Report for Experiment 4

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ABSTRACT:

8.092 / .998K = 6.082 / .998K = 10.094 / .998K

I 2.07 / 0.998K = mA

4.08 / .998K =

DATA:

2.07 / 1.473

4.08 / 1.473

6.09 / 1.473

8.09 / 1.473

10.09 / 1.473

Table 4–1

Component	Listed Value	Measured Value
R_1	1.0 kΩ	998Ω
R_2	1.5 kΩ	1.473Ω
R_3	2.2 kΩ	2.2875KΩ

Table 4–2 (R_1)

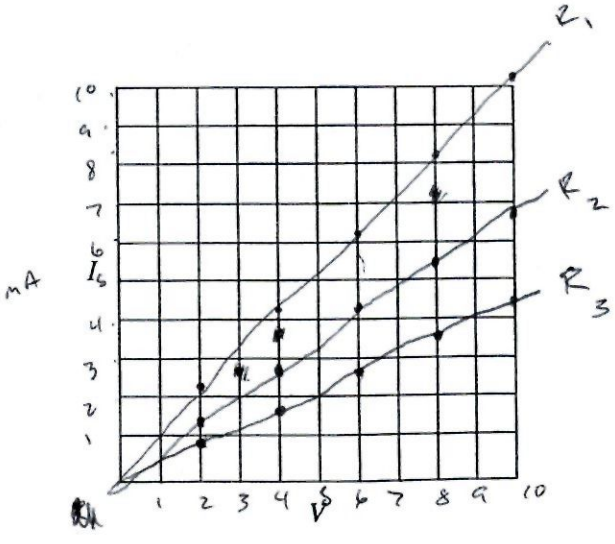
V_S =	2.0 V	4.0 V	6.0 V	8.0 V	10.0 V
I =	2.07mA	4.08mA	6.09mA	8.1mA	10.11mA

Table 4–3 (R_2)

V_S =	2.0 V	4.0 V	6.0 V	8.0 V	10.0 V
I =	1.40mA	2.77mA	4.13mA	5.49mA	6.85mA

Table 4–4 (R_3)

V_S =	2.0 V	4.0 V	6.0 V	8.0 V	10.0 V
I =	0.9mA	1.78mA	2.66mA	3.54mA	4.41mA



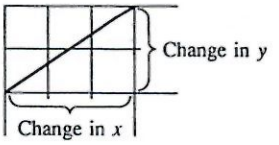
2.07 / 2.2875 = 4.07 / 2.2875 = 6.085 / 2.2875

8.098 / 2.2875 = 10.099 / 2.2875

Plot 4–1

EVALUATION AND REVIEW QUESTIONS:

1. The slope of a line is the change in the y direction divided by the change in the x direction. The definition for slope is illustrated in Figure 4–4. Find the slope for each resistor on Plot 4–1. Note that the slope for a resistor has units for conductance, the siemens.



$$\text{Slope} = \frac{\text{Change in } y}{\text{Change in } x} = \frac{2}{3}$$

Figure 4–4

2. What happens to the slope of the I-V curve for larger resistors?

The slope decreases in milli Amp value due to higher current control with larger resistors

3. (a) If the resistance is halved and the voltage is not changed, what will happen to the current in a resistive circuit?

The current will increase in value

(b) If the voltage is doubled and the resistance is not changed, what will happen to the current in a resistive circuit?

The current shall also double

4. If the current in a resistive circuit is 24 mA and the applied voltage is 48 V, what is the resistance?

$R = \frac{V}{I}$ $\quad \frac{48V}{24\,mA} = 2k\Omega$

5. What current is in a 10 Ω resistor with 5.0 V applied?

$I = \frac{V}{R}$ $\quad \frac{5}{10} = 0.5\,A$

6. The resistance of a tungsten bulb increases as it gets hotter. How does this help explain why many bulbs burn out when they are first turned on?

When initially turned on, the resistance will be too ~~high~~ low for the power rating of the bulb.