

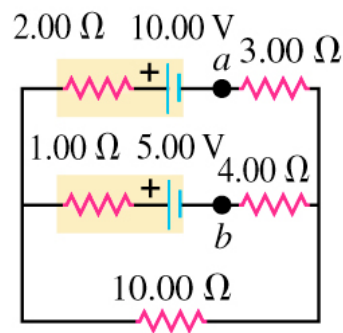
PY212

**Discussion Worksheet 5**

Please work with your partners on the following exercises.

- 1.) The circuit shown contains three resistors and two batteries with minimal internal resistance.

- a. Identify the directions of any currents and any voltage loops you would use to solve this problem.



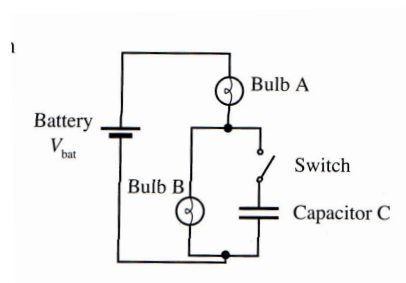
- b. From the loops you have drawn, write the equations for the potential drops and solve for the current in each branch. (Don't forget a separate equation for the current too!)

- c. What is the potential difference of point  $a$  relative to point  $b$ ?

2.) Two identical bulbs and a capacitor are connected to an ideal battery as shown below. The capacitor is initially uncharged.

a. Just after the switch is closed.

i. What is the potential difference across bulb A, across bulb B, across the capacitor C, and across the battery? Explain



ii. Rank the currents  $i_A$ ,  $i_B$ ,  $i_C$ , and  $i_{bat}$ . Explain your reasoning

b. A long time after the switch is closed.

i. Rank the currents  $i_A$ ,  $i_B$ ,  $i_C$ , and  $i_{bat}$ . Explain your reasoning

ii. What is the potential difference across bulb A, bulb B, the capacitor C, and the battery? Explain.

c. Summarize your results by describing the behavior of bulb A and of bulb B *from just after the switch is closed until a long time later*.