Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/61**

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

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.

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

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.

Question	Answer	Marks
1(a)(i)	*A* and *B* values correct *A:40.0, 35.0, 30.0, 25.0, 20.0* *B:34.0, 28.8, 24.0, 19.2, 14.0*	**1**
1(a)(ii)	cm, cm, N cm, N cm	**1**
1(b)	Graph: Axes correctly labelled with quantity, right way round	**1**
	Appropriate scales, starting at origin (0,0)	**1**
	All plots correct to ½ small square	**1**
	Good line judgement, thin, continuous, single line through the plots; with neat plots	**1**
1(c)	Method shown on graph and Y correct to ½ small square.	**1**
1(d)	W = 1.0–1.4. No ecf	**1**
1(e)	Difficulty of achieving balance or other sensible suggestion	**1**
1(f)	Expect agree; allow ecf. Explanation includes idea of close enough (or, ecf, too different)	**1**
		Total 10

Question	Answer	Marks
2(a)	8.2 0.44–0.45 Units V and A	**1** **1** **1**
2(b)	19(°C)	**1**
2(c)	Perpendicular to scale and at bottom of meniscus	**1**
		Total 5

Question	Answer	Marks
3(a)(i)	*R* values 1.60, 1.51, 1.35, 1.21 *R* values all to 2 significant figures or all to 3 significant figures.	**1** **1**
3(a)(ii)	Column headings m, V, A, Ω	**1**
3(b)	No; there is a <u>current</u> reading	**1**
3(c)	filament changes brightness, owtte increase / decrease / change in temperature of <u>filament / lamp</u>	**1** **1**
3(d)(i)	Variable resistor (rheostat)	**1**
3(d)(ii)	Correct symbol for variable resistor Correct diagram, with variable resistor in series with power supply	**1** **1**
		Total 9

Question	Answer	Marks
4	**MP1** Uses same container throughout	**1**
	MP2 Hot water in container (any) and takes temperatures at intervals or at start and after a fixed time OR Hot water in container (any) and takes time for a fixed temperature fall.	**1**
	MP3 Repeats with different insulators (all three used)	**1**
	MP 4&5 Any two from: Constant room temperature Same starting temperatures (clearly stated) Same volumes of hot water (clearly stated) Same thickness/amount of insulator Use container without insulation Use of a lid Insulates bottom of container Uses the copper can only	**2**
	MP6 Table or tables as appropriate to method: Temperatures with unit °C and time with unit s (or min) and different insulators shown	**1**
	MP7 Use of readings: graph of temperature against time OR compare results and comment that longest time to cool = best insulator or smallest drop in temperature in fixed time = best insulator (or reverse arguments)	**1**
		Total 7

Question	Answer	Marks
5(a)	u = 50, v = 21	**1**
5(b)(i)	U = 500, V = 210 ecf from **(a)**	**1**
5(b)(ii)	f_1 = 148 or 150 or 147.9 (mm) ecf from **(i)** 2 or 3 significant figures	**1** **1**
5(c)	f_2 136 (mm) c.a.o.	**1**
5(d)	Yes / statement is correct, owtte (6 mm) difference is very small / within limits of experimental error / Difference explained by uncertainty in her focal length measurement	**1** **1**
5(e)	Any two from: Use of darkened room / brighter lamp 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) Object and lens and screen perpendicular to bench Move screen (slowly) back and forth to obtain best image (owtte) Ensure rule is touching object / lens / holder / screen or look perpendicular to ruler	**2**
		Total 9