



# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

## DEPARTMENT OF MECHANICAL ENGINEERING



### INSTRUMENTS PERFORMANCES

All instrumentation systems are characterized by the system characteristics or system response. It consists of two basic characteristics such as static and dynamic.

If the instrument is required to measure a condition not varying with time characteristics are called static while for a time varying process variable measurement, the dynamic characteristics are more important.

Static response: The static characteristics of an instrument are considered for instruments which are used to measure an unvarying process conditions.

Terms in Measurement: Sensitivity: Sensitivity of the instrument is defined as the ratio of the magnitude of the output signal to the magnitude of the input signal.

It denotes the smallest change in the measured variable to which the instruments responds. Sensitivity has no unique unit. It has wide range of the units which dependent up on the instrument or measuring system.

Readability: Readability is a word which is frequently used in the analog measurement. The readability is depends on the both the instruments and observer. Readability is defined as the closeness with which the scale of an analog instrument can be read.

The susceptibility of a measuring instrument to having its indications converted to a meaningful number. It implies the ease with which observations can be made accurately. For getting better readability the instrument scale should be as high as possible.

Accuracy: Accuracy may be defined as the ability of instruments to respond to a true value of a measured variable under the reference conditions. It refers to how closely the measured value agrees with the true value.

**Precision:** Precision is defined as the degrees of exactness for which an instrument is designed or intended to perform. It refers to repeatability or consistency of measurement when the instruments are carried out under identical conditions at a short interval of time. It can also be defined as the ability of the instruments to reproduce a group of the instruments as the same measured quantity under the same conditions.

**Correction:** Correction is defined as a value which is added algebraically to the uncorrected result of the measurement to compensate for an assumed systematic error.

**Dynamic response:** The behaviours of an instrument under such time varying input – output conditions are called dynamic response of an instrument. The instrument analysis of such dynamic response is called dynamic analysis of the measurement.