Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 22-12-2025 **Time:** 01:00pm – 04:00pm

School: SOCSE	**Program:** B. Tech	
Course Code: CSD3413	**Course Name**: Data Visualization and Dashboards	
Semester: V	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**
Marks	**24**	**24**	**26**	**26**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Explain the term 'Data Visualization' and mention two of its real-world applications.	2 Marks	L1	CO1
2.	What is meant by data abstraction? Provide one suitable example.	2 Marks	L1	CO1
3.	Mention any two Python libraries widely used for creating data visualizations.	2 Marks	L2	CO2
4.	Compare and contrast a histogram and a boxplot in terms of purpose and data representation.	2 Marks	L2	CO2
5.	Define interactive data visualization and cite an example of its use.	2 Marks	L1	CO3
6.	Explain the purpose of the hover feature in visualization tools.	2 Marks	L1	CO3
7.	Name any two tools used to build interactive visual dashboards.	2 Marks	L1	CO3
8.	Define a dashboard and describe its role in business decision-making.	2 Marks	L1	CO4
9.	List two core elements essential for effective data storytelling.	2 Marks	L1	CO4
10.	Identify any two types of dashboards and their specific purposes.	2 Marks	L1	CO4

Part B

Answer the Questions. **Total Marks 80M**

11.	a.	Explain the role of interacting with databases in data visualization. Discuss methods of connecting Python with databases.	10 Marks	L2	CO1
	b.	Explain the various types of data analytics like descriptive, diagnostic, predictive, and prescriptive and discuss their role in organizational decision-making.	10 Marks	L2	CO1
Or					
12.	a.	Discuss data transformation techniques used in visualization. Give examples using Python libraries.	10 Marks	L2	CO1
	b.	Compare and contrast static and interactive data visualizations. Explain the role of interactivity in improve data-driven insights.	10 Marks	L2	CO1

13.	a.	Explain techniques for visualizing multidimensional data. Discuss any two methods in detail.	10 Marks	L2	CO2
	b.	Choose the different types of distribution plots used in Python. Discuss how they help in understanding data variability.	10 Marks	L3	CO2
Or					
14.	a.	Explain matrix visualization techniques. With an example explain heatmaps are useful for large datasets and write the Python code for visualizing matrix.	10 Marks	L2	CO2
	b.	Differentiate between categorical and numerical data visualization techniques. Experiment these types of data using python code for these types of data.	10 Marks	L3	CO2

15.	a.	Explain the following: i. Linking in visualization ii. Real-time data updates.	10 Marks	L2	CO3
	b.	Develop a Python code to read earthquake data (latitude, longitude, magnitude) from a CSV file and plot the locations on a world map using Matplotlib.	10 Marks	L3	CO3
Or					
16.	a.	Explain the following: i. Linking in visualization ii. Real-time data updates.	10 Marks	L2	CO3

	b.	Develop a Python code to visualize earthquake locations on an interactive map where the marker color represents earthquake magnitude using Folium.	10 Marks	L3	CO3

17.	a.	Explain the process of building dashboards in Python using libraries like Dash or Streamlit. How do interactive dashboards support data-driven decision-making?	10 Marks	L2	CO4
	b.	A hospital system gathers live data containing Patient ID, Department, Treatment Cost, Wait Time, Satisfaction Score, and Bed Availability. Use Power BI to: i. Build a healthcare performance dashboard showing patient flow and satisfaction by department. ii. Trigger alerts when bed availability drops below a set level. iii. Evaluate how Power BI real-time insights can improve hospital resource management.	10 Marks	L3	CO4
		Or			
18.	a.	Explain hierarchical data visualization methods such as treemaps and sunburst charts. Provide a use case where these techniques are most effective.	10 Marks	L2	CO4
	b.	A manufacturing firm maintains a live dataset including Machine ID, Production Line, Output Quantity, Downtime (hours), Maintenance Cost, and Efficiency Rate. Design a Power BI dashboard to: i. Visualize machine efficiency and downtime trends across production lines. ii. Set up alerts when downtime exceeds acceptable thresholds. iii. Explain how real-time monitoring in Power BI can enhance operational efficiency.	10 Marks	L3	CO4