



## **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.

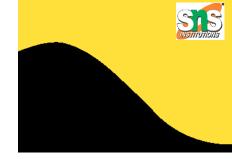
### Instrumentation



#### l in measurement system



## **Physical Variables**

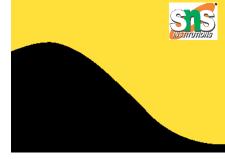


- □ Temperature
- □ Pressure
- □ Light intensity
- □ Displacement
- □ Level



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	А
Temperature	Kelvin	К
Luminous intensity	candela	cd
Matter	mole	mol







### **Derived Units**

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

