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

A. Power BI is a business analytics tool by Microsoft that allows users to visualize data, share insights, and make informed decisions.

Difference from Excel:

Power BI is designed for interactive dashboards and advanced data modeling.

Excel is spreadsheet-based and better suited for manual data analysis.

Power BI handles larger datasets and real-time updates better.

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

A. Data modeling is the process of connecting tables using relationships and defining calculations (measures and columns) to build a semantic layer for analysis. It allows for efficient querying and analysis of complex datasets.

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

A. Import Mode – Data is imported and stored in Power BI.

DirectQuery – Queries the data source in real-time without importing.

Live Connection – Connects to SSAS (SQL Server Analysis Services) for real-time analysis.

Composite Model – Mix of Import and DirectQuery in a single repot.

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

A. Data transformation is done in Power Query Editor using steps like:

Removing duplicates

Changing data types

Merging or splitting columns

Filtering rows

Creating custom columns

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

A. DAX is a formula language used in Power BI to create custom calculations and logic in calculated columns, measures, and tables. It's important for dynamic and advanced data analysis.

6) Difference between calculated columns and measures in Power BI?

A. Calculated Column: Row-level calculation, stored in the data model.

Measure: Aggregate-level calculation, evaluated at query time and not stored.

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

A. Use the Model View to create relationships between tables.

Define cardinality (one-to-many, many-to-one) and cross-filter direction.

Ensure relationships are based on unique keys for accuracy.

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

A. It allows secure data transfer between on-premises data sources and Power BI cloud services for scheduled refreshes and DirectQuery access.

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

A. Go to the dataset settings in Power BI Service.

Enable and configure scheduled refresh (daily/hourly).

Requires a gateway for on-premises sources.

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

A. Row-level security (RLS) restricts data access for users based on filters. You define roles and DAX filters, and when users log in, they only see data relevant to their role.

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

A. Power BI Desktop: A Windows app for building and designing reports.Power BI Service: A cloud platform to publish, share, and collaborate on reports.

Desktop is for development; Service is for deployment and sharing.

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

A. DirectQuery allows Power BI to fetch data directly from the source without storing it. Ideal for large datasets and real-time data analysis, but limited in transformation and DAX usage.

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

A. Templates (.pbit files) include report layout, visuals, and queries but not the data. They are used to standardize reporting and share report structures without data.

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

A. Set up in Power BI Desktop under table settings. Use date-based filters and define:

Range Start and End parameters

Useful for large datasets and optimized refresh.

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

A. Power Query is the data transformation and preparation tool in Power BI. It helps clean, merge, and shape data before loading into the model.

16) Difference between calculated columns and calculated tables in Power BI?

A. Calculated Column: Adds a new column to existing tables.

Calculated Table: Creates a new table based on DAX logic.

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

A. Use Power BI marketplace to import visuals.

Create custom visuals using TypeScript and Power BI Visuals SDK.

Ideal for unique visual needs.

18) Best practices for optimizing performance in Power BI?

A. Reduce number of visuals

Use star schema

Avoid complex DAX

Use Import mode where possible

Use summarization and aggregation.

19) How can you integrate Power BI with Azure and Office 365?

A. Use Azure SQL, Synapse, or Data Lake as data sources.

Embed reports in Teams, SharePoint.

Automate with Power Automate and use Azure AD for authentication.

20) Explain the concept of aggregations in Power BI.

A. Aggregations pre-calculate summaries of large datasets to improve performance. Power BI automatically uses them when possible to optimize queries.

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

A. Use Power Query to detect and replace errors

Use conditional columns to handle missing or invalid data

Monitor refresh failures and set alerts

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

A. Power BI Embedded allows developers to embed Power BI reports into web or mobile apps using APIs. Used for external users or clients who don't use Power BI service directly.