Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/63**

Paper 6 Alternative to Practical **May/June 2016**

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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NOTES ABOUT MARK SCHEME SYMBOLS AND OTHER MATTERS

Brackets ( )	Brackets around words or units in the mark scheme are intended to indicate wording used to clarify the mark scheme, but the marks do not depend on seeing the words or units in brackets, e.g. 10 (J) means that the mark is scored for 10, regardless of the unit given.
Underlining	Underlining indicates that this must be seen in the answer offered, or something very similar.
OR / or	This indicates alternative answers or words, any one of which is satisfactory for scoring the marks.
AND	Both answers or words must be given for credit to be awarded.
e.e.o.o.	This means “each error or omission”.
o.w.t.t.e.	This means “or words to that effect”.
c.a.o.	This means “correct answer only”.
NOT	This indicates that an incorrect answer is not to be disregarded, but cancels another otherwise correct alternative offered by the candidate, i.e. right plus wrong penalty applies.
e.c.f.	This means “error carried forward”. If a candidate has made an earlier mistake and has carried an incorrect value forward to subsequent stages of working, marks indicated by e.c.f. may be awarded, provided the subsequent working is correct, bearing in mind the earlier mistake. This prevents a candidate from being penalised more than once for a particular mistake, but **only** applies to marks annotated e.c.f.

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Question	Answer	Marks
1(a)	θ_R = 21(°C)	**1**
1(b)	s, °C , °C time values correct 30, 60, 90, 120, 150, 180	**1** **1**
1(c)(i)	'thermometer **A** cools more rapidly' and 'greater overall temperature change' reference to 'in the same time'	**1** **1**
1(c)(ii)	rate increases then decreases OR cooling is less in first 30 s than in subsequent 30 s periods	**1**
1(d)(i)	makes comparison fair / only one factor changed	**1**
1(d)(ii)	causes start temperature to be lower	**1**
1(e)	any two appropriate factors: e.g. start temperature, room temperature, draughts, humidity, amount of insulation, type of thermometer	**2**
		Total: 10

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Question	Answer	Marks
2(a)	indication of taking mean reading / deducing half load length and adding or subtracting	1
	scale reading = 70(.0)	1
2(b)	*F* values=1.45, 2.20, 2.80, 3.55, 4.05	1
	consistent 2 dp	1
2(c)	**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(d)(i)	*y* read correctly from graph	1
2(d)(ii)	*W* in range 1.4 to 2.0	1
	to 2 or 3 sig fig and with unit of N	1
2(e)	any suitable source on inaccuracy, e.g.: • rule not uniform / weight not distributed evenly, • load slips on rule, • forcemeter not at zero to start, • load values not exact	1
		Total: 12

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Question	Answer	Marks
3	**apparatus:** diagram – lens, (illuminated) object, screen in suitable order for experiment	**1**
	in line on flat surface	**1**
	instructions: set / measure object distance, move screen to get image, measure image height,	**1**
	repeat for different object distances	**1**
	limiting factor for range of object distances – one from: • image virtual / too big for screen, • image too dim / too small to measure, • must be greater than focal length	**1**
	graph: image size / magnification against object distance	**1**
	precaution: any one suitable precaution and consequence of not taking it, e.g. • dark room / bright light – image might not be distinct, • lens and object at same height – image might not appear on screen, • lens, object and screen perpendicular – image might be distorted, • fix rule – may move and give incorrect distances • mark position of lens on holder – cannot judge correct measurements / owtte • detailed means of obtaining a sharp image – might not be correctly focused • means of measuring image height accurately – might be obscured	**1**
		Total: 7

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Question	Answer	Marks
4(a)	correct voltmeter symbol in parallel with lamp **P**	**1**
4(b)	I = 0.23 unit of A	**1** **1**
4(c)	V_P = 2.7 and V_Q = 0.3	**1**
4(d)(i)	some current in the circuit, pd across lamp **Q** is small / not equal to supply voltage / reference to lamp **P** bright and is in series	**1**
4(d)(ii)	V_P greater than / near working voltage V_Q much less than working voltage	**1** **1**
4(e)	R = 13(.0) allow ecf 2 / 3sig figs and unit of Ω	**1** **1**
4(f)	statement matches results some correct values used and reference to 'within limits of experimental accuracy' / owtte	**1** **1**
		Total: 11

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