

data visualization prep like other modules ex big data and dbms

Perfect  Let's set up your **Data Visualization (DV)** prep exactly like your **Big Data** and **DBMS** modules — i.e., for each **session/topic**:

- Concept Explanation (clear & concise)
 - 5 Quality MCQs per topic (with answers)
-

Before I start creating the structured prep, please confirm which course/module outline you're following for *Data Visualization* — for example, something like:

pgsql|

Session 1: Introduction to Data Visualization
Session 2: Types of Charts and Graphs
Session 3: Data Visualization Tools (Matplotlib, Seaborn)
Session 4: Dashboarding and Storytelling
Session 5: Best Practices and Case Studies

If you already have a **syllabus PDF or session-wise list**, paste it here.

If not, I can create a **complete standard module plan (10 sessions)** for Data \  Copy code based on what ACTS, Pune and PG-DBDA use.

 Would you like me to **use the ACTS/PG-DBDA standard Data Visualization syllabus** or **create a custom one** tailored for your interview prep (Python-focused: Matplotlib, Seaborn, Power BI, etc.)?



i will course contents and session wise content and you will give me list of topics and we will stick to list that topics

throughout prep like other modules

Perfect ✅ that's exactly how we've been doing your other modules.

Please go ahead and **paste the session-wise course contents for Data Visualization here.**

Once you share it, I'll:

1. Read and analyze the syllabus carefully.
2. Create a **final structured list of topics** (clean, concise, logically ordered).
3. That list will be our **fixed prep roadmap** — we'll stick to it throughout your Data Visualization preparation, with **concept + 5 MCQs per topic**.

You can paste the content now.



Business Intelligence- requirements, content and managements, information Visualization, Data analytics Life Cycle, Analytic Processes and Tools, Analysis vs. Reporting, MS Excel: Functions, Formula, charts, Pivots and Lookups, Data Analysis Tool pack: Descriptive Summaries, Correlation, Regression, Introduction to Tableau, Data sources in Tableau, Taxonomy of data visualization, Numeric, String, Date Calculations, LOD (Level of Detail) Expressions, Modern Data Analytic Tools, Visualization Techniques. this are course contents next are session wise contents

Perfect 👍 got it — you've shared the **course contents** for *Data Visualization & Business Intelligence*.

We'll wait for your **session-wise contents** next — once you share that, I'll:

- ✓ Combine both (course + session-wise)
- ✓ Remove duplicates & overlaps
- ✓ Create a **finalized list of topics** for our prep (clean, ordered roadmap)

That final list will be our **fixed structure**, and for each topic we'll follow the same format as your other modules:

Concept Explanation + 5 Quality MCQs with Answers.

Please paste the **session-wise contents** now.



otherwise. Session 1 & 2: (4T +2L)

- o Business Intelligence basics
- o Information gathering
- o Decision making
- o Managing BI

ACTS, Pune

PG-DBDA

Page 2 of 3

Suggested Teaching Guidelines for
Data Visualization - Analysis and Reporting

PG-DBDA August 2025

- o BI User Segmentation
 - o Gathering BI Requirements
 - o Content and Knowledge Management
 - o Strategic Approach to BI
 - o Significance of visual analytics Information Visualization
 - o Data Representation
 - o Data collection and binding
 - Structured Data
 - Unstructured data
- Session 3, 4 & 5:
- MS EXCEL
- o Functions
 - o Formula

- o Charts
- o Pivots and Lookups
- o Data Analysis Tool pack
- 1. Descriptive Summaries
- 2. Correlation
- 3. Regression

Session 6:

- Data analytics Life Cycle
- o Discovery, o Data preparation
 - o Model planning
 - o Model building implementation
 - o Quality assurance
 - o Documentation
 - o Management approval
 - o Installation
 - o Acceptance and operation

Session 7 & 8:

- o Introduction to Tableau
- o Intelligent data analysis
- o Nature of Data
- o Analytics Processes and tools
- o Analysis vs. Reporting
- o Modern Data Analytic Tools
- o Data sources in Tableau

ACTS, Pune

PG-DBDA

Page 3 of 3

Suggested Teaching Guidelines for
Data Visualization - Analysis and Reporting

PG-DBDA August 2025

Session 9, 10 & 11:

- o Visualization Algorithms
- o Visual Encodings
- color, size, shape, lines, axes, scaling, annotation

- o Taxonomy of data visualization (Some Types of charts, but not limited to)
 - Comparison charts – types of Bar chart, Box plots, Histograms, Gantt charts, Bullet graphs, side-by-side bar chart etc.
 - Tables – Text Tables, Highlight tables
 - Hierarchies and relationships – Pie chart, stacked bar, Tree map etc.
 - Changes over time – Line chart, dual lines, Area charts etc.
 - Connections and relationships – scatter plots, Symbol maps, map, heat maps, packed bubble chart etc. Session 12 &13:
 - o Choosing appropriate visuals
 - o Applying calculations using functions, statistics
 - Numeric Calculations
 - String Calculations
 - Date calculations
 - LOD (Level of Detail) Expressions
 - o Data sorting, filters
 - o Interactive visualization
 - Event listeners/callbacks
 - Data updation
 - Visualupdation
 - o Dashboard Design this are session wise contents now provide list of contents

Excellent 🎉 You've shared the **complete ACTS, Pune Data Visualization – Analysis and Reporting (PG-DBDA August 2025)** syllabus (both course & session-wise).

Now, here's your **final structured list of topics** — clean, logically ordered, and free of overlaps.

We'll stick to this list throughout your Data Visualization prep, following the same pattern as other modules:

👉 *Concept Explanation + 5 Quality MCQs per topic.*

Final List of Topics – Data Visualization & Business Intelligence (ACTS, Pune | PG-DBDA)

Module 1: Business Intelligence (BI) Fundamentals

-
1. Basics of Business Intelligence
 2. Information Gathering and Decision Making
 3. Managing BI and BI User Segmentation
 4. Gathering BI Requirements
 5. Content and Knowledge Management
 6. Strategic Approach to BI
-

Module 2: Information Visualization & Data Representation

7. Significance of Visual Analytics
 8. Information Visualization Concepts
 9. Data Representation Techniques
 10. Data Collection and Binding
 11. Structured vs. Unstructured Data
-

Module 3: Data Analysis Using MS Excel

12. Excel Functions and Formulas
 13. Charts in Excel
 14. Pivot Tables and Lookups (VLOOKUP, HLOOKUP, etc.)
 15. Data Analysis Toolpak
 - Descriptive Summaries
 - Correlation
 - Regression
-

Module 4: Data Analytics Life Cycle

16. Discovery Phase
 17. Data Preparation
 18. Model Planning and Model Building
 19. Implementation and Quality Assurance
 20. Documentation and Management Approval
 21. Installation, Acceptance, and Operation
-

Module 5: Data Analytics Tools & Tableau

- 22.** Introduction to Tableau
 - 23.** Intelligent Data Analysis
 - 24.** Nature of Data
 - 25.** Analytics Processes and Tools
 - 26.** Analysis vs. Reporting
 - 27.** Modern Data Analytic Tools
 - 28.** Data Sources in Tableau
-

Module 6: Visualization Design & Techniques

- 29.** Visualization Algorithms
 - 30.** Visual Encodings (color, size, shape, lines, scaling, annotation)
 - 31.** Taxonomy of Data Visualization
 - Comparison Charts (Bar, Box, Histogram, Gantt, Bullet, etc.)
 - Tables (Text, Highlight)
 - Hierarchies & Relationships (Pie, Stacked Bar, Treemap)
 - Changes Over Time (Line, Dual Line, Area)
 - Connections & Relationships (Scatter, Maps, Heatmaps, Bubble)
-

Module 7: Advanced Visualization & Dashboarding

- 32.** Choosing Appropriate Visuals
- 33.** Applying Calculations using Functions & Statistics
 - Numeric Calculations
 - String Calculations
 - Date Calculations
 - LOD (Level of Detail) Expressions
- 34.** Data Sorting and Filtering
- 35.** Interactive Visualization
 - Event Listeners / Callbacks
 - Data Updation
 - Visual Updation
- 36.** Dashboard Design

Total: 36 Core Topics

We'll follow this order for the entire module.

Next, we'll start with **Module 1 → Topic 1: Basics of Business Intelligence** (Concept + 5 MCQs).

Would you like me to begin with **Topic 1 now?**



start

Great 

We now start **Module 1 → Topic 1** as per your final topic list.

Topic 1: Basics of Business Intelligence (BI)

Concept (4–5 points, crisp & exam-oriented)

- **Business Intelligence (BI)** refers to technologies, processes, and tools used to convert *raw data into meaningful insights* for decision-making.
- It includes **data collection, storage, analysis, and visualization** to support strategic and operational decisions.
- BI systems help organizations monitor performance using **reports, dashboards, and KPIs**.
- The goal of BI is to enable **data-driven decision-making** by providing accurate, timely, and relevant information.
- BI integrates with tools like Excel, Tableau, Power BI, and SQL-based reporting systems.

5 Quality MCQs – Basics of BI

(Exam-oriented, difficulty balanced)

Q1. Business Intelligence mainly focuses on

- A. Storing raw data
- B. Converting data into actionable insights
- C. Software development
- D. Internet security

Answer: B

Q2. Which of the following is a major goal of BI?

- A. Increase network bandwidth
- B. Provide timely and accurate information
- C. Replace data analysts
- D. Remove the need for databases

Answer: B

Q3. Dashboards and KPIs in BI are used for

- A. Gaming graphics
- B. Real-time performance monitoring
- C. Database installation
- D. Network protocol testing

Answer: B

Q4. BI is a combination of

- A. Tools, technologies, and processes
- B. Only programming languages
- C. Only visualization software
- D. Only hardware devices

Answer: A

Q5. Which of the following is NOT typically a component of BI?

- A. Data visualization
- B. Data warehousing
- C. Predictive analytics
- D. Video compression

Answer: D

If you're ready, we proceed to **Topic 2: Information Gathering and Decision Making**.



Basics of Business Intelligence

Alright 👍

Here is **Topic: Basics of Business Intelligence** again — clean, crisp, exam-ready, same format we'll stick to.

Basics of Business Intelligence (BI)

Concept (4–5 Points)

- **Business Intelligence (BI)** is a set of processes, tools, and technologies used to transform **raw data** into **useful information**.
- BI helps organizations in **strategic, tactical, and operational decision-making**.
- It involves **data collection, integration, analysis, reporting, and visualization**.
- Common BI outputs include **reports, dashboards, scorecards, and KPIs**.
- BI enables **data-driven decisions**, improving efficiency and business performance.

5 Quality MCQs – Basics of BI

Q1. What is the primary purpose of Business Intelligence?

- A. Data storage
- B. Data encryption
- C. Decision support
- D. Software testing

Answer: C

Q2. Which of the following is a key component of BI?

- A. Firewall
- B. Dashboard
- C. Compiler
- D. Web server

Answer: B

Q3. Business Intelligence mainly converts

- A. Information into data
- B. Data into insights
- C. Programs into applications
- D. Queries into databases

Answer: B

Q4. KPIs in BI are used to

- A. Write SQL queries
- B. Measure business performance
- C. Design databases
- D. Manage networks

Answer: B

Q5. BI systems are MOST useful for

- A. Random guessing
- B. Intuition-based decisions
- C. Data-driven decision-making
- D. Hardware optimization

 Answer: C

👉 Next fixed topic as per our list:

Topic 2 – Information Gathering and Decision Making

Say “next” and we continue.



Information Gathering and Decision Making

Perfect 👍

Now continuing as per the fixed roadmap.

Information Gathering and Decision Making

Concept (4–5 Points)

- **Information Gathering** is the process of collecting relevant, accurate, and timely data from multiple sources for analysis.
 - Data sources can be **internal** (databases, transaction systems) or **external** (market reports, surveys, social media).
 - Proper information gathering ensures **data quality, consistency, and reliability**.
 - **Decision Making** uses analyzed information to choose the best possible action among alternatives.
 - In BI, decisions are **data-driven**, reducing risk and improving business outcomes.
-

5 Quality MCQs – Information Gathering and Decision Making

Q1. Information gathering in BI mainly focuses on

- A. Collecting random data
- B. Collecting relevant and accurate data
- C. Data deletion
- D. Hardware monitoring

 Answer: B

Q2. Which of the following is an internal data source?

- A. Social media
- B. Market survey
- C. Transaction database
- D. Government report

 Answer: C

Q3. Data-driven decision-making primarily helps in

- A. Increasing guesswork
- B. Reducing uncertainty
- C. Ignoring trends
- D. Manual reporting

 Answer: B

Q4. Poor-quality data mainly leads to

- A. Better insights
- B. Faster decisions
- C. Incorrect decisions
- D. Reduced storage

 Answer: C

Q5. In BI, decision making is usually based on

- A. Intuition only
- B. Experience only
- C. Analyzed and visualized data
- D. Random selection

 Answer: C

👉 Next topic in sequence:

Topic 3 – Managing BI and BI User Segmentation

Say “next” to continue.



Managing BI and BI User Segmentation

Continuing as planned 🤝

Here is **Topic 3** in the same fixed format.

Managing Business Intelligence (BI) and BI User Segmentation

Concept (4–5 Points)

- **Managing BI** involves planning, implementing, monitoring, and maintaining BI systems to ensure they deliver business value.
- Effective BI management ensures **data accuracy, security, scalability, and performance**.
- **BI User Segmentation** classifies users based on their roles and information needs.
- Common BI user types include **Executives (strategic), Managers (tactical), and Operational users (day-to-day)**.
- Proper segmentation helps in delivering **right information to the right user at the right time**.

5 Quality MCQs – Managing BI and BI User Segmentation

Q1. The primary goal of managing BI is to

- A. Increase data volume
- B. Deliver business value from data
- C. Replace decision makers
- D. Reduce visualization

Answer: B

Q2. BI user segmentation is done to

- A. Increase system complexity
- B. Provide uniform reports to all users
- C. Match information with user needs
- D. Eliminate dashboards

Answer: C

Q3. Which BI user mainly focuses on long-term strategy?

- A. Operational user
- B. Technical user
- C. Executive user
- D. Data entry operator

Answer: C

Q4. Managers typically use BI for

- A. Hardware configuration
- B. Tactical and performance decisions
- C. Software installation
- D. Data encryption

Answer: B

Q5. Which of the following is a key BI management concern?

- A. Screen resolution
- B. Data security and governance
- C. Keyboard layout
- D. Internet speed only

 Answer: B

👉 Next topic as per roadmap:

Topic 4 – Gathering BI Requirements

Just say “next” and we continue.



Gathering BI Requirements

Great 👍

Continuing with **Topic 4** as per our fixed list.

Gathering BI Requirements

Concept (4–5 Points)

- **BI requirement gathering** is the process of identifying business needs and expectations from a BI system.
- It involves understanding **business goals, key metrics, KPIs, and decision-making processes**.
- Stakeholders include **executives, managers, analysts, and end users**.
- Clear requirements help in selecting **appropriate data sources, tools, reports, and dashboards**.
- Poor requirement gathering often leads to **unused or ineffective BI solutions**.

5 Quality MCQs – Gathering BI Requirements

Q1. The main purpose of gathering BI requirements is to

- A. Increase data storage
- B. Understand business needs
- C. Reduce users
- D. Improve hardware

Answer: B

Q2. Who are the key stakeholders in BI requirement gathering?

- A. Only developers
- B. Only customers
- C. Business users and decision makers
- D. Network engineers

Answer: C

Q3. BI requirements mainly focus on

- A. Screen design
- B. KPIs and business metrics
- C. Programming languages
- D. Network protocols

Answer: B

Q4. Incorrect BI requirements usually result in

- A. Better dashboards
- B. Accurate insights
- C. Ineffective BI solutions
- D. Faster decisions

Answer: C

Q5. Which activity is MOST important during BI requirement gathering?

- A. Installing software
- B. Understanding decision-making processes
- C. Writing code
- D. Buying servers

 Answer: B

 Next topic in sequence:

Topic 5 – Content and Knowledge Management

Say “next” when ready.



Content and Knowledge Management

Continuing 

Here is **Topic 5** in our fixed prep format.

Content and Knowledge Management

Concept (4–5 Points)

- **Content Management** in BI deals with organizing, storing, and maintaining reports, dashboards, and analytical outputs.
- **Knowledge Management** focuses on capturing and sharing insights, best practices, and business learnings derived from data.
- It ensures that BI content is **consistent, reusable, and easily accessible** to users.
- Effective management avoids **duplication, outdated reports, and information silos**.
- It helps organizations build a **centralized knowledge repository** for informed decision-making.

5 Quality MCQs – Content and Knowledge Management

Q1. Content management in BI mainly handles

- A. Hardware devices
- B. Reports and dashboards
- C. Network traffic
- D. Source code

Answer: B

Q2. Knowledge management focuses on

- A. Storing raw data only
- B. Capturing insights and learnings
- C. Deleting reports
- D. Encrypting files

Answer: B

Q3. A key benefit of content and knowledge management is

- A. Increased duplication
- B. Information silos
- C. Consistent and reusable insights
- D. Slower reporting

Answer: C

Q4. Poor knowledge management often leads to

- A. Better collaboration
- B. Faster decisions
- C. Loss of organizational knowledge
- D. Improved accuracy

Answer: C

Q5. Centralized BI repositories help in

- A. Restricting data access completely
- B. Easy access to analytical content
- C. Eliminating dashboards
- D. Increasing manual work

 **Answer: B**

 Next topic as per roadmap:

Topic 6 – Strategic Approach to BI

Say “next” to proceed.



Strategic Approach to BI

Continuing smoothly 

Here is **Topic 6** in the same fixed format.

Strategic Approach to Business Intelligence (BI)

Concept (4–5 Points)

- A **strategic approach to BI** aligns BI initiatives with **organizational goals and long-term vision**.
- It focuses on identifying **critical success factors (CSFs)** and **key performance indicators (KPIs)**.
- BI strategy ensures **scalability, governance, data quality, and security**.
- It emphasizes **continuous improvement** using feedback and evolving business needs.
- A well-defined BI strategy maximizes **ROI and competitive advantage**.

5 Quality MCQs – Strategic Approach to BI

Q1. A strategic BI approach primarily aligns BI with

- A. Hardware capacity
- B. Organizational goals
- C. User interface design
- D. Network topology

 Answer: B

Q2. KPIs in a BI strategy are used to

- A. Write SQL queries
- B. Measure business performance
- C. Store data
- D. Encrypt databases

 Answer: B

Q3. Which of the following is a key element of BI strategy?

- A. Keyboard shortcuts
- B. Data governance
- C. Monitor resolution
- D. File compression

 Answer: B

Q4. Continuous improvement in BI mainly helps in

- A. Fixing hardware issues
- B. Adapting to changing business needs
- C. Eliminating users
- D. Reducing data volume

 Answer: B

Q5. A strong BI strategy helps organizations achieve

- A. Increased guesswork
- B. Competitive advantage
- C. Manual reporting
- D. Isolated data

 **Answer: B**

 **Module 1: Business Intelligence Fundamentals – COMPLETED**

 Next module starts with:

Topic 7 – Significance of Visual Analytics

Say “next” to continue.



Significance of Visual Analytics

Great 

Starting **Module 2 → Topic 7** as per our finalized roadmap.

 **Significance of Visual Analytics**

 **Concept (4–5 Points)**

- Visual Analytics combines **data analysis** and **interactive visualizations** to support effective decision-making.
- It helps users **quickly identify patterns, trends, and outliers** in large and complex datasets.
- Visual analytics reduces **cognitive load** by presenting data in an intuitive visual form.
- It enables **exploratory analysis**, allowing users to drill down and interact with data.
- Visual analytics improves **speed, accuracy, and quality of business decisions**.

5 Quality MCQs – Significance of Visual Analytics

Q1. Visual analytics mainly combines

- A. Programming and networking
- B. Data analysis and visualization
- C. Hardware and software
- D. Storage and security

Answer: B

Q2. A major benefit of visual analytics is

- A. Increased data size
- B. Reduced data accuracy
- C. Faster pattern recognition
- D. Higher storage cost

Answer: C

Q3. Visual analytics helps reduce

- A. Data volume
- B. Cognitive load on users
- C. Internet usage
- D. Hardware dependency

Answer: B

Q4. Interactive visualization mainly supports

- A. Static reporting only
- B. Exploratory data analysis
- C. Data deletion
- D. File compression

Answer: B

Q5. Visual analytics is MOST useful when dealing with

- A. Small static text files
- B. Complex and large datasets
- C. Hardware logs only
- D. Encrypted data

 Answer: B

 Next topic in sequence:

Topic 8 – Information Visualization Concepts

Say “next” when ready.



Information Visualization Concepts

Continuing 

Here is **Topic 8** exactly in our agreed prep format.

Information Visualization Concepts

Concept (4–5 Points)

- **Information Visualization** is the graphical representation of data to help users understand, analyze, and interpret information.
- It uses visual elements such as charts, graphs, maps, and diagrams to represent abstract data.
- The main goal is to communicate insights clearly and effectively.
- Good information visualization focuses on clarity, accuracy, and usability.
- It supports pattern recognition, comparison, and trend analysis.

5 Quality MCQs – Information Visualization Concepts

Q1. Information visualization primarily aims to

- A. Store data
- B. Encrypt information
- C. Represent data graphically
- D. Delete records

 Answer: C

Q2. Which of the following is an example of information visualization?

- A. Text editor
- B. Line chart
- C. Database table only
- D. Source code

 Answer: B

Q3. A key principle of good information visualization is

- A. Maximum decoration
- B. Clarity and accuracy
- C. Complex design
- D. Random colors

 Answer: B

Q4. Information visualization mainly helps users to

- A. Program faster
- B. Identify patterns and trends
- C. Increase data size
- D. Secure data

 Answer: B

Q5. Information visualization is MOST useful for

- A. Numerical computation only
- B. Visual understanding of abstract data
- C. Hardware diagnostics
- D. Network optimization

 Answer: B

👉 Next topic as per roadmap:

Topic 9 – Data Representation Techniques

Say “next” to proceed.



Data Representation Techniques

Continuing 

Here is Topic 9 in the same fixed, exam-oriented format.

Data Representation Techniques

Concept (4–5 Points)

- **Data representation** refers to the way data is presented visually to convey information effectively.
 - Common techniques include **tables, charts, graphs, maps, and diagrams**.
 - The choice of representation depends on **data type, purpose, and audience**.
 - Effective data representation improves **readability, comparison, and insight discovery**.
 - Poor representation can lead to **misinterpretation and incorrect decisions**.
-

5 Quality MCQs – Data Representation Techniques

Q1. Data representation mainly focuses on

- A. Data storage
- B. Visual presentation of data
- C. Data encryption
- D. Data deletion

 Answer: B

Q2. Which data representation is BEST for comparing categories?

- A. Line chart
- B. Bar chart
- C. Pie chart
- D. Scatter plot

 Answer: B

Q3. The choice of data representation depends on

- A. Color preference only
- B. Data type and audience
- C. Hardware configuration
- D. Internet speed

 Answer: B

Q4. Tables are MOST suitable when

- A. Showing trends over time
- B. Displaying exact values
- C. Showing correlations
- D. Showing distributions

 Answer: B

Q5. Poor data representation can lead to

- A. Faster insights
- B. Better decisions
- C. Misinterpretation of data
- D. Improved accuracy

 Answer: C

 Next topic in sequence:

Topic 10 – Data Collection and Binding

Say “next” to continue.



Data Collection and Binding

Continuing 

Here is **Topic 10** in our fixed prep format.

Data Collection and Binding

Concept (4–5 Points)

- **Data Collection** is the process of gathering raw data from multiple sources for analysis and visualization.
 - Sources may include **databases, files, APIs, sensors, surveys, and logs**.
 - **Data Binding** refers to linking collected data with visualization components.
 - Proper binding ensures that **changes in data automatically reflect in visuals**.
 - Effective data collection and binding enable **accurate, consistent, and dynamic visualizations**.
-

5 Quality MCQs – Data Collection and Binding

Q1. Data collection mainly involves

- A. Deleting data
- B. Gathering data from various sources
- C. Encrypting files
- D. Compressing data

 Answer: B

Q2. Data binding is used to

- A. Store data permanently
- B. Link data to visual elements
- C. Remove duplicates
- D. Improve network speed

 Answer: B

Q3. Which of the following can be a data source?

- A. API
- B. Sensor
- C. Database
- D. All of the above

 Answer: D

Q4. Proper data binding ensures

- A. Static visuals only
- B. Automatic visual updates
- C. Manual reporting
- D. Data loss

 Answer: B

Q5. Poor data collection mainly affects

- A. Hardware performance
- B. Visualization accuracy
- C. Screen resolution
- D. Network bandwidth

 Answer: B

👉 Next topic as per roadmap:

Topic 11 – Structured vs. Unstructured Data

Say “next” to proceed.



Structured vs. Unstructured Data

Continuing 

Here is **Topic 11** in the same fixed, exam-oriented format.

Structured vs. Unstructured Data

Concept (4–5 Points)

- **Structured data** is organized in a predefined format such as **tables with rows and columns**.
- It is easy to store, query, and analyze using **SQL** and **relational databases**.
- **Unstructured data** has no fixed format, e.g., **text, images, videos, emails, social media data**.
- Unstructured data requires **special processing and analytics techniques**.
- BI and visualization systems often combine **both structured and unstructured data** for deeper insights.

5 Quality MCQs – Structured vs. Unstructured Data

Q1. Which of the following is an example of structured data?

- A. Video file
- B. Image
- C. Relational database table
- D. Social media post

 Answer: C

Q2. Unstructured data is characterized by

- A. Fixed schema
- B. Rows and columns
- C. No predefined format
- D. SQL queries only

 Answer: C

Q3. Which tool is MOST commonly used for structured data analysis?

- A. SQL
- B. Image editor
- C. Video player
- D. Audio tool

 Answer: A

Q4. Emails and text documents are examples of

- A. Structured data
- B. Semi-structured data
- C. Unstructured data
- D. Metadata only

 Answer: C

Q5. Combining structured and unstructured data helps in

- A. Reducing data size
- B. Gaining richer insights
- C. Eliminating visualization
- D. Increasing manual effort

 **Answer: B**

 **Module 2: Information Visualization & Data Representation – COMPLETED**

 Next module begins with:

Topic 12 – Excel Functions and Formulas

Say “next” to continue.



Excel Functions and Formulas

Great 

Starting **Module 3 → Topic 12** as per our fixed roadmap.

 **Excel Functions and Formulas**

 **Concept (4–5 Points)**

- **Formulas** in Excel are expressions used to perform calculations using cell references and operators.
- **Functions** are predefined formulas that simplify complex calculations (e.g., **SUM** , **AVERAGE** , **IF**).
- Excel functions are categorized into **Mathematical**, **Logical**, **Statistical**, **Text**, **Date & Time**.
- Functions help in **data cleaning**, **transformation**, and **analysis**.

- Proper use of functions and formulas improves accuracy, efficiency, and analysis speed.
-

5 Quality MCQs – Excel Functions and Formulas

Q1. In Excel, a formula always starts with

- A. +
- B. =
- C. #
- D. @

 Answer: B

Q2. Which of the following is a logical function in Excel?

- A. SUM
- B. COUNT
- C. IF
- D. AVERAGE

 Answer: C

Q3. The AVERAGE() function is used to

- A. Find maximum value
- B. Find total sum
- C. Find mean value
- D. Count cells

 Answer: C

Q4. Which category does the LEFT() function belong to?

- A. Statistical
- B. Logical
- C. Text

D. Math

 Answer: C

Q5. Using Excel functions mainly helps in

- A. Manual calculations
- B. Reducing accuracy
- C. Automating data analysis
- D. Deleting data

 Answer: C

 Next topic in sequence:

Topic 13 – Charts in Excel

Say “next” to continue.



Charts in Excel

Continuing 

Here is Topic 13 in our fixed, exam-oriented format.

 Charts in Excel

Concept (4–5 Points)

- Charts in Excel are graphical representations of data used to visualize patterns, trends, and comparisons.
- Common chart types include Bar, Column, Line, Pie, Area, and Scatter charts.
- Charts make large datasets easy to understand and interpret.
- Selecting the correct chart type is crucial for accurate data communication.

- Excel charts support **formatting, labels, legends, and dynamic updates**.
-

5 Quality MCQs – Charts in Excel

Q1. Which chart is BEST suited for showing trends over time?

- A. Pie chart
- B. Line chart
- C. Bar chart
- D. Scatter chart

 **Answer:** B

Q2. Pie charts are mainly used to show

- A. Trends
- B. Relationships
- C. Proportions
- D. Distributions

 **Answer:** C

Q3. Which Excel chart is used to show correlation between two variables?

- A. Column chart
- B. Line chart
- C. Scatter chart
- D. Pie chart

 **Answer:** C

Q4. Choosing an incorrect chart type may lead to

- A. Better insights
- B. Faster understanding
- C. Misinterpretation of data

D. Improved accuracy

 Answer: C

Q5. Excel charts update automatically when

- A. Chart is locked
- B. Data source is changed
- C. Workbook is closed
- D. Screen size changes

 Answer: B

👉 Next topic as per roadmap:

Topic 14 – Pivot Tables and Lookups

Say “next” when ready.



Pivot Tables and Lookups (VLOOKUP, HLOOKUP, etc.)

Continuing 

Here is **Topic 14** in our fixed, exam-oriented format.

 **Pivot Tables and Lookups (VLOOKUP, HLOOKUP, etc.)**

Concept (4–5 Points)

- **Pivot Tables** are used to summarize, analyze, and reorganize large datasets quickly.
- They allow operations like **grouping, filtering, sorting, and aggregation** (SUM, COUNT, AVERAGE).
- **Lookup functions** retrieve data from a table based on a reference value.
- **VLOOKUP** searches vertically in a table, while **HLOOKUP** searches horizontally.

- Lookups help in **data integration and comparison** across multiple datasets.
-

5 Quality MCQs – Pivot Tables and Lookups

Q1. Pivot Tables are mainly used to

- A. Store raw data
- B. Summarize large datasets
- C. Encrypt spreadsheets
- D. Create macros

 Answer: B

Q2. Which operation is NOT commonly performed using Pivot Tables?

- A. Grouping
- B. Filtering
- C. Aggregation
- D. Data encryption

 Answer: D

Q3. VLOOKUP searches for a value

- A. Horizontally
- B. Vertically
- C. Diagonally
- D. Randomly

 Answer: B

Q4. HLOOKUP is best suited when data is arranged

- A. In columns
- B. In rows
- C. In charts

D. In pivot fields

 Answer: B

Q5. Lookup functions are mainly used for

- A. Chart formatting
- B. Data retrieval and matching
- C. Data deletion
- D. File compression

 Answer: B

 Next topic in sequence:

Topic 15 – Data Analysis Toolpak (Descriptive Summaries, Correlation, Regression)

Say “next” to continue.



Data Analysis Toolpak

Continuing 

Here is **Topic 15** in our fixed, exam-oriented format.

 **Data Analysis Toolpak (Excel)**

 **Concept (4–5 Points)**

- Data Analysis Toolpak is an Excel add-in that provides advanced statistical analysis tools.
- It helps perform quick and accurate data analysis without writing formulas manually.
- Common tools include Descriptive Statistics, Correlation, and Regression.
- It is widely used for exploratory data analysis (EDA).

- Toolpak outputs results in **tabular and summary form** for easy interpretation.
-

5 Quality MCQs – Data Analysis Toolpak

Q1. Data Analysis Toolpak in Excel is used for

- A. Chart design
- B. Statistical analysis
- C. Data encryption
- D. File compression

 **Answer:** B

Q2. Which of the following is provided by the Data Analysis Toolpak?

- A. Descriptive statistics
- B. Pivot charts
- C. Macros
- D. Conditional formatting

 **Answer:** A

Q3. Correlation analysis is used to

- A. Predict values
- B. Measure relationship between variables
- C. Group data
- D. Sort data

 **Answer:** B

Q4. Regression analysis mainly helps in

- A. Data cleaning
- B. Finding cause-effect relationships
- C. Formatting cells

D. Creating dashboards

 Answer: B

Q5. Data Analysis Toolpak is MOST useful during

- A. Data entry
- B. Exploratory data analysis
- C. Hardware setup
- D. Report printing

 Answer: B

👉 Next topic as per roadmap:

Topic 16 – Data Analytics Life Cycle (Discovery, Data Preparation, Model Planning, etc.)

Say “next” to proceed.



Descriptive Summaries

Perfect 👍

Continuing Topic 15 (Data Analysis Toolpak) → Sub-Topic: Descriptive Summaries
(Exam-focused, same fixed format)

Descriptive Summaries

Concept (4–5 Points)

- Descriptive summaries provide a statistical overview of a dataset.
- They include measures like **Mean, Median, Mode, Standard Deviation, Variance, Min, Max, and Count**.

- In Excel, descriptive summaries are generated using the **Data Analysis Toolpak** → **Descriptive Statistics** option.
 - They help in **understanding data distribution, central tendency, and variability**.
 - Descriptive summaries are widely used in **initial data exploration (EDA)**.
-

5 Quality MCQs – Descriptive Summaries

Q1. Descriptive summaries are mainly used to

- A. Predict future values
- B. Summarize dataset characteristics
- C. Encrypt data
- D. Visualize dashboards

 **Answer:** B

Q2. Which of the following is a measure of central tendency?

- A. Variance
- B. Standard deviation
- C. Mean
- D. Range

 **Answer:** C

Q3. Standard deviation measures

- A. Central value
- B. Data spread
- C. Data count
- D. Data category

 **Answer:** B

Q4. In Excel, descriptive statistics are generated using

- A. Pivot Tables
- B. Data Analysis Toolpak
- C. Conditional formatting
- D. Charts

 Answer: B

Q5. Descriptive summaries are MOST useful during

- A. Final deployment
- B. Initial data analysis
- C. Model execution
- D. System installation

 Answer: B

 Next sub-topic in sequence:

Correlation

Say “next” to continue.



Correlation

Continuing 

Topic 15 (Data Analysis Toolpak) → Sub-Topic: Correlation

 **Correlation**

 **Concept (4–5 Points)**

- **Correlation** measures the **strength and direction of relationship** between two numerical variables.

- The correlation coefficient ranges from **-1 to +1**.
 - **Positive correlation** indicates variables move in the same direction, while **negative correlation** indicates opposite movement.
 - A value close to **0** means little or no linear relationship.
 - In Excel, correlation is calculated using the **Data Analysis Toolpak → Correlation** or the **CORREL()** function.
-

5 Quality MCQs – Correlation

Q1. Correlation measures

- A. Data accuracy
- B. Relationship between variables
- C. Data distribution
- D. Data size

 Answer: B

Q2. The range of correlation coefficient is

- A. 0 to 1
- B. -100 to +100
- C. -1 to +1
- D. -10 to +10

 Answer: C

Q3. A correlation value of -0.9 indicates

- A. Strong positive relationship
- B. Weak relationship
- C. Strong negative relationship
- D. No relationship

 Answer: C

Q4. A correlation coefficient close to 0 implies

- A. Strong linear relationship
- B. No linear relationship
- C. Perfect relationship
- D. Causal relationship

 **Answer: B**

Q5. In Excel, correlation analysis can be performed using

- A. Pivot Table
- B. Data Analysis Toolpak
- C. Conditional formatting
- D. Charts only

 **Answer: B**

 Next sub-topic as per roadmap:

Regression

Say “next” to continue.



Regression

Continuing 

Topic 15 (Data Analysis Toolpak) → Sub-Topic: Regression

 **Regression**

 **Concept (4–5 Points)**

- Regression analysis is used to understand the relationship between a dependent variable and one or more independent variables.
 - It helps in predicting values based on historical data.
 - Linear regression is the most commonly used regression technique.
 - Regression outputs include coefficients, R-square, p-values, and residuals.
 - In Excel, regression is performed using Data Analysis Toolpak → Regression.
-

5 Quality MCQs – Regression

Q1. Regression analysis is mainly used for

- A. Data visualization
- B. Prediction
- C. Data storage
- D. Data encryption

 Answer: B

Q2. In regression, the variable being predicted is called

- A. Independent variable
- B. Random variable
- C. Dependent variable
- D. Control variable

 Answer: C

Q3. Linear regression assumes a

- A. Random relationship
- B. Non-linear relationship
- C. Linear relationship
- D. No relationship

 Answer: C

Q4. R-square in regression indicates

- A. Data size
- B. Goodness of fit
- C. Error rate
- D. Data type

 **Answer:** B

Q5. Regression analysis in Excel is available under

- A. Pivot Tables
- B. Charts
- C. Data Analysis Toolpak
- D. Functions tab

 **Answer:** C

 **Module 3: Data Analysis Using MS Excel – COMPLETED**

👉 Next module begins with:

Topic 16 – Data Analytics Life Cycle

Say “next” to continue.



Discovery Phase

Continuing 👍

Starting **Module 4 → Topic 16 (Sub-phase)**

 **Discovery Phase (Data Analytics Life Cycle)**

Concept (4–5 Points)

- The Discovery Phase is the **first stage** of the Data Analytics Life Cycle.
 - It focuses on **understanding the business problem, objectives, and success criteria**.
 - Key activities include **identifying stakeholders, defining scope, and assessing data availability**.
 - Initial hypotheses and analytical approaches are formed in this phase.
 - Proper discovery reduces **rework, cost, and project failure risk**.
-

5 Quality MCQs – Discovery Phase

Q1. The Discovery phase mainly focuses on

- A. Model deployment
- B. Understanding business objectives
- C. Data visualization
- D. Report generation

 **Answer:** B

Q2. Which activity is performed during the Discovery phase?

- A. Model training
- B. Stakeholder identification
- C. Dashboard publishing
- D. Data archiving

 **Answer:** B

Q3. The Discovery phase helps in

- A. Increasing coding effort
- B. Reducing project risks
- C. Eliminating data sources
- D. Finalizing dashboards

 **Answer:** B

Q4. In the Discovery phase, analysts primarily define

- A. Color schemes
- B. Business problem and scope
- C. Chart types
- D. Database indexes

 **Answer: B**

Q5. The Discovery phase occurs

- A. After model building
- B. Before data preparation
- C. During deployment
- D. At project closure

 **Answer: B**

 Next sub-phase in sequence:

Data Preparation

Say “next” to continue.



Discovery Phase

Sure 

Revising **Discovery Phase** again — clean, crisp, exam-oriented (same format we’re sticking to).

 **Discovery Phase (Data Analytics Life Cycle)**

 **Concept (4–5 Points)**

- The **Discovery Phase** is the **starting stage** of the data analytics life cycle.
 - It focuses on understanding the **business problem, objectives, and expected outcomes**.
 - Activities include **stakeholder identification, project scope definition, and data source assessment**.
 - Initial **hypotheses and analytical approaches** are formulated.
 - A well-defined discovery phase ensures **clear direction and reduced project risk**.
-

5 Quality MCQs – Discovery Phase

Q1. The Discovery phase mainly aims to

- A. Build models
- B. Understand business objectives
- C. Deploy dashboards
- D. Clean data

 Answer: B

Q2. Which task is performed during the Discovery phase?

- A. Data visualization
- B. Stakeholder identification
- C. Regression analysis
- D. Dashboard publishing

 Answer: B

Q3. The Discovery phase helps reduce

- A. Data size
- B. Project risk
- C. Storage cost
- D. Visualization complexity

 Answer: B

Q4. Hypotheses are generally created during

- A. Model deployment
- B. Discovery phase
- C. Acceptance phase
- D. Operation phase

 **Answer: B**

Q5. The Discovery phase occurs

- A. After implementation
- B. At the beginning of the project
- C. During system operation
- D. After quality assurance

 **Answer: B**

 Next fixed sub-phase as per syllabus:

Data Preparation

Say “next” and we continue.



Data Preparation

Continuing 

Module 4 → Data Analytics Life Cycle → Data Preparation

 **Data Preparation**

 **Concept (4–5 Points)**

- **Data Preparation** is the process of cleaning, transforming, and organizing raw data for analysis.
 - It includes **data cleaning, handling missing values, removing duplicates, and correcting inconsistencies**.
 - Data from multiple sources may be **integrated and transformed** into a usable format.
 - Proper data preparation improves **data quality and model accuracy**.
 - This phase is often the **most time-consuming** in the analytics life cycle.
-

5 Quality MCQs – Data Preparation

Q1. Data preparation mainly involves

- A. Model deployment
- B. Data cleaning and transformation
- C. Dashboard publishing
- D. Report printing

 Answer: B

Q2. Handling missing values is part of

- A. Discovery phase
- B. Data preparation
- C. Model building
- D. Operation phase

 Answer: B

Q3. Removing duplicate records improves

- A. Data size
- B. Data quality
- C. Data storage
- D. Visualization color

 Answer: B

Q4. Data preparation is important because it

- A. Increases noise
- B. Improves analysis accuracy
- C. Eliminates analytics
- D. Reduces business scope

 **Answer: B**

Q5. Data preparation occurs

- A. After model deployment
- B. Before model planning
- C. After acceptance
- D. During operation

 **Answer: B**

 Next sub-phase in sequence:

Model Planning

Say “next” to continue.



Model Planning and Model Building

Continuing 

Module 4 → Data Analytics Life Cycle → Model Planning and Model Building

 **Model Planning and Model Building**

 **Concept (4–5 Points)**

- **Model Planning** involves selecting appropriate **analytical techniques, algorithms, and tools** based on the problem.
 - It defines **input variables, output variables, evaluation metrics, and assumptions**.
 - **Model Building** is the process of creating, training, and testing the analytical model.
 - Models are refined using **iterations and validation techniques**.
 - Proper planning and building ensure **accurate and reliable analytical outcomes**.
-

5 Quality MCQs – Model Planning and Model Building

Q1. Model planning mainly focuses on

- A. Data cleaning
- B. Selecting techniques and metrics
- C. Dashboard design
- D. Report printing

 **Answer:** B

Q2. Model building involves

- A. Problem definition
- B. Training and testing models
- C. Data collection
- D. Visualization formatting

 **Answer:** B

Q3. Choosing input and output variables is part of

- A. Discovery phase
- B. Data preparation
- C. Model planning
- D. Operation phase

 **Answer:** C

Q4. Iterative model refinement helps in

- A. Increasing errors
- B. Improving model performance
- C. Removing data sources
- D. Reducing computation

 **Answer: B**

Q5. Model planning and building occur

- A. Before data preparation
- B. After data preparation
- C. After deployment
- D. During operation

 **Answer: B**

 Next sub-phase as per syllabus:

Implementation and Quality Assurance

Say “next” to continue.



Implementation and Quality Assurance

Continuing 

Module 4 → Data Analytics Life Cycle → Implementation and Quality Assurance

 **Implementation and Quality Assurance**

 **Concept (4–5 Points)**

- **Implementation** involves deploying the developed model or analytical solution into the business environment.
 - It includes **integrating models with systems, dashboards, or applications**.
 - **Quality Assurance (QA)** ensures the solution meets **business requirements and accuracy standards**.
 - QA includes **validation, testing, and performance evaluation**.
 - Proper implementation and QA reduce errors, risks, and business impact failures.
-

5 Quality MCQs – Implementation and Quality Assurance

Q1. Implementation in the analytics life cycle refers to

- A. Data collection
- B. Deploying analytical solutions
- C. Requirement gathering
- D. Visualization selection

 **Answer:** B

Q2. Quality Assurance mainly focuses on

- A. Increasing data size
- B. Validating accuracy and performance
- C. Reducing users
- D. Changing business goals

 **Answer:** B

Q3. Testing models after deployment helps in

- A. Increasing errors
- B. Identifying issues
- C. Reducing data quality
- D. Removing reports

 **Answer:** B

Q4. QA ensures that the solution

- A. Meets business requirements
- B. Uses more storage
- C. Increases complexity
- D. Eliminates analytics

 **Answer:** A

Q5. Implementation and QA occur

- A. Before model building
- B. After model building
- C. At project discovery
- D. During data collection

 **Answer:** B

 Next sub-phase in sequence:

Documentation and Management Approval

Say “next” to continue.



Introduction to Tableau

Continuing 

Module 5 → Topic 22: Introduction to Tableau

 **Introduction to Tableau**

 **Concept (4–5 Points)**

- Tableau is a powerful data visualization and business intelligence tool used for creating interactive dashboards and reports.
 - It allows users to connect to multiple data sources and perform drag-and-drop visual analytics.
 - Tableau supports fast data exploration with minimal coding.
 - It is widely used for descriptive and exploratory data analysis.
 - Tableau helps in transforming raw data into actionable visual insights.
-

5 Quality MCQs – Introduction to Tableau

Q1. Tableau is primarily used for

- A. Data storage
- B. Data visualization and BI
- C. Programming applications
- D. Network monitoring

 Answer: B

Q2. One key feature of Tableau is

- A. Manual coding only
- B. Drag-and-drop interface
- C. Text-based reporting
- D. Data encryption

 Answer: B

Q3. Tableau is MOST useful for

- A. Hardware configuration
- B. Interactive dashboards
- C. Operating system management
- D. File compression

 Answer: B

Q4. Tableau supports analysis by

- A. Static charts only
- B. Interactive visual exploration
- C. Manual calculations only
- D. SQL scripting only

 **Answer:** B

Q5. Tableau helps decision-making by providing

- A. Raw data
- B. Visual insights
- C. System logs
- D. Program code

 **Answer:** B

 Next topic in sequence:

Topic 23 – Intelligent Data Analysis

Say “next” to continue.



Intelligent Data Analysis

Continuing 

Module 5 → Topic 23: Intelligent Data Analysis

 **Intelligent Data Analysis**

 **Concept (4–5 Points)**

- Intelligent Data Analysis combines analytics, visualization, and domain knowledge to derive meaningful insights.
 - It focuses on identifying patterns, trends, anomalies, and relationships in data.
 - Tools like Tableau, Power BI, and advanced analytics platforms support intelligent analysis.
 - It enables interactive and exploratory analysis rather than static reporting.
 - Intelligent data analysis supports better, faster, and informed decision-making.
-

5 Quality MCQs – Intelligent Data Analysis

Q1. Intelligent data analysis mainly aims to

- A. Store large data
- B. Extract meaningful insights
- C. Encrypt datasets
- D. Reduce visualization

 Answer: B

Q2. Which of the following is a key feature of intelligent data analysis?

- A. Static reports
- B. Pattern and anomaly detection
- C. Manual calculations
- D. Data deletion

 Answer: B

Q3. Intelligent data analysis is best supported by

- A. Text editors
- B. BI and visualization tools
- C. Operating systems
- D. Network devices

 Answer: B

Q4. Exploratory analysis allows users to

- A. Fix schemas
- B. Interact with data dynamically
- C. Remove dashboards
- D. Encrypt information

 **Answer: B**

Q5. Intelligent data analysis improves

- A. Hardware utilization
- B. Decision-making quality
- C. File size
- D. Network bandwidth

 **Answer: B**

 Next topic as per roadmap:

Topic 24 – Nature of Data

Say “next” to continue.



Nature of Data

Continuing 

Module 5 → Topic 24: Nature of Data

 **Nature of Data**

 **Concept (4–5 Points)**

- Nature of data refers to the characteristics and type of data used for analysis.

- Data can be **quantitative** (numerical) or **qualitative** (categorical).
 - It may also be **structured**, **semi-structured**, or **unstructured**.
 - Understanding the nature of data helps in selecting **appropriate analysis and visualization techniques**.
 - Incorrect interpretation of data nature can lead to **wrong insights and decisions**.
-

5 Quality MCQs – Nature of Data

Q1. Numerical data is also known as

- A. Qualitative data
- B. Quantitative data
- C. Categorical data
- D. Binary data

 Answer: B

Q2. Examples of qualitative data include

- A. Age and salary
- B. Height and weight
- C. Gender and color
- D. Temperature and distance

 Answer: C

Q3. Understanding the nature of data helps in

- A. Hardware selection
- B. Choosing correct visualization
- C. Data encryption
- D. Network optimization

 Answer: B

Q4. Structured data is typically stored in

- A. Images
 - B. Videos
 - C. Tables
 - D. Audio files
-  Answer: C
-

Q5. Misunderstanding data nature may lead to

- A. Better insights
- B. Correct decisions
- C. Incorrect analysis
- D. Faster processing

 Answer: C

👉 Next topic in sequence:

Topic 25 – Analytics Processes and Tools

Say “next” to continue.



Analytics Processes and Tools

Continuing 

Module 5 → Topic 25: Analytics Processes and Tools

 Analytics Processes and Tools

 Concept (4–5 Points)

- **Analytics processes** define the step-by-step approach used to analyze data and generate insights.

- Typical processes include **data collection, preparation, analysis, visualization, and interpretation**.
 - **Analytics tools** support these processes by automating and simplifying analysis tasks.
 - Common tools include **Excel, Tableau, Power BI, Python, and R**.
 - Selecting appropriate processes and tools ensures **efficient and accurate analytics outcomes**.
-

5 Quality MCQs – Analytics Processes and Tools

Q1. Analytics processes mainly focus on

- A. Data storage only
- B. System maintenance
- C. Converting data into insights
- D. Network monitoring

 Answer: C

Q2. Which of the following is an analytics tool?

- A. Firewall
- B. Tableau
- C. Web browser
- D. Operating system

 Answer: B

Q3. Data preparation is part of

- A. Visualization only
- B. Analytics process
- C. Hardware setup
- D. Network design

 Answer: B

Q4. Analytics tools help in

- A. Manual calculations
- B. Automating analysis tasks
- C. Reducing data quality
- D. Removing insights

 **Answer:** B

Q5. Choosing the right analytics tool mainly depends on

- A. Screen size
- B. Business problem and data
- C. Keyboard type
- D. Internet speed

 **Answer:** B

 Next topic as per roadmap:

Topic 26 – Analysis vs. Reporting

Say “next” to continue.



Analysis vs. Reporting

Continuing 

Module 5 → Topic 26: Analysis vs. Reporting

 **Analysis vs. Reporting**

 **Concept (4–5 Points)**

- Analysis focuses on exploring data to identify patterns, trends, and insights.

- It involves **question-driven and exploratory** activities.
 - **Reporting** focuses on presenting **predefined information** in a structured format.
 - Reports are usually **static and repetitive**, while analysis is **dynamic and flexible**.
 - Analysis supports **decision-making**, whereas reporting supports **information dissemination**.
-

5 Quality MCQs – Analysis vs. Reporting

Q1. Analysis primarily focuses on

- A. Static presentation
- B. Exploring data for insights
- C. Printing reports
- D. Data storage

 Answer: B

Q2. Reporting is generally

- A. Exploratory
- B. Dynamic
- C. Predefined and structured
- D. Hypothesis-driven

 Answer: C

Q3. Which of the following best represents analysis?

- A. Monthly sales report
- B. Dashboard with fixed KPIs
- C. Ad-hoc data exploration
- D. Invoice generation

 Answer: C

Q4. Reports are mainly used for

- A. Discovering new patterns
- B. Communicating known information
- C. Model building
- D. Data cleaning

 Answer: B

Q5. Analysis differs from reporting because it is

- A. Static
- B. Flexible and interactive
- C. Repetitive
- D. Rule-based

 Answer: B

👉 Next topic in sequence:

Topic 27 – Modern Data Analytic Tools

Say “next” to continue.



Modern Data Analytic Tools

Continuing 

Module 5 → Topic 27: Modern Data Analytic Tools

 Modern Data Analytic Tools

 Concept (4–5 Points)

- **Modern data analytic tools** enable efficient data processing, analysis, and visualization.

- They support handling large, diverse, and real-time datasets.
 - Common tools include Tableau, Power BI, Python, R, Apache Spark, and cloud-based analytics platforms.
 - These tools offer automation, scalability, and advanced analytics capabilities.
 - Modern tools help organizations achieve faster insights and better decision-making.
-

5 Quality MCQs – Modern Data Analytic Tools

Q1. Modern data analytic tools are designed to handle

- A. Only small datasets
- B. Large and complex data
- C. Text files only
- D. Manual records

 Answer: B

Q2. Which of the following is a modern BI/analytics tool?

- A. Notepad
- B. Tableau
- C. Paint
- D. Calculator

 Answer: B

Q3. A key advantage of modern analytic tools is

- A. Manual processing
- B. Scalability
- C. Reduced visualization
- D. Fixed reports only

 Answer: B

Q4. Cloud-based analytics tools mainly help in

- A. Local storage
- B. Hardware dependency
- C. Scalable and flexible analysis
- D. Offline reporting

 Answer: C

Q5. Modern analytic tools improve

- A. Guesswork
- B. Decision-making speed
- C. Data duplication
- D. Manual effort

 Answer: B

👉 Next topic as per roadmap:

Topic 28 – Data Sources in Tableau

Say “next” to continue.



Data Sources in TableauData Sources in Tableau

Continuing 

Module 5 → Topic 28: Data Sources in Tableau

 Data Sources in Tableau

 Concept (4–5 Points)

- Tableau can connect to a wide variety of **data sources** for analysis and visualization.

- Supported sources include **files (Excel, CSV, Text), databases (MySQL, SQL Server, Oracle), and cloud platforms**.
 - Tableau allows **live connections and extract connections**.
 - Live connections fetch data in real time, while extracts improve **performance and offline analysis**.
 - Multiple data sources can be **joined or blended** within Tableau.
-

5 Quality MCQs – Data Sources in Tableau

Q1. Tableau can connect to which type of data source?

- A. Only Excel files
- B. Only databases
- C. Files, databases, and cloud sources
- D. Text documents only

 Answer: C

Q2. A live connection in Tableau means

- A. Data is stored locally
- B. Data is refreshed manually only
- C. Data is fetched in real time
- D. Data is deleted after use

 Answer: C

Q3. Tableau extracts are mainly used to

- A. Increase data size
- B. Improve performance
- C. Encrypt data
- D. Reduce visualization

 Answer: B

Q4. Combining data from multiple sources in Tableau is called

- A. Formatting
- B. Filtering
- C. Data blending
- D. Annotation

 **Answer: C**

Q5. Tableau supports which file format as a data source?

- A. Excel
- B. CSV
- C. Text files
- D. All of the above

 **Answer: D**

 Next module begins with:

Topic 29 – Visualization Algorithms

Say “next” to continue.



Visualization Algorithms

Continuing 

Module 6 → Topic 29: Visualization Algorithms

 **Visualization Algorithms**

 **Concept (4–5 Points)**

- Visualization algorithms define how data is transformed into visual forms.

- They determine **layout, positioning, scaling, and mapping** of data elements.
 - Common algorithms are used for **charts, graphs, maps, and network visualizations**.
 - Efficient algorithms improve **clarity, performance, and interpretability** of visuals.
 - Visualization algorithms help in **revealing patterns, trends, and relationships** in data.
-

5 Quality MCQs – Visualization Algorithms

Q1. Visualization algorithms mainly decide

- A. Data storage format
- B. How data is displayed visually
- C. Data encryption
- D. Network routing

 Answer: B

Q2. Visualization algorithms are used for

- A. Data cleaning
- B. Layout and mapping of visuals
- C. Writing SQL queries
- D. File compression

 Answer: B

Q3. Efficient visualization algorithms improve

- A. Hardware speed
- B. Visual clarity and performance
- C. Data duplication
- D. Network latency

 Answer: B

Q4. Visualization algorithms help identify

- A. System errors
- B. Patterns and relationships
- C. File permissions
- D. User passwords

 Answer: B

Q5. Visualization algorithms are MOST relevant in

- A. Data visualization tools
- B. Operating systems
- C. Network protocols
- D. Text editors

 Answer: A

👉 Next topic in sequence:

Topic 30 – Visual Encodings (color, size, shape, lines, axes, scaling, annotation)

Say “next” to continue.



Visual Encodings (color, size, shape, lines, scaling, annotation)

Continuing 👍

Module 6 → Topic 30: Visual Encodings

 **Visual Encodings (Color, Size, Shape, Lines, Scaling, Annotation)**

 **Concept (4–5 Points)**

- Visual encoding refers to mapping data values to visual elements.

- Common encodings include **color, size, shape, lines, position, and scale**.
 - Proper encoding improves **clarity, comparison, and perception** of data.
 - **Annotations** provide additional context and explanations in visuals.
 - Incorrect visual encoding can cause **misinterpretation of data**.
-

5 Quality MCQs – Visual Encodings

Q1. Visual encoding maps data to

- A. Databases
- B. Visual elements
- C. Storage formats
- D. Network devices

 Answer: B

Q2. Which visual encoding is BEST for showing magnitude differences?

- A. Shape
- B. Size
- C. Annotation
- D. Color hue

 Answer: B

Q3. Color encoding is mainly used to

- A. Store data
- B. Differentiate categories
- C. Increase data size
- D. Encrypt values

 Answer: B

Q4. Annotations in visualization are used to

- A. Hide data
- B. Provide additional context
- C. Reduce accuracy
- D. Change scale

 Answer: B

Q5. Poor visual encoding may lead to

- A. Better understanding
- B. Misinterpretation of data
- C. Faster insights
- D. Improved perception

 Answer: B

👉 Next topic as per roadmap:

Topic 31 – Taxonomy of Data Visualization

Say “next” to continue.



Taxonomy of Data Visualization

Continuing 

Module 6 → Topic 31: Taxonomy of Data Visualization

 Taxonomy of Data Visualization

 Concept (4–5 Points)

- Taxonomy of data visualization classifies visualizations based on **data type** and **analytical purpose**.

- It helps in selecting the **most appropriate chart or graph**.
 - Major categories include **comparison, distribution, relationship, composition, and trend visualizations**.
 - Each category uses specific chart types like **bar, line, pie, scatter, histogram, treemap**.
 - Proper taxonomy improves **clarity and effectiveness of visual communication**.
-

5 Quality MCQs – Taxonomy of Data Visualization

Q1. Taxonomy of data visualization is used to

- A. Store charts
- B. Classify visualization types
- C. Encrypt data
- D. Reduce data size

 Answer: B

Q2. Bar charts are commonly used for

- A. Showing relationships
- B. Showing comparisons
- C. Showing distributions
- D. Showing hierarchies

 Answer: B

Q3. Scatter plots are **BEST** suited for

- A. Trends over time
- B. Relationships between variables
- C. Category comparison
- D. Part-to-whole analysis

 Answer: B

Q4. Line charts are mainly used to show

- A. Distribution
- B. Hierarchy
- C. Changes over time
- D. Correlation only

 Answer: C

Q5. Choosing charts based on taxonomy helps in

- A. Increasing confusion
- B. Effective data communication
- C. Data duplication
- D. Reducing insight

 Answer: B

👉 Next topic in sequence:

Topic 32 – Choosing Appropriate Visuals

Say “next” to continue.



Comparison Charts (Bar, Box, Histogram, Gantt, Bullet, etc.)
explain each briefly

Sure 👍

Here is a brief, clear explanation of each Comparison Chart — exam-oriented and easy to revise.

 Comparison Charts

 Bar Chart

- Used to compare values across categories.
 - Length of bars represents magnitude.
 - Best for discrete/categorical data.
-

2 Box Plot (Box-and-Whisker Plot)

- Shows data distribution, median, quartiles, and outliers.
 - Useful for comparing spread and variability between groups.
 - Highlights outliers clearly.
-

3 Histogram

- Represents frequency distribution of continuous data.
 - Data is grouped into bins (intervals).
 - Useful for understanding data shape and skewness.
-

4 Gantt Chart

- Used for project scheduling and task comparison over time.
 - Shows task duration, start and end dates.
 - Widely used in project management.
-

5 Bullet Graph

- Compares actual performance vs target.
 - More compact alternative to gauge charts.
 - Often used in KPI dashboards.
-

6 Side-by-Side Bar Chart

- Compares multiple categories across groups.
 - Useful for multi-dimensional comparison.
-

7 Stacked Bar Chart

- Shows **part-to-whole comparison** across categories.
 - Useful when composition comparison is needed.
-

📌 Key Exam Tip

- Bar → category comparison
- Box → distribution & outliers
- Histogram → frequency distribution
- Gantt → time-based task comparison
- Bullet → performance vs target

If you want, next I can cover:

👉 Tables (Text Tables, Highlight Tables)

👉 Hierarchies & Relationships charts

👉 Changes over Time charts

Just say which one next 👍



Tables (Text, Highlight)

Here you go 👍

Tables explained briefly, clearly, and exam-oriented.

✅ Tables

1 Text Table

- Displays data in **rows and columns with exact values**.
- Best when **precise numbers** are important.
- Easy to read but **limited for pattern detection**.
- Commonly used in **reports and summaries**.

2 Highlight Table

- A text table enhanced with color encoding.
 - Uses color intensity to show magnitude or patterns.
 - Combines accuracy of tables with visual cues.
 - Useful for quick comparison and trend spotting.
-

📌 Key Difference (Exam Tip)

Feature	Text Table	Highlight Table
Values	Exact numbers	Exact numbers + color
Pattern detection	Difficult	Easy
Visual appeal	Low	High
Use case	Detailed reporting	Comparative analysis

🧠 One-Line Memory Trick

- Text Table → Accuracy
- Highlight Table → Accuracy + Insight

Next, as per taxonomy, we can cover:

- 👉 Hierarchies & Relationships (Pie, Stacked Bar, Treemap)
- 👉 Changes over Time (Line, Area)
- 👉 Connections & Relationships (Scatter, Maps, Heatmaps)

Just tell me next 👍



Got it 🤘

I'll now strictly switch to CDAC CCEE MODE for this module.

CDAC CCEE MODE RULES (I will follow):

- Short, crisp theory (exam-ready)
 - Bullet points only
 - Direct definitions
 - MCQ-focused language
 - No extra fluff / storytelling
 - High probability exam points
-

Tables – Text Table & Highlight Table (CDAC CCEE MODE)

Text Table

- Displays data in **rows and columns**.
 - Shows **exact numerical values**.
 - Best when **accuracy is more important than patterns**.
 - Poor at showing **trends and comparisons visually**.
 - Commonly used in **reporting**.
-

Highlight Table

- Text table enhanced with **color encoding**.
 - Color intensity represents **magnitude of values**.
 - Helps in **quick comparison and pattern detection**.
 - Combines **precision + visualization**.
 - Widely used in **BI dashboards**.
-

Key Differences (Very Important for MCQs)

Feature	Text Table	Highlight Table
Values	Exact	Exact
Color usage	✗ No	✓ Yes
Pattern detection	✗ Difficult	✓ Easy
Visualization	Low	Medium
Use case	Reporting	Analysis & comparison

✓ 5 CDAC-LEVEL MCQs – Tables

Q1. Which visualization shows exact values without color encoding?

- A. Heatmap
- B. Highlight table
- C. Text table
- D. Scatter plot

✓ Answer: C

Q2. Highlight tables are mainly used to

- A. Store data
- B. Show relationships
- C. Detect patterns quickly
- D. Encrypt data

✓ Answer: C

Q3. Which feature differentiates highlight table from text table?

- A. Rows
- B. Columns
- C. Color encoding

D. Sorting

Answer: C

Q4. Text tables are BEST suited for

- A. Trend analysis
- B. Exact numerical reporting
- C. Correlation analysis
- D. Distribution analysis

Answer: B

Q5. Highlight tables are commonly used in

- A. Operating systems
- B. BI dashboards
- C. Network analysis
- D. File systems

Answer: B

👉 Next in Taxonomy of Data Visualization (as per syllabus):

Hierarchies & Relationships Charts

- Pie Chart
- Stacked Bar Chart
- Tree Map

Say “next” and we continue in pure CDAC CCEE MODE 🔥



Understood 

Continuing in **STRICT CDAC CCEE MODE**.

Hierarchies & Relationships Charts

1 Pie Chart

- Represents **part-to-whole relationship**.
 - Circle divided into **slices (percentages)**.
 - Best for **few categories**.
 - Poor for **precise comparison**.
 - Total always equals **100%**.
-

2 Stacked Bar Chart

- Bars divided into **sub-categories**.
 - Shows **part-to-whole + category comparison**.
 - Better than pie chart for **multiple categories**.
 - Can become confusing with **many segments**.
-

3 Treemap

- Uses **nested rectangles**.
 - Size of rectangle represents **value**.
 - Best for **hierarchical data**.
 - Efficient for **space utilization**.
 - Color can represent **additional dimension**.
-

Quick Comparison (High-Probability Exam Table)

Chart	Purpose	Strength	Limitation
Pie	Part-to-whole	Simple	Hard to compare

Chart	Purpose	Strength	Limitation
Stacked Bar	Composition + comparison	Clear grouping	Cluttered
Treemap	Hierarchy	Space-efficient	Less precise

5 CDAC-LEVEL MCQs

Q1. Pie chart is mainly used to show

- A. Trend
- B. Correlation
- C. Part-to-whole relationship
- D. Distribution

 Answer: C

Q2. Total value in a pie chart always equals

- A. Maximum value
- B. Average
- C. 100%
- D. Count

 Answer: C

Q3. Which chart is BEST for hierarchical data?

- A. Bar chart
- B. Line chart
- C. Treemap
- D. Scatter plot

 Answer: C

Q4. Stacked bar charts are useful for

- A. Time-series analysis
- B. Part-to-whole comparison across categories
- C. Correlation analysis
- D. Frequency distribution

 Answer: B

Q5. Which chart uses nested rectangles?

- A. Histogram
- B. Heatmap
- C. Treemap
- D. Pie chart

 Answer: C

👉 Next in Taxonomy of Data Visualization (CDAC sequence):

Changes Over Time (Line, Area, Dual Line)

Say “next” to continue 🔥



Changes Over Time (Line, Dual Line, Area)

Continuing in **STRICT CDAC CCEE MODE** 🔥

Changes Over Time Charts

1 Line Chart

- Used to show **trends over time**.
- X-axis represents **time**, Y-axis represents **value**.

- Best for **continuous data**.
 - Clearly shows **increase/decrease patterns**.
-

2 Dual Line Chart

- Displays **two related variables** on the same time axis.
 - Used for **comparison of trends**.
 - Helps identify **relationships or divergence**.
 - Should be used carefully to avoid **confusion**.
-

3 Area Chart

- Similar to line chart but **area below line is filled**.
 - Emphasizes **magnitude and volume over time**.
 - Useful for **cumulative values**.
 - Can hide details if overlapping areas exist.
-

Quick Comparison (Exam-Oriented)

Chart	Best For	Key Feature
Line	Trend analysis	Simple & clear
Dual Line	Compare trends	Two variables
Area	Magnitude over time	Filled area

5 CDAC-LEVEL MCQs

Q1. Which chart is **BEST** suited for trend analysis?

- A. Bar chart
- B. Pie chart
- C. Line chart

D. Treemap

Answer: C

Q2. Dual line charts are mainly used to

- A. Show distributions
- B. Compare two trends
- C. Show hierarchy
- D. Show frequency

Answer: B

Q3. Area charts differ from line charts because they

- A. Use bars
- B. Fill area under the line
- C. Show categories
- D. Use rectangles

Answer: B

Q4. Time is generally plotted on which axis in line charts?

- A. Y-axis
- B. Z-axis
- C. X-axis
- D. Color axis

Answer: C

Q5. Area charts are BEST used to show

- A. Exact values
- B. Cumulative trends
- C. Correlation

D. Hierarchy

 Answer: B

 Next in Taxonomy of Data Visualization (CDAC CCEE MODE):

Connections & Relationships (Scatter Plot, Maps, Heatmaps, Packed Bubble)

Say "next" to continue 



Connections & Relationships (Scatter, Maps, Heatmaps, Bubble)

Continuing in STRICT CDAC CCEE MODE 

Connections & Relationships Charts

1 Scatter Plot

- Shows relationship between two numerical variables.
 - Each point represents one observation.
 - Used to identify correlation, clusters, and outliers.
 - Often used in regression analysis.
-

2 Maps (Geographical Maps)

- Used to visualize location-based data.
 - Shows spatial relationships and regional patterns.
 - Can represent data using color, size, or symbols.
 - Common in sales, population, and logistics analysis.
-

3 Heatmap

- Uses **color intensity** to represent data values.
 - Helps identify **patterns, density, and concentration**.
 - Effective for **large datasets**.
 - Poor for **exact value reading**.
-

4 Bubble Chart

- Extension of scatter plot with **bubble size as third variable**.
 - Shows **three dimensions of data**.
 - Used for **comparative and relationship analysis**.
 - Can become cluttered if many bubbles exist.
-

Quick Comparison (High-Probability Exam Table)

Chart	Purpose	Key Feature
Scatter	Correlation	Points
Map	Spatial relationship	Geography
Heatmap	Density/pattern	Color intensity
Bubble	Multi-variable	Size dimension

5 CDAC-LEVEL MCQs

Q1. Scatter plots are BEST used to show

- A. Trends
- B. Correlation
- C. Hierarchy
- D. Distribution

 **Answer: B**

Q2. Which visualization uses geographical boundaries?

- A. Scatter plot
- B. Heatmap
- C. Map
- D. Bubble chart

Answer: C

Q3. Heatmaps primarily use

- A. Shapes
- B. Lines
- C. Color intensity
- D. Text

Answer: C

Q4. Bubble charts add which extra dimension compared to scatter plots?

- A. Color
- B. Shape
- C. Size
- D. Text

Answer: C

Q5. Which chart is LEAST suitable for showing exact values?

- A. Text table
- B. Bar chart
- C. Heatmap
- D. Pivot table

Answer: C

Module 6: Visualization Design & Techniques – COMPLETED

👉 Next module (Final):

Choosing Appropriate Visuals

Calculations (Numeric, String, Date, LOD)

Interactive Visualization & Dashboard Design

Say "next" to continue in CDAC CCEE MODE 🚀



Choosing Appropriate Visuals

Continuing in STRICT CDAC CCEE MODE 🔥

✓ Choosing Appropriate Visuals

📌 Key Concepts (Exam-Oriented Points)

- Choosing appropriate visuals depends on **data type, purpose, and audience**.
 - **Categorical data** → Bar / Column charts.
 - **Time-series data** → Line / Area charts.
 - **Relationships** → Scatter / Bubble charts.
 - **Part-to-whole** → Pie / Stacked bar / Treemap.
 - Wrong visual choice leads to **misinterpretation of data**.
-

📌 High-Probability Mapping Table (VERY IMPORTANT)

Purpose	Best Visual
Compare categories	Bar chart
Trend over time	Line chart
Correlation	Scatter plot

Purpose	Best Visual
Distribution	Histogram / Box plot
Part-to-whole	Pie / Treemap
Geographic data	Maps

5 CDAC-LEVEL MCQs – Choosing Appropriate Visuals

Q1. Line charts are BEST suited for

- A. Category comparison
- B. Trend analysis
- C. Correlation
- D. Hierarchy

 Answer: B

Q2. Which chart is MOST suitable for showing relationship between two variables?

- A. Pie chart
- B. Bar chart
- C. Scatter plot
- D. Area chart

 Answer: C

Q3. Pie charts are mainly used for

- A. Trends
- B. Distribution
- C. Part-to-whole comparison
- D. Correlation

 Answer: C

Q4. Using an incorrect visualization may result in

- A. Better insights
- B. Faster analysis
- C. Misinterpretation of data
- D. Higher accuracy

 **Answer: C**

Q5. Geographic data is BEST represented using

- A. Histogram
- B. Scatter plot
- C. Map
- D. Line chart

 **Answer: C**

 Next as per syllabus (CDAC CCEE MODE):

Applying Calculations using Functions & Statistics

- Numeric Calculations
- String Calculations
- Date Calculations
- LOD Expressions

Say "next" to continue 



Applying Calculations using Functions & Statistics

Continuing in **STRICT CDAC CCEE MODE** 🔥

 **Applying Calculations using Functions & Statistics**

Key Concepts (Exam-Oriented Points)

- Calculations are used to derive new values from existing data.
 - Functions help in data transformation, aggregation, and analysis.
 - Statistical calculations support summary and insight generation.
 - Used extensively in Excel, Tableau, and BI tools.
 - Correct calculations improve accuracy of visualizations and decisions.
-

Types of Calculations (VERY IMPORTANT)

1 Numeric Calculations

- Perform mathematical operations.
 - Examples: SUM, AVG, COUNT, MIN, MAX.
 - Used for aggregation and comparison.
-

2 String Calculations

- Operate on text data.
 - Examples: LEFT, RIGHT, MID, UPPER, LOWER.
 - Used for data cleaning and formatting.
-

3 Date Calculations

- Work with date and time values.
 - Examples: YEAR, MONTH, DATEDIFF.
 - Used for time-based analysis.
-

4 Statistical Calculations

- Used for data analysis and inference.
 - Examples: Mean, Median, Standard Deviation, Variance.
 - Help in understanding distribution and variability.
-

5 CDAC-LEVEL MCQs

Q1. Numeric calculations are mainly used for

- A. Text manipulation
- B. Mathematical operations
- C. Date formatting
- D. Visualization design

 Answer: B

Q2. Which function is used for string manipulation?

- A. SUM
- B. AVG
- C. LEFT
- D. COUNT

 Answer: C

Q3. Date calculations are MOST useful for

- A. Category comparison
- B. Time-based analysis
- C. Correlation analysis
- D. Distribution analysis

 Answer: B

Q4. Statistical calculations help in

- A. Encrypting data
- B. Understanding data distribution
- C. Formatting dashboards
- D. Sorting visuals

 Answer: B

Q5. Applying correct calculations mainly improves

- A. Guesswork
- B. Visualization accuracy
- C. Data duplication
- D. Manual effort

 Answer: B

👉 Next as per syllabus (CDAC CCEE MODE):

LOD (Level of Detail) Expressions

Say "next" to continue 



Numeric Calculations

Continuing in STRICT CDAC CCEE MODE 🔥

Numeric Calculations

Key Points (Exam-Oriented)

- Numeric calculations perform mathematical operations on numerical data.
 - Used for aggregation, comparison, and summarization.
 - Common operations include addition, subtraction, multiplication, division.
 - Widely used in Excel, Tableau, and BI tools.
 - Form the base for KPIs and performance metrics.
-

Common Numeric Functions

- SUM → Total
- AVG / AVERAGE → Mean

- COUNT → Number of values
 - MIN / MAX → Lowest / Highest value
 - ROUND → Rounding values
-

5 CDAC-LEVEL MCQs – Numeric Calculations

Q1. Numeric calculations are applied on

- A. Text data
- B. Date data
- C. Numerical data
- D. Image data

 Answer: C

Q2. Which function calculates the total of values?

- A. COUNT
- B. AVG
- C. SUM
- D. MIN

 Answer: C

Q3. COUNT() function returns

- A. Sum of values
- B. Average value
- C. Number of values
- D. Maximum value

 Answer: C

Q4. Numeric calculations are mainly used to

- A. Encrypt data
- B. Aggregate and compare data

C. Format text

D. Design dashboards

 Answer: B

Q5. Which numeric function returns the highest value?

A. MIN

B. MAX

C. SUM

D. AVG

 Answer: B

 Next in syllabus (CDAC CCEE MODE):

String Calculations

Say "next" to continue 



String Calculations

Continuing in STRICT CDAC CCEE MODE 

String Calculations

Key Points (Exam-Oriented)

- String calculations operate on text (character) data.
- Used for data cleaning, formatting, and transformation.
- Common operations include extracting, converting, and concatenating text.
- Frequently used in Excel, Tableau, and BI tools.
- Help standardize data for accurate analysis and visualization.

Common String Functions

- LEFT() → Extracts characters from left
 - RIGHT() → Extracts characters from right
 - MID() → Extracts characters from middle
 - UPPER() / LOWER() → Change text case
 - CONCAT() → Combine strings
-

5 CDAC-LEVEL MCQs – String Calculations

Q1. String calculations are applied on

- A. Numeric data
- B. Date data
- C. Text data
- D. Binary data

 Answer: C

Q2. Which function extracts characters from the left side of a string?

- A. RIGHT()
- B. MID()
- C. LEFT()
- D. CONCAT()

 Answer: C

Q3. UPPER() function is used to

- A. Count characters
- B. Convert text to uppercase
- C. Extract substring
- D. Join numbers

 Answer: B

Q4. String calculations are mainly used for

- A. Prediction
- B. Data cleaning
- C. Correlation
- D. Aggregation

 **Answer: B**

Q5. Which function is used to combine text values?

- A. SUM()
- B. CONCAT()
- C. AVG()
- D. COUNT()

 **Answer: B**

 Next as per syllabus (CDAC CCEE MODE):

Date Calculations

Say “next” to continue 



Date Calculations

Continuing in **STRICT CDAC CCEE MODE** 🔥

 **Date Calculations**

 **Key Points (Exam-Oriented)**

- Date calculations operate on date and time data.

- Used for **time-based analysis** and trend evaluation.
 - Common operations include **extracting parts of a date** and calculating differences.
 - Widely used in **Excel, Tableau, and BI tools**.
 - Essential for **time-series analysis and reporting**.
-

Common Date Functions

- `YEAR()` → Extracts year
 - `MONTH()` → Extracts month
 - `DAY()` → Extracts day
 - `DATEDIFF()` → Difference between dates
 - `TODAY() / NOW()` → Current date/time
-

5 CDAC-LEVEL MCQs – Date Calculations

Q1. Date calculations are used for

- A. Text manipulation
- B. Time-based analysis
- C. Correlation analysis
- D. Hierarchical analysis

 Answer: B

Q2. Which function extracts the year from a date?

- A. `DAY()`
- B. `MONTH()`
- C. `YEAR()`
- D. `NOW()`

 Answer: C

Q3. `DATEDIFF()` is used to

- A. Add dates
- B. Subtract numbers
- C. Find difference between dates
- D. Format text

 Answer: C

Q4. Time-series analysis mainly relies on

- A. Numeric calculations
- B. String calculations
- C. Date calculations
- D. Logical calculations

 Answer: C

Q5. Which function returns the current date and time?

- A. TODAY()
- B. YEAR()
- C. NOW()
- D. MONTH()

 Answer: C

 Next in syllabus (CDAC CCEE MODE):

LOD (Level of Detail) Expressions

Say “next” to continue 



LOD (Level of Detail) Expressions

Continuing in **STRICT CDAC CCEE MODE** 

LOD (Level of Detail) Expressions

Key Points (Exam-Oriented)

- LOD expressions control the **granularity of calculations** in visualization tools (especially Tableau).
 - They allow calculations **independent of the view level**.
 - Used to perform **fixed, inclusive, and exclusive calculations**.
 - Helpful for **advanced analytics** and accurate aggregations.
 - Improve **consistency and correctness of insights**.
-

Types of LOD Expressions (VERY IMPORTANT)

1 FIXED

- Computes values at a **specified dimension level**.
 - Ignores view-level dimensions.
 - Syntax: { FIXED [Dimension] : Aggregation }
-

2 INCLUDE

- Computes values by **adding extra dimensions** to the view.
 - Affects view-level granularity.
 - Syntax: { INCLUDE [Dimension] : Aggregation }
-

3 EXCLUDE

- Computes values by **removing dimensions** from the view.
 - Useful to compare overall vs detailed values.
 - Syntax: { EXCLUDE [Dimension] : Aggregation }
-

5 CDAC-LEVEL MCQs – LOD Expressions

Q1. LOD expressions are mainly used to control

- A. Color encoding
- B. Level of data aggregation
- C. Chart type
- D. Data source

Answer: B

Q2. Which LOD expression ignores view-level dimensions?

- A. INCLUDE
- B. EXCLUDE
- C. FIXED
- D. FILTER

Answer: C

Q3. INCLUDE LOD expressions

- A. Remove dimensions
- B. Add dimensions to calculations
- C. Fix aggregation level
- D. Ignore filters

Answer: B

Q4. EXCLUDE LOD expressions are used to

- A. Add dimensions
- B. Remove dimensions from view
- C. Fix data source
- D. Change chart type

Answer: B

Q5. LOD expressions are MOST commonly used in

- A. Excel
- B. Tableau
- C. PowerPoint
- D. Notepad

 Answer: B

👉 Next final topics (CDAC CCEE MODE):

Data Sorting & Filters → Interactive Visualization → Dashboard Design

Say "next" to continue 



Data Sorting and Filtering

Continuing in STRICT CDAC CCEE MODE 🔥

Data Sorting and Filtering

Key Points (Exam-Oriented)

- **Sorting** arranges data in a **specific order** (ascending or descending).
 - Helps in **ranking and quick comparison** of values.
 - **Filtering** displays only **relevant data** based on conditions.
 - Filters reduce **data clutter** and **focus analysis**.
 - Widely used in **Excel, Tableau, and BI dashboards**.
-

Types (VERY IMPORTANT)

Sorting

- Ascending (A–Z, smallest–largest)
- Descending (Z–A, largest–smallest)

Filtering

- Value-based filter
 - Range filter
 - Condition filter
 - Top-N filter
-

5 CDAC-LEVEL MCQs – Data Sorting and Filtering

Q1. Sorting is used to

- A. Hide data
- B. Arrange data in order
- C. Delete records
- D. Encrypt values

 Answer: B

Q2. Filtering helps in

- A. Showing all data
- B. Displaying selected data
- C. Increasing data size
- D. Rearranging data

 Answer: B

Q3. Which filter is used to display top values?

- A. Range filter
- B. Condition filter
- C. Top-N filter
- D. Text filter

 Answer: C

Q4. Sorting is MOST useful for

A. Pattern detection

B. Ranking values

C. Aggregation

D. Data cleaning

 Answer: B

Q5. Data sorting and filtering are commonly used in

A. Operating systems

B. BI and visualization tools

C. Network protocols

D. Hardware design

 Answer: B

 Next in syllabus (CDAC CCEE MODE):

Interactive Visualization

Say "next" to continue 



Interactive Visualization

Continuing in STRICT CDAC CCEE MODE 

 Interactive Visualization

 Key Points (Exam-Oriented)

- Interactive visualization allows users to interact with data visuals.
- Users can filter, drill down, zoom, and highlight data.
- Interactivity improves exploratory analysis and user engagement.

- Supports real-time data updates.
 - Common in Tableau, Power BI, and modern BI dashboards.
-

Interaction Components (VERY IMPORTANT)

- Filters
 - Tooltips
 - Drill-down / Drill-through
 - Event listeners / callbacks
 - Dynamic data updates
-

5 CDAC-LEVEL MCQs – Interactive Visualization

Q1. Interactive visualization allows users to

- A. View static charts only
- B. Interact with data dynamically
- C. Store data
- D. Encrypt visuals

 Answer: B

Q2. Drill-down in visualization is used to

- A. Remove data
- B. View detailed data
- C. Encrypt information
- D. Change data source

 Answer: B

Q3. Tooltips are used to

- A. Hide data
- B. Show additional information
- C. Delete visuals

D. Resize dashboards

Answer: B

Q4. Interactive visualization improves

- A. Hardware usage
- B. Exploratory analysis
- C. Data duplication
- D. Manual effort

Answer: B

Q5. Interactive dashboards are MOST commonly created using

- A. Notepad
- B. Tableau
- C. Compiler
- D. Text editor

Answer: B

👉 Final topic (CDAC CCEE MODE):

Dashboard Design

Say “next” to finish the module 🚀



Event Listeners / Callbacks

Continuing in STRICT CDAC CCEE MODE 🔥

Event Listeners / Callbacks

Key Points (Exam-Oriented)

- Event listeners detect user actions such as click, hover, filter change, or selection.
 - Callbacks are functions executed in response to an event.
 - Used to enable interactivity and dynamic behavior in visualizations.
 - Help in updating data, visuals, or dashboards automatically.
 - Commonly used in interactive BI tools and web-based visualizations.
-

Common Events (IMPORTANT)

- Click
 - Hover
 - Selection
 - Filter change
 - Data refresh
-

5 CDAC-LEVEL MCQs – Event Listeners / Callbacks

Q1. Event listeners are used to

- A. Store data
- B. Detect user actions
- C. Encrypt visuals
- D. Design layouts

 Answer: B

Q2. A callback function is executed

- A. Before visualization loads
- B. Automatically on system start
- C. When a specific event occurs
- D. Only during deployment

 Answer: C

Q3. Which action can trigger an event listener?

- A. Data storage
- B. User click
- C. File compression
- D. Report printing

 **Answer:** B

Q4. Event listeners mainly support

- A. Static reporting
- B. Interactive visualization
- C. Data cleaning
- D. Model building

 **Answer:** B

Q5. Event listeners and callbacks are MOST relevant in

- A. Static charts
- B. Interactive dashboards
- C. Text tables
- D. Printed reports

 **Answer:** B

 Next (final piece in syllabus, **CDAC CCEE MODE**):

Dashboard Design

Say “next” to complete the module 



Continuing in **STRICT CDAC CCEE MODE** 🔥

Data Updation

Key Points (Exam-Oriented)

- Data updation refers to **refreshing or modifying data** used in visualizations.
- Ensures dashboards show **latest and accurate information**.
- Can be **manual or automatic** (scheduled / real-time).
- Data updation triggers **visual refresh** in interactive dashboards.
- Critical for **real-time and operational analytics**.



Visual Updation

Continuing in **STRICT CDAC



Visual Updation

Continuing in **STRICT CDAC CCEE MODE** 🔥

Visual Updation

Key Points (Exam-Oriented)

- Visual updation refers to **automatic refresh of charts/visuals** when data changes.
- Ensures visuals always reflect **latest data values**.
- Triggered by **data updation, filters, events, or user interaction**.

- Maintains consistency between data and visualization.
 - Essential for interactive and real-time dashboards.
-

Causes of Visual Updation (IMPORTANT)

- Data refresh
 - Filter change
 - Event listener / callback
 - Parameter update
 - User interaction (click, hover)
-

5 CDAC-LEVEL MCQs – Visual Updation

Q1. Visual updation occurs when

- A. Dashboard is closed
- B. Data changes
- C. File is saved
- D. System shuts down

 Answer: B

Q2. Visual updation ensures

- A. Static reporting
- B. Data–visual mismatch
- C. Consistency between data and visuals
- D. Manual refresh only

 Answer: C

Q3. Which action can trigger visual updation?

- A. Hardware change
- B. Filter application
- C. File rename

D. Screenshot

Answer: B

Q4. Visual updation is MOST important for

- A. Printed reports
- B. Static tables
- C. Real-time dashboards
- D. Text documents

Answer: C

Q5. Visual updation is closely linked with

- A. Data encryption
- B. Data updation
- C. Data deletion
- D. File compression

** Answer: B



Dashboard Design

Continuing in STRICT CDAC CCEE MODE 🔥

FINAL TOPIC of the module

Dashboard Design

Key Points (Exam-Oriented)

- Dashboard is a visual interface that displays KPIs, metrics, and insights in one place.
- Designed for quick understanding and decision-making.
- Combines charts, tables, filters, and indicators.

- Should be simple, clear, and focused on business goals.
 - Widely used in BI tools like Tableau and Power BI.
-

Dashboard Design Principles (VERY IMPORTANT)

- Clarity & simplicity
 - Logical layout & alignment
 - Consistent color scheme
 - Minimal clutter
 - Proper use of interactivity
-

Types of Dashboards (HIGH-PROBABILITY)

- Operational Dashboard → Real-time monitoring
 - Analytical Dashboard → Deep analysis
 - Strategic Dashboard → High-level KPIs
-

5 CDAC-LEVEL MCQs – Dashboard Design

Q1. A dashboard is mainly used for

- A. Data storage
- B. Quick decision-making
- C. Model training
- D. Data cleaning

 Answer: B

Q2. Which principle is MOST important in dashboard design?

- A. Maximum charts
- B. Bright colors only
- C. Clarity and simplicity
- D. Complex layout

 Answer: C

Q3. Real-time monitoring dashboards are called

- A. Strategic
- B. Analytical
- C. Operational
- D. Static

 **Answer: C**

Q4. Dashboards commonly display

- A. Source code
- B. KPIs and metrics
- C. Network logs
- D. System files

 **Answer: B**

Q5. Dashboards are MOST commonly created using

- A. Notepad
- B. Tableau / Power BI
- C. Compiler
- D. File explorer

 **Answer: B**

  **DATA VISUALIZATION MODULE – COMPLETED (CDAC CCEE READY)**

If you want next, I can provide:

- ✓ Last-day revision sheet (1–2 pages)
- ✓ 50–100 CDAC-level MCQs
- ✓ Quick comparison tables only
- ✓ Mock test (CCEE pattern)

Just tell me 

Last-day revision sheet (1–2 pages)

Perfect 👍

Here is your  LAST-DAY REVISION SHEET (CDAC CCEE MODE)

👉 Ultra-compressed, high-yield, exam-oriented

👉 Readable in 1–2 hours before exam

DATA VISUALIZATION & BI – LAST DAY REVISION SHEET (CCEE)

◆ 1. Business Intelligence (BI)

- BI = Data → Information → Insight → Decision
 - Components: Data collection, analysis, reporting, visualization
 - Outputs: Reports, Dashboards, KPIs
 - BI Users:
 - Executives → Strategic
 - Managers → Tactical
 - Operational users → Day-to-day
 - Goal: Data-driven decision making
-

◆ 2. Information & Visual Analytics

- Information Visualization = Graphical representation of data
- Visual Analytics = Visualization + Analysis + Interaction
- Benefits:
 - Faster pattern detection
 - Reduced cognitive load

- Better decisions
-

◆ 3. Data Representation

- Depends on **data type + purpose**
 - Poor representation → **wrong insights**
-

◆ 4. Data Types

- Quantitative → Numeric
 - Qualitative → Categorical
 - Structured → Tables, RDBMS
 - Unstructured → Text, images, videos
-

◆ 5. Excel for Data Analysis

Functions & Formulas

- Formula starts with =
- Common functions: SUM, AVG, COUNT, IF, LEFT, RIGHT

Charts

- Bar → Comparison
- Line → Trend
- Pie → Part-to-whole
- Scatter → Relationship

Pivot Tables

- Summarize large data
- Group, filter, aggregate

Data Analysis Toolpak

- Descriptive Statistics
- Correlation
- Regression

◆ 6. Descriptive Statistics

- Mean, Median, Mode
 - Variance, Standard Deviation
 - Min, Max, Count
 - Used in EDA
-

◆ 7. Correlation

- Measures relationship strength
 - Range: -1 to $+1$
 - $+ve \rightarrow$ same direction
 - $-ve \rightarrow$ opposite direction
 - $0 \rightarrow$ no linear relation
-

◆ 8. Regression

- Predicts dependent variable
 - Linear regression most common
 - Key output: R-square (goodness of fit)
-

◆ 9. Data Analytics Life Cycle

1. Discovery
 2. Data Preparation
 3. Model Planning
 4. Model Building
 5. Implementation
 6. Quality Assurance
 7. Documentation & Approval
 8. Operation
-

◆ 10. Tableau Basics

- BI & visualization tool
 - Drag-and-drop
 - Interactive dashboards
 - Data connections:
 - Files (Excel, CSV)
 - Databases
 - Cloud
 - **Live vs Extract**
 - Live → Real-time
 - Extract → Performance
-

◆ 11. Analysis vs Reporting

Analysis	Reporting	□
Exploratory	Predefined	
Dynamic	Static	
Question-driven	Format-driven	

◆ 12. Modern Analytics Tools

- Tableau, Power BI
 - Python, R
 - Spark, Cloud tools
 - Features: **Scalable, fast, automated**
-

◆ 13. Visualization Algorithms

- Decide layout, mapping, scaling
 - Improve clarity & performance
-

◆ 14. Visual Encodings

- Color → Categories
 - Size → Magnitude
 - Shape → Classification
 - Position → Accuracy
 - Annotation → Context
-

◆ 15. Taxonomy of Visualizations

◆ Comparison

- Bar, Box, Histogram
- Gantt, Bullet

◆ Tables

- Text Table → Exact values
- Highlight Table → Values + color

◆ Hierarchies

- Pie → Part-to-whole
- Stacked Bar → Composition
- Treemap → Hierarchy

◆ Changes Over Time

- Line → Trend
- Dual Line → Compare trends
- Area → Magnitude over time

◆ Relationships

- Scatter → Correlation
 - Bubble → 3 variables
 - Heatmap → Density
 - Maps → Geographic data
-

◆ 16. Choosing Appropriate Visuals (VERY IMPORTANT)

Purpose	Visual
Comparison	Bar
Trend	Line
Relationship	Scatter
Distribution	Histogram
Part-to-whole	Pie / Treemap
Geography	Map

◆ 17. Calculations

Numeric

- SUM, AVG, COUNT, MIN, MAX

String

- LEFT, RIGHT, MID
- UPPER, LOWER, CONCAT

Date

- YEAR, MONTH, DAY
- DATEDIFF, NOW

◆ 18. LOD Expressions (Tableau)

- FIXED → Ignore view
- INCLUDE → Add dimension
- EXCLUDE → Remove dimension
- Used to control aggregation level

◆ 19. Sorting & Filtering

- Sorting → Ranking
 - Filtering → Focused analysis
 - Types:
 - Range
 - Condition
 - Top-N
-

◆ 20. Interactive Visualization

- Filters, tooltips
 - Drill-down
 - Dynamic updates
 - Event listeners & callbacks
-

◆ 21. Data & Visual Updation

- Data update → Visual update
 - Ensures **real-time accuracy**
 - Triggered by:
 - Filters
 - Events
 - Refresh
-

◆ 22. Dashboard Design

- Single-screen view of KPIs

- Principles:
 - Simplicity
 - Clarity
 - Minimal clutter
- Types:
 - Operational
 - Analytical
 - Strategic

EXAM GOLDEN RULES

- Correlation ≠ Causation
 - Line → Time
 - Scatter → Relationship
 - Pie → 100%
 - FIXED LOD ignores view
 - Highlight table = Text + Color
-

If you want next 

- 100 CDAC-level MCQs (with answer key)
- One-page ultra-short cheat sheet
- Full CCEE mock test

Just tell me 

