

# OCR (A) Physics A-level

## PAG 03.2 - Investigating Electrical Characteristics

### Practical Flashcards

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How can the current passing through a component be measured?



How can the current passing through a component be measured?

An ammeter can be connected in series with the component to measure the current passing through it.



How can the potential difference across a component be measured?



How can the potential difference across a component be measured?

A voltmeter can be connect in parallel to the component to measure the potential difference across it.



# What is a rheostat?



## What is a rheostat?

A rheostat is a component whose resistance can be varied throughout an experiment to produce varying currents.



# State Ohm's Law.





## State Ohm's Law.

Ohm's Law states that the current flowing through a component is directly proportional to the potential difference across it, assuming constant conditions (no temperature changes).



How can you obtain readings for negative voltages?



How can you obtain readings for negative voltages?

To obtain readings for negative voltages, reverse the polarity of your supply across the component.



Describe the I-V graph for an Ohmic component.



Describe the I-V graph for an Ohmic component.

Current and potential difference are directly proportional so the I-V graph will form a straight line that passes through the origin.



Describe the I-V characteristics of a diode.



Describe the I-V characteristics of a diode.

Diodes only let current flow in one direction, and require a minimum potential difference (threshold voltage) before current can flow.

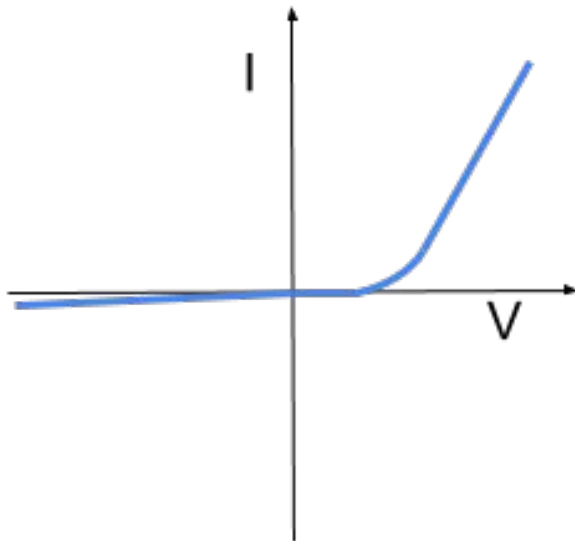


Draw the I-V graph for a diode.





Draw the I-V graph for a diode.



Why should the power source be switched off between readings?



Why should the power source be switched off between readings?

Electrical components can become very hot when currents pass through them for extended periods of time. To reduce this heating effect, the power source should be switched off when not in use.



Suggest why the reading given by a voltmeter may differ slightly from the true value.



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Voltmeters are assumed to have infinite resistance and so it is assumed that no current is drawn through them. In reality a very small current may be drawn, resulting in the reading differing slightly from the true value.



Suggest why the reading given by an ammeter may slightly differ from the true value.



Suggest why the reading given by an ammeter may slightly differ from the true value.

Ammeters are assumed to have zero resistance and so it is assumed that there is no voltage drop across them. In reality they may have a very small voltage drop across them, resulting in the reading differing slightly from the true value.



Why is it important that the surrounding temperature remains constant when carrying out this experiment?





Why is it important that the surrounding temperature remains constant when carrying out this experiment?

Temperature changes can affect the resistance of components, which may result in inaccurate characteristics being observed.



# Why does temperature affect resistance?



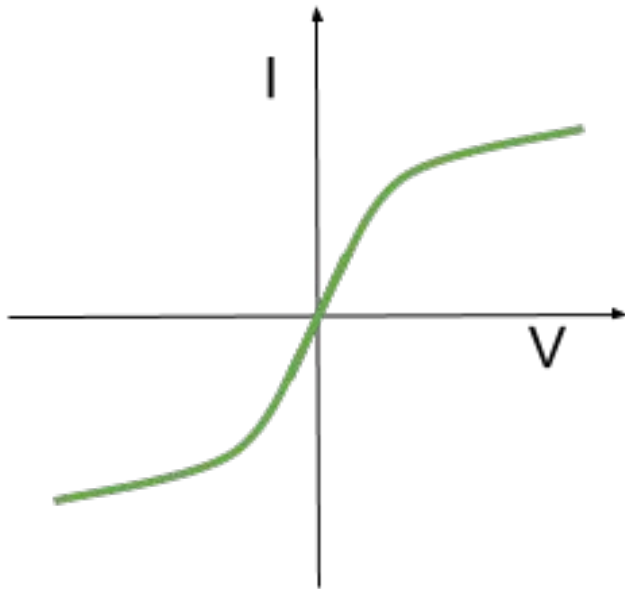
## Why does temperature affect resistance?

When temperature increases, the ions in the component gain kinetic energy and so vibrate more. This makes it harder for the electrons (the current) to flow through the component, and so the resistance is

Draw the I-V curve for a filament lamp.



Draw the I-V curve for a filament lamp.



What safety precautions should be taken when carrying out this experiment?



What safety precautions should be taken when carrying out this experiment?

Switch off the power supply when not in use, to reduce the components becoming too hot.

Never touch exposed metal contacts and ensure the voltages being used don't exceed the ratings of the components.

