SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE404 MEASUREMENT &INSTRUMENTATION

II YEAR /IV SEMESTER

Topic 1 :TRANSDUCERS - ADVANTAGES, REQUIREMENTS, CLASSIFICATION AND SELECTION

DATA LOGGERS

Review Answers for worksheet-36

Transducer – Definition, Advantages, Requirements

Activity

Transducers – Classification, Selection

M&I Star of the Week

Summary

Worksheet-37

TRANSDUCERS - DEFINITION

> A device that receives energy from one system and transmits it to another, often in a different form.

> A device Which converts energy from one form to another.

> A device which converts a physical quantity or a physical condition in to an electrical signal. It is also known as pickup.

TRANSDUCERS - ADVANTAGES

- Electrical amplification & attenuation can be easily done.

- Effects of friction are minimised.

- Mass-inertia effects are minimised.

- Very small power is required for controlling.

- Electrical output can be amplified to any desired level.

- Output can be indicated and recorded remotely at a distance from sensing medium.

- Output can be processed (modified) to meet the indicating and controlling units. Signal magnitude can be related in terms of current or voltage.

- Signal can be conditioned or mixed to obtain any combinations with outputs of similar transducers or control signals.

- Electrical output can be easily used, transmitted and processed for the purpose of measurement.

TRANSDUCERS - REQUIREMENTS

- Ruggedness
- Linearity
- Repeatability
- High output and signal quality
- High reliability and stability
- Good dynamic response
- No hysterisis
- Residual deformation

TRANSDUCERS - CLASSIFICATION

- ➢ **Basis of transduction form used**
- - **Resistive, Inductive & Capacitive**
- ➢ **Basis of method of applications**
- - **Primary** (Thermistor) and **Secondary** (Bourdon tube)
- ➢ **Basis of method of Energy conversion**
- - **Active** (Self generating type – Tacho-generator, Thermocouples, Piezoelectric crystal) and **Passive** (Strain gauges, Thermistor)

TRANSDUCERS - CLASSIFICATION

- ➢ **Basis of nature of output signal**
- - **Analog and Digital**
- ➢ **Inverse Transducer**
- - **Converts electrical qty in to non-electrical qty.**
- - **Precision actuator**
- - **Used in feed back measuring systems**

TRANSDUCERS - SELECTION

- Operating Range
- Sensitivity
- Electrical output characteristics
- Environmental conditions
- Errors
- Accuracy

THANK YOU