



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**PHYSICS**

**0625/51**

Paper 5 Practical

**October/November 2016**

MARK SCHEME

Maximum Mark: 40

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**Published**

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| <b>Question</b> | <b>Answer</b>  | <b>Mark</b>          |
|-----------------|--|----------------------|
| 1(a)            | Either suitable use of a horizontal straight edge<br><br>Or holding rule close to pendulum<br>Or line of sight perpendicular to rule   | <b>1</b>             |
| 1(b)(i)         | $t = 27.8 - 29.0$ (s)  | <b>1</b>             |
| 1(b)(ii)        | $T$ correct<br>Unit s  | <b>1</b><br><b>1</b> |
| 1(b)(iii)       | More likely to miscount/pendulum may stop swinging   | <b>1</b>             |
| 1(c)(i)         | Correct calculation and unit $s^2$   | <b>1</b>             |
| 1(c)(ii)        | $g$ between 9 and 11 from correct $T$ and working<br>2 or 3 significant figures  | <b>1</b><br><b>1</b> |
| 1(d)(i)         | Explanation of cause of inaccuracy in measurement of $t$ or $l$ .<br>e.g. student did not react quickly enough when starting/stopping stopwatch OR difficulty in measuring accurately to centre of bob | <b>1</b>             |
| 1(d)(ii)        | Any two from:<br>Use different length(s)<br>Repeat timing<br>Use of a fiducial mark<br>Increased number of oscillations<br>Plot a graph using length and time or time <sup>2</sup>                     | <b>2</b>             |
|                 | <b>Total:</b>  | <b>11</b>            |

|               |  |                 |              |
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| <b>Question</b> | <b>Answer</b>   | <b>Mark</b> |
|-----------------|---|-------------|
| 2(a)            | $\theta_H$ 60 – 100<br>$\theta_C$ 10 – 40 and $\theta_{AV}$ correct<br>Unit °C  | 1<br>1<br>1 |
| 2(b)            | $\theta_M$ between $\theta_H$ and $\theta_C$  | 1           |
| 2(c)            | Perpendicular viewing of scale<br>OR wait until temperature stops rising<br>OR carry out without undue delay between parts  | 1           |
| 2(d)(i)         | Correct diagram with lid<br>Insulation placed round beaker  | 1<br>1      |
| 2(d)(ii)        | Sensible series of values with $\theta_M$ between $\theta_H$ and $\theta_C$   | 1           |
| 2(d)(iii)       | Statement and justification to match results  | 1           |
| 2(d)(iv)        | Two from:<br>Room temperature (or other environmental condition)<br>Temperature of cold water<br>Temperature of hot water<br>Volumes of water<br>Size/shape/material/surface area of beaker | 2           |
|                 | <b>Total</b>  | <b>11</b>   |

|               |  |                 |              |
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| <b>Question</b> | <b>Answer</b>  | <b>Mark</b>      |
|-----------------|--|------------------|
| 3(a)            | Ray trace:<br>Correct normal and all lines in approximately the right places<br>P at least 5 cm from <b>AB</b><br>Table:<br>$\theta$ values within $\pm 2^\circ$ of ray trace values<br>$\theta$ values within $\pm 1^\circ$ of 20, 30, 40, 50, 60 | 1<br>1<br>1<br>1 |
| 3(b)            | Graph:<br>Axes correctly labelled and right way round<br>Suitable scales<br>All plots correct to $\frac{1}{2}$ small square<br>Good line judgement, thin, continuous line  | 1<br>1<br>1<br>1 |
| 3(c)            | Triangle method shown on graph <u>and</u> triangle using at least half of candidate's line<br>G 0.9 – 1.1  | 1<br>1           |
| 3(d)            | Points close to/scattered from line (to match graph)/all on line.  | 1                |
|                 | <b>Total:</b>  | <b>11</b>        |

|               |  |                 |              |
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| <b>Question</b> | <b>Answer</b>   | <b>Mark</b> |
|-----------------|---|-------------|
| 4               | <b>MP1</b> On circuit diagram: one voltmeter in parallel with any component   | <b>1</b>    |
|                 | <b>MP2</b> Circuit diagram correctly shows power supply, ammeter, unless in a branch, two or more resistors in parallel   | <b>1</b>    |
|                 | <b>MP3</b> Circuit diagram: Correct symbols for ammeter, voltmeter and fixed resistor   | <b>1</b>    |
|                 | <b>MP4</b> Repeat with a different number of resistors (in parallel)  | <b>1</b>    |
|                 | <b>MP5</b> Table that includes columns for number of resistors, voltage/V and current/A   | <b>1</b>    |
|                 | <b>MP6 &amp; MP7</b> Then any two from:<br><br>Resistance calculated (may be shown in table)<br>Use low current (to stop resistors getting too hot)/switch off between readings<br><br>Use at least 5 different combinations<br><br>Repeat with different current or voltage or variable resistor setting<br><br>Drawing a graph of number of resistors against combined resistance | <b>2</b>    |
|                 | <b>Total:</b>   | <b>7</b>    |