Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/62**

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

MARK SCHEME

Maximum Mark: 40

Published

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MARK SCHEME ABBREVIATIONS

Brackets ( )	The word, phrase or unit in brackets is not required but is in the mark scheme for clarification.
accept	Accept the response.
AND	Both responses are necessary for the mark to be allowed.
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.
OR / or	This indicates alternative answers, any one of which is satisfactory for scoring the marks.
Ignore	This indicates that something which is not correct or irrelevant is to be disregarded and does not cause a right plus wrong penalty.
Underlining	Mark is not allowed unless the underlined word or idea is used by the candidate.
c.a.o.	Correct answer only.
e.e.o.o.	This means "each error or omission".
o.w.t.t.e.	This means “or words to that effect”.
ecf	meaning "error carried forward" is mainly applicable to numerical questions, but may in particular circumstances be applied in non-numerical questions. This indicates that if a candidate has made an earlier mistake and has carried an incorrect value forward to subsequent stages of working, marks indicated by ecf 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 ecf.
Spelling	Be generous about spelling and use of English. If an answer can be understood to mean what we want, give credit.
Significant figs.	Significant figures or decimal places will be penalised only where indicated.
Arithmetic errors	Deduct one mark if the **only** error in arriving at a final answer is clearly an arithmetic one. Regard a power-of-ten error as an arithmetic error.
Transcription errors	Deduct one mark if the **only** error in arriving at a final answer is because previously calculated data has clearly been misread but used correctly.
Any [number] from:	accept the [number] of valid responses from list
Max	Indicates the maximum number of marks
Fractions	Allow these **only** where specified in the mark scheme.
Crossed out work	Work which has been crossed out **and not replaced but can easily be read,** should be marked as if it had not been crossed out.
Use of NR	(# key on the keyboard). Use this if the answer space for a question is completely blank or contains no readable words, figures or symbols.

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Question	Answer	Marks
1(a)	l_0 = 55 (mm) c.a.o.	**1**
1(b)(i)	4, 9, 14, 19, 23 ecf **(a)**	**1**
1(b)(ii)	Viewing scale at right angles or use of straight edge / set square / pointer between bottom of spring and scale / ruler	**1**
1(c)	Graph: Axes correctly labelled with quantity and unit Suitable scales All plots correct to ½ small square Good line judgement, thin, continuous line, neat plots	 **1** **1** **1** **1**
1(d)(i)	*e* = 17 (mm) ecf **(a)**	**1**
1(d)(ii)	method clearly shown on graph *W* value 3.5–3.75 Unit N needed No ecf from **(i)**	**1** **1**
		Total: 10

Question	Answer	Marks
2(a)	*x* shown clearly from centre of **P** to pivot	**1**
2(b)	Make **Q** into a cube / regular shape / small contact area with rule	**1**
2(c)	Move Q or P slowly one way until it just tips, then back other way until it tips back and take middle reading OR repeat procedure / experiment **AND** take average	**1**

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Question	Answer	Marks
2(d)	Measure width w of cube Place w / 2 either side of desired position OR draw centre line on cube / find centre of mass of cube and mark side of rule in desired position OR take readings on both sides of the cube and find the mean	**1** **1**
2(e)	Place rule on pivot (without P and Q) and record / find balance point	
		Total: 6

Question	Answer	Marks
3(a)	m_1 =2.94	**1**
3(b)	(m_2 = 0.329 OR 0.33) m_1 **and** m_2 to 2 or 3 significant figures only **AND** both m with no unit (accept ×)	**1**
3(c)	Statement, expect YES. Must match results. e.c.f .allowed Justification to include idea of within (or beyond) limits of (experimental) accuracy	**1** **1**
3(d)	Any two from: • Use of darkened room / brighter lamp / no other lights • Mark position of centre of lens on holder • Place metre rule on bench (or clamp in position) • Ensure object and centre of lens are same height from the bench • Move **lens** slowly / to and fro (when focussing) • Lens, object, screen vertical / perpendicular to bench • Repeat with different D • Use of graph paper / cm scale on screen to measure image	**max 2**

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Question	Answer	Marks
3(e)	image appears well focused over a (small) range of lens positions / not all of image focussed at same time / relevant reference to chromatic aberration	**1**
		Total: 7

Question	Answer	Marks
4	Circuit diagram: **MP1** Sample of wire must be clearly identifiable by a label on the diagram or by letters on the diagram with an explanation in the text **MP2** All circuit symbols correct (even if circuit is incorrect) Method: **MP3** Take readings of V and I **MP4** For 5 or more lengths **MP5** Range of lengths must be between 5 cm and 2 m **with the largest length at least twice the smallest** Table drawn with headings: **MP6** l / m, V / V, I / A, R / Ω Key variables to control: **MP7** Any one from • Material / resistivity / conductivity / type of wire • Diameter / radius / thickness / cross sectional area • Temperature of wire	**1** **1** **1** **1** **1** **1** **1**
		Total: 7

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Question	Answer	Marks
5(a)(i)	s, °C, °C, °C	**1**
5(a)(ii)	83(°C)	**1**
5(b)(i)	First box / sentence indicated	**1**
5(b)(ii)	Clear reference to <u>readings</u> with examples of <u>temperature</u> differences	**1**
5(c)	Any two from: • Room temperature (or suitable reference to draughts or similar) • <u>Starting</u> temperature (of water) • Density of packing / amount / type of insulation • Thickness of lids / identical lids	**max 2**
5(d)	Card or any suitable insulating material Should be a good insulator / poor conductor	**1** **1**
5(e)	Perpendicular viewing / view at right angles / eye level Reading to bottom of meniscus	**1** **1**
		Total: 10

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