Electricity Past Paper Questions Edexcel Physics IGCSE -Higher

1.

(a) The diagram shows some electrical circuit symbols.

(i) Which symbol represents a switch?

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(ii) Which symbol represents a diode?

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(b) A hairdryer connected to the mains supply takes a current of 5.5 A.

(i) Which of these fuses should be used with the hairdryer?

(1)

- ☒ **A** 3 A
- ☒ **B** 5 A
- ☒ **C** 7 A
- ☒ **D** 13 A

(ii) Explain your answer.

(1)

(iii) The hairdryer has a plastic case so there is no need for an earth wire connection in the plug.

Explain why the hairdryer is still safe to use.

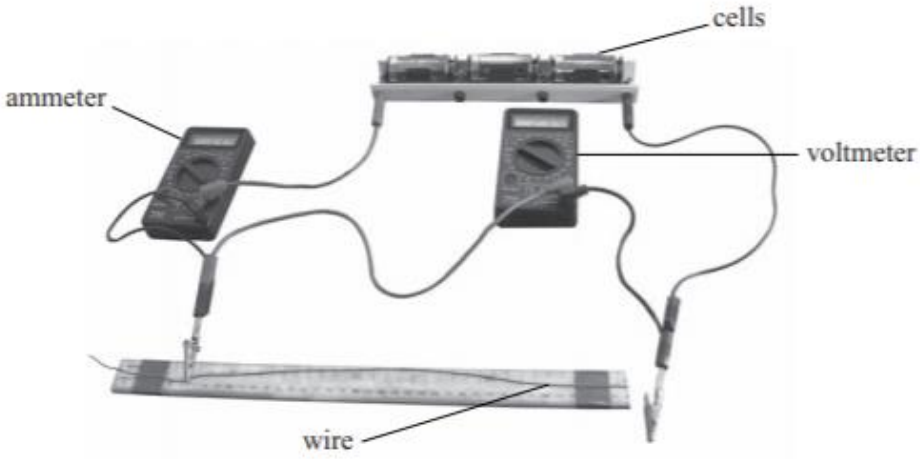
(2)

(Total for Question 1 = 6 marks)

2.

A student investigates how the resistance of a wire depends on its length.

The photograph shows the circuit that the student uses.



(a) Draw a circuit diagram to show how the components in the photograph are connected.

(3)

(b) (i) Complete the table by naming the key variables in this investigation.

(1)

independent variable	
dependent variable	

(ii) Describe the method the student should use for this investigation.

(5)

(c) The table shows the student's measurements.

Length of wire in cm	Voltage in V	Current in A	Resistance of wire in Ω
20	4.5	3.6	1.3
40	4.5	1.8	2.5
60	4.5	1.2	3.8
80	4.5	0.9	5.0
100	4.5	0.7	

(i) State the equation linking voltage, current and resistance.

(1)

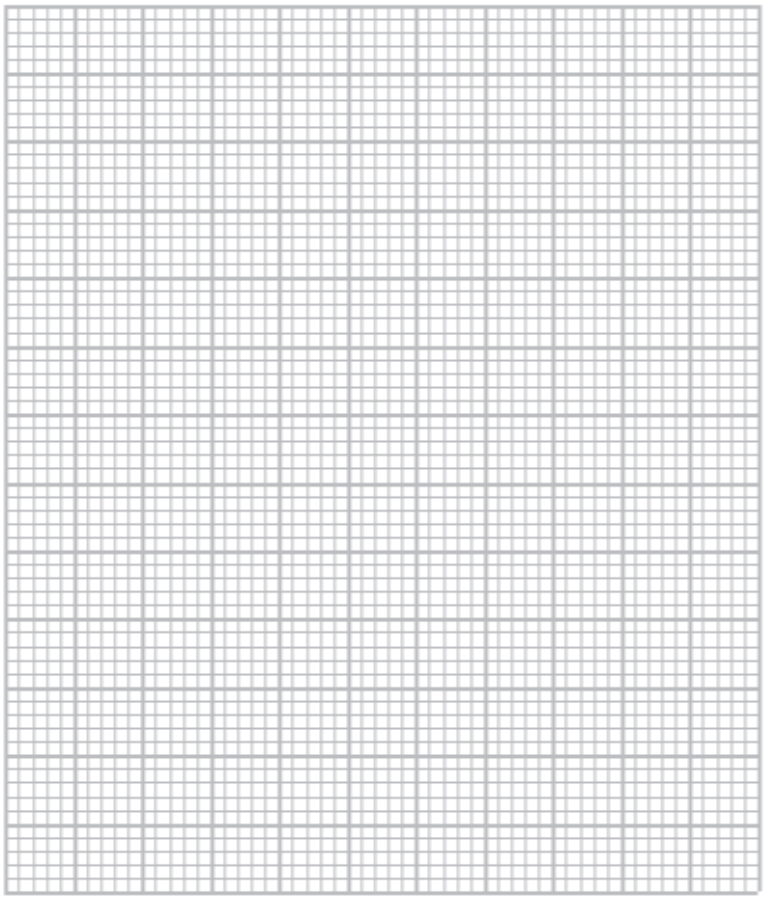
(ii) Complete the table by calculating the missing value of resistance.

(1)

V

(d) (i) Use the results from the table opposite to plot a graph of resistance (y-axis) against length of wire (x-axis) and draw the line of best fit.

(5)



(ii) Write a conclusion for the investigation.

(1)

(iii) Explain how the graph supports this conclusion.

(2)

3.

The photograph shows an extension cable on a reel.

There is a warning label on the reel.

WARNING
maximum allowable power
when cable fully extended – 2400 W, 240 V
when cable coiled up – 700 W, 240 V

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

(1)

(ii) Complete the table by inserting the missing value.

(1)

Power in W	Voltage in V	Current in A
700	240	
2400	240	10

(b) The extension cable is fitted with a 13 A fuse.

(i) Describe how the fuse protects the cable.

(3)

(ii) Explain why a 5 A fuse is **not** suitable for this extension cable.

(2)

(iii) Suggest why the maximum recommended current is lower when the cable is coiled up.

(1)

4.

Mains electricity is used in circuits at home.

(a) Double insulation is needed for safety when there is

(1)

- ☒ **A** no circuit breaker
- ☒ **B** no earth connection
- ☒ **C** no fuse
- ☒ **D** no switch

(b) A fuse is used so that

(1)

- ☒ **A** an earth connection is not needed
- ☒ **B** the appliances are more efficient
- ☒ **C** the circuit cannot overheat if there is a fault
- ☒ **D** the user cannot touch a live wire

(c) Most lamps at home have their own switch.

This is because the lamps are connected

(1)

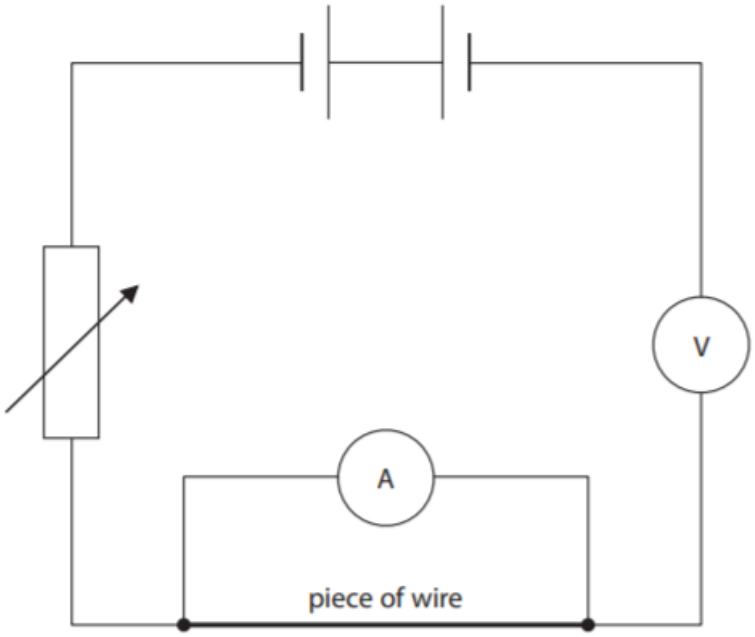
- ☒ **A** in parallel
- ☒ **B** in series
- ☒ **C** to a fuse
- ☒ **D** to an earth wire

(Total for Question 1 = 3 marks)

5.

A student plans to measure the resistance of a piece of wire.

He sets up this circuit and finds that it does not work.



(a) Identify the three errors in the student's circuit.

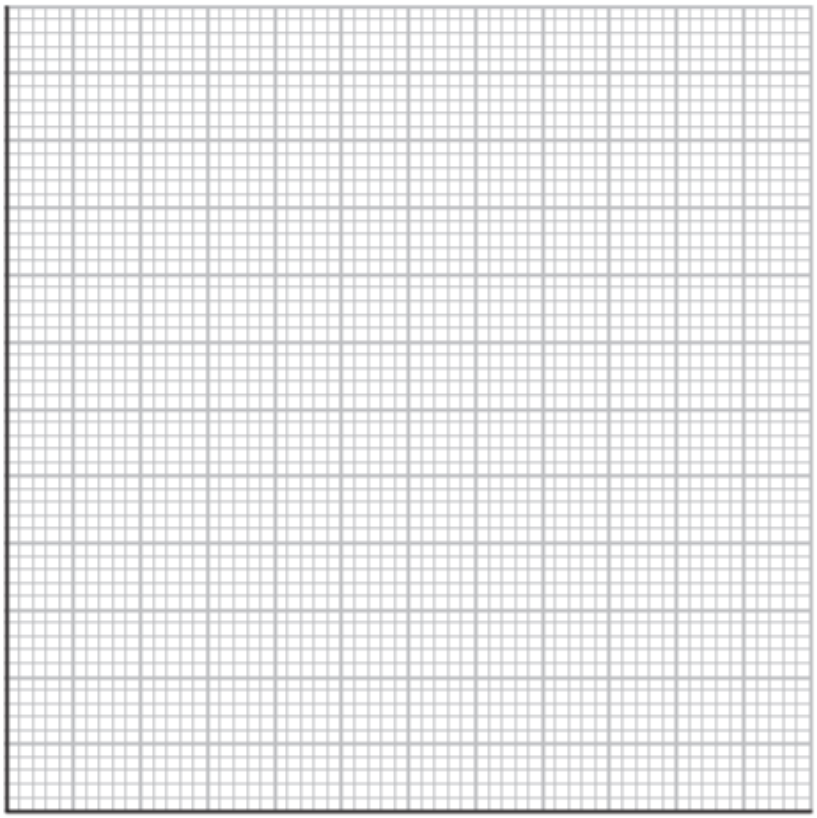
(3)

(b) The student uses a correct circuit to obtain these results.

Current in amps	Voltage in volts
0.00	0.0
0.24	1.5
0.71	4.5
0.89	6.0
1.00	7.5
1.10	9.0

(i) Plot a graph to show the relationship between current and voltage for the wire.

(5)



(ii) Find the current when the voltage is 2.5 V.

(1)

(iii) Suggest why the line on the graph curves.

(1)

(iv) Describe what else the student should do to find an accurate value for the resistance of the piece of wire at a constant temperature.

(4)