FREE REVISION PACK

Charge, Current & Potential Difference

AQA A-level Physics · 7407 / 7408 · Specification 3.5.1.1

Easy | Medium | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Counting doubly charged ions	AQA June 2018 · A-level Paper 1 · Q25	1 mark
2	Easy	Counting electrons	AQA June 2016 · AS Paper 2 · Q28	1 mark
3	Medium	Charge from a current–time graph	AQA June 2025 · A-level Paper 1 · Q29	1 mark
4	Medium	Charge carried by a moving belt	AQA June 2019 · A-level Paper 1 · Q21	1 mark
5	Medium	Reducing the charge that flows	AQA June 2016 · AS Paper 2 · Q30	1 mark

Key ideas to have ready

- Current is the rate of flow of charge: $I = \Delta Q / \Delta t$. $1\ A = 1\ C\ s^{-1}$.
- The charge on an electron is $e = 1.60 \times 10^{-19}$ C, so the number of charge carriers = Q / (charge on each carrier).
- Potential difference is the energy transferred per unit charge: $V = W / Q$. $1\ V = 1\ J\ C^{-1}$.
- The area under a current–time graph is the charge that has flowed.

How to use this pack

1. The questions are grouped into levels (Easy and Medium). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in AQA's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–2

Only **one** answer per question is allowed. For each question, completely fill in the circle alongside the appropriate answer.

AQA June 2018 · A-level Paper 1 · Q25

1 A gas containing doubly-charged ions flows to give an electric current of $0.64\ \text{A}$

How many ions pass a point in 1.0 minute?

[1 mark]

A 2.0×10^{18} ⬭

B 4.0×10^{18} ⬭

C 1.2×10^{20} ⬭

D 2.4×10^{20} ⬭

AQA June 2016 · AS Paper 2 · Q28

2 The current in a wire is $20\ \text{mA}$.

How many electrons pass a point in the wire in 2 minutes?

[1 mark]

A 2.5×10^{17} ⬭

B 1.5×10^{19} ⬭

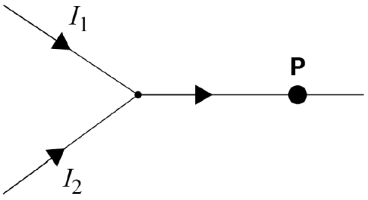
C 2.5×10^{20} ⬭

D 1.5×10^{22} ⬭

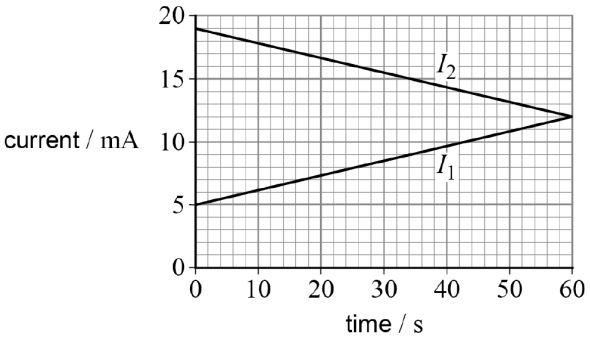
Medium Two or three steps. Roughly a third to a half of students get these right. **Questions 3–5**

AQA June 2025 · A-level Paper 1 · Q29

3 The diagram shows part of a circuit.



The graph shows how the two currents I_1 and I_2 vary with time.



What is the total charge that flows through point **P** in 60 s?

[1 mark]

A 1.44 C ⬭

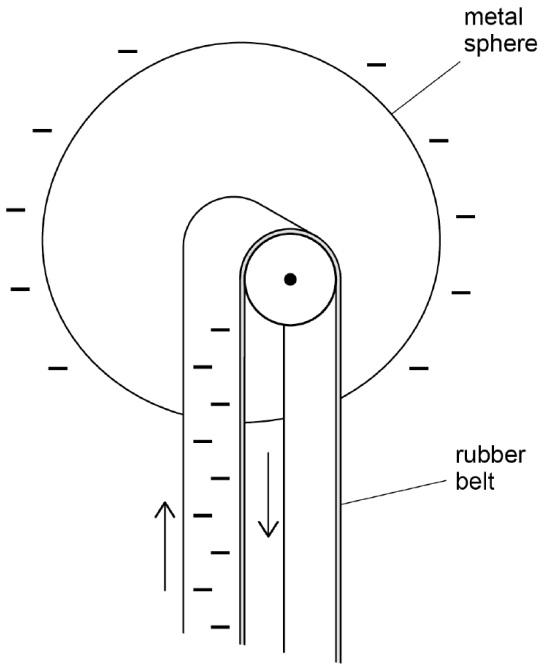
B 0.93 C ⬭

C 0.72 C ⬭

D 0.42 C ⬭

AQA June 2019 · A-level Paper 1 · Q21

4 A rubber belt in an electrostatic machine has a width of $0.1\ \text{m}$ and moves with speed $0.4\ \text{m s}^{-1}$.
Each square metre of the belt carries a charge Q coulomb. The charge is removed and transferred to a metal sphere.



What is the charge collected by the sphere each second?

[1 mark]

A $0.016Q$ ○

B $0.04Q$ ○

C $0.25Q$ ○

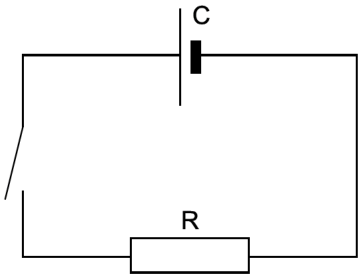
D $4Q$ ○

AQA June 2016 · AS Paper 2 · Q30

5 A cell C of negligible resistance and a switch are in series with a resistor R. The switch is moved to the on (closed) position for a time t.

Which change reduces the amount of charge flowing through R in time t?

[1 mark]



A Add an identical cell in parallel with C. ⬭

B Add an identical cell in series with C. ⬭

C Add a second resistor in series with R. ⬭

D Add a second resistor in parallel with R. ⬭

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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