

# Unit – 3

# Transducers

**Lecture\_3.1**

**Introduction to Transducers**

# Introduction to transducers

- A transducer is a device that converts one form of energy to other form. It converts the measurand to a usable electrical signal.
- In other word it is a device that is capable of converting the physical quantity into *a proportional electrical quantity such as voltage or current.*
  - The physical quantity may be mechanical, chemical, optical or thermal.
- Transducers are classified based on,
  - Application.
  - Method of energy conversion.
  - Nature of output signal.

# Classification of transducers

**The transducers can be classified as:**

- I. Active and passive transducers.
  - II. Analog and digital transducers.
  - III. On the basis of transduction principle used.
  - IV. Primary and secondary transducer
  - V. Transducers and inverse transducers.
- **Electrical transducers**
    - voltage, current, frequency.
    - R, C, I component and its effects.
  - **Non-electrical transducers**
    - Detector (*sensor*).
    - Physical quantity is obtained which is converted to electrical quantity.
  - **Displacement transducers**
    - Capacitive, oscillation, potentiometric, photoelectric, piezoelectric (*Force Summing Devices*).
  - **Opto-electronic transducers**
    - Converts light energy into electrical energy.
    - Photoconductive cell, photovoltaic cell, solar cell, photo tube, photo multiplier, etc.