



BRAINWARE UNIVERSITY

Library
Brainware University
398, Ramkrishnapur Road, Barasat
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Term End Examination 2024-2025
Programme – B.Tech.(CSE)-DS-2021
Course Name – Introduction to Data Analytics and Visualization
Course Code - PEC-CSD702B
(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) Select the correct variable declaration in Python?
 - a) int x = 10
 - b) x:=10
 - c) x=10
 - d) declare x as Integer
- (ii) Identify the command that is used to import the Matplotlib library in Python
 - a) import matplotlib
 - b) import matplotlib.pyplot as plt
 - c) import matplotlib.graph as mg
 - d) import matplotlib
- (iii) Select the primary goal of data visualization.
 - a) To store data
 - b) To interpret raw data
 - c) To present data in a visual format for better understanding
 - d) To encrypt data
- (iv) Choose the main benefit of using interactive visualizations.
 - a) Requires less data processing
 - b) Allows users to explore data from different perspectives
 - c) Simplifies data storage
 - d) Limits data access
- (v) Identify the technique used to create smooth curves in 2-D vector graphics.
 - a) Bezier curves
 - b) Polygon meshes
 - c) Pixel mapping
 - d) Ray tracing
- (vi) Identify the field where photorealism is most commonly used.
 - a) Cartoons
 - b) Virtual reality
 - c) Technical drawing
 - d) Artistic illustrations
- (vii) Identify the part of the retina responsible for color vision.
 - a) Rods
 - b) Cones

- c) Macula
(viii) Choose the correct definition of data mapping.
a) Transforming data into a visual format
b) Storing data in a database
c) Analyzing data using statistical methods
d) Collecting data from various sources
d) Optic nerve
- (ix) Choose the best chart type for showing trends over time.
a) Histogram
b) Bar chart
c) Line chart
d) Pie chart
- (x) Select the chart type used for displaying multivariate data.
a) Histogram
b) Pie chart
c) Parallel coordinates
d) Line chart
- (xi) Select the most suitable application for stacked graphs.
a) Comparing sales over time
b) Showing part-to-whole relationships
c) Displaying population distributions
d) Highlighting categorical differences
- (xii) Identify the key feature of tree maps.
a) They represent hierarchical data
b) They are used for 3D graph visualization
c) They map geographical data
d) They display multivariate data
- (xiii) Identify the type of graph typically used to represent social networks.
a) Planar graph
b) Multigraph
c) Bipartite graph
d) Network graph
- (xiv) Identify the method used to get the first few rows of a Pandas DataFrame:
a) head()
b) first()
c) top()
d) begin()
- (xv) Select the correct layer function in ggplot2 that adds points to a plot
a) geom_line()
b) geom_histogram()
c) geom_point()
d) geom_bar()

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain the key features of 2-D graphics and their applications. (3)
3. Describe the tools commonly used for 2-D drawing in graphic design. (3)
4. Explain the difference between 2-D and 3-D graphics in computer graphics. (3)
5. Illustrate the role of principal component analysis in visual data interpretation. (3)
6. Solve how Principal Component Analysis (PCA) reduces dimensionality in data visualization. (3)

OR

Determine the significance of graph visualization in network analysis. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Discuss the importance of different parts in human eye (5)
8. Explain how stacked graphs can be utilized to represent part-to-whole relationships in time-series data and analyze their effectiveness. (5)
9. Estimate the standardized and normalized value of 10, 20, 30, 40, 50. (5)
10. Distinguish between Tufte's Design Rules and general visualization principles for effective data representation. (5)

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11. Establish the benefits of using plotly for interactive data visualizations. (5)
12. Solve the challenge of mapping high-dimensional data onto two-dimensional spaces using glyphs, and evaluate the effectiveness of glyph representations. (5)

OR

Write a method to improve the visualization of numerical data by combining charts and parallel coordinates for enhanced insights. (5)
