Creating a Dashboard with Visualization Tool

Assignment:-

1. **What is Power BI and how does it differ from Excel?**
   - Power BI is MicroSoft tool for making Interactive reports and dashboard. It can connect the many data sources for clean the data, transform, visualize the data, etc.
   - The main difference is Excel is for spreadsheets and small analysis, while Power BI is for bigger datasets, better visuals, and automatic refresh.

2. **Explain the concept of data modeling in Power BI.**
   - Data modeling is the process of structuring and relating tables to create a logical data model for analysis.
   - Defining relationships between tables as one-to-one, one-to-many, many-to-many.

3. **What are the different types of connections available in Power BI?**
   i. **Import:** Loads data into Power BI's internal storage.
   ii. **DirectQuery:** Keeps data in the source, queries in real time.
   iii. **Live Connection:** Connects directly to services like SQL Server Analysis Services or Power BI datasets.

4. **How do you handle data transformation in Power BI?**
   - Power Query in Power BI to clean or change the data before loading it. Use like removing duplicates, changing column names, splitting columns, or changing data types are all done in data transformation.

5. **What is DAX (Data Analysis Expressions) and why is it important in Power BI?**
   - DAX (Data Analysis Expressions) is a formula language in Power BI, Excel Power Pivot, and SSAS Tabular models.
   - **Importance**:
     i. Used to create measures, calculated columns, and calculated tables.
     ii. Enables complex aggregations, time intelligence, and filtering logic.

6. **Can you explain the difference between calculated columns and measures in Power BI?**
   - **Calculated column**:- Works row by row, stored in the table, uses more space.
   - **Measure**:- Calculated only when needed, better for performance, usually used in visuals for totals and averages.

7. **How do you handle relationships between tables in Power BI?**
   - In Power BI, A relationships between tables in the model view. In which column connects to which, and define if it's one-to-many or many-to-many and also set filter direction.

8. **What is the purpose of a Power BI Gateway?**
   - Acts as a bridge between on-premises data sources and Power BI Service.
   - Without it, online Power BI can't refresh from local databases or files. There are personal and enterprise gateways.
     i. **Personal Gateway:** For personal use, refresh only.
     ii. **Enterprise Gateway:** Shared by multiple users, supports scheduled refresh and live queries.

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

- After publishing to Power BI Service, I go to the dataset settings, set up the gateway if needed, and then choose how often it refreshes (daily, weekly, etc.).

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

- RLS is used to show different data to different users. I make roles with filters in Power BI Desktop, then assign people to those roles in the service.

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

- **Desktop**:- Free app on my PC for building reports and models.
- **Service**:- Online platform to share, refresh, and view reports.

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

- Direct Query means the data is not stored inside Power BI. Instead, every time I make a report or filter, Power BI sends a query to the original database. This way, I always see the latest data, but it can be a bit slower than import mode.

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

- Templates are pre-built report files with visuals, data model, and queries but without the actual data. They are useful because I can share a standard design and other people can connect their own data to it.

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

- Instead of reloading the whole dataset every time, incremental refresh only refreshes the new or changed data. This saves time and makes refresh faster, especially with large datasets.

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

- Power Query is the tool inside Power BI where I prepare and clean the data before loading it. I use it to remove errors, change formats, merge tables, and make the data ready for reporting.

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

i. **Calculated Column** → A new column added to an existing table, works row by row.
ii. **Calculated Table** → A completely new table created using DAX formulas, usually from existing tables.

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

- If the default visuals are not enough, I can either download custom visuals from the AppSource marketplace or create my own using tools like Power BI Developer SDK.

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

i. Keep the data model simple.
ii. Avoid too many calculated columns.
iii. Use measures instead of columns where possible.
iv. Reduce the number of visuals on a page.
v. Use star schema instead of snowflake for modeling.

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

i. With **Azure**, I can connect to Azure SQL DB, Data Lake, or Machine Learning models.
ii. With **Office 365**, I can embed reports in Teams, SharePoint, or Excel for easy sharing.

20. Explain the concept of aggregations in Power BI.

- Aggregations are summary tables created on top of large datasets. Instead of always querying the detailed data, Power BI uses the aggregated table for faster performance when doing totals, counts, averages, etc.

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

- I handle it mostly in Power Query by removing nulls, filtering errors, changing data types, and replacing missing values. I also make sure the source data is clean before loading it into Power BI.

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

- Power BI Embedded is mainly for developers. It lets me embed Power BI dashboards and reports inside other applications or websites. It's used when a company wants to give users analytics inside their own app without sending them to Power BI Service.