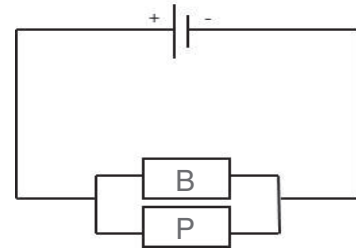




Exercise 13

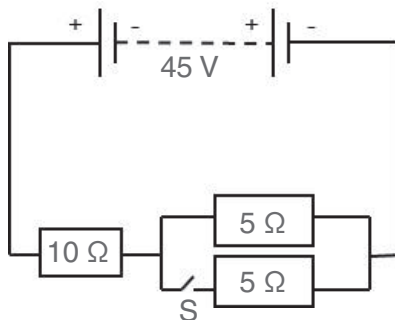
Date:

- 1 In the sketch, the light bulbs B and P are identical.
 1.1 How does the brightness of the light bulbs compare? Explain your answer.



- 1.2 If the magnitude of the current through the battery is I , what is the current flowing through the light bulbs P and B?
- 1.3 Does the current first flow through P and then through B, or first B and then P, or neither of these? Explain your answer.

- 2 Answer the following questions about the sketch below.



- 2.1 What is the total resistance of the circuit when switch S is open?

- 2.2 Calculate the current in the circuit with S open.



2.3 Calculate the potential difference across the $10\ \Omega$ resistor if S is open.

2.4 Calculate the total resistance in the circuit if switch S is closed.

2.5 Calculate the current through the $10\ \Omega$ resistor if S is closed.

2.6 Calculate the potential difference across the parallel resistors if S is closed.

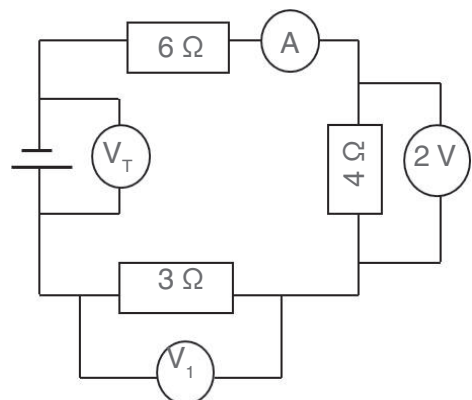
2.7 Calculate the current through one of the $5\ \Omega$ resistors.

2.8 Calculate the potential difference across one of the $5\ \Omega$ resistors.

3 Consider the following circuit and answer the questions that follow. Three resistors of $3\ \Omega$, $4\ \Omega$ and $6\ \Omega$ are connected in series. The voltmeter reading across the $4\ \Omega$ resistor is $2\ \text{V}$.

3.1 Calculate the total resistance of the circuit.

3.2 Calculate the current through the $4\ \Omega$ resistor.





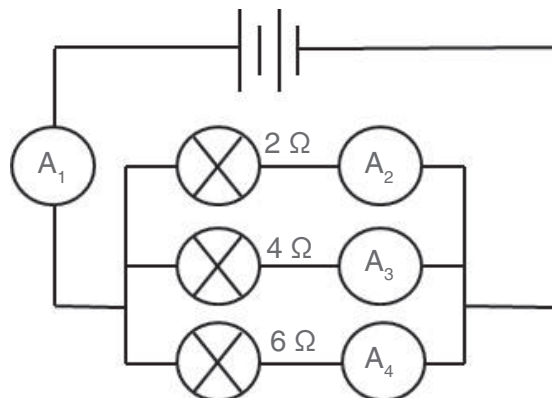
3.3 What current will flow through the $6\ \Omega$ resistor? _____

3.4 Calculate the reading on voltmeter V_T .

3.5 Calculate the reading on V_1 .

3.6 What will happen to the ammeter reading if the $6\ \Omega$ resistor is replaced with a $2\ \Omega$ resistor? Give a reason for your answer.

4 Consider the following circuit and answer the questions that follow. Three light bulbs with resistances of $2\ \Omega$, $4\ \Omega$ and $6\ \Omega$ are connected to a battery with an emf of $12\ \text{V}$.



4.1 Calculate the resistance of the circuit.

4.2 Calculate the ammeter reading on A_1 .

4.3 What will the potential difference across the parallel connection be?

