

**MEC 3102 – PRODUCTION  
ENGINEERING I AND  
ELECTRICITY & ELECTRONICS II**  
**Department of Mechanical Engineering**

**Name: Mr. Munkombwe Boyd,**

**Old School of Engineering Blg.,**

**Cell: 0968315273/0950435239**

**Email: boyd.munkombwe@unza.zm**

**2<sup>nd</sup> Series Assignment [4]**

### QUESTION ONE:

Explain what is meant by:

- (a) Active instruments
- (b) Passive instruments

Give examples of each and discuss the relative merits of these two classes of instruments.

### QUESTION TWO:

What are the three categories of systematic errors in the instrument and explain in detail.

### QUESTION THREE:

- i. Briefly define and explain the following static characteristics of measuring instruments;
  - (a) Accuracy
  - (b) Resolution
  - (c) Sensitivity
  - (d) Linearity
- ii. Define and explain the types of static errors possible in an instrument.

### QUESTION FOUR:

- i. Explain the difference between accuracy and precision in an instrument.
- ii. Discuss in detail the various dynamic characteristics of a measuring system.

### QUESTION FIVE:

A tungsten/5% rhenium-tungsten/26% rhenium thermocouple has an output e.m.f. as shown in the following table when its hot (measuring) junction is at the temperatures shown. Determine the sensitivity of measurement for the thermocouple in mV/°C

mV	4.37	8.74	13.11	17.48
°C	250	500	750	1000

**DUE: 08/09/21**