



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

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**PHYSICS**

**0625/63**

Paper 6 Alternative to 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)(i)	$\theta = 82(.0), 80(.0)$	<b>1</b>
1(a)(ii)	units all correct (symbols or words) $t$ values all present (30, 60, 90, 120, 150 and 180)	<b>1</b> <b>1</b>
1(b)	any 2 appropriate precautions:  e.g. viewing perp. to thermometer scale (to avoid parallax) stir before reading keep thermometer at same level/not touching beaker walls wait until reading stops rising at the start	<b>2</b>
1(c)(i)	Conclusion <u>and</u> explicit quoting of figures from the table which relate to the <i>whole</i> 180 s period (eg 15.0 and 9.5 °C, or 5.5 °C more)  statement that B cools more <u>quickly</u> /its <u>temperature</u> drops <u>faster</u> /its temperature falls more <u>in the same time</u>	<b>1</b> <b>1</b>
1(c)(ii)	any suitable improvement to apparatus relating to comparison: e.g. insulate sides, use plastic beaker, stand on mat  matching explanation: e.g. thermal energy only escapes from surface, surface area only variable changed, less transfer of thermal energy/heat by sides  appropriate effect on values of $\theta$ : e.g. all higher	<b>1</b>  <b>1</b>  <b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
1(d)	any appropriate factor: e.g. volume of water, initial temperature of water, similar ratio of surface areas, type / material / size of beaker, room temperature	<b>1</b>
	<b>Total</b>	<b>11</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
2(a)(i)	$h_o = 1.5$ (cm) $h_i = 4.0$ (cm)	<b>1</b> <b>1</b>
2(a)(ii)	$M = 2.7$ (or ecf) <u>and</u> no unit for $M$	<b>1</b>
2(a)(iii)	Answer given to 2/3 sig figs <u>and</u> with appropriate unit Value given for $f_1$ rounds to 14.5 or 14.6 (cm)	<b>1</b> <b>1</b>
2(a)(iv)	any appropriate difficulty: e.g. hand/ruler in way of image  matching improvement: e.g. use translucent screen and view from behind use transparent ruler, fix ruler/grid to screen	<b>1</b>   <b>1</b>
2(b)(i)	distance present, and $v = 25.0$ (cm)	<b>1</b>
2(b)(ii)	$f_2$ present (expect 15.4 (cm)) <u>and</u> statement matching results  justification matching correct statement ('within limits of experimental accuracy' / owtte)	<b>1</b>  <b>1</b>
2(c)	any suitable precaution:  e.g. dark room/bright light (centre of) lens and object same height (above bench), lens/object/screen perpendicular (any one will suffice), ruler fixed/placed on bench, mark centre of lens on holder repeat with different values of $u$ /different sizes of object	<b>1</b>
	<b>Total</b>	<b>11</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
3(a)	Four correct $I$ values (0.12, 0.15, 0.17, 0.19 and 0.21) present The fifth one is also correct	<b>1</b> <b>1</b>
3(b)	correct calculations of $R$ (4.2, 6.7, 8.8, 10.5, 11.9) or ecf from <b>(a)</b>	<b>1</b>
3(c)	graph:  axes correct way round, labelled with quantity and unit  appropriate scales (plots occupying at least $\frac{1}{2}$ grid)  plots all correct to $\frac{1}{2}$ small square  well-judged line <u>and</u> thin line, precise plots	<b>1</b>  <b>1</b>  <b>1</b>  <b>1</b>
3(d)	simple statement matching candidate's line (e.g. resistance increases with p.d.)  qualified (e.g. changes less rapidly for greater p.d. values)	<b>1</b>  <b>1</b>
3(e)	correct symbol for variable resistor (rectangle with strike-through arrow only)  in correct series circuit	<b>1</b>  <b>1</b>
	<b>Total</b>	<b>11</b>

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
4	<p>apparatus – workable arrangement</p> <p>how applied force is measured</p> <p>suitable table for results / plot a bar graph</p> <p>how to conclude which is strongest</p> <p>one suitable control variable: e.g. same width of sample same thickness / weight / length of paper all samples fixed in same way</p> <p>any 2 from: 2nd control variable, force applied smoothly / no jerking ensure no tears before applying force repeat for each type of sample / repeat with samples of different widths soft mat under weights (to cushion fall) / clamp stand to bench add weight of lower block to value of load any other suitable precaution</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p>
	<b>Total</b>	<b>7</b>