**Q.1 What is Power BI, and how does it differ from Excel?**

**Ans. Power BI is a business analytics tool used to:**

* **Connect to various data sources**
* **Transform and model data**
* **Create interactive dashboards and reports**
* **Share insights across an organization**
* **Support real-time data monitoring**

**Power BI is more powerful when it comes to handling large datasets, creating interactive dashboards, and automating data refresh. It connects easily to multiple live data sources and is made for business intelligence and decision-making.**

**On the other hand, Excel is better for manual work, quick calculations, and flexible data entry. It’s great for smaller tasks but lacks the automation and visual capabilities that Power BI provides.**

**Power BI is made for professional reporting and data dashboards, while Excel is best for flexible, hands-on data work and calculations.**

**Q.2 Explain the concept of data modeling in Power BI.**

**Ans.**  **Data modeling in Power BI is the process of creating relationships between different data tables and organizing data in a way that makes analysis easy and accurate.**

* **When importing data from multiple sources (like sales data, customer info, product lists), they often come as separate tables. Data modeling helps connect these tables logically, allowing us to analyze them together.**

**Example:- We have two tables.**

** Customers (CustomerID, Name, City)**

** Orders (OrderID, CustomerID, Amount)**

**So we can create relationships using the Customer Id and access both of the tables.**

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

**Ans. In Power BI, there are several types of data connections that allow you to bring in data from various sources. These connections define how Power BI accesses, stores, and refreshes the data.**

**1. Import Mode**

* **Data is loaded and stored into Power BI’s internal memory.**

**2. Direct Query Mode**

* **Data stays in the original source; Power BI queries it live every time you interact with visuals.**

**3. Live Connection**

* **Similar to Direct Query but used specifically with Analysis Services models (like SSAS).**

**4. Composite Models**

* **Lets you combine Import and Direct Query in the same model.**

**Example: Connection type = How you access the groceries — do you bring them home (Import), visit the store every time (DirectQuery), or get a live view of their stock (Live Connection)**

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

**Ans. Data transformation in Power BI is done using Power Query Editor a powerful tool that allows you to clean, shape, and prepare your data before loading it into the data model.**

* **Steps to Handle Data Transformation:**

**Open Power Query Editor:- Click on "Transform Data" from the Home tab in Power BI Desktop.**

**Common Data Transformation Tasks:**

* **Remove Columns/Rows**
* **Rename Columns**
* **Change Data Types**
* **Split Columns**
* **Merge Columns**
* **Replace Values**
* **Group By**
* **Append Queries Etc.**

**After all transformations, click** "**Close & Apply" to load the cleaned data into Power BI for reporting.**

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

**Ans. DAX is a formula language used in Power BI, Power Pivot, and Analysis Services to create custom calculations, measures, and columns on the data.**

**It’s similar to Excel formulas, but more powerful and optimized for relational data models and dynamic analysis.**

**Why is DAX Important in Power BI?**

** Perform Advanced Calculations**

* **Calculate totals, averages, growth %, YOY, running totals, etc.**

** Create Measures and KPIs**

* **Dynamic metrics like total sales, profit margin, or top-performing products.**

** Work with Filter Context**

* **DAX respects filters/slicers in reports and calculates accordingly.**

** Build Custom Columns**

* **Generate new data columns based on existing data (e.g., classify "High", "Medium", "Low" sales).**

** Improve Report Interactivity**

* **Create dynamic visualizations that respond intelligently to user selections.**

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

**Ans.**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Calculated Column** | **Measure** |
| **Definition** | Adds a new column to a table | Performs a dynamic calculation |
| **Evaluation** | Row by row | Based on filter context |
| **Storage** | Stored in the data model | Not stored, computed when needed |
| **Memory Usage** | Consumes more memory | More memory efficient |
| **Use in Visuals** | Can be used in slicers, rows, columns | Can be used only in the values section |
| **When to Use** | When you need a column for filtering or relationships | When you need a dynamic value or summary |
| **Example** | FullName = [FirstName] & " " & [LastName] | Total Sales = SUM(Sales[Amount]) |

**Q.7 How do you handle relationships between tables in PowerBI?**

**Ans. In Power BI, when import data from multiple tables (like Orders, Customers, and Products), need to define relationships so Power BI knows how the tables are connected. These relationships are essential for building accurate reports and dashboards.**

* **Steps to Handle Relationships:**

1. **Go to the Model View:- In Power BI Desktop, click on the “Model” icon on the left sidebar.**
2. **Create a Relationship Manually:- Drag a column from one table to a related column in another table.**
3. **Edit Relationship Settings:- Click on manage relationships.**

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

**Ans. A Power BI Gateway acts as a bridge between on-premises data sources like SQL Server, Excel files, or Oracle and Power BI Service cloud. It allows Power BI to securely access and refresh data stored locally not in the cloud.**

**Main Purpose:** T**o enable secure data transfer from the local system or company server to the Power BI Service for:**

* **Scheduled data refreshes**
* **Real-time live queries**
* **Publishing and sharing up-to-date dashboards and reports**

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

**Ans. Scheduling a data refresh in Power BI Service ensures that dashboards and reports always display up-to-date data from data sources — especially when using Import mode or data connected via Power BI Gateway.**

**Steps to Schedule Data Refresh:**

**1. Publish Your Report**

* **First, publish your Power BI report (.pbix) to the Power BI Service (workspace).**

**2. Go to Power BI Service**

* **Visit: https://app.powerbi.com**
* **Go to My Workspace or your target workspace.**
* **Find your dataset (not the report).**

**3. Open Dataset Settings**

* **Click on the three dots (⋮) next to your dataset.**
* **Select Settings.**

**4. Set Up a Gateway (if needed)**

* **If your data is from an on-premises source, make sure a Power BI Gateway is installed and configured.**
* **Map your data sources under "Gateway connection".**

**5. Configure Scheduled Refresh**

* **Under "Scheduled refresh", turn it On.**
* **Set:**
  + **Time zone**
  + **Refresh frequency (Daily or Weekly)**
  + **Refresh times (e.g., 8:00 AM, 6:00 PM)**
  + **Email notifications for refresh failures**

**6. Apply Settings**

* **Click Apply to save the refresh schedule.**

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

**Ans. Row-Level Security (RLS) in Power BI is a feature that allows you to control what data each user can see in a report — based on filters you define. It ensures that users only access the data they are allowed to view, even though everyone uses the same report or dashboard.**

**Why Use RLS?**

**Imagine you have a sales report for all regions — but you want:**

* **A manager in Gujarat to see only Gujarat data**
* **A manager in Maharashtra to see only Maharashtra data**

**With RLS, you can apply filters automatically to each user’s view without making separate reports for each one.**

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

**Ans. Power BI Desktop is a Windows-based application that you install on your computer.**

** Connect to different data sources like Excel, SQL, web APIs, etc.**

** Clean and transform the data using Power Query.**

** Build relationships between tables (data modeling).**

** Create visuals, charts, dashboards, and write DAX formulas.**

**Power BI Service (also called Power BI Online) is a cloud-based platform.**

** Publish, view, and share reports and dashboards that you created in Power BI Desktop.**

** Collaborate with colleagues by sharing workspaces.**

** Schedule data refresh so reports always show the latest data.**

** Manage security, like Row-Level Security and user access.**

** Access your reports from anywhere on web or mobile.**

**In Short :-  Power BI Desktop is where you prepare and build your reports on your local machine.**

** Power BI Service is where you publish, share, and manage those reports in the cloud.**

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

**Ans. DirectQuery is a mode in Power BI that allows you to connect directly to your data source without importing the data into Power BI.**

**The data stays in the original database, and Power BI only sends queries to fetch data when needed**

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

**Ans. A Power BI template is a special kind of Power BI file with the extension .pbit.**

**A Power BI template (.pbit) is like a blueprint of your Power BI report —  
it has all the visuals, data model, and queries, but waits to be filled with actual data when opened.**

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

**Ans. Incremental refresh allows Power BI to load only new or changed data, instead of reloading your entire dataset every time.**

**This makes refreshing faster, more efficient, and reduces load on your data source, especially for large datasets.**

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

**Ans. Power Query is the data loading and transformation engine in Power BI.  
It’s used to connect to data sources, clean, transform, and shape your data before it’s loaded into the Power BI data model.**

**Power Query is like the kitchen of Power BI — where you clean, prepare, and cook the raw data before serving it as reports.**

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

**Ans.**

**Calculated Columns:- A calculated column adds a new column to an existing table.**

**It uses a DAX formula to calculate values row by row, based on data in that table**

**Calculated Tables:- A calculated table creates a new table entirely, generated by a DAX expression.**

**It’s often used to create summary tables, filtering tables, or tables that don’t exist in your data source.**

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

**Ans.  Most people use pre-built custom visuals from the marketplace.**

** If you need total control, you can code your own visual using the Power BI SDK.**

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

**Ans.**

* 1. **. Optimize the data model**
  2. **. Reduce data volume**
  3. **. Efficient DAX measures**
  4. **. Manage visuals and avoid more slicers.**
  5. **. Refresh the data**
  6. **. Optimize Relationship**

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

**Ans. We can integrate Power BI with Azure by connecting to services like Azure SQL Database, Data Lake, Synapse, and Machine Learning for advanced data storage, processing, and predictive analytics.**

**With Office 365, Power BI works seamlessly with Excel, SharePoint, OneDrive, Outlook, and Teams to easily import data, share reports, embed dashboards, and collaborate within familiar Microsoft tools.**

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

**Ans. Aggregations in Power BI are a way to summarize detailed data into higher-level data, so that your reports run faster and handle large datasets efficiently.**

**Instead of always querying millions of rows in a big fact table, Power BI can query a small summarized table (aggregation table) that stores totals, averages, or counts grouped by certain fields. This reduces the data scanned and speeds up visuals.**

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

**Ans. In Power BI, most data quality and error handling is done in the Power Query Editor, which is designed exactly for cleaning and preparing your data before loading it into the model.**

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

**Ans. Power BI Embedded is a Microsoft Azure service that lets you embed Power BI reports, dashboards, and visuals into your own custom applications or websites.**

**Use Power BI Embedded when want to integrate interactive reports directly into own app or website, so customers see analytics without needing Power BI accounts. It’s ideal for external users and custom-branded experiences, especially in SaaS or client portals.**

**LINK OF GOOGLE DOCX FILE:-**

[**https://docs.google.com/document/d/1RbFQxSfxYeDyNBtZdoaQn1wl26IWBYQ4AdeMEyzaMs0/edit?usp=sharing**](https://docs.google.com/document/d/1RbFQxSfxYeDyNBtZdoaQn1wl26IWBYQ4AdeMEyzaMs0/edit?usp=sharing)