

**University of Jordan  
School of Engineering  
Electrical Engineering Department**

**EE 219  
Electrical Circuits Lab**

**EXPERIMENT 1 REPORT  
MEASUREMENT DEVICES**

**Group # \_\_\_\_\_**

**Student Name**

**ID**

- 1.**
- 2.**
- 3.**
- 4.**

# EXPERIMENT 1

## MEASUREMENT DEVICES

### PROCEDURE A - CONNECTING YOUR CIRCUIT

1. List the name of each device currently on your bench and count the number of such devices. For example, 1 oscilloscope, 4 multimeters, etc.

.....

5. Write one paragraph explaining the function of a breadboard.

.....

6. Write one paragraph explaining the function of a DC power supply.

.....

7. Use a Voltmeter to measure the **voltage** across  $R$ , and record it below. Remember to select the V button with a suitable range (depending on the screen reading), and to connect the voltmeter to the resistor using two suitable leads, the positive lead should be inserted in the V/ $\Omega$  terminal and the negative lead should be connected to the COM terminal. In DC measurements select the DC option, and **pay attention** to the polarity when connecting your voltmeter.

.....

8. Did you connect the Voltmeter in series or parallel with the resistor  $R$ ?

.....

9. Calculate the expected current in the resistor  $R$  and the LED using Ohm's law? Show your equation.

.....

10. Now use an Ammeter to measure the **current** in the LED, and record it below. Remember to select the DCA button with a suitable range (depending on the screen reading), and to connect the ammeter using two suitable leads, the positive lead should be inserted in the 2A or 20A terminal and the negative lead should be connected to the COM terminal. In DC measurements, select the DC option, and **pay attention** to the polarity when connecting your ammeter.

.....

11. Did you connect the Ammeter in series or parallel with the LED?

.....

12. Are the theoretical and measured values for the current in the LED close or far apart?

.....

13. Now use an Ohmmeter to measure the actual **resistance** value for  $R$ , and record it below. Remember to select the  $\Omega$  button with a suitable range (depending on the screen reading), and to connect the ohmmeter to the resistor using two suitable leads, one lead should be inserted in the  $V/\Omega$  terminal and the other lead should be connected to the COM terminal. Make sure you disconnect the resistor  $R$  from the circuit and move it somewhere else to measure its resistance.

.....

14. Explain why you should disconnect  $R$  from the circuit when measuring its resistance using an Ohmmeter.

.....

15. Is the actual resistance value for  $R$  exactly the same as its nominal value? Or slightly different?

.....

16. Now re-calculate using Ohm's law the expected current in the resistor  $R$  using its actual value (rather than its nominal value) and the value of the voltage across the resistor. Record this value below.

.....

17. Is the new current value close to the ammeter reading you had earlier in part 10?

.....

**PROCEDURE B - ON/OFF AND REFRESH RATE**

1. In the above circuit, replace the DC power supply  $V_s$  with a function generator that produces an 8 V<sub>pk-to-pk</sub> and 100 Hz square wave signal. Which knobs did you fiddle with for the function generator?

.....

2. Connect the oscilloscope in parallel with the function generator and observe the signal on the oscilloscope. Explain how do you read the period, frequency, peak-to-peak voltage and peak voltage from the oscilloscope screen?

.....

3. Does the LED flicker at 100 Hz?

.....

4. Change the frequency of the function generator from 100 Hz slowly to 5 Hz? At which frequency did the LED start flickering?

.....

5. Search the Web for the refresh rate for a typical computer screen? Write it below. Why do you think they use this frequency?

.....

6. Reduce the peak-to-peak voltage from the function generator. How do you do that?

.....

7. What happens to the light from the LED as you decreased the voltage?

.....

8. Read the input impedance of your oscilloscope and record it below? Why is it high?

.....

