



# Interactive Example Candidate Responses

Paper 6 (May / June 2016), Question 5

**Cambridge IGCSE™**  
**Physics 0625**



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5 A student is investigating the cooling of water.

Some of the apparatus is shown in Fig. 5.1.

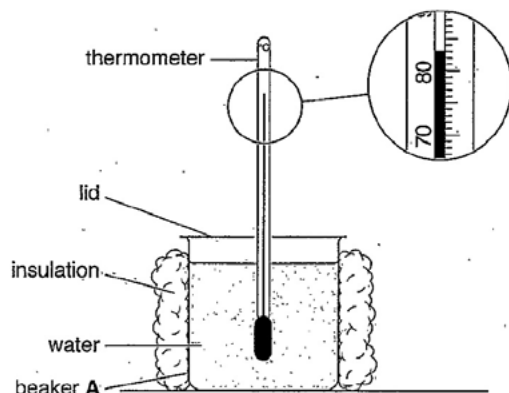


Fig. 5.1

- (a) The student pours  $200\text{ cm}^3$  of hot water into a  $250\text{ cm}^3$  insulated beaker labelled **A**. He covers the top of the beaker with a lid.

The student takes a temperature reading every 30s as the water cools. The readings are shown in Table 5.1.

- (i) Complete the column headings in the table. [1]

- (ii) The starting temperature  $\theta$  of the hot water in beaker **A** is shown on Fig. 5.1.

Record this temperature in the table at time  $t = 0\text{ s}$ . [1]

Table 5.1

	beaker <b>A</b> insulation and lid	beaker <b>B</b> insulation, no lid	beaker <b>C</b> lid, no insulation
$t/\text{s}$	$\theta/^\circ\text{C}$	$\theta/^\circ\text{C}$	$\theta/^\circ\text{C}$
0	83	85	78
30	80	79	74
60	77	74	71
90	75	70	68
120	73	67	66
150	71	64	64

Select  
page

Your  
Mark

5(a)(i)

5(a)(ii)

5(b)(i)

5(b)(ii)

5(c)

5(d)

5(e)

## Q5 Mark scheme

(a)(i)	s, °C, °C, °C
(a)(ii)	83(°C)
(b)(i)	First box/sentence indicated
(b)(ii)	Clear reference to readings with examples of temperature differences
(c)	Any two from: <ul style="list-style-type: none"> <li>Room temperature (or suitable reference to draughts or similar)</li> <li>Starting temperature (of water)</li> <li>Density of packing/amount/type of insulation</li> <li>Thickness of lids/identical lids</li> </ul>
(d)	Card or any suitable insulating material Should be a good insulator/poor conductor
(e)	Perpendicular viewing/view at right angles/eye level Reading to bottom of meniscus

- (b) The student repeats the procedure using a  $250\text{ cm}^3$  beaker labelled **B**. This beaker is insulated but has no lid.

He repeats the procedure again using a  $250\text{ cm}^3$  beaker labelled **C**. This beaker has a lid but no insulation.

All the readings are shown in Table 5.1.

- (i) Tick the statement that best describes the results of the investigation.

- ☐ Removing the lid speeds up the rate of cooling significantly more than removing the insulation.
- ☐ Removing the insulation speeds up the rate of cooling significantly more than removing the lid.
- ☒ There is no significant difference between removing the lid and removing the insulation.

[1]

- (ii) Justify your answer by reference to the readings.

Low difference of changing in temperature  
 $85^\circ\text{C} - 71^\circ\text{C} = 14^\circ\text{C}$      $78^\circ\text{C} - 70^\circ\text{C} = 8^\circ\text{C}$      $6^\circ\text{C} - 4^\circ\text{C} = 2^\circ\text{C}$   
 $74^\circ\text{C} - 70^\circ\text{C} = 4^\circ\text{C}$      $71^\circ\text{C} - 68^\circ\text{C} = 3^\circ\text{C}$      $6^\circ\text{C} - 3^\circ\text{C} = 3^\circ\text{C}$   
 So the low difference should be [1] be indicated

- (c) State two of the conditions that should be kept the same in this experiment in order for the comparison to be fair.

1. Initial <sup>hot</sup> temperature of water
2. Repeat of experiment humidity

[2]

- (d) Suggest a suitable material for the lid. Give a reason for your choice of material.

material wood

reason Because it is a insulator and can keep heat inside the beaker efficiently

[2]

Your  
Mark

5(a)(i)

5(a)(ii)

5(b)(i)

5(b)(ii)

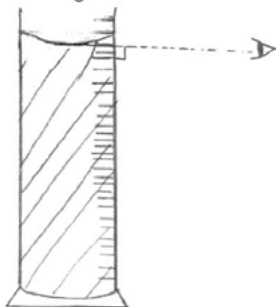
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- (e) Describe briefly how a measuring cylinder is read in order to obtain a reliable value for the volume of water. You may draw a diagram.



.....Eyes should be perpendicular to the measuring cylinder's scale at  
 ...level of water.....

[2]

[Total: 10]

Select  
page

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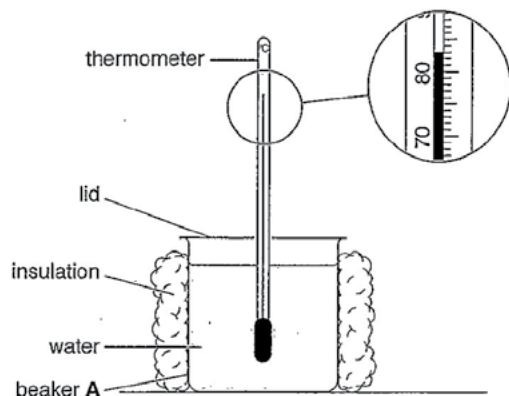


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[1]

- (ii) Justify your answer by reference to the readings.

Beaker B and C ~~are~~ have different rates of cooling at the start but then Beaker B's rate gets faster and they become almost same.

[1]

- (c) State two of the conditions that should be kept the same in this experiment in order for the comparison to be fair.

- Volume of water
- Initial temperature of water

[2]

- (d) Suggest a suitable material for the lid. Give a reason for your choice of material.

material Rubber

reason Good insulator

[2]

Your  
Mark

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5(a)(ii)

5(b)(i)

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5(c)

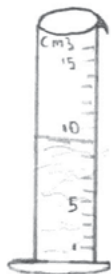
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- (e) Describe briefly how a measuring cylinder is read in order to obtain a reliable value for the volume of water. You may draw a diagram.



The point at which the top of the water is read in the scale provided so in this case the volume of the water is 9cm<sup>3</sup>

[2]

[Total: 10]

Select  
page

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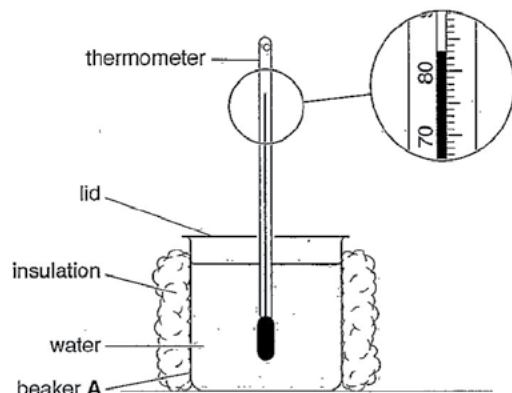


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[1]

- (ii) Justify your answer by reference to the readings.

*Because in beaker C, you can see the results and temperature going down much faster than beaker B.*

[1]

- (c) State two of the conditions that should be kept the same in this experiment in order for the comparison to be fair.

1. *Surrounding temperature should be kept same/normal at all times.*
2. *Size of the beaker used that is used.*

[2]

- (d) Suggest a suitable material for the lid. Give a reason for your choice of material.

material *Glass.*

reason *It's expensive and it also catches water droplets.*

[2]

Your  
Mark

5(a)(i)

5(a)(ii)

5(b)(i)

5(b)(ii)

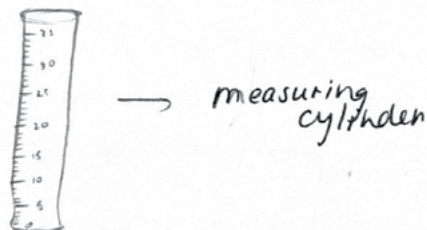
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- (e) Describe briefly how a measuring cylinder is read in order to obtain a reliable value for the volume of water. You may draw a diagram.



Water is filled inside measuring cylinder. The readings will be given and there are proper divisions in the cylinder you you to obtain a much more accurate reading [2]

[Total: 10]

Your  
Mark

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5(a)(ii)

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