

WELCOME

INTRUDUCTION

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CHIEF INSTRUCTOR(TECH) ELECTRONIC

DHAKA POLYTECHNIC INSTITUTE

INTRODUCTION OF CLASS

- ▶ DEPARTMENT : ELECTRONICS
- ▶ SEMESTER: FIFTH
- ▶ SUBJECT : ELECTRONIC MEASURING INSTRUMENTS
- ▶ CODE :66852
- ▶ TIME : 45 MIN.

Presentation on

Measuring Instruments and its classification

01. Understand measuring Instruments and its classification:

- ❖ 1.1 State measuring instrument.
- ❖ 1.2 Mention different types of measuring instruments.
- ❖ 1.3 Describe absolute and secondary instruments.
- ❖ 1.4 List different types of secondary instruments.

1.1 State Measuring Instrument

- ▶ The device used for comparing the unknown quantity with the unit of measurement or standard quantity is called a Measuring Instrument.
- ▶ "OR"An instrument may be defined as a machine or system which is designed to maintain functional relationship between prescribed properties of physical variables & could include means of communication to human observer."

1.2 Methods:

Methods

There are two methods we follow to measure any physical parameters,
The are-

1. Direct Method
2. Indirect Method

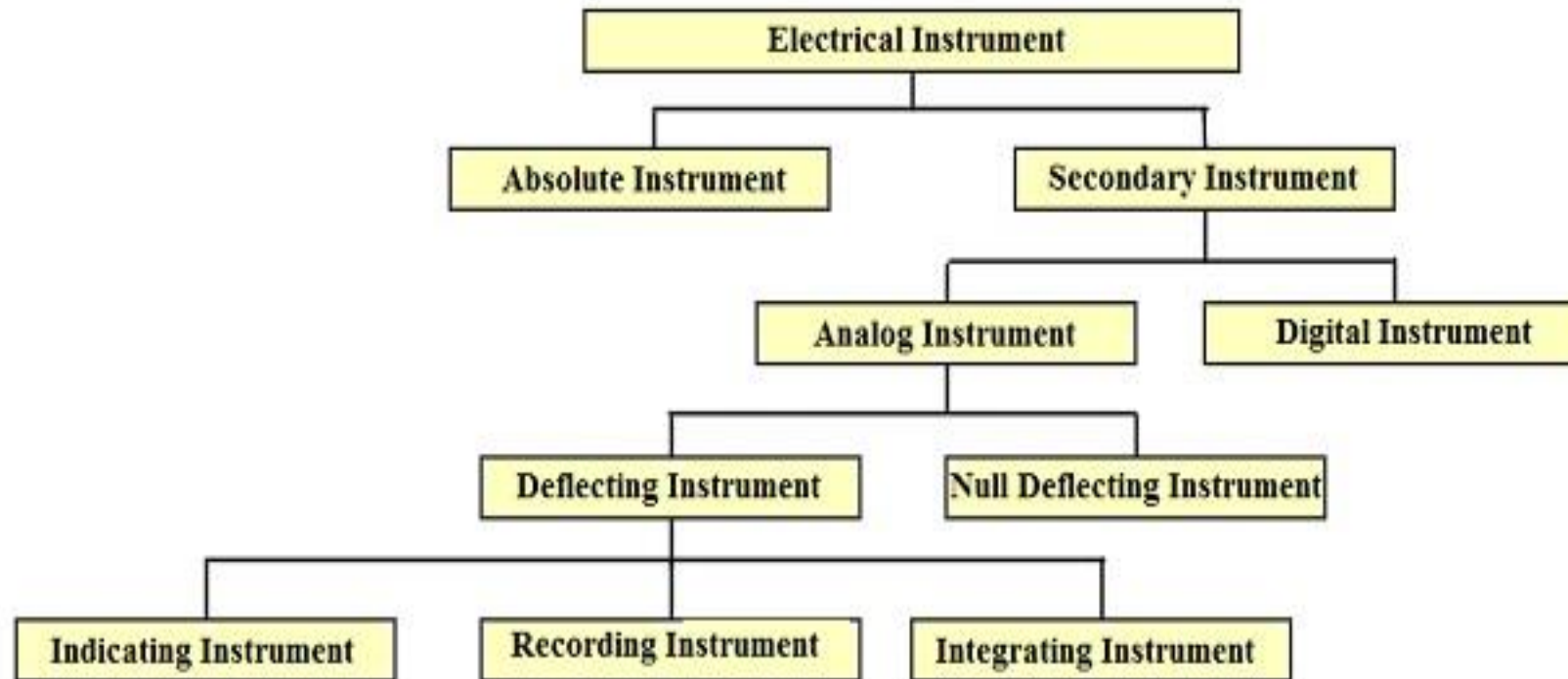
Types of Instruments:



° Types of instruments

1. Mechanical Instruments
2. Electrical Instruments
3. Electronic Instruments

Classification:



Electrical Instrument Classification

1.3 Defination of Deflecting Instrument:

- ▶ **Indicating Instruments**

It indicate the magnitude of an electrical quantity at the time when it is being measured. The indications are given by a pointer moving over a graduated dial.

- ▶ **Recording Instruments**

The instruments which keep a continuous record of the variations of the magnitude of an electrical quantity to be observed over a defined period of time.

- ▶ **Integrating Instruments**

The instruments which measure the total amount of either quantity of electricity or electrical energy supplied over a period of time. For example : Energy meters

Observation of different types of Instrument.

Multimeter:

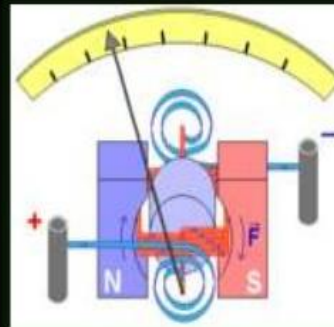
- ▶ A electronic instrument having ability to measure current,voltage,Resistance,conductance.

OR

- ▶ A electronic device having ability to work as Ammeter, Ohmmeter or voltmeter.



Permanent Magnet Moving Coil (PMMC)



Tangent Galvanometer



The instruments from the left side is called, Permanent Magnet Moving Coil in short PMMC. The other one from the right side is called a Tangent Galvanometer. A Tangent Galvanometer has the mechanical inertia same as like the PMMC but PMMC is more efficient then the Tangent Galvanometer. The PMMC and the Tangent Galvanometer is also called Absolute Instrument.



Analog Ammeter

2. Electrical Instruments

The electrical instruments mainly work by their electrical methods of indicating the output which much more rapid, fast and smother than the mechanical instruments. But every electrical instrument has a mechanical inertia problem when they are used for measuring. In this reason all the electrical instruments depend on the mechanical instruments have disadvantages like-

- i. Limited time & frequency response
- ii. Inertia due to mechanical part.

Electrical Measuring Instruments:



THESE ARE INSTRUMENTS FOR MEASURING MAJOR ELECTRICAL PARAMETERS SUCH AS KVA, KW, PF, HERTZ, KVAR, AMPS AND VOLTS. IN ADDITION SOME OF THESE INSTRUMENTS ALSO MEASURE HARMONICS.

Energy meter and Recoding Instrument:



1.4 Functions and Application:

All measuring instruments have various types of functions and applications.

Functions-

1. Indicating Function- Vehicles have Speed Meter.
2. Recording Function- Digital Diabetics Checker.
3. Controlling Function- Air Pressure Controller.

Application-

1. Monitoring- Digital Processing Analysis.
2. Control of Process & Operation- Room Temperature Controller.
3. Experimental Engineering Analysis- Formula Analysis.

Assure the Question?

- ▶ What are Measuring Instrument?
- ▶ What are the different types of Measureing Instrument?
- ▶ Explain the different types of Deflecting Instrument?

Home work

Explain the different types of Secondary Instrument.

Next Presentation:

- ▶ Perform the operation of Ammeter and Voltmeter.

THANK YOU

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