Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/63**

Paper 6 Alternative to Practical **May/June 2017**

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Question	Answer	Marks
1(a)	W_1 = 1.5 (N)	1
1(b)(i)	V_1 = 155 (cm^3)	1
1(b)(ii)	line of sight perpendicular	1
	to bottom of meniscus	1
1(c)	W_2 = 0.7 (N) and V_2 = 235 (cm^3)	1
1(d)	ρ_1 = 1.0 or ecf	1
	unit g/cm^3	1
1(e)	m_1 = 241 (g)	1
1(f)	ρ_{AV} 0.978 / 0.977(g/cm^3)	1
1(g)	appropriate cause of inaccuracy: e.g: • some water still in empty measuring cylinder • water spilled, splashed when putty put in water • water drops on putty when removed • air bubbles on putty	1
	suitable improvement: e.g: • measure m_2 at start (when cylinder dry) • measure new volume in Method OR refill to correct value • shake putty to remove air / smooth surface to minimise bubbles	1
	Total:	11

Question	Answer	Marks
2(a)(i)	correct voltmeter symbol connected in parallel across **P** and **Q**	**1**
2(a)(ii)	I = 0.38(A)	**1**
2(b)	graph: axes labelled with quantity and unit	**1**
	appropriate scales (plots occupying at least ½ grid)	**1**
	plots all correct to ½ small square	**1**
	well-judged straight line and thin line, precise plots	**1**
2(c)(i)	M present and triangle method seen on graph	**1**
2(c)(ii)	R in range 1.8 to 2.4 Ω	**1**
	2 or 3 sig figs and unit = Ω	**1**
2(d)	suitable reason: wire becomes too hot, current exceeds full scale deflection(owtte) of meter / becomes too large	**1**
2(e)	correct symbol for variable resistor (rectangle with strike-through arrow only)	**1**
	Total:	**11**

Question	Answer	Marks
3(a)	$\theta = 30° \pm 1°$	1
3(b)	distance $\geqslant 5$ cm $\leqslant 15$ cm	1
3(c)(i)	normal correct	1
3(c)(ii)	$a = 6.4$ (cm) and $b = 4.3$ (cm)	1
3(c)(iii)	$n = 1.49$ or ecf	1
	2 or 3 sig figs and no unit	1
3(d)(i)	all lines in correct places and neat	1
	$\alpha = 28° \pm 3$	1
3(d)(ii)	statement matching results	1
	justification matching the statement ('within limits of experimental accuracy' / owtte)	1
3(e)	difficulty in aligning pins / placing pins accurately, pins (too) thick	1
	Total:	11

Question	Answer	Marks
4 MP1	**apparatus** beaker with insulation and thermometer and stopclock (or alternative) mentioned	**1**
MP2	**method** pour hot water into container measure temperature of hot water over period of time	**1**
MP3	repeat for additional layers	**1**
MP4	**results:** suitable table / graph / cooling curve	**1**
MP5	**control variables** any pair from: same initial temperature, same volume of water, same size/material/thickness of beaker, same thickness of each layer,	**1**
MP6 MP7	**additional points** 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^3 to 500 cm^3)	**2**
	Total:	**7**