GIX MSTI Program

TECHIN 512, SENSORS and CIRCUITS Lab 2

DATE: <date>

Team:

<name>

<name>

**Introduction**

The purpose of this lab is to…..

**Prelab**

PreLab 1.

PreLab 2.

PreLab 3.

PreLab 4.

**Procedure**

1. **Ohm’s Law**

1.1 Measure the resistance of your 1000 Ohm resistor.

Measured resistance = x Ohm

1.2

1.6 [draw a diagram of your circuit]

> Calculated current

> Measured current

> Current error

1.8 [paste graph voltage (Y axis) vs. Current (X axis). Label your graph with units]

Measured current was x and x for .2V, 2.5V, 5V, and 10V

1. **Parallel Resistors**

2.1 Power Supply Readout =

2.3 DMM Current Readout =

2.4a Voltage Across Resistors =

2.4b xA Across Each Resistor

2.4c Sum is x, compared to measured x. x% error.

2.5 V=I\*R <find the resistance using Ohm’s law>

2.6 Measured resistance = x, and compare with result from 2.5

2.7 [draw a diagram with labels]

2.8 RTotal =

V = ITotalRTotal

V = I1000 \* R1000

1. **Series Resistors**

3.3 Open the circuit at three points and measure the current at each gap:

3.3.1 Power supply ground connection = x mA

3.3.2 Connection between two resistors = x mA

3.3.3 Power supply positive connection = x mA

>1000 Ohm resistor measurement: x Ohms

>500 Ohm measurement: x Ohms

>Resistance of all resistors in series: x Ohms

* 1. [draw a diagram of the circuit and label all the voltages and currents]

3.6 Verify that each resistor follows [Ohm’s Law]

VTotal = I \* RTotal

V1K = I \* R1K

V500 = I \* R500

1. **Voltage Dividers**

4.3. > Measure and record the voltage between ground

4.3.1. Ground (should be 0.0!!) :

4.3.2. Junction between the two resistors:

4.3.3. Compare voltage measured in **4.3.2** to prediction of voltage divider equation. Calculated = <equation>. This is very close to our x measurement

4.3.4. Power (should be 5.0V!!):

4.3.5. Compare your measurement with predicted voltage divider output voltage Calculated = <equation>.

4.5. Measure current in the load resistor and voltage across the load resistor: x V, x mA

4.6. Explain why this voltage divider does not follow the **4.3.2** voltage prediction now that a load resistor has been added.

1. **ESP32 - Blink a LED**

Checked off by <name of the TA that checked your work>

1. **Conclusions**