

Interactive Example Candidate Responses

Paper 6 (May / June 2016), Question 4

Cambridge IGCSE™
Physics 0625



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- 4 A student is investigating how the resistance of a wire depends on the length of the wire. The student aims to plot a graph.

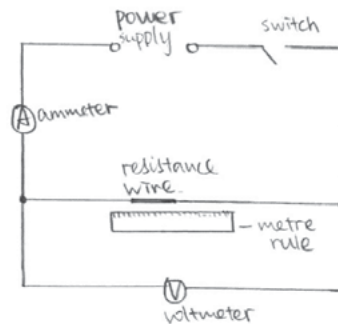
The following apparatus is available to the student:

ammeter
voltmeter
power supply
variable resistor
switch
connecting leads
resistance wires of different lengths
metre rule.

Plan an experiment to investigate how the resistance of a wire depends on the length of the wire.

You should

- draw a diagram of the circuit you could use to determine the resistance of each wire
- explain briefly how you would carry out the investigation
- suggest suitable lengths of wire
- state the key variables that you would control
- draw a table, or tables, with column headings to show how you would display your readings. You are not required to enter any readings in the table.



Your
Mark

4

Q4 Mark scheme

Circuit diagram:

MP1 Sample of wire must be clearly identifiable by a label on the diagram or by letters on the diagram with an explanation in the text

MP2 All circuit symbols correct (even if circuit is incorrect)

Method:

MP3 Take readings of V and I

MP4 For 5 or more lengths

MP5 Range of lengths must be between 5 cm and 2 m with the largest length at least twice the smallest

Table drawn with headings:

MP6 l/m , V/V , I/A , R/Ω

Key variables to control:

MP7 Any one from

- Material/resistivity/conductivity/type of wire
- Diameter/radius/thickness/cross sectional area
- Temperature of wire

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Steps: ① According to the diagram, connect the circuit with the apparatus, and connect a ¹⁰cm resistance wire (length measured by metre rule)

② close the switch, read the current on the ammeter, I and the potential difference on the voltmeter, V and record them into the table.

③ Use the formula, resistance = $\frac{p.d}{current}$, calculate the resistance of this wire ^{as R} and record the data.

④ repeat the experiment, only change the wires measured by meter rule, they are with different lengths, ~~10cm~~ 15cm, 20cm, 25cm, 30cm, 35cm, 40cm separately, calculate their resistance and record the data (Keep the power supply constant.)

length of resistance wire/cm	I/A	V/V	R/Ω

[7]

[Total: 7]

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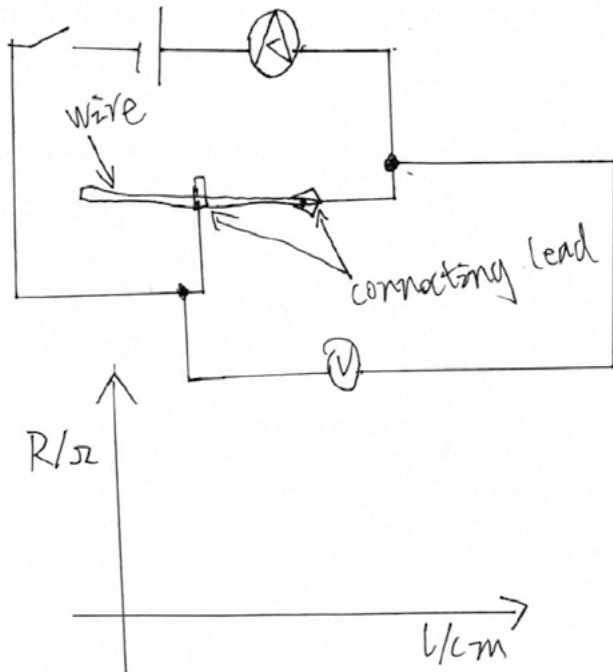
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~~First, connect the circuit.~~
The length of wire should be 50 cm long.

First, connect the connecting lead on the wire and connect the circuit.
Record the length of the wire which is connected into the circuit and the voltage and the current. Use $R = \frac{V}{I}$ to get the resistance of the wire.

Then change the position of the connecting lead and repeat the experiment.
In the experiment, you should not change the wire and the sectional area of the wire and the voltage of the battery.

[7]

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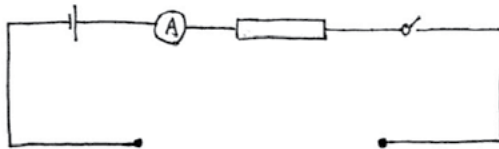
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length / cm	Test 1			Test 2		
	Ammeter (A)	V (V)	R (Ω)	A (A)	V (V)	R (Ω)

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