



**QUESTION BANK**

**Year / Semester: III B.Tech VI Semester**

**Regulation: R23**

**Subject and Code: DATA VISUALIZATION & 23CSD351A**

**SYLLABUS**

**UNIT -1**

Introduction, the importance of Context, Choosing and effective visual

**UNIT-II**

Clutter is your enemy, Focus your audience's attention, Lessons in Storytelling

**UNIT-III**

Communicating data: A step in the process, a model of communication, Three types of communication problems, six principles of communicating data. Introduction to Tableau: Using Tableau, Tableau products, connecting to data. How much and How many: Communicating how much, communicating how many Ratios and Rates: Ratios, Rates

**UNIT-IV**

Proportions and Percentages: Part to whole, current to historical, actual to target. Mean and Median Variation and Uncertainty: Respecting variation, Variation over time-Control charts, Understanding uncertainty

**UNIT-V**

Multiple Quantities: Scatter plots, Stacked Bars, Regression and Trend Lines, The Quadrant Chart Changes over time: The origin of time charts, the line chart, the dual axis line chart, the connected scatter plot, the date filed type and seasonality, the timeline, the slope graph Maps and Location: One special map, circle maps, filled maps, dual encoded maps.



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**Max Marks: 10**

S.No.	CO	Questions	BT
<b>Unit I</b>			
1	1	Define Data Visualization. Explain its objectives, importance, and benefits with suitable real-time examples.	L5,L6
2	1	Explain the data visualization process and its role in the data science lifecycle.	L2
3	1	Discuss different types of data visualization roles, such as showing change over time, part-to-whole composition, comparison, distribution, and relationships, with examples.	L2.L6
4	1	a. Explain exploratory analysis and explanatory analysis.(5M) b. Highlight the differences between them using a real-time industry example.(5M)	L2,L4 L4,L1
5	1	a. What is the importance of context in data visualization? (4M) b. Explain the concepts of <i>Who, What, and How</i> with real-world examples.(6M)	L6,L5 L6
6	1	Describe various data visualization tools such as Tableau, power bi, Google Charts, and Chart.js.	L5
7	1	Explain when to use simple text, tables, and graphs in data visualization. Justify your answer with examples.	L5
8	1	Discuss different chart types such as bar charts, line charts, pie charts, heat maps, slope graphs, and waterfall charts, and their appropriate use cases.	L5,L6
9	1	Explain the benefits of data visualization for organizations and decision-makers	L4
10	1	a. Describe the process of storyboarding in data communication. (6M) b. How does it help in creating effective presentations? (4M)	L3 L5



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S.No.	CO	Questions	BT
<b>Unit II</b>			
1	2	Explain clutter in data visualization and methods to reduce it.	L1
2	2	Explain Gestalt principles used in data visualization with examples.	L3
3	2	Explain how the audience's attention can be focused using visual design	L6,L4
4	2	Explain the importance of storytelling in data communication.	L2
5	2	Explain the 3-Act structure of storytelling with a business example.	L5
6	2	Explain de-cluttering step-by-step in data visualization.	L1
7	2	a. Discuss the concept of lack of visual order in data visualization. (6M) b. What are its causes and how can it be corrected?(4M)	L5,L6 L4
8	2	Explain the role of human memory (Iconic, Short-Term, and Long-Term Memory) in data visualization.	L2
9	2	What is reverse storyboarding? Explain how it helps improve presentation flow and communication effectiveness.	L5
10	2	What are preattentive attributes? Explain how they help in focusing the audience's attention.	L5,L6
11	2	a. Explain storytelling in data visualization using the Three-Act Structure. (5M) b. How does reverse storyboarding improve presentation effectiveness?(5M)	L1,L5 L1,L4



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S.No.	CO	Questions	BT
<b>Unit III</b>			
1	3	Explain the Six Principles of Communicating Data.	L2
2	3	Explain the Model of Communication and its components.	L1
3	3	Explain the complete process of communicating data with a neat explanation.	L2,L4
4	3	Explain the importance of selecting suitable visualizations with examples.	L5,L6
5	3	Explain “How Much” and “How Many” in data communication and difference between them with real time examples.	L1,L5
6	3	Explain Ratios, Rates, Proportions, and Percentages with real- time examples.	L5
7	3	a. Explain about Tableau and use of Tableau with real –time examples.(4M) b. Explain various charts types in Tableau with suitable examples.(6M)	L3,L5 L6
8	3	Explain the importance of choosing effective medium and channel.	L2
9	3	Explain the importance of aesthetics in data visualization.	L4
10	3	Explain the RUI Model in detail.	L4



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S.No.	CO	Questions	BT
<b>Unit IV</b>			
1	4	a. Explain the importance of proportions and percentages in data visualization. (6M) b. How do they improve comparison over raw numbers?(4M)	<b>L1,L2</b> <b>L6</b>
2	4	Discuss part-to-whole comparisons. Which visualization techniques are most effective for representing part-to-whole data? Explain with examples.	<b>L5,L6</b>
3	4	a. Explain why filtering is important before presenting proportional data. (5M) b. How can improper filtering mislead audiences?(5M)	<b>L3</b> <b>L6</b>
4	4	Describe waterfall charts and explain how they help in understanding cumulative contributions	<b>L3</b>
5	4	Explain reference lines in data visualization. How do they help in actual-to-target comparisons?	<b>L2</b>
6	4	a. Explain the Differentiate between mean, median and mode.(5M) b. When should median be preferred over mean? Explain with examples.(5M)	<b>L2</b> <b>L1,L5</b>
7	4	Explain normal distribution. Discuss its properties and real-world examples.	<b>L2</b>
8	4	What is non-normal distribution? Explain different types such as skewed, bimodal, and heavy-tailed distributions.	<b>L2</b>
9	4	Explain the concept of variation in data visualization. Why is showing variation important instead of only showing averages?	<b>L2,L6</b>
10	4	Explain uncertainty and confidence intervals. Why is it important to communicate uncertainty honestly in business and finance?	<b>L5,L2</b>



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S.No.	CO	Questions	BT
<b>Unit V</b>			
1	5	a. Explain scatter plots. How are they used to analyze relationships between two variables? (6M) b. Discuss the role of regression and trend lines with examples.(4M)	L2,L5 L5
2	5	What are stacked bar charts? Explain their advantages and limitations in comparing multiple quantities.	L2
3	5	Explain regression and trend lines. How do they help in identifying patterns and predicting future values?	L2,L6
4	5	What is a quadrant chart? Explain its structure and business applications with examples.	L4
5	5	Discuss the origin of time charts and explain the importance of the line chart in showing changes over time.	L2,L5
6	5	Explain dual axis line charts. What are their advantages and potential risks in data interpretation?	L3
7	5	What is a connected scatter plot? How is it different from a regular scatter plot and line chart?	L3,L5
8	5	Explain the concept of date field types and seasonality in time-series data.	L5
9	5	Describe timeline and slope graph. How are they useful in comparing changes over time?	L3,L6
10	5	a. Explain different types of maps in data visualization: circle maps, filled maps, and dual encoded maps.(6M) b. Discuss their appropriate use cases.(4M)	L1,L6 L5

Note: L1-Remembering, L2-Understanding, L3-Applying, L4-Analyzing, L5-Evaluating, and L6-Creating



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**Instruction to Faculty Members:**

**The Six Levels of Bloom's Taxonomy:**

1. **Remembering:** Retrieving, recognizing, and recalling relevant knowledge from long-term memory (e.g., list, define, name, locate).
2. **Understanding:** Constructing meaning, explaining ideas, or concepts (e.g., summarize, interpret, classify, compare).
3. **Applying:** Using information in new situations or implementing procedures to solve problems (e.g., solve, use, demonstrate, implement).
4. **Analyzing:** Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure (e.g., contrast, categorize, distinguish, diagram).
5. **Evaluating:** Making judgments based on criteria and standards through checking and critiquing (e.g., judge, critique, justify, defend, argue).
6. **Creating:** Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure (e.g., design, construct, develop, formulate).