**Creating Dashboard with Visualization Tool**

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

* Power BI is a business intelligence tool used to create interactive reports and dashboards by connecting to multiple data sources.
* It differs from Excel because Excel is primarily a spreadsheet application for calculations and data manipulation, while Power BI focuses on data visualization, advanced analytics, and connecting to large datasets from various sources.

2) Explain the concept of data modeling in Power BI.

* Data modeling in Power BI is the process of defining the structure of your data by creating relationships between different tables, often involving the use of keys (like primary and foreign keys). This model allows Power BI to understand how different pieces of data connect and work together.

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

* **Import**: Loads data into Power BI, creating a static copy.
* **Direct Query**: Allows Power BI to query the data source directly without storing it.
* **Live Connection**: Connects to certain data sources (like SSAS) where all computations happen in the source.

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

* Data transformation is handled through **Power Query** in Power BI. It allows you to clean, shape, and modify the data before loading it into your model. Tasks include removing duplicates, filtering rows, splitting columns, and more.

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

* DAX is a formula language used in Power BI to create custom calculations, aggregations, and more advanced data manipulations. It’s important because it allows you to perform dynamic calculations on your data for deeper analysis.

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

* **Calculated Columns**: Added to your data table and are calculated row by row when the data is loaded.
* **Measures**: Calculations made on the fly, used in reports and visualizations, and calculated based on filters applied to the report.

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

* Relationships are created between tables by linking columns, usually through keys. You can manage relationships in the **Model view** by specifying how tables relate to one another (e.g., one-to-many).

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

* Power BI Gateway allows on-premises data sources (like SQL Server) to securely connect to the Power BI Service in the cloud. It enables scheduled refreshes and live queries to those data sources.

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

* In Power BI Service, you can schedule data refresh by setting up refresh intervals (e.g., daily, weekly). You configure this in the dataset settings by defining the frequency and time.

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

* Row-level security (RLS) restricts data access for certain users. You define security roles that filter the data visible to users based on their permissions, ensuring that users can only see the data relevant to them.

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

* **Power BI Desktop**: A free application used to create reports and data models on your local machine.
* **Power BI Service**: A cloud service where you publish and share reports, collaborate with others, and schedule refreshes.

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

* Direct Query allows you to directly connect and query large databases without importing the data. Queries are sent to the data source each time you interact with visuals.

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

* Power BI templates are reusable report formats that include the structure, visuals, and data model but not the data itself. They are useful for creating standardized reports.

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

* Incremental refresh only updates the new or changed data during a scheduled refresh, reducing the time and resources needed compared to refreshing the entire dataset.

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

* Power Query is the tool used to connect, clean, and transform data before loading it into the Power BI model. It handles data manipulation like filtering, merging, and grouping.

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

* **Calculated Columns**: New columns added to existing tables using DAX.
* **Calculated Tables**: Entire new tables generated from DAX expressions, independent of the original data source.

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

* Custom visuals are created using development tools like the Power BI SDK or from the marketplace. You write code (using JavaScript/TypeScript) to define how the visual behaves and looks.

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

* Use **star schema** for your data model.
* Avoid too many calculated columns.
* Use **aggregations** and **measures** efficiently.
* Optimize DAX expressions and reduce the number of visuals per report page.

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

* Power BI integrates with Azure by connecting to Azure data sources like Azure SQL or Data Lake. It also connects with Office 365 services like Excel, SharePoint, and Teams for data sharing and collaboration.

20) Explain the concept of aggregations in Power BI.

* Aggregations involve pre-summarizing large datasets at various granularities to improve performance when querying. This reduces the amount of data processed and speeds up report performance.

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

* Power Query helps identify and fix data issues through data profiling, removing duplicates, fixing data types, or applying transformations. You can also create error-handling logic in DAX formulas.

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

* Power BI Embedded allows developers to embed Power BI reports and dashboards into their own applications. It’s used when you need to provide analytics within third-party applications without requiring the full Power BI platform.

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