

ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS

UNIT: I Philosophy of Measurement

- Methods of measurement
- Measurement system
- Classification of instrument systems
- Characteristics of instruments & measurement systems
- Errors in measurement & its analysis, Standards

Methods of measurement

Direct Comparison with the Standard

- In the direct comparison method of measurement, we compare the quantity directly with the
- primary or secondary standard. Say for instance, if we have to measure the length of the bar, we
- will measure it with the help of the measuring tape or scale that acts as the secondary standard.

Indirect Method of Measurement

- There are number of quantities that cannot be measured directly by using some instrument.
- For instance we cannot measure the strain in the bar due to applied force directly.
- We may have to record the temperature and pressure in the deep depths of the ground

Measurement system

- Measurement involves the use of instruments as a physical means of determining quantities and variables.
- In simple cases, an instrument consists of a single unit which gives an output reading or signal according to the unknown variable applied to it.
- In more complex measurement situations, however, a measuring instrument may consist of several separate elements.
- These elements may consist of transducing elements which convert the measurand to the analogous form.
- The analogous signal is then processed by some intermediate means and then fed to the end devices to present the results of the measurement for the purposes of display and or control.