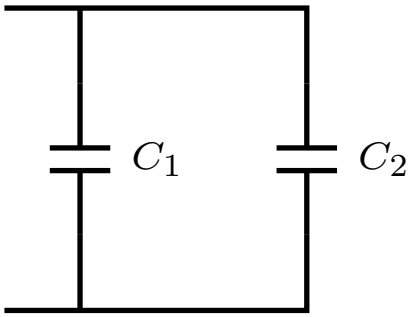
Question 1

Two capacitors are connected in parallel as illustrated.



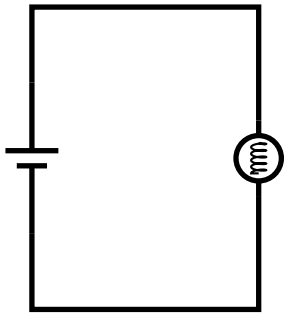
Let ΔV_1 and q_1 be the potential difference across and the charge on capacitor 1. Let ΔV_2 and q_2 be the potential difference across and the charge on capacitor 2.

Suppose that $C_1 \neq C_2$. Which of the following is true?

1. $\Delta V_1 = \Delta V_2$ and $q_1 = q_2$
2. $\Delta V_1 = \Delta V_2$ and $q_1 \neq q_2$
3. $\Delta V_1 \neq \Delta V_2$ and $q_1 = q_2$
4. $\Delta V_1 \neq \Delta V_2$ and $q_1 \neq q_2$

Question 2

A bulb is connected to a battery as illustrated.



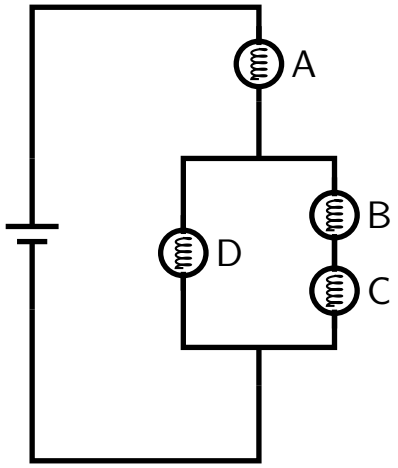
The wires offer negligible resistance. The potential difference is held constant at a particular initial value and the power is observed.

The potential difference is increased to four times its initial value. Which of the following is true of the power after this has been done?

1. The power stays the same.
2. The power is 2 times what it had initially been.
3. The power is 4 times what it had initially been.
4. The power is 16 times what it had initially been.

Question 3

Several identical bulbs are connected in a circuit as illustrated.



The relative brightnesses of these bulbs depend only on the relative currents which flow through them.

At some point bulb C is removed, leaving a gap. What happens to bulb A?

1. Bulb A gets brighter.
2. Bulb A gets dimmer.
3. Bulb A is unchanged.
4. Bulb A goes out.