Oxford Cambridge and RSA

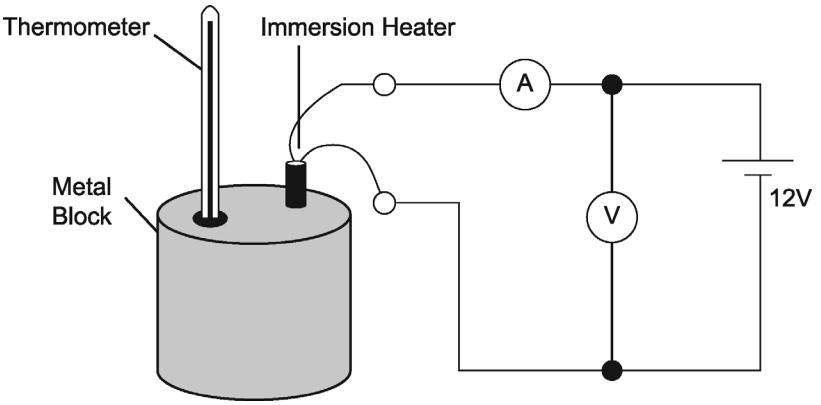
GCSE Physics A (Gateway)

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

Question Set 16

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 3. time heater is on for
2. temperature change

[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

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

[4]

Total Marks for Question Set 16: 9