

Electricity Formulas

Edexcel International GCSE Physics · Electricity

Write each **formula**, say what it **means**, then make up an **example question** and draw the **circuit** it describes.

Power

power, current, voltage

write the formula

$$P =$$

what does it mean? (include units)

your example question + circuit

Energy transferred

energy, current, voltage, time

write the formula

$$E =$$

what does it mean? (include units)

your example question + circuit

Voltage & resistance

voltage, current, resistance

write the formula

$$V =$$

what does it mean? (include units)

your example question + circuit

Charge

charge, current, time

write the formula

$$Q =$$

what does it mean? (include units)

your example question + circuit

Key definition

Current is the flow of _____ charged _____.

Energy & charge

energy, charge, voltage

write the formula

$$E =$$

what does it mean? (include units)

your example question + circuit

Energy, Charge and Voltage

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Energy Transfers in a Circuit

Work out the energy transferred by the cell and by a bulb. Use $Q = I t$, $E = Q V$ and $E = I V t$. Show your working in the space on the right.

EXAMPLE

Make up your own circuit and values.

Draw a cell and a component, choose a current, a potential difference and a time, then calculate the charge and the energy transferred.

CIRCUIT



WORKING & ANSWERS

1 SERIES · [6 marks]

A 6.0 V cell is connected in **series** with two identical bulbs. The circuit is switched on for 2 minutes.

p.d. of cell = 6.0 V
current in circuit = 0.50 A
time = 2 minutes

(a) Calculate the charge that flows through the cell. [2 marks]

$Q = \underline{\hspace{2cm}}$ C

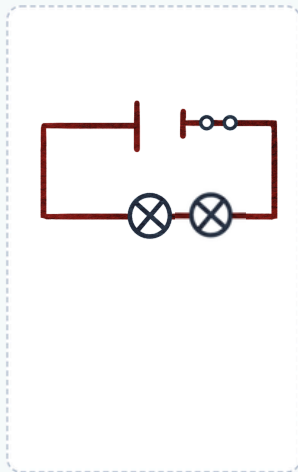
(b) Calculate the energy transferred by the cell. [2 marks]

$E = \underline{\hspace{2cm}}$ J

(c) The bulbs are identical. Calculate the energy transferred by **one bulb**. [2 marks]

$E = \underline{\hspace{2cm}}$ J

CIRCUIT



WORKING & ANSWERS

2 PARALLEL · [6 marks]

A 12 V cell is connected to two identical bulbs in **parallel**. The circuit is switched on for 5 minutes.

p.d. of cell = 12 V
current through *each* bulb = 0.30 A
time = 5 minutes

(a) Calculate the current through the cell. [1 mark]

$I = \underline{\hspace{2cm}}$ A

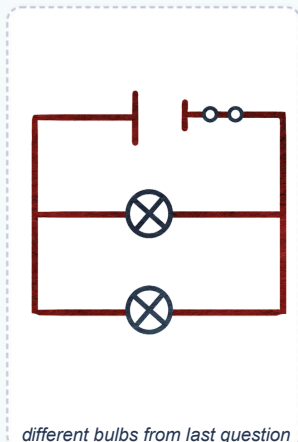
(b) Calculate the energy transferred by the cell in this time. [3 marks]

$E = \underline{\hspace{2cm}}$ J

(c) Calculate the energy transferred by **one bulb**. [2 marks]

$E = \underline{\hspace{2cm}}$ J

CIRCUIT



WORKING & ANSWERS

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Each question is worth **5 marks**. There are no steps to follow — work out the route yourself, **show all your working**, and watch the **unit prefixes**.

Question 1

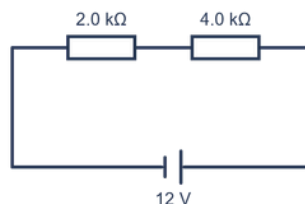
[5 marks]

The diagram shows two resistors connected in **series** to a 12 V battery.

The circuit is switched on for **3.5 minutes**.

Calculate the energy transferred by the 4.0 kΩ resistor.

Give your answer to 2 significant figures.



working

energy transferred = _____ J

Question 2

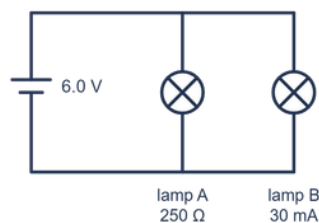
[5 marks]

The diagram shows two lamps connected in **parallel** to a 6.0 V battery.

The lamps are switched on for **2.0 minutes**.

Calculate the total charge that flows through the battery in this time.

Give your answer to 2 significant figures.



working

total charge = _____ C