UNIT – 1

SCIENCE OF MEASUREMENT AND TRANSDUCERS

What is Measurement?

Measurement

• Measurement (also called metrology) is the science of determining values of physical variables.

• A method to obtain information regarding the physical values of the variable.

• Measurement of a given quantity is essentially an act or result of comparison between the quantity (whose magnitude is unknown) and predetermined or predefined standards.

• Two quantities are compared the result is expressed in numerical values.

Instrumentation

d in measurement system

Physical Variables

- Temperature
- Pressure
- Light intensity
- Displacement
- Speed
- Level
- low-rate etc.,

Why Do We Measure?

In the case of process industries and industrial manufacturing

– To improve the quality of the product

– To improve the efficiency of production

– To maintain the proper operation.

Fundamental Units

Quantity	*Standard Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Temperature	Kelvin	K
Luminous intensity	candela	cd
Matter	mole	mol

Derived Units

Quantity	*Standard Unit*	*Unit Standard*
Area square	metre	m^2
Volume cubic	metre	m^3
Velocity	metre per second	m/s
Acceleration	metre per second squared	m/s^2
Angular velocity	radian per second	rad/s
Angular acceleration	radian per second squared	rad/s^2
Density	kilogram per cubic metre	kg/m^3