

Lab 1 - Electronics

Lab 12:30 W 2:00 W 3:30 W
 Section 11:00 F 12:30 F

This sheet can be used in class to record the answers to the Lab 1 questions. All answers should eventually be edited into the "Lab1_Answers.txt" file from the class web site, and that file must be uploaded to Vocareum by the Lab 1 due date. **You do not have to turn in this sheet.**

1. (1 point) What voltage was the power supply set for, and what voltage did the DMM measure?

Power supply? _____ DMM? _____

2. (3 points) What are the values of the resistors? List the values from smallest to largest.

a. From the color bands? R_1 : _____ R_2 : _____ R_3 : _____

b. The measured values? R_1 : _____ R_2 : _____ R_3 : _____

3. (2 points) In the circuit with $V_S = 5V$ and resistors R_1 and R_2 in series, what are the **calculated** voltages across them?

$V_1 =$ _____ $V_2 =$ _____

4. (2 points) In the circuit with $V_S = 5V$ and resistors R_1 and R_2 in series what are the **measured** voltages across them?

$V_1 =$ _____ $V_2 =$ _____

Checkpoint: Show an instructor your measurements on the DMM for the two voltages above to receive the bonus point.

5. (1 point) What are the voltages (or range of voltages after watching for a few seconds) on the switch output when it is not pressed and when it is pressed?

Not pressed? _____ Pressed? _____

6. (1 point) With resistor R_2 added to the circuit, what are the voltages on the switch output when it is not pressed and when it is pressed?

Not pressed? _____ Pressed? _____

7. (2 points) Using the values you just measured for the voltages across R_1 and R_3 , and the values you measured previously for those resistor values, use Ohm's Law to calculate the current that was passing through the resistors in both cases.

Problem continued on back.

	Voltage	Resistance	Current
R_1 :	_____	_____	_____
R_3 :	_____	_____	_____

8. (2 points) What were the values that you measured with the DMM in current mode for the current flowing through the LED for both R_1 or R_3 ?

	Current
R_1 :	_____
R_3 :	_____

Review Problems

- (3 points) Given the digital circuit you built with the button, inverter and LED, suppose as you test it the output LED is always OFF regardless of the button position. For each of the following possible explanations, write a sentence that explains why that issue would cause the LED to always be off.
 - VDD was not connected to the IC chips.
 - The ground connection for the button was not connected appropriately.
 - The LED was plugged in backwards.
- (2 points) Given two resistors R_{LO} and R_{HI} whose resistance values are such that $R_{LO} < R_{HI}$
 - If they are connected in **series** giving a series effective resistance of R_{Eff} , which of the following is true?
 - $R_{Eff} < R_{LO}$
 - $R_{LO} < R_{Eff} < R_{HI}$
 - $R_{HI} < R_{Eff}$
 - If they are connected in **parallel**, giving a parallel effective resistance of R_{Eff} , which of the following is true?
 - $R_{Eff} < R_{LO}$
 - $R_{LO} < R_{Eff} < R_{HI}$
 - $R_{HI} < R_{Eff}$
- (1 point) **True** or **False** : Ohm's Law applies to both LEDs and resistors.