📘 Data Analyst Teaching Plan (Theory + Answers)

Step 1: Introduction to Data & Analytics

Q1: What is Data?
Answer: Data is raw facts and figures collected from different sources. It can be numbers, text, images, videos, or transactions.

- **Structured data** → organized in rows & columns (e.g., Excel, databases).
- **Unstructured data** → no fixed format (e.g., emails, images, social media posts).

Q2: What is Data Analytics?
Answer: Data Analytics is the process of examining data to find useful insights, patterns, and trends that help in making decisions.

Q3: What are the types of Analytics?
Answer:

1. **Descriptive Analytics** → "What happened?" (e.g., monthly sales report).
2. **Diagnostic Analytics** → "Why did it happen?" (e.g., why sales dropped).
3. **Predictive Analytics** → "What will happen?" (e.g., forecast sales).
4. **Prescriptive Analytics** → "What should we do?" (e.g., marketing strategy).

Q4: Who is a Data Analyst?
Answer: A Data Analyst collects, cleans, and analyzes data to provide meaningful insights to support business decisions.

Step 2: Basics of Excel/Spreadsheets

Q1: What is a spreadsheet?

Answer: A spreadsheet is a digital sheet made up of rows and columns that stores and processes data (e.g., Excel, Google Sheets).

Q2: What are common Excel functions used by analysts?
Answer:

- **SUM** → adds numbers.
- **AVERAGE** → finds the mean.
- **IF** → applies conditions.
- **VLOOKUP** → finds values from another table.

Q3: What is a Pivot Table?
Answer: A Pivot Table is a tool in Excel used to quickly summarize, analyze, and organize data into reports.

Q4: Why do analysts use charts?
Answer: Charts help in visualizing data so that patterns, comparisons, and trends are easy to understand.

Step 3: Databases & SQL

Q1: What is a database?
Answer: A database is a structured collection of data stored electronically. It allows easy access, management, and updating of data.

Q2: What is SQL?
Answer: SQL (Structured Query Language) is a language used to interact with databases—fetching, updating, and analyzing data.

Q3: What are some common SQL commands?
Answer:

- **SELECT** → retrieves data.
- **WHERE** → applies conditions.
- **ORDER BY** → sorts data.
- **GROUP BY** → groups similar data.
- **HAVING** → applies conditions on grouped data.

Q4: What are SQL Joins?
Answer: SQL Joins combine rows from two or more tables based on related columns.

- **INNER JOIN** → matching rows only.
- **LEFT JOIN** → all rows from left table + matches from right.
- **RIGHT JOIN** → all rows from right table + matches from left.
- **FULL OUTER JOIN** → all rows from both tables.

Step 4: Introduction to Python

Q1: Why use Python in Data Analytics?
Answer: Python is simple, has many libraries (Pandas, NumPy, Matplotlib, Seaborn), and is widely used for handling, analyzing, and visualizing data.

Q2: What is a library in Python?
Answer: A library is a collection of pre-written code that provides functions and tools (e.g., Pandas for data, Matplotlib for charts).

Q3: What are key Python libraries for analysts?
Answer:

- **NumPy** → works with numbers and arrays.
- **Pandas** → data cleaning and manipulation.
- **Matplotlib** → data visualization.
- **Seaborn** → advanced statistical plots.

Step 5: Data Cleaning & Preparation

Q1: What is Data Cleaning?
Answer: Data Cleaning is the process of correcting or removing errors in data (e.g., missing values, duplicates, incorrect formats).

Q2: Why is Data Cleaning important?
Answer: Because poor-quality data leads to wrong insights and poor business decisions.

Q3: What are common data problems?
Answer:

- Missing values.
- Duplicates.
- Outliers (unusual values).
- Inconsistent formats (e.g., date formats).

Q4: What is Exploratory Data Analysis (EDA)?
Answer: EDA is the process of exploring datasets using statistics and visualizations to understand patterns and relationships.

Step 6: Data Visualization

Q1: Why do we visualize data?
Answer: To make data easy to understand, spot trends quickly, and communicate insights effectively.

Q2: What are the principles of good visualization?
Answer:

- Be clear and simple.
- Avoid misleading scales.
- Use the right chart for the right data.
- Highlight key insights.

Q3: What are common chart types?
Answer:

- Line chart → trends over time.
- Bar chart → comparison.
- Histogram → distribution.
- Scatter plot → relationships between variables.
- Heatmap → correlations.

Q4: What is a dashboard?
Answer: A dashboard is a visual display of key metrics and insights, often interactive, used by businesses for quick decision-making.

Step 7: Business Applications of Analytics

Q1: How is Data Analytics used in real life?
Answer:

- **Retail** → sales forecasting, customer behavior.

- **Finance** → fraud detection, credit risk.
- **Healthcare** → patient data, treatment analysis.
- **Marketing** → campaign performance, customer segmentation.

Q2: Why is asking the right business question important?
Answer: Because analysis without the right question gives irrelevant results. For example, instead of just asking “What are sales?” ask “Why did sales drop in June?”

Q3: What is data storytelling?
Answer: Data storytelling is the practice of explaining insights from data in a clear, logical, and impactful way to help business leaders make decisions.

Step 8: Projects & Case Studies

Q1: What is the analytics workflow?
Answer:

1. Data Collection.
2. Data Cleaning.
3. Data Analysis.
4. Data Visualization.
5. Reporting & Decision-making.

Q2: Example Projects for Beginners?
Answer:

- **Sales Analysis** → identify top products, revenue trends.
- **Customer Behavior Analysis** → understand buying patterns.
- **YouTube Data Analysis** → analyze video performance metrics.