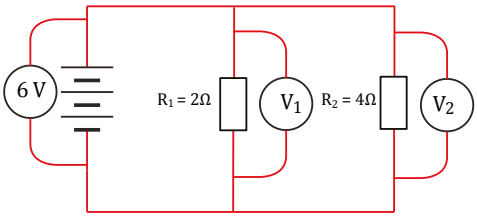
Parallel connections question 1

In this circuit, a 6 V battery is connected to two resistors in series.
The resistance of R_2 is bigger than the resistance of R_1.



What are the readings on voltmeters V_1 and V_2? Tick ONE box (✓).

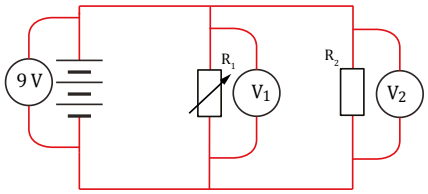
	voltmeter V_1	voltmeter V_2
☐	4 V	2 V
☐	2 V	4 V
☐	3 V	3 V
☐	6 V	6 V
☐	12 V	24 V
☐	3 V	1.5 V

How confident are you that your answers to this question are correct?
Tick ONE box (✓).

Very confident	Fairly confident	Not confident	Just guessing
☐	☐	☐	☐

Parallel connections question 2

In this circuit, a 6 V battery is connected to two resistors in series.
The resistance of R_1 is bigger than the resistance of R_2.



How confident are you that your answers to this question are correct?
Tick ONE box (✓)

Very confident	Fairly confident	Not confident	Just guessing
☐	☐	☐	☐

(a) What happens to the reading on voltmeter V_1?
Tick ONE box (✓)

- ☐ It gets bigger.
- ☐ It stays the same.
- ☐ It gets smaller.

(b) What happens to the reading on voltmeter V_2?
Tick ONE box (✓)

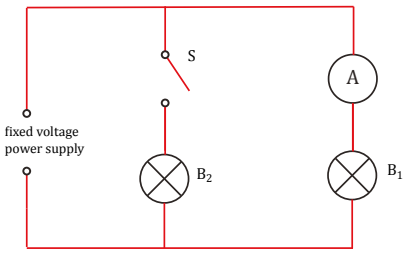
- ☐ It gets bigger.
- ☐ It stays the same.
- ☐ It gets smaller.

(b) How would you explain this? Tick ONE box (✓)

- ☐ As R increases, the voltage across it gets bigger (because V = I × R). The other voltmeter is across a fixed resistance, so it stays the same.
- ☐ As R increases, the voltage across it gets bigger (because V = I × R). The sum of the two voltages has to be equal to the supply voltage. So the voltage across the other resistor gets smaller.
- ☐ Both resistors are connected directly across the power supply, so the readings on both voltmeters are equal to the supply voltage.

Parallel connections question 3

In this circuit, the power supply has a fixed voltage output.
Switch S is open.
Bulb B_1 is lit.
There is a reading on the ammeter.



How confident are you that your answers to this question are correct?
Tick ONE box (✓)

Very confident	Fairly confident	Not confident	Just guessing
☐	☐	☐	☐

(a) What happens to the reading on ammeter?
Tick ONE box (✓)

- ☐ It gets bigger.
- ☐ It stays the same.
- ☐ It gets smaller.

(b) What happens to the brightness of bulb B_1?
Tick ONE box (✓)

- ☐ It gets brighter.
- ☐ It stays the same brightness.
- ☐ It gets dimmer.

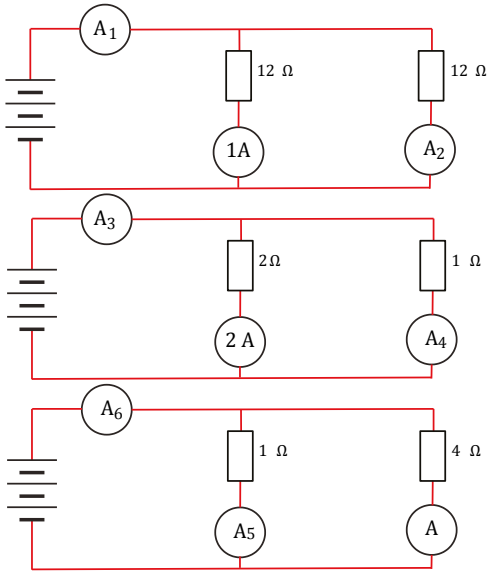
(b) How would you explain this? Tick ONE box (✓)

- ☐ Some of the current now goes through B_2, bypassing B_1.
- ☐ Two bulbs need a bigger current from the power supply.
- ☐ The voltage across each parallel branch stays the same.
- ☐ The total resistance is now bigger, so the current gets less.

Other (please explain): _____

Parallel connections question 4

In each of these circuits, two resistors are connected in parallel to a battery.
The resistance of each resistor is shown.
All the meters are ammeters. The readings on some of the ammeters are shown.
Write down the readings you would expect to see on the other ammeters.



(a) The reading on ammeter A_1 is ___ ampere

(b) The reading on ammeter A_2 is ___ ampere

(c) The reading on ammeter A_3 is ___ ampere

(d) The reading on ammeter A_4 is ___ ampere

(e) The reading on ammeter A_5 is ___ ampere

(f) The reading on ammeter A_6 is ___ ampere

How confident are you that your answers to this question are correct?
Tick ONE box (✓)

Very confident	Fairly confident	Not confident	Just guessing
☐	☐	☐	☐

Answers

Question 1

The potential difference across both resistors in a parallel circuit is the same, irrespective of resistance (the current through each resistor is different).

Question 2

This is just the same as question 1.

Question 3

When the switch is closed, the ammeter reading stays the same, as does the bulb brightness. This is because the potential difference across B_1 stays the same.

Question 4

A_1 is 2 ampere. A_2 is 1 ampere (current equal in equal arms);

A_3 is 6 ampere and A_4 is 4 ampere (current inversely proportional to resistance. Big resistance, small current);

A_5 is 4 ampere (current inversely proportional to resistance) and A_6 is 5 ampere.