Kirchoff's Laws

Name:_____ Date: _____

Instructor: _____

Teammates

1.- _____ 2.- _____

3.- _____ 4.- _____

Instructions: Follow the steps on this worksheet, using your lab manual as a guide, unless directed to do otherwise by your lab instructor. Show at least one sample calculation for each step. Box final mathematical results. Do not forget the units.

1 Data

Build a circuit as shown in Figure 1 of your lab manual and set the voltage of the power supply to 5 V.

1.1 Kirchoff's Loop Law

Measure and record the potential difference across each resistor in the circuit. Organize your data in a table.

1.2 Kirchoff's Node Law

Measure and record the current flowing in and out of N_1 and N_2. (The DMM must be connected in series to measure current.) You should have a total of 6 current measurements. Organize your data in a table.

2 Analysis

2.1 Kirchoff's Loop Law

Examine whether or not your data supports Kirchhoff's Loop Law.

1. Make a sketch of the loop containing containing V_s, N_1, R_1, N_2, and R_3 showing all your measurements.

2. Write the algebraic sum of all the voltages around this loop and discuss the result.

3. Repeat the previous analysis for the loop that contains N_1, R_1, N_2, and R_2.

2.2 Kirchoff's Node Law

Examine whether or not your data supports Kirchhoff's Node Law.

1. Make a sketch of all the currents at node N_1. For each current indicate if it is entering or leaving the node.

2. Write down the algebraic sum of all the currents for N_1, and discuss the result.

3. Repeat the previous analysis for node N_2.

Voltage Divider

Data

1. Obtain two resistors with nominal values of 1, and 10 kilo-Ohms. Using the Digital Multimeter (DMM) measure the actual resistance of each resistor and record them.

2. Arrange the resistors as in Figure 2 of the lab manual and set the voltage supply to 10 V. Measure the voltage drop across each resistor and record them.

Analysis

1. Derive equations one and two of the lab manual.

2. Determine the power dissipated in each resistor.

3. Sketch Figure 2 showing all your measurements and results.