**\*Creating Dashboard with Visualization Tool\***

**1) What is Power BI and how does it differ from Excel?**

**A:🡪** Power BI is a business intelligence tool by Microsoft that helps to connect to different data sources, clen the data, and create interactive dashboards and reports, while excel is mainly used as a spreadsheet for calculations, data entry and basic analysis.   
  
**2) Explain the concept of data modeling in Power BI.**

**A:🡪** In Power BI, data modeling means organizing and connecting different tables of data so they work together in one model. Instead of keeping all data in a single big table, you can have multiple related tables like (sales, products and customers) and link using relationships, usually through keys such as IDs. This makes the data more structured, avoids duplication, and allows to create meaningful calculations and visualizations using DAX.

**3) What are the different types of connections available in Power BI?**

**A:🡪** In Power BI there are mainly two ways to connect

1. Import - The data is loaded into Power BI’s internal storage. It’s fast for analysis and visuals; it needs to refresh the dataset when the source updates.
2. Direct Query - Data stays in the source (like SQL Server or Oracle), and Power BI queries it lives each time to interact with visuals. Good for large data, but performance depends on the source speed.

**4) How do you handle data transformation in Power BI?**

**A:🡪** In Power BI, data transformation is handled using the Power Query Editor. It allows you to clean, shape, and prepare raw data before loading it into your report. Common transformations include removing duplicates, filtering rows, splitting or merging columns, changing data types, creating calculated columns, and combining multiple tables.

**5) What is DAX (Data Analysis Expressions) and why is it important in Power BI?**

**A:🡪** DAX (Data Analysis Expressions) is a formula and expression language used in Power BI, Excel, and other Microsoft tools to create custom calculations. It helps to build calculated columns, measures, and tables that go beyond basic aggregations. For example, it can use DAX to calculate year-to-date sales, running totals, or percentage growth. It’s important in Power BI because it allows to perform advanced calculations, apply business logic, and get deeper insights from data that simple charts or raw fields can’t provide.

**6) Can you explain the difference between calculated columns and measures in Power BI?**

**A:🡪** In Power BI, a calculated column adds a new field to your table by calculating values row by row (like creating a Profit column = Sales – Cost), while a measure is a calculation done on the fly, such as totals or averages, that changes based on filters in your report (like Total Sales for a selected region).

**7) How do you handle relationships between tables in Power BI?**

**A:🡪**  In Power BI, relationships between tables are handled in the **Model view**, where it connect tables using common fields (like CustomerID or ProductID). This link tells Power BI how the data in one table relates to another. Relationships can be **one-to-many, many-to-one, or one-to-one**, and you it set the **cross-filter direction** to control how filters flow between tables. By creating proper relationships, it can build reports using fields from multiple tables without merging them into one big table.

**8) What is the purpose of a Power BI Gateway?**

**A:🡪** A **Power BI Gateway** is used to create a secure bridge between our **on-premises data sources** (like SQL Server, Oracle, Excel files, etc. stored locally) and the **Power BI cloud service**. Its main purpose is to let it can refresh a reports and dashboards with the latest data without manually uploading files each time.

**9) How can you schedule data refresh in Power BI Service?**

**A:🡪**  In Power BI Service, you can schedule a data refresh by going to a **dataset setting**, selecting **Schedule Refresh**, and then setting the frequency (daily or multiple times a day) and time. This ensures that a reports and dashboards automatically update with the latest data from the connected source. If the data is from on-premises sources, it also need to configure a **Power BI Gateway**

**10) Explain the concept of row-level security in Power BI.**

**A:🡪**  **Row-Level Security (RLS)** in Power BI is a way to control what data a user can see in a report. Instead of showing the full dataset to everyone, it can create filters (roles) that restrict rows of data based on conditions.

**11) What is the Power BI Desktop and how does it differ from Power BI Service?**

**A:🡪**  **Power BI Desktop** is a free application it can install on a computer to create reports — it can use it to connect to data, transform it, build visuals, and design dashboards.  
**Power BI Service** is the online (cloud) platform where you publish, view, share, and collaborate on those reports.

**12) Explain the concept of Direct Query in Power BI.**

**A:🡪** Direct Query in Power BI is a connection method where the data is not imported into Power BI but stays in the original source (like SQL Server, Oracle, or other databases). Every time it interact with a report or dashboard, Power BI sends a query to the source and fetches the latest data in real time.

**13) What are Power BI templates and how are they useful?**

A:🡪 Power BI templates are pre-designed report files that contain the structure of a report (like visuals, data model, queries, and formatting) but do not include the actual data. When it can open a template, just connect it to own data source, and the report gets populated.

**14) How do you handle incremental data refresh in Power BI?**

**A:🡪**  In Power BI, **incremental refresh** means instead of refreshing the whole dataset every time, only the new or updated data gets refreshed. For example, if it has 5 years of sales data, Power BI can keep all 5 years but refresh only the latest month. This makes the refresh much faster and saves resources

**15) What is the role of Power Query in Power BI?**

**A:🡪** Power Query in Power BI is used for data preparation. It helps to connect to different data sources, clean the data, and transform it into the shape you need before loading it into a report. For example, it can remove duplicates, split columns, change data types, or merge tables.

**16) Explain the difference between calculated columns and calculated tables in Power BI.**

**A:🡪** In Power BI, a calculated column adds a new column to an existing table by performing row-by-row calculations (for example, adding a *Profit* column = Sales – Cost).  
A calculated table, on the other hand, creates an entirely new table based on a DAX expression (for example, creating a summary table that shows total sales by region).

**17) How do you create custom visuals in Power BI?**

**A:🡪** In Power BI, it can create custom visuals either by importing them from the AppSource marketplace (like special charts and graphs) or by building a own using developer tools with coding (TypeScript, D3.js).

**18) What are the best practices for optimizing performance in Power BI?**

**A**:🡪 To make Power BI run faster, it should bring in only the data you really need, organize it properly with simple table relationships, and use measures instead of extra columns where possible. For large data, use features like incremental refresh and keep your report pages light with fewer visuals.

**19) How can you integrate Power BI with other Microsoft products like Azure and Office 365?**

**A:🡪** Power BI works well with other Microsoft products. It can connect it with Azure services (like Azure SQL Database, Azure Data Lake, or Azure Machine Learning) to pull big data, store it, or even apply AI models. With Office 365, Power BI integrates with Excel (you can import/export data and use PivotTables), Teams (share reports directly in chats), and SharePoint (embed dashboards on sites). In simple words, Power BI connects with Azure for handling and analyzing large or advanced data, and with Office 365 for easy sharing and collaboration.

**20) Explain the concept of aggregations in Power BI.**

**A:🡪**  In Power BI, aggregations mean storing summarized data (like total sales by month or region) instead of always using the full detailed data with millions of rows. This makes reports load much faster because Power BI looks at the smaller summary first and only checks the full data when needed.

**21) How do you handle error handling and data quality in Power BI?**

**A:🡪**  In Power BI, you handle errors and data quality in **Power Query** by cleaning the data. This includes removing duplicates, fixing wrong data types, handling missing values, or replacing error values. It can also check data quality using profiling tools.

**22) What is the purpose of Power BI Embedded and when would you use it?**

**A:🡪** Power BI Embedded is a service that lets developers embed Power BI reports and dashboards into their own applications or websites. This way, users can see interactive visuals without needing a separate Power BI account. It’s mostly used by software companies or organizations that want to give analytics features inside their apps.