📊 Histograms – Notes & Examples

1️⃣ Draw and Interpret Histograms

- A **histogram** is a type of bar chart that represents **continuous grouped data**.
- Unlike bar charts, **there are no gaps** between the bars.
- Each bar represents a **class interval** (group).
- The **height** of each bar represents the **frequency density**, **not** just frequency.

2️⃣ Frequency Density

To draw a histogram, you first need to calculate the **frequency density** using the formula:

$$\text{Frequency Density} = \frac{\text{Frequency}}{\text{Class Width}}$$

- The **class width** is the difference between the upper and lower boundaries of the class.

📌 Example 1: Calculating Frequency Density

Class Interval	Frequency
0 – 10	20
10 – 20	30
20 – 40	40

➡️ Calculate the **frequency density**:

Class Interval	Frequency	Class Width	Frequency Density
0 – 10	20	10	20 ÷ 10 = 2
10 – 20	30	10	30 ÷ 10 = 3
20 – 40	40	20	40 ÷ 20 = 2

Now you can plot the histogram with:

- X-axis: class intervals (e.g., 0–10, 10–20, 20–40)
- Y-axis: frequency density (2, 3, 2)
- Bars touch each other

📌 Example 2: Interpreting a Histogram

If you are **given a histogram**, and need to **calculate frequency**, use:

$$\text{Frequency} = \text{Frequency Density} \times \text{Class Width}$$

Say one bar has:

- Class interval: 30–50 (width = 20)
- Frequency density = 1.5

$$\text{Frequency} = 1.5 \times 20 = 30$$