



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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2017 series for most Cambridge IGCSE[®], Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

© IGCSE is a registered trademark.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

Question	Answer	Marks
1(a)	$W_1 = 1.5 \text{ (N)}$	1
1(b)(i)	$V_1 = 155 \text{ (cm}^3\text{)}$	1
1(b)(ii)	line of sight perpendicular	1
	to bottom of meniscus	1
1(c)	$W_2 = 0.7 \text{ (N)}$ <u>and</u> $V_2 = 235 \text{ (cm}^3\text{)}$	1
1(d)	$\rho_1 = 1.0$ or ecf	1
	unit g/cm^3	1
1(e)	$m_1 = 241 \text{ (g)}$	1
1(f)	$\rho_{AV} 0.978 / 0.977(\text{g/cm}^3)$	1
1(g)	appropriate cause of inaccuracy: e.g: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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)	$I = 0.38(\text{A})$	1
2(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
2(c)(i)	M present and triangle method <u>seen on graph</u>	1
2(c)(ii)	R in range 1.8 to 2.4 Ω	1
	2 or 3 sig figs <u>and</u> 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)	$\theta = 30^\circ \pm 1^\circ$	1
3(b)	distance $\geq 5 \text{ cm} \leq 15 \text{ cm}$	1
3(c)(i)	normal correct	1
3(c)(ii)	$a = 6.4 \text{ (cm)}$ <u>and</u> $b = 4.3 \text{ (cm)}$	1
3(c)(iii)	$n = 1.49$ or ecf	1
	2 or 3 sig figs <u>and</u> no unit	1
3(d)(i)	all lines in correct places and neat	1
	$\alpha = 28^\circ \pm 3$	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 <u>with</u> insulation <u>and</u> thermometer <u>and</u> stopclock (or alternative) mentioned	1
MP2	method pour <u>hot</u> 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