

CHAPTER 2 PHYSICAL QUANTITIES AND MEASUREMENT

Measurement: Is done to ascertain the size, shape, amount or degree of physical bodies. It is done by comparison with a standard unit or with an object of known size.

MEASUREMENT OF LENGTH:

Length is defined as the separation or distance between 2 points in space. For measuring the length of any object, we require to choose a proper measuring device.

Ruler: is a measuring stick marked with units for measuring along its edge.

Precautions to be observed while measuring with a scale:

1. Scale should be properly placed:
 - a. It should be placed horizontally straight.
 - b. It should be placed very close to the object to be measured.
2. When the zero mark of the scale is damaged, measurement should be done using any other full mark of the scale. Then this mark value should be subtracted from the final value to get the actual length.
3. The eye must be placed vertically above the mark being read.
4. When the marking of the scale is not uniform then the length should be measured several times using different parts of the measuring scale. Then the average of all observations should be taken to get the value nearest to the actual length.

Measuring tape can be used to measure lengths of curved or non-rigid bodies.

Units of length:

SI unit of length is metre(m). For measuring small lengths, smaller units of length are used like cm and mm. For measuring large distances larger units of length like km(kilo metre) is used.

$$1000 \text{ mm}=1\text{m}$$

$$100 \text{ cm}=1\text{m}$$

$$1000\text{m}=1\text{km}$$

MEASUREMENT OF MASS

Mass- is defined as the quantity of matter contained in a body. It is measured using a **balance** (eg beam balance).

Units of mass- Standard unit of mass is Kg (kilogram)

$$1 \text{ kg}=1000 \text{ gms}$$

$$1 \text{ quintal}= 100 \text{ kg}$$

$$1 \text{ tonne}=10 \text{ quintal}$$

Beam Balance:

The mass of a body is measured by a beam balance, comparing its mass with standard masses.

- It consists of a light and rigid beam of brass, a metallic pillar, wooden base, two pans, a metallic pointer and an ivory scale
- It is enclosed in a box to avoid the effect of wind.
- A weight box containing standard weights is kept for comparison.
- The body whose mass is required to be known is kept in one pan, and the standard weights are kept on the other pan and then calculating it from the standard weights placed and the resting point of the pointer.
- If the resting point of the balance coincides with the zero resting point, then the mass at the resting point gives the correct mass of the body.(see diagrams given on page 21 of your book)

Electronic balance: is a device used to find accurate measurement of mass.

Electronic Balance precautions:

1. Balance should be kept on level and stable surface.
2. The range of balance should be appropriate for the mass being measured.
3. Make sure that the balance reads to the correct decimal place.
4. The pan should be free of any unwanted particles or substances.
5. Substance from the container should be carefully transferred to the pan in small quantities.
6. Discard ant substance present on the spatula.
7. Never return stock chemicals to the container.

NOTE: Read the chapter till page 22 from the book.
