

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech.III Year I Semester Regular Examinations December-2025**

**DATA VISUALIZATION**

(Common to CSM & CAI)

**Time: 3 Hours**

**Max. Marks: 70**

**PART-A**

(Answer all the Questions 10 x 2 = 20 Marks)

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|---|---|---|-----|----|----|
| 1 | a | Define data visualization.  | CO1 | L1 | 2M |
|   | b | State the purpose of the Data-Ink Ratio.                                      | CO1 | L1 | 2M |
|   | c | What is the main difference between a histogram and a bar chart?              | CO2 | L1 | 2M |
|   | d | Mention two best practices in labeling and coloring charts.                   | CO2 | L2 | 2M |
|   | e | What is a Parallel Coordinates Plot?  | CO3 | L1 | 2M |
|   | f | Write challenges in Network Visualization.                                    | CO3 | L1 | 2M |
|   | g | Name two Python libraries used for creating interactive charts.               | CO4 | L1 | 2M |
|   | h | Mention one advantage of using Plotly over Matplotlib for data visualization. | CO4 | L2 | 2M |
|   | i | What is a dashboard in the context of business reporting?                     | CO5 | L1 | 2M |
|   | j | Define storytelling in data visualization.                                    | CO5 | L1 | 2M |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

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|---|---|---|-----|----|----|
| 2 | a | Explain various data types used in data visualization with suitable examples. | CO1 | L3 | 5M |
|   | b | List and explain key visualization design principles.                         | CO1 | L2 | 5M |

**OR**

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|---|--|---|-----|----|-----|
| 3 |  | Define the concept of Data-Ink Ratio in data visualization. Discuss Edward Tufte's five Data-Ink Laws with suitable examples. | CO1 | L3 | 10M |
|---|--|---|-----|----|-----|

**UNIT-II**

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|---|---|---|-----|----|----|
| 4 | a | Discuss various types of bar charts with use cases.       | CO2 | L2 | 5M |
|   | b | Explain the advantages and limitations of a bubble chart. | CO2 | L3 | 5M |

**OR**

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|---|---|--|-----|----|----|
| 5 | a | Explain the role of column charts in data comparison with diagram.     | CO2 | L3 | 5M |
|   | b | What are the best practices for axis titles, legends, and data labels? | CO2 | L2 | 5M |

**UNIT-III**

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|---|--|--|-----|----|-----|
| 6 |  | Describe the construction and interpretation of a Radar Chart. Discuss its advantages and limitations. | CO3 | L3 | 10M |
|---|--|--|-----|----|-----|

**OR**

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|---|--|---|-----|----|-----|
| 7 |  | Explain the role of Geographic Data Visualization. Compare Maps and Choropleths with use cases. | CO3 | L3 | 10M |
|---|--|---|-----|----|-----|

**UNIT-IV**

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|---|---|---|-----|----|----|
| 8 | a | Discuss the data visualization capabilities of Pandas.                        | CO4 | L2 | 5M |
|   | b | How can Pandas be used to generate quick plots for exploratory data analysis? | CO4 | L3 | 5M |

**OR**

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|---|--|--|-----|----|-----|
| 9 |  | Explain key steps in transforming raw data into an interactive visual dashboard. | CO4 | L3 | 10M |
|---|--|--|-----|----|-----|

**UNIT-V**

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|----|--|---|-----|----|-----|
| 10 |  | Discuss the principles of dashboard design and their application in business reporting for effective decision-making. | CO5 | L2 | 10M |
|----|--|---|-----|----|-----|

**OR**

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|----|--|---|-----|----|-----|
| 11 |  | Examine the various types of bias that can occur in data visualizations and discuss strategies to minimize or prevent them. | CO5 | L3 | 10M |
|----|--|---|-----|----|-----|

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