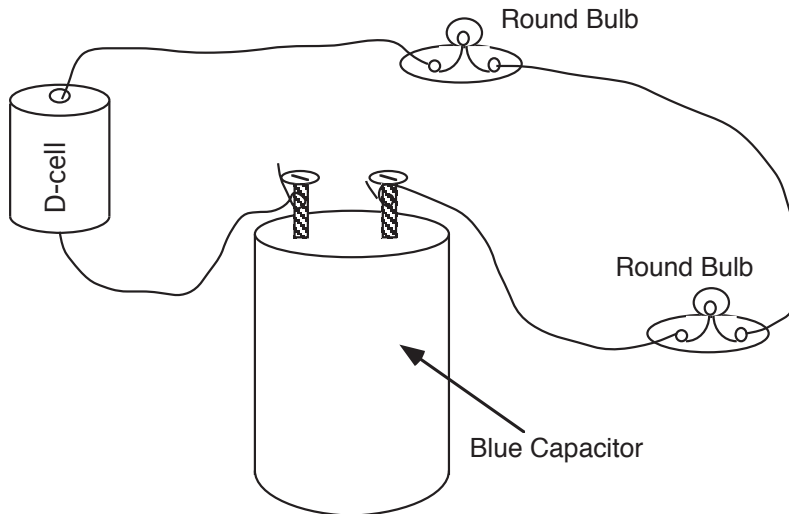


Homework Questions – Section 3

1. Examine the diagram of a circuit below and redraw it as a schematic diagram using appropriate symbols for each part of the circuit.



2. In the circuit at right (Figure 2), suppose the compass is shown deflected at the moment the battery was connected. In words, describe the compass deflection when the battery is removed from the circuit and the free ends of the wires are connected to each other. Explain why this observation makes sense.

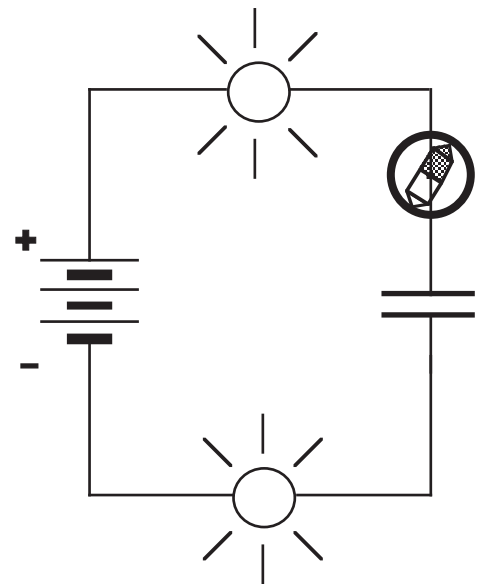


Figure 2

3. Describe two different investigations you could do to determine whether a capacitor is already charged or if it is uncharged. Explain each investigation carefully.

#1:

#2:

4. Bulbs A and B light temporarily when the circuit in Figure 1 below is connected. They will also light temporarily if they are connected as shown in Figure 2.

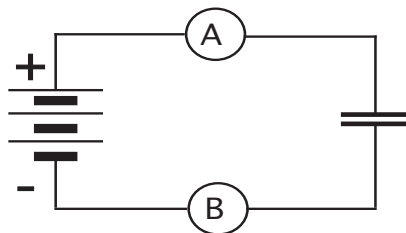


Figure 1

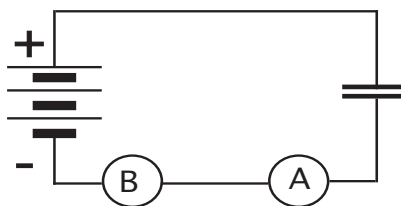


Figure 2

- a. Draw arrowtails on both diagrams to show the movement of charge during charging, **at the first moment when the circuit is connected**. Also draw starbursts on each bulb.
- b. Explain where the charge comes from that moves through the bulbs in Figure 2.

5. Below are sketches of possible patterns of charge flow during the interval when the capacitor is charging, and when it is discharging. For each sketch, state whether or not the charge flow arrows shown are correct. Support your answer with evidence based on observations made in the laboratory.

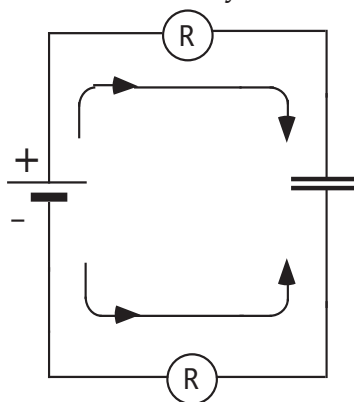


Figure A — Charging

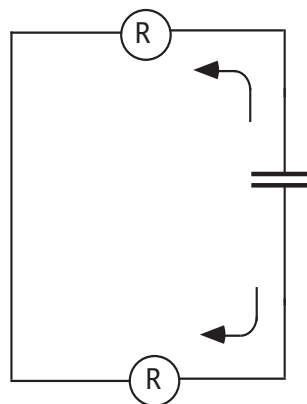


Figure B — Discharging

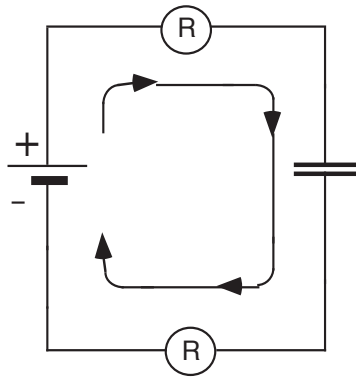


Figure C — Charging

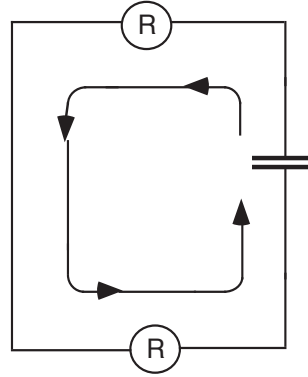


Figure D — Discharging

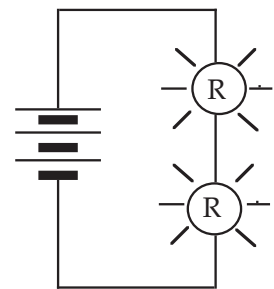
Figure A:

Figure B:

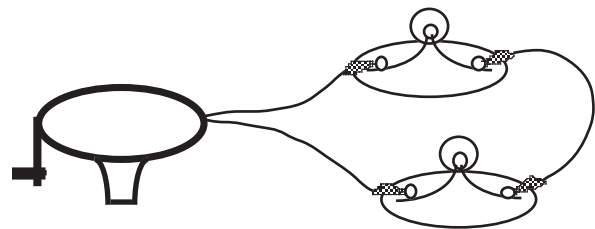
Figure C:

Figure D:

6. In this circuit, what causes the charge to move through the bulbs? Your explanation should include the term “energy”.



7. In this circuit, what causes the charge to move through the bulbs? Your explanation should include the term “energy”.



8. A capacitor is charged through two bulbs (Figure 8a) and then discharged through a single bulb (Figure 8b).

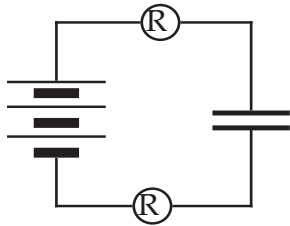


Figure 8a

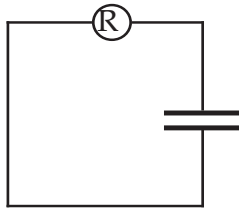


Figure 8b

Show appropriate starbursts and arrowtails for the bulbs in each circuit.

Mark each of the following statements as True or False (T or F). If a statement is False, re-write it as a correct statement.

- a. ____ The same amount of charge flows during charging and discharging.
- b. ____ More charge flows through the single bulb than through the two bulbs.
- c. ____ Charge flows at a greater rate through the single bulb than through the two bulbs.
- d. ____ The single bulb shines brighter than either bulb in the two-bulb circuit.
- e. ____ The total resistance of the two bulbs is greater than that of the single bulb.
- f. ____ A compass would show a larger deflection for Figure 8a than for Figure 8b.
- g. ____ The brightest bulb(s) indicate the fastest charge flow.