

Ohm's law and component characteristics

Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers $V = IR$, circuit measurements, I-V graphs and sensors. Show your working and give units. A calculator and a ruler are allowed. The paper is worth 20 marks.

Level: Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE P2, IGCSE 4.3

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Definitions (2 marks)

- Write the equation that defines resistance. (1 mark)
- State what a potential difference of 1 volt means. (1 mark)

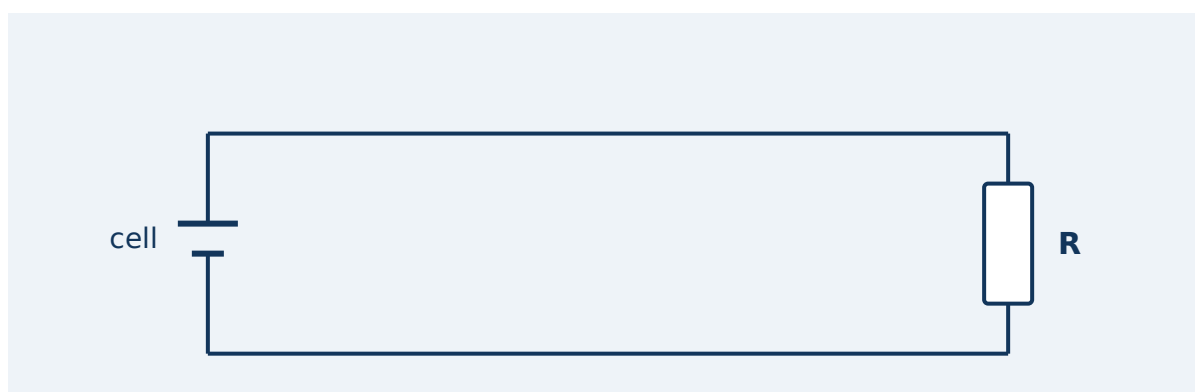
Question 2 Using $V = IR$ (3 marks)

- A resistor has 7.5 V across it and a current of 0.050 A. Calculate its resistance. (2 marks)
- Calculate the potential difference when the current is raised to 0.080 A. (1 mark)

Question 3 Measuring resistance (3 marks)

The circuit shows a cell and a resistor R.

- Copy the circuit and add an ammeter and a voltmeter to measure the resistance of R. (2 marks)
- State the equation used to find R. (1 mark)



The resistor R is connected to the cell. No meters are shown.

Question 4 Filament lamp (3 marks)

The I-V graph of a filament lamp is a curve whose gradient decreases as the voltage increases. Explain what this shows about the resistance and why it happens. (3 marks)

Question 5 Sensors (3 marks)

- a. State how the resistance of an LDR changes when the light intensity increases. (1 mark)
- b. Describe how a thermistor can be used to switch on a cooling fan. (2 marks)

Question 6 Energy transferred (2 marks)

A charge of 25 C passes through a lamp across which the potential difference is 12 V. Calculate the energy transferred. (2 marks)

Question 7 Diode (2 marks)

State what a diode does to a current, and give one use. (2 marks)

Question 8 Longer wire (2 marks)

A wire has a resistance of $6.0\ \Omega$. Another wire of the same material and thickness is twice as long. State its resistance and explain. (2 marks)