



RAN-2411000503011001

M. Sc. (Computer Application) (Sem. - III) Examination October - 2025 Data Intelligence and Visualization (Paper - 901)

Time: 3 Hours]

[Total Marks: 70

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the above details on your answer book.

Seat No.:

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Student's Signature

Q. 1. Select most correct answer from the following: (Write only correct choice) (10)

- Which of the following Pandas functions is commonly used for handling missing values in a dataset?
 - drop_duplicates()
 - fillna()
 - sort_values()
 - pivot_table()
- Normalization of data using NumPy ensures:
 - The dataset has fewer rows
 - The dataset is converted into text format
 - Data values are scaled to a common range
 - Data is stored in JSON format
- Which of the following plots is best suited for showing the relationship between two continuous variables?
 - Bar chart
 - Line chart
 - Scatter plot
 - Histogram
- In Matplotlib, which function is used to draw a line chart?
 - plt.bar()
 - plt.plot()
 - plt.hist()
 - plt.scatter()
- Seaborn is built on top of which Python library?
 - NumPy
 - Pandas
 - Matplotlib
 - SciPy
- What is the primary role of Power BI Desktop?
 - To create, design, and publish reports
 - To manage user accounts and licenses
 - To run real-time collaboration chats
 - To deploy AI models directly
- Which of the following is *not* a core component of Power BI?
 - Power BI Desktop
 - Power BI Service
 - Power BI Mobile
 - Power BI Compiler
- In Power BI, which of the following is used for shaping and cleaning raw data before analysis?
 - Power Query Editor
 - DAX
 - Power View
 - Dashboard

9. Changing the column "Date" from text format to "Date/Time" format is an example of:
 - a) Data Profiling
 - b) Data Transformation
 - c) Data Aggregation
 - d) Data Append
10. Data profiling in Power BI is mainly used to:
 - a) Create dashboards
 - b) Check data quality (missing values, distinct count, errors)
 - c) Create calculated measures
 - d) Build relationships between tables

B. Answer following in one or two lines : (Short Answers) (ANY SIX) (12)

1. What is the role of Pandas in data pre-processing?
2. Why is normalization important in data analysis?
3. How can you add interactivity in a Bokeh visualization?
4. What is the difference between a scatter plot and a line chart in data visualization?
5. Name the main components of Power BI.
6. What is Power BI and why is it used?
7. Explain DAX and its importance.
8. What is the difference between Calculated Columns and Measures in DAX?

Q. 2. Answer Following in detail:

- A. Explain the process of *data cleaning and pre-processing* using Pandas and NumPy. (07)

OR

- A. What is *data transformation and normalization*? Explain techniques with examples using NumPy.

- B. Define *Exploratory Data Analysis (EDA)*. What are its steps, tools, and importance in data science? (05)

Q. 3. Answer Following in detail:

- A. Explain the role of data visualization in data analytics. Compare and contrast Matplotlib, Seaborn, and Bokeh with examples. How does interactivity in Bokeh improve data interpretation compared to static charts? (07)

OR

- A. Discuss the different types of plots such as scatter plot, line chart, bar chart, and histogram. For each, explain its purpose, give an example scenario of use and highlight the differences in visualization across Matplotlib, Seaborn, and Bokeh.

- B. Describe the process of adding widgets in Bokeh. Explain how widgets like Buttons, CheckboxGroup, RadioGroup and Sliders enhance interactivity in dashboards. Illustrate with a real-world application, such as a sales or weather monitoring dashboard. (05)

Q. 4. Answer Following in detail:

- A. Power BI can also connect to other sources like OData, Web and SharePoint. Explain in detail how these sources can be used in organizations and what advantages they provide for collaboration and automation. (07)

OR

- A. Discuss how Python scripts can be integrated with Power BI. Explain step-by-step procedure and give examples where Python enhances Power BI capabilities.

- B. Explain the role of Power Query Editor in Power BI. Describe its features such as data cleaning, transformation, merging queries, appending queries and handling missing values with examples. (05)

Q. 5. Write short-note on following : (Any Two) (12)

1. Explain the importance of data transformation in Power BI. How do formatting and data type conversion impact the accuracy of reports?
 2. What is data profiling in Power BI? Describe different profiling tools (Column Quality, Column Distribution and Column Profile) and explain how they help in ensuring data quality.
 3. Differentiate between Merge Queries and Append Queries in Power BI. Give suitable real-life examples where each would be used.
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