Week 1 Prelab

Briefly answer the following questions.

Name: Kevin Liu

1. Identify the resistors:

UID: 504862375

Yellow-Violet-Orange-Gold
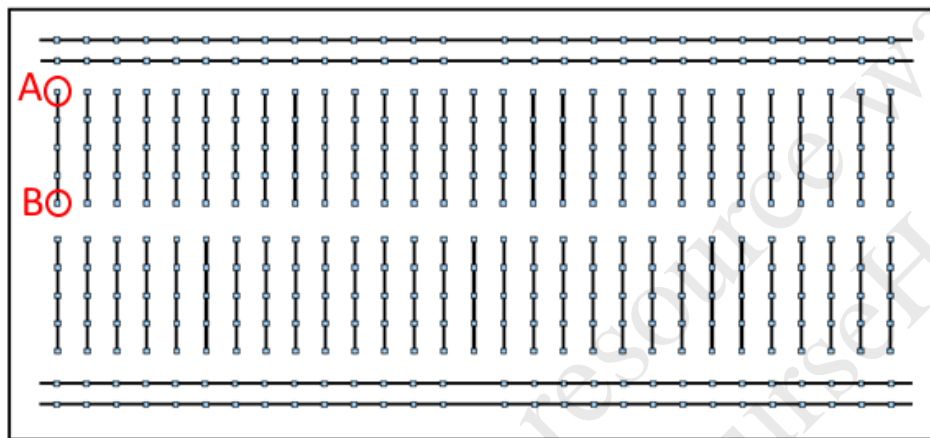
<u>47k</u> Ω with a tolerance of +/- <u>5</u> %.

Brown-Black-Yellow-Silver

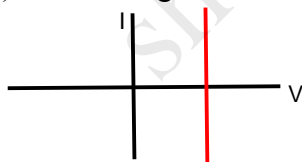<u>100k</u> Ω with a tolerance of +/- <u>10</u> %.

2.

If a resistor is inserted into the breadboard with one leg at point A and one leg at point B, what resistance will an ohmmeter measure for that resistor? Why? What should you do instead to measure the proper resistance?
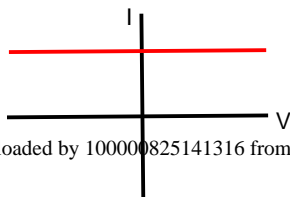
An ohmmeter will measure 0 because that row is already internally connected and current will bypass the resistor. To get the proper resistance, either leg A or leg B but not both should be moved to a connection on the column rows. Thereby only allowing current to travel through the resistor.

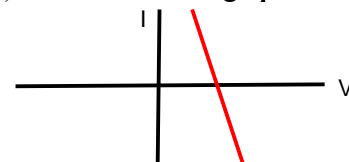3. Draw the I-V curves for the following diagrams
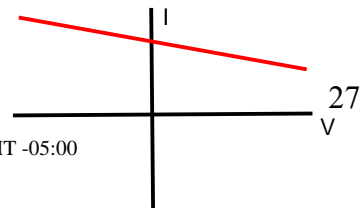
(a) Ideal voltage source

(b) Non-ideal voltage source
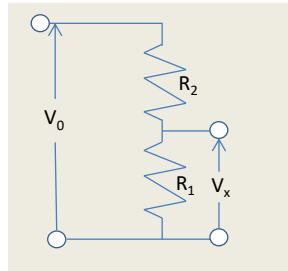

(c) Ideal current source

(d) Non-ideal current source

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4. Prove the voltage and current divider equations: They are basic and very commonly used equations that you should memorize for use in all your future electronics courses.

Voltage Divider

Problem: show that

$$V_x = V_0 R_1/(R_1+R_2)$$

YOUR SOLUTION HERE:

$V0 = I(R1 + R2)$

$I = V0/(R1 + R2)$

$Vx = I(R1)$
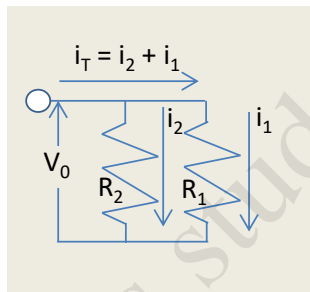
$I = Vx/R1$

$V0/(R1 + R2) = Vx/R1$

$Vx = (V0)(R1)/(R1 + R2)$

Current Divider

$i_T = i_2 + i_1$

Problem: show that

$$I_1 = i_T R_2/(R_1+R_2)$$

YOUR SOLUTION HERE:

$V0 = iT(Req)$ $Req = 1/((R1 + R2)/R1R2) = R1R2/(R1 + R2)$ $V0 = (I1)(R1)$

$V0 = (iT)(R1)(R2)/(R1 + R2)$

$(iT)(R1)(R2)/(R1 + R2) = (I1)(R1)$

$I1 = (iT)(R2)/(R1 + R2)$

Week 1 Prelab End

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