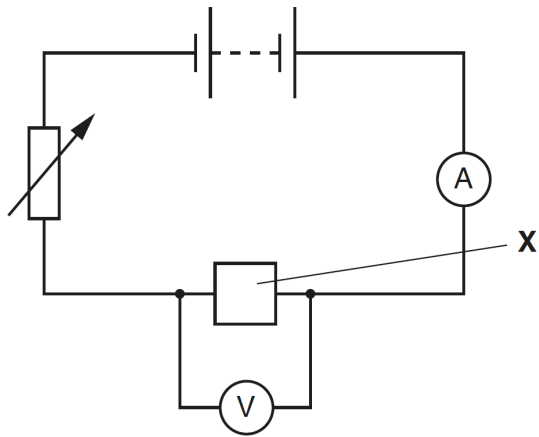


GCSE Physics A (Gateway)

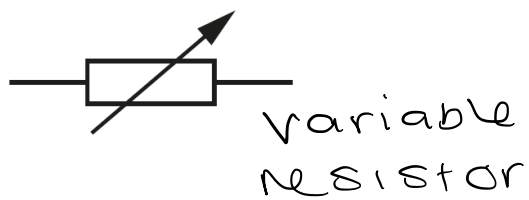
J249/03 Physics A P1-P4 and P9 (Higher Tier)

Question Set 1

- 1 (a) A student builds a circuit to investigate the resistance of component X.



- (a) (i) What is the name of this component?



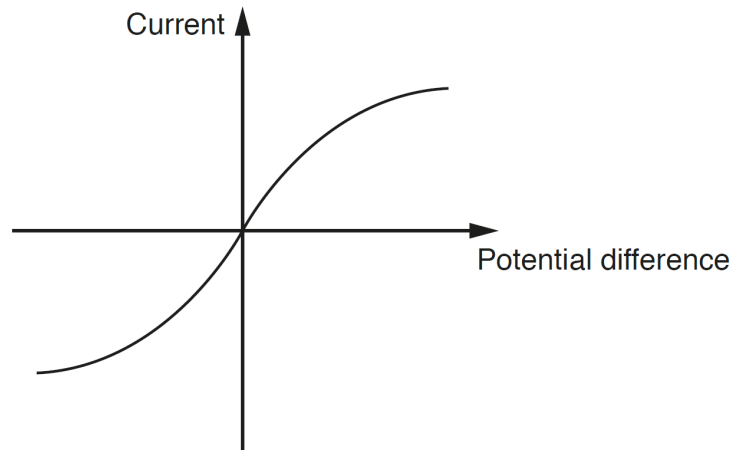
[1]

- (ii) Why is this component needed in this circuit?

to change the resistance in the circuit. [1]

(b) The student uses the circuit to take current and potential difference readings.

The student plots a graph of her results.



(i) Look at the graph.

What is component **X** in the circuit?

Filament Lamp

[1]

(ii) The resistance of component **X** varies as the potential difference changes.

Describe **how** the graph shows this and explain **why** this happens.

As potential difference increases, the temperature across the bulb also increases, this means more vibrations in the filament making it narrower for electrons to get past and for current to flow, therefore increasing the resistance of the bulb.

This is shown by the changing gradient.

[3]

(c) Component **X** has a resistance of 16Ω when a current of 0.25A flows.

(i) Calculate the potential difference across component **X**.

Use the equation: Potential difference = Current \times Resistance

$$0.25 \times 16 = 4$$

Answer = 4.0 V

[2]

(ii) Calculate the power of component **X** when a current of 0.25A flows.

$$P = I^2 R = 0.25^2 \times 16 = 1$$

Answer = ^{1.0} W

[3]

Total Marks for Question Set 1: 11

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