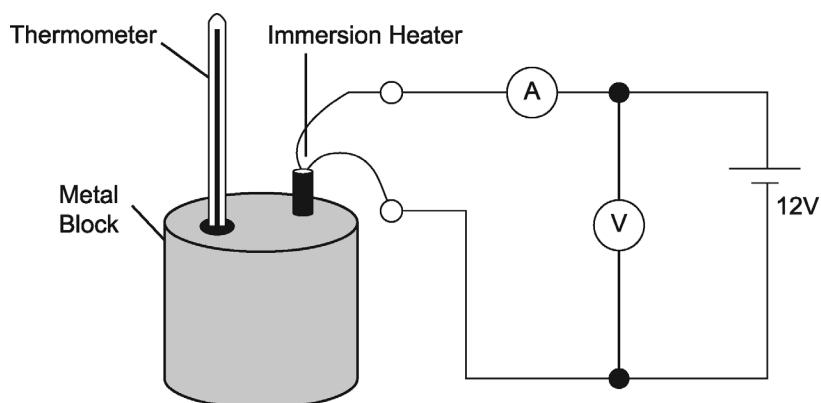


**GCSE Physics A (Gateway)**  
**J249/03 Physics A P1-P4 and P9 (Higher Tier)**

**Question Set 16**

A student does an experiment to find the specific heat capacity of a metal block.

The diagram shows the apparatus used.



- (a) (i) The student measures the voltage and current.

Suggest **three** other measurements he needs to take.

1. mass  
2. temperature change  
3. time heater is on for

[3]

- (ii) Describe how these measurements could be used to find the specific heat capacity of the metal. Use  $P = IV$  to find the power, then  $P = \frac{E}{t} \rightarrow Pt = E$

to find energy transferred then  $\frac{E}{m \Delta \theta} = c$  to find specific heat capacity.

[2]

- (b) The specific heat capacity obtained from the experiment is much larger than expected.

- Suggest **two** reasons for this difference.
  - ① Heat escapes to the surroundings
  - ② Part of the heater is outside the block
- Suggest **two** improvements to the method that might give a more accurate value for the specific heat capacity.

① Insulate the heater

[4]

② make sure all of the heater is inside the block.

**Total Marks for Question Set 16: 9**

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