1 What is Matplotlib and why is it used?

Meaning (very simple)

Matplotlib is a **Python library used to draw graphs**.

We use it to:

- See patterns in data
- Compare values
- Understand data visually instead of numbers

2 Difference between line plot, bar plot, and scatter plot

◆ Line Plot (Trend over time)

Used when data is **continuous** (time, growth, temperature)

⬥ Bar Plot (Comparison)

Used to **compare categories**

Example: Marks of students, sales of products

⬥ Scatter Plot (Relationship)

Used to see **relationship between two variables**

Example: Study hours vs marks

3 What are figure and axes in Matplotlib?

Simple meaning

- **Figure** → whole graph window
- **Axes** → actual plotting area (X & Y axis)

4 How do labels, titles, and legends improve visualization?

- **Title** → What is this graph about?
- **Labels** → What do X and Y mean?
- **Legend** → Which line is which?

✦ Without labels → graph is confusing
✦ With labels → graph is readable

5 Why is data visualization important before building AI models?

Because **models learn from data**, and **bad data = bad model**

Why visualization is important in AI?

✓ Detect outliers
✓ Find patterns
✓ Understand data distribution
✓ Reduce overfitting risk
✓ Improve model accuracy