involved in the cartographic visualization process. Describe the cartographic rules and provide the examples of how these aspects influence the final map output.	*CO2*	*PO2*	**10**
		c)	Explain the process of representing terrain elevation through mapping.	*CO3*	*PO1*	**4**
			OR			
	10	a)	Illustrate the different visualization strategies employed for the analysis and the interpretation of the volumetric data.	*CO3*	*PO2*	**8**
		b)	Exemplify the techniques for mapping both qualitative and quantitative data by providing good and bad examples.	*CO3*	*PO3*	**8**
		c)	Explain the methods of visualizing time series data through mapping.	*CO3*	*PO1*	**4**

******