

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

**Question Set 19**

19

A student takes voltage and current measurements for four resistors (**A**, **B**, **C** and **D**).

The table shows the results from this experiment.

Resistor	Voltage (V)	Current (A)	Resistance ( $\Omega$ )
<b>A</b>	12.0	2.0	
<b>B</b>	6.0	1.5	
<b>C</b>	7.5	1.5	
<b>D</b>	8.0	2.0	

(a) Which two resistors have the same resistance value?

Use the results to show this.

[2]

(b) Calculate the maximum resistance that can be made using all four resistors.

Answer = .....  $\Omega$

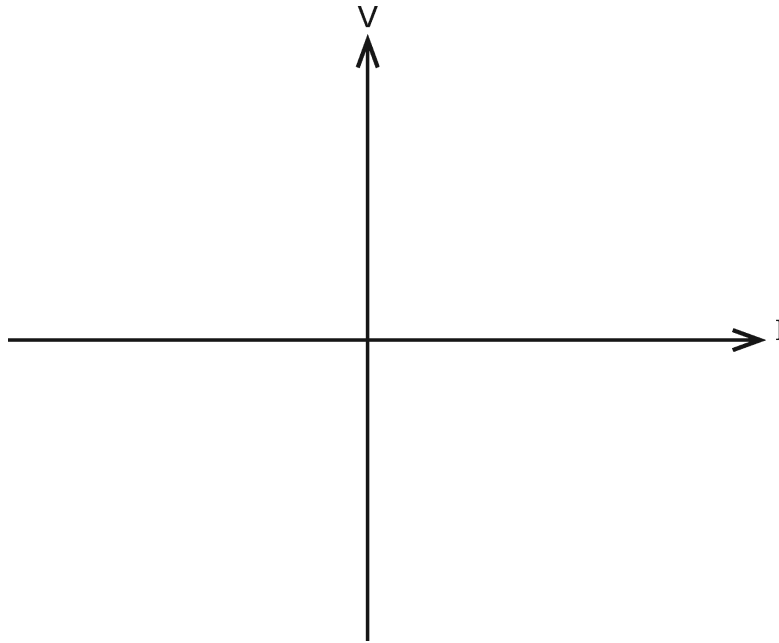
[1]

(c) (i) Draw a circuit diagram that could be used to find out how the resistance of a filament bulb changes with current.

Describe the readings you need to take.

[4]

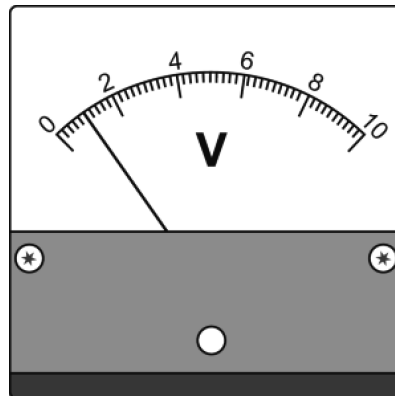
(ii) Sketch the shape of the graph from (c)(i) using the axes below.



State how this graph can be used to calculate resistance at any specific value of current.

(d) A voltmeter is used to measure the output voltages produced from the circuit. [2]

The voltmeter is **not** connected to a circuit and **not** recording a voltage.



Name the type of error on the voltmeter and suggest how it should be dealt with.

[2]

**Total Marks for Question Set 19: 11**

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