

Electricity - 1

Exercise A

1. A current of 3 A flows through a bulb in a circuit.

Calculate,

(a) The amount of charge passing through the bulb in 2 minutes.

(b) The number of electrons passing through the bulb in 2 minutes.

2. In a circuit, 1500 C of charge passes through a motor in 5 minutes. Calculate the current flowing through the motor during this time.

3. How long will it take for a charge of 24000 C to pass through a lamp, if the current flowing through the lamp is 4 A?

4.

A 3 volt battery can supply a current of 5 amps for 20 minutes before it needs recharging.

Calculate how much charge the battery can provide before it needs recharging.

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Tip: convert to seconds first.

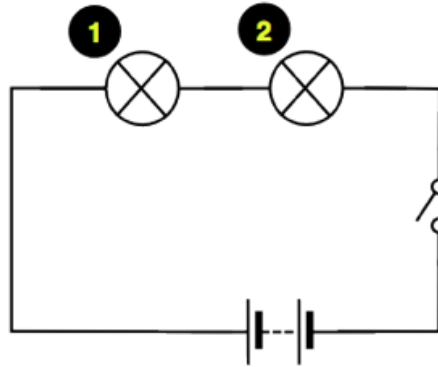
5.

The motor in a fan is attached to a 9 V battery.
If a current of 4 A flows through the motor for 7 minutes:

Calculate the total charge passed.

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6. The diagram given below shows two bulbs connected in a circuit.

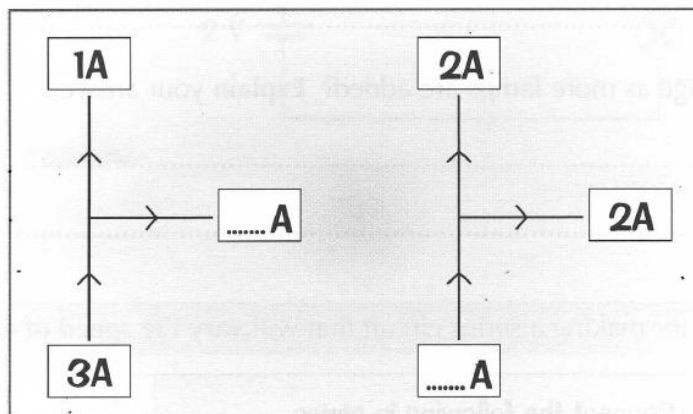


How do the currents flowing through bulbs 1 and 2 compare?

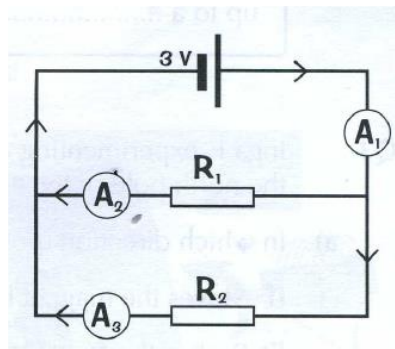
7.

The diagrams show currents at junctions in two parallel circuits.

Write in the **missing** values.



8.



In the diagram shown above the cell supplies a steady current.

The total amount of charge leaving the cell in a duration of one-minute is 300 C.

The reading of ammeter A₂ is 2 A.

(a) Calculate the current supplied by the cell.

(b) What reading is shown on ammeter A₃?

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9. Each row of the table given below shows the voltage (potential difference) across a component, the current through the component and the resistance of the component in a circuit.

Fill in the missing values in the table below.

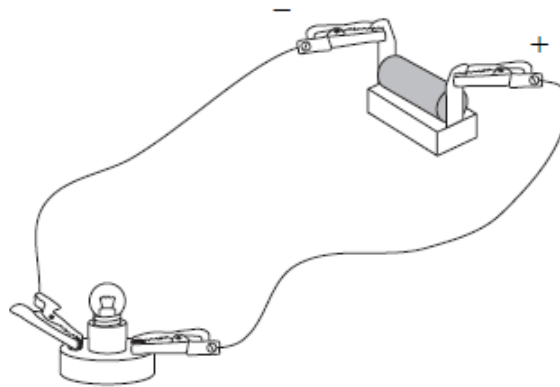
Use the formula triangle to help.

Voltage (V)	Current (A)	Resistance (Ω)
6	2	
8		2
	3	3
4	8	
2		4
	0.5	2

Exercise B

1.

- (a) The drawing shows an electrical circuit containing a cell, a lamp and some insulated copper wire with clips.



- (i) A direct current passes through the circuit.

Name the particles that flow.

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Why do the particles flow from the negative terminal to the positive terminal?

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(2)

- (ii) The circuit has a 1.5 V cell.

Complete the sentence by adding the names of the two missing units.

A volt is a per

(1)

- (b) A student has a reading lantern. It contains a 1.5 V rechargeable battery. The lantern uses solar cells to charge its battery during the day. The student switches on the lantern at night to read.

Given that the battery delivers 216 J in 2 hours, work out the current supplied by the battery.

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2.

A torch uses three cells to light a bulb. The voltage across the bulb is 4.5 V and the current in it is 1.5 A.

- (a) Calculate the amount of charge flowing through the bulb in 2 minutes.
- (b) Calculate the energy, in joules, transferred to the bulb when the torch is used for 2 minutes.

3.

A 3 volt battery can supply a current of 5 amps for 20 minutes before it needs recharging.

- a) Calculate how much charge the battery can provide before it needs recharging.

Tip: convert to seconds first.

- b) Each coulomb of charge from the battery can carry 3 J of energy. Calculate how much work the battery can do before it needs recharging.

4.

Sally is comparing two lamps, A and B. She takes the measurements shown in the table.

Calculate the **missing values** and write them in the table.



	Lamp A	Lamp B
Current through lamp (A)	2	4
Potential difference across lamp (V)	3	2
Charge passing in 10 s (C)		
Work done in 10 s (J)		

5.

The motor in a fan is attached to a 9 V battery. If a current of 4 A flows through the motor for 7 minutes:

- a) Calculate the total charge passed.

- b) Calculate the work done by the motor.

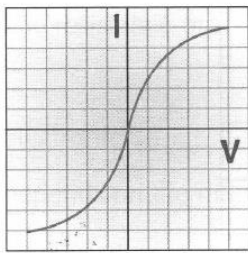
6.

Match the correct label to each of the V-I graphs below.

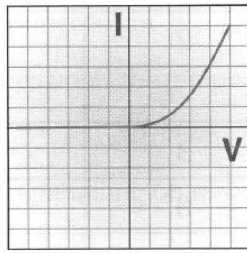
RESISTOR

FILAMENT LAMP

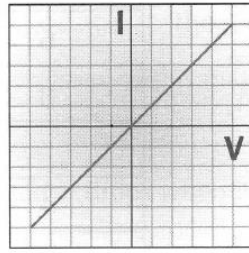
DIODE



A



B



C

7.

An electrical current flowing through a **filament bulb** causes it to get **hot**. Explain why this makes its resistance **increase**. You should give your answer in terms of **electrons** and **ions**.

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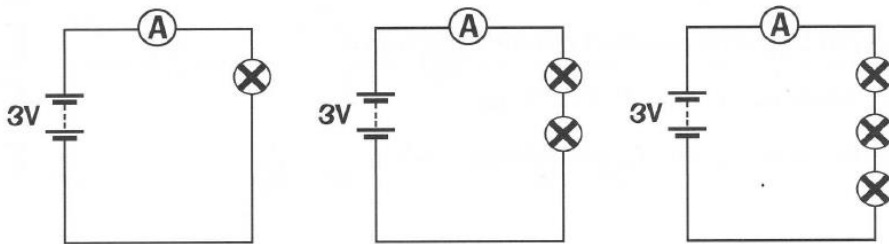
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8.

Vikram does an experiment with different numbers of lamps in a series circuit. The diagram below shows his three circuits.



a) What do you think happens to the **brightness** of the lamps as he adds more of them? **Explain** your answer.

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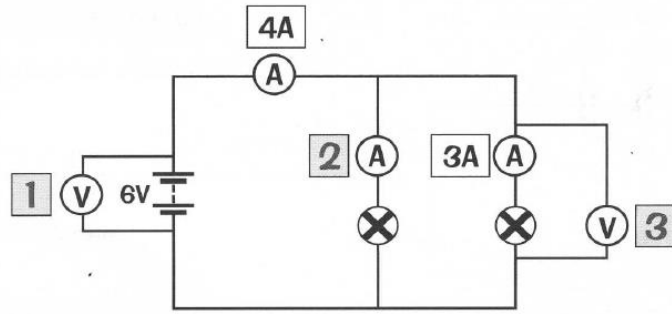
b) How does the **current** change as more lamps are added? **Explain** your answer.

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9.

Find the **missing values** in this parallel circuit.



1.

2.

3.