

ERROR in MEASUREMENT

The difference between the measured value and true value of a physical quantity is called error in measurement.

The errors in measurement can be broadly classified as

(a) Systematic errors and (b) random errors.

Systematic errors

The **systematic errors** are those errors that tend to be in one direction, either positive or negative.

Some of the sources of systematic errors are:

(a) **Instrumental error:**

The errors that arise due to imperfect design or calibration of the measuring instrument, zero error in the instrument, etc. are called **instrumental error**.

For example, the temperature graduations of a thermometer may be inadequately calibrated (it may read $104\text{ }^{\circ}\text{C}$ at the boiling point of water at STP whereas it should read $100\text{ }^{\circ}\text{C}$); in a vernier callipers the zero mark of vernier scale may not coincide with the zero mark of the main scale, or simply an ordinary meter scale may be worn off at one end.