Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/53**

Paper 5 Practical **October/November 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.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

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

© UCLES 2016

NOTES ABOUT MARK SCHEME SYMBOLS AND OTHER MATTERS

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	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.E/W.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.

© UCLES 2016

Question	Answer	Marks
1(a)	θ for beaker **A** decreasing	**1**
1(b)(i)	θ for beaker **B** decreasing, faster than for **A** and both to at least 1 °C	**1** **1**
1(b)(ii)	units all correct (symbols or words) *t* values all present (30, 60, 90, 120, 150 and 180)	**1**
1(c)	any appropriate precaution: e.g. avoidance of parallax(only if explained) stir before reading keep thermometer at same level wait until reading stops rising at the start	**1**
1(d)(i)	conclusion matching results <u>and</u> correct mention of comparative temperature change 'in same time'	**1** **1**
1(d)(ii)	any suitable improvement to apparatus relating to comparison: e.g. insulate sides, use plastic beaker, stand on mat matching explanation: e.g. thermal energy only escapes from surface, surface area only variable changed, less transfer of thermal energy by sides appropriate effect on values of θ: e.g. all higher	**1** **1** **1**

© UCLES 2016

Question	Answer	Marks
1(e)	any appropriate factor: e.g. volume of water, initial temperature of water, similar ratio of surface areas, type / material of beaker, room temperature / appropriate environmental factor	**1**
	Total	**11**

Question	Answer	Marks
2(a)	5 / values, all increasing all < 1.00 A and to 2dp at least	**1** **1**
2(b)	correct calculations of *R*	**1**
2(c)	graph: axes labelled with quantity and unit appropriate scales (plots occupying at least ½ grid) plots all correct to ½ small square well-judged line and thin line, precise plots	**1** **1** **1**
2(d)	simple statement matching line (e.g. increases with p.d.) qualified (e.g. changes less rapidly for greater p.d. values)	**1** **1**
2(e)	correct symbol for variable resistor (rectangle with strike-through arrow only) in correct series circuit	**1** **1**
	Total	**11**

© UCLES 2016

Question	Answer	Marks
3(a)(i)	sensible values for h_O (1.0 to 2.5 (cm)) and h_I (h_O ±0.5 (cm))	**1**
3(a)(ii)	*M* calculation correct no unit for *M*	**1** **1**
3(a)(iii)	f_1 in range 14 to 16 (cm) to 2/3 sig figs and with unit of cm	**1**
3(a)(iv)	any appropriate difficulty: e.g. hand / ruler in way of image matching improvement: e.g. use translucent screen and view from behind, fix ruler / grid to screen	**1** **1**
3(b((i)	v = 24 ± 2 (cm)	**1**
3(b)(ii)	f_2 within 10% of f_1	**1**
3(b)(iii)	statement matching results with justification matching statement ('within limits of experimental accuracy'/owtte)	**1**
3(c)	any suitable precaution: e.g. dark room, (centre of) lens and object same height (above bench), lens / object / screen perpendicular, ruler fixed / placed on bench, mark centre of lens on holder	**1**
	Total	**11**

© UCLES 2016

Question	Answer	Marks
4	apparatus – workable arrangement	**1**
	how applied force is measured	**1**
	suitable table for results / plot a bar graph	**1**
	how to conclude which is strongest	**1**
	one suitable control variable: e.g. same width of sample same thickness / weight / length of paper all samples fixed in same way	**1**
	any 2 from: 2nd control variable, force applied smoothly / no jerking ensure no tears before applying force repeat for each type of sample / repeat with samples of different widths soft mat under weights (to cushion fall) / clamp stand to bench add weight of lower block to value of load any other suitable precaution	**2**
	Total	**7**

© UCLES 2016