GCSE Physics Topic 2 AQA: Electricity
Exam Questions/Mock Exam Questions
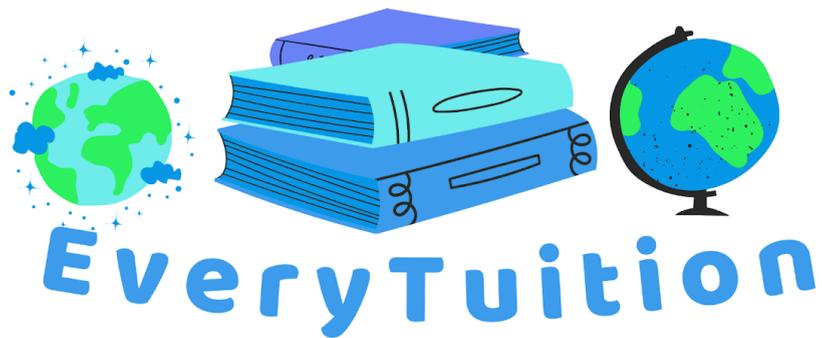
(It would still be recommended to answer the foundation tier questions for triple science and higher tier to ensure you have good understanding).

Q1.
 Jack is revising electrical circuits.
 State the unit of current.

_____

[1]

Q2.
 Harry builds a simple circuit.

(a) State the equation linking current, charge and time.

_____

[1]

(b) A current of 2 A flows for 30 s. Calculate the charge that flows.

_____

_____

[2]

[Total: 3 marks]

Q3.
 Ben investigates potential difference.

(a) State the unit of potential difference.

_____

[1]

(b) Suggest one piece of equipment used to measure potential difference.

_____

[1]

[Total: 2 marks]

Q4.
Daniel studies resistance.
State the equation linking potential difference, current and resistance.

_____

[1]

Q5.
Oliver connects a 12 V supply to a 6 Ω resistor.
Calculate the current in the circuit.

_____

_____

[2]

Q6.
Ethan looks at current in a series circuit.

(a) State how current is shared in a series circuit.

_____

[1]

(b) State how potential difference is shared in a series circuit.

_____

[1]

[Total: 2 marks]

Q7.
Sam builds a parallel circuit.
Explain how current is shared in a parallel circuit.

_____

_____

[2]

Q8.
Charlie investigates resistance.

(a) State the equation linking resistance, resistivity, length and area of a wire.

_____

[1]

(b) State one factor (other than length and area) that affects resistance of a wire.

_____

[1]

[Total: 2 marks]

Q9.
Noah studies resistors.
Explain what happens to the total resistance when two resistors are connected in parallel.

_____

_____

_____

[3]

Q10.
Jacob learns about charge flow.

(a) State the unit of charge.

_____

[1]

(b) A current of 0.5 A flows for 2 minutes. Calculate the charge.

[3]

[Total: 4 marks]

Q11.

William investigates power in electrical devices.

(a) Write the equation linking power, current and potential difference.

[1]

(b) A kettle works at 230 V with a current of 8 A. Calculate the power.

[3]

[Total: 4 marks]

Q12.

Alex looks at electrical appliances.
Explain what is meant by the term "power rating" of an appliance.

[2]

Q13.
Luke studies energy transfer.

(a) State the equation linking energy, power and time.

_____

[1]

(b) A 60 W light bulb is on for 5 hours. Calculate the energy transferred in kWh.

_____

_____

_____

[3]

[Total: 4 marks]

Q14.
James is revising mains electricity.

(a) State the potential difference of the UK mains supply.

_____

[1]

(b) State the frequency of the UK mains supply.

_____

[1]

[Total: 2 marks]

Q15.
Tom draws the wiring diagram of a plug.

(a) Name the colour of the live wire.

_____

[1]

(b) State the function of the earth wire.

_____

_____

[2]

(c) Explain why the earth wire is a safety feature.

_____

_____

_____

[3]

[Total: 6 marks]

Higher Tier

Q16.
 Jack investigates current in a circuit.

(a) State the equation linking current, charge and time.

_____

[1]

(b) A current of 3.5 A flows for 2 minutes. Calculate the charge that flows.

_____

_____

_____

[3]

[Total: 4 marks]

Q17.
 Harry is measuring resistance.

(a) State the equation linking potential difference, current and resistance.

[1]

(b) A resistor has a potential difference of 12 V across it and a current of 0.5 A. Calculate its resistance.

[3]

[Total: 4 marks]

Q18.
Ben investigates I–V characteristics.

(a) Sketch the shape of the I–V graph for a filament lamp.

[2]

(b) Explain why the shape of the graph is not a straight line.

[3]

[Total: 5 marks]

Q19.
Daniel is learning about Ohmic conductors.

Explain what is meant by an Ohmic conductor.

_____

_____

_____

[2]

Q20.
Oliver investigates resistors in series and parallel.

(a) Describe what happens to the total resistance when two resistors are connected in series.

_____

_____

[2]

(b) Explain what happens to the total resistance when two resistors are connected in parallel.

_____

_____

_____

[3]

[Total: 5 marks]

Q21.
Ethan studies diodes.

(a) Draw the symbol for a diode.

_____

[1]

(b) Explain how a diode behaves in a circuit.

_____

_____

[2]

[Total: 3 marks]

Q22.
 Sam investigates charge.

A charge of 240 C passes through a lamp in 2 minutes.

Calculate the current.

_____

_____

_____

[3]

Q23.
 Charlie studies the National Grid.

(a) Explain why transformers are used in the National Grid.

_____

_____

_____

[3]

(b) State whether step-up or step-down transformers are used at:

- The power station → _____

- Homes → _____

[2]

[Total: 5 marks]

Q24.
Noah investigates the heating effect of a resistor.

(a) State the equation linking power, current and resistance.

_____

[1]

(b) A current of 4 A flows through a 12 Ω resistor. Calculate the power.

_____

_____

_____

[3]

[Total: 4 marks]

Q25.
Jacob is studying energy transfer.

A kettle is rated at 2.2 kW and is used for 3 minutes.

Calculate the energy transferred.

_____

_____

_____

[3]

Q26.
William investigates alternating and direct current.

(a) Describe the difference between alternating current (a.c.) and direct current (d.c.).

_____

[2]

(b) State one example of a source of a.c. and one source of d.c.

a.c. source: _____

d.c. source: _____

[2]

[Total: 4 marks]

Q27.
 Alex learns about mains electricity.

State:

(a) The frequency of UK mains electricity.
_____

[1]

(b) The potential difference of UK mains electricity.
_____

[1]

[Total: 2 marks]

Q28.
 Luke connects a lamp and a variable resistor in series.

Explain what happens to the brightness of the lamp when the resistance is increased.

_____

_____

_____

[3]

Q29.
 James investigates charge flow.

A current of 0.75 A flows through a circuit for 200 s.

Calculate the charge that flows.

[3]

Q30.
 Tom builds a model circuit with a thermistor.

(a) State what happens to the resistance of the thermistor as temperature increases.

[1]

(b) Suggest one use of a thermistor in everyday life.

[1]

[Total: 2 marks]

Q31.
 Jack studies energy transfer in electrical appliances.

(a) State the equation linking energy, charge and potential difference.

[1]

(b) A charge of 500 C flows through a potential difference of 9 V. Calculate the energy transferred.

[3]

[Total: 4 marks]

Q32.
 Harry is studying electrical safety.

Explain why the earth wire is a safety feature in appliances with a metal case.

[3]

Q33.
 Ben is using fuses.

State how a fuse works when too much current flows through a circuit.

[2]

Q34.
 Daniel measures power.

An electric heater is connected to a 230 V supply. The current is 5 A.

(a) Calculate the power of the heater.

[3]

(b) State one energy transfer that takes place in the heater.

_____

[1]

[Total: 4 marks]

Q35.
Oliver is looking at resistors.

(a) Sketch the I–V graph for a fixed resistor at constant temperature.

_____

_____

[2]

(b) Explain why the graph has this shape.

_____

_____

[2]

[Total: 4 marks]

Q36.
Ethan tests a filament lamp.

(a) Sketch the I–V graph for a filament lamp.

_____

_____

[2]

(b) Explain the behaviour of resistance as current increases.

_____

_____

_____

[3]

[Total: 5 marks]

Q37.
 Sam investigates LEDs.

State one advantage of LEDs compared to filament lamps.

_____

_____

[2]

Q38.
 Charlie measures current in a parallel circuit.

A circuit has two identical branches. A total current of 6 A flows.

(a) State the current in each branch.

_____

[1]

(b) Explain your answer.

_____

_____

[2]

[Total: 3 marks]

Q39.
 Noah is revising electricity equations.

(a) Write the equation linking energy, power and time.

_____

[1]

(b) A television has a power rating of 120 W and is on for 10 hours. Calculate the energy transferred in kWh.

_____

_____

_____

[3]

[Total: 4 marks]

Q40.
 Jacob is studying electrical safety.

Explain why circuit breakers are safer than fuses.

_____

_____

_____

[3]

Triple Science

Q41.
 William investigates resistivity.

(a) State the equation linking resistance, resistivity, length and area.

_____

[1]

(b) Explain how increasing the cross-sectional area of a wire affects its resistance.

_____

_____

[2]

[Total: 3 marks]

Q42.
Alex investigates superconductors.

Explain what is meant by a superconductor.

_____

_____

_____

[3]

Q43.
Luke measures the heating effect of current.

State two disadvantages of resistors heating up when current flows.

_____

_____

[2]

Q44.
James studies alternating current.

(a) Sketch the shape of a graph showing potential difference against time for alternating current.

_____

_____

[2]

(b) Explain how the graph would look for direct current.

_____

_____

[2]

[Total: 4 marks]

Q45.
Tom investigates transformers.

(a) Write the equation linking potential difference and number of turns for the primary and secondary coils of a transformer.

_____

[1]

(b) A transformer has 500 turns on the primary coil and 100 turns on the secondary coil. The primary potential difference is 230 V. Calculate the secondary potential difference.

_____

_____

_____

[3]

[Total: 4 marks]

Q46.
Jack studies efficiency in the National Grid.

Explain how high-voltage transmission reduces energy loss.

_____

_____

_____

[3]

Q47.
Harry investigates step-up and step-down transformers.

State the purpose of each type of transformer in the National Grid.

Step-up: _____

Step-down: _____

[2]

Q48.
 Ben investigates power in terms of current and resistance.

Derive the equation P=I2RP = I^2 RP=I2R from the equations you have studied.

_____

_____

_____

[3]

Q49.
 Daniel studies current in different materials.

Explain why metals are good conductors of electricity.

_____

_____

_____

[3]

Q50.
 Oliver investigates fuses.

A hairdryer works at 230 V and has a power rating of 2000 W.

(a) Calculate the current in the hairdryer.

_____

_____

_____

[3]

(b) State which fuse rating should be chosen: 3 A, 5 A, or 13 A.

_____

[1]

[Total: 4 marks]

Q51.
 Ethan studies resistance at different temperatures.

Explain why the resistance of a metal increases as temperature increases.

_____

_____

_____

[3]

Q52.
 Sam is researching potential difference.

Explain, in terms of energy, what potential difference means.

_____

_____

_____

[3]

Q53.
 Charlie investigates circuit design.

(a) Explain one advantage of using parallel circuits in household wiring.

_____

_____

[2]

(b) Explain one disadvantage of series circuits in household wiring.

_____

_____

[2]

[Total: 4 marks]

Q54.
 Noah works out efficiency.

A transformer has an input power of 500 W and an output power of 480 W.

Calculate the efficiency of the transformer.

_____

_____

_____

[3]

Q55.
 Jacob studies alternating current.

Explain why alternating current is used in the National Grid instead of direct current.

_____

_____

_____

[3]