



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

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**PHYSICS**

**0625/53**

Paper 5 Practical Test

**May/June 2017**

MARK SCHEME

Maximum Mark: 40

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**Published**

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This document consists of **5** printed pages.

Question	Answer	Marks
1(a)	<u>5</u> $I$ values, <u>all</u> increasing	1
	all < 5.00 A and to 2dp at least	1
1(b)	graph: axes labelled with quantity and unit	1
	appropriate scales (plots occupying at least $\frac{1}{2}$ grid)	1
	plots all correct to $\frac{1}{2}$ small square	1
	Well-judged straight line <u>and</u> thin line, precise plots	1
1(c)(i)	$M$ present and triangle method <u>seen on graph</u>	1
1(c)(ii)	$R$ in range 0.5 to 4.0 $\Omega$	1
	2 or 3 sig figs <u>and</u> unit = $\Omega$	1
1(d)	suitable reason:  e.g.: wire becomes too hot, current exceeds full scale deflection(owtte) of meter/becomes too large	1
1(e)	correct symbol for variable resistor (rectangle with strike-through arrow only)	1
	<b>Total:</b>	<b>11</b>

Question	Answer	Marks
2(a)	sensible value for $W_1$ (0.7 to 1.3 N)	1
2(b)(i)	sensible value for $V_1$ (140 to 160 cm <sup>3</sup> )	1
2(b)(ii)	line of sight perpendicular	1
	to bottom of meniscus	1
2(c)	$W_2 < W_1$ <u>and</u> $V_2 > V_1$	1
2(d)	correct calculation of $\rho_1$	1
	unit g / cm <sup>3</sup>	1
2(e)	$m_1 > m_2$ by between 100 g and 200 g	1
2(f)	$\rho_2$ <u>and</u> $\rho_1$ in range 0.9 to 1.1	1
2(g)	appropriate cause of inaccuracy: e.g.: <ul style="list-style-type: none"> <li>• some water still in empty measuring cylinder</li> <li>• water spilled, splashed when putty put in water</li> <li>• water drops on putty when removed</li> <li>• air bubbles on putty</li> </ul>	1
	suitable improvement: e.g.: <ul style="list-style-type: none"> <li>• measure <math>m_2</math> at start (when cylinder dry)</li> <li>• measure new volume in Method OR refill to correct value</li> <li>• shake putty to remove air / smooth surface to minimise bubbles</li> </ul>	1
	<b>Total:</b>	<b>11</b>

Question	Answer	Marks
3(a)	normal correct and $\theta = 30^\circ \pm 1^\circ$	1
3(b)	pin separation $\geq 5$ cm	1
3(c)(i)	first set of lines in correct place	1
3(c)(ii)	<i>a</i> <u>and</u> <i>b</i> lengths correct	1
	<i>n</i> calculation correct	1
	in range 1.3 to 1.7 <u>and</u> no unit	1
3(d)	all lines present and neat	1
3(e)(i)	$\alpha = 30^\circ \pm 3^\circ$	1
3(e)(ii)	statement matching results	1
	justification using values <u>and</u> matching the statement ('within limits of experimental Accuracy'/owtte)	1
3(f)	difficulty in aligning pins/placing pins accurately, pins (too) thick	1
	<b>Total:</b>	<b>11</b>

Question	Answer	Marks
4 MP1	<b>apparatus</b> beaker <u>with</u> insulation <u>and</u> thermometer <u>and</u> stopclock (or alternative) mentioned	1
MP2	<b>method</b> pour <u>hot</u> water into container measure temperature of hot water over period of time	1
MP3	repeat for additional layers	1
MP4	<b>results:</b> suitable table/graph/cooling curve	1
MP5	<b>control variables</b> any pair from: same initial temperature, same volume of water, same size/material/thickness of beaker, same thickness of each layer,	1
MP6 MP7	<b>additional points</b> any 2 from: how cooling rate calculated/how to compare cooling curves, read thermometer perpendicularly, thermometer at same depth (for repeat) thermometer not touching beaker, stir before reading thermometer, use of lid, minimum of 5 different thicknesses of insulation, repeat experiment with different sized beakers/different amount of water, sensible amount of water (50 cm <sup>3</sup> to 500 cm <sup>3</sup> )	2
	<b>Total:</b>	<b>7</b>