BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(CSE)-AIML-2021
Course Name – Introduction to Data Analytics and Visualization
Course Code - PEC-CSM702B
(Semester VII)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Recall the primary purpose of a line plot in data visualization.
a) To show the distribution of data
b) To depict the frequency of data points within specified ranges
c) To display the relationship between two continuous variables over time
d) To visualize categorical data with frequency counts

(ii) Select from the following that best describes an area plot.
a) A plot that uses bars to represent frequency distributions
b) A plot that fills the area between the line and the x-axis to show cumulative values
c) A plot that shows the relationship between two discrete variables
d) A plot that represents data with a series of points connected by lines

(iii) You have a dataset with monthly sales data over a year. Predict the type of plot that would be most appropriate to visualize the trend over time.
a) Histogram
b) Area Plot
c) Box Plot
d) Line Plot

(iv) Identify among the content the following is NOT a common use of data visualization.
a) Tracking performance trends
b) Generating reports
c) Creating complex animations
d) Communicating insights

(v) Observe the visualization type is best for showing changes over time.
a) Pie Chart
b) Bar Chart
c) Line Graph
d) Scatter Plot

(vi) Tell the distinguishes among 2-D graphics and 3-D graphics.

a) 2-D graphics have depth
b) 2-D graphics have height and width but no depth
c) 2-D graphics are more complex
d) 2-D graphics are less colorful

(vii) Predict the format is commonly used for 2-D vector graphics.
a) JPEG
b) PNG
c) SVG
d) GIF

(viii) Identify the graph is most appropriate for comparing the same variable across different categories
a) Pie Chart
b) Line Graph
c) Bar Chart
d) Scatter Plot

(ix) Identify the graph is best for showing the relationship between three variables
a) Scatter Plot
b) 3D Surface Plot
c) Line Graph
d) Histogram

(x) Classify the graph would you use to display data with both a central tendency and variability
a) Pie Chart
b) Box Plot
c) Histogram
d) Line Graph

(xi) Classify thetype of graph is best suited to show the frequency of categories, where the categories are sorted in descending order?
a) Bar Chart
b) Pie Chart
c) Line Graph
d) Pareto Chart

(xii) Identify the type of chart that is most appropriate for visualizing hierarchical data.
a) Line Chart
b) Treemap
c) Bar Chart
d) Pie Chart

(xiii) Identify the option that represents the height of the bars in a histogram.
a) The frequency of data points within a bin
b) The sum of the data values
c) The range of the data
d) The median of the data

(xiv) Choose In a stacked bar chart, what does each bar segment represent?
a) A continuous variable
b) A categorical variable's contribution to the total
c) A time-based data point
d) A distribution of frequencies

(xv) Choose When creating a chart for a report, which of the following would be consistent with Tufte's design rules?
a) Using vibrant colors to make the chart visually appealing
b) Adding patterns and backgrounds to attract attention
c) Maximizing the data-ink ratio by focusing on data without unnecessary decorations
d) Minimizing the size of the chart to save space

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Mention the difference between a bar graph and a line graph. (3)
3. Express the concept of 2-D drawing and its application in graphic design. (3)
4. Identify the suitability of using a pie chart to represent the distribution of market shares among five competing companies. Explain why a pie chart might not be the best choice if the market shares are very close in value. (3)
5. Identify tools that are commonly used for data mapping. (3)
6. Explain a key advantage of using charts for numerical data. (3)

OR

Explain types of glyphs are commonly used in data visualization. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Critique the visual representation of part-to-whole relationships using waffle charts versus pie charts. (5)
8. Write the differences between Oculomotor Cues, Monocular cues, Binocular Cues. (5)
9. Differentiate and contrast raster and vector graphics in 2-D visualization. (5)
10. Justify Stacked Graphs, and how do they differ from other chart types? (5)
11. Justify how can Tufte's Design Rules improve modern data visualizations? (5)
12. Differentiate the force directed layout in graph visualization. (5)

OR

Evaluate how the tree maps help to visualize hierarchical data compared to other visualizations methods like bar charts or pie charts. (5)

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