

Cambridge IGCSE™

PHYSICS**0625/62**

Paper 6 Alternative to Practical

February/March 2024

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.

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Question	Answer	Marks
1(a)	$d = 28(.0)$ (cm)	1
1(b)(i)	balance point between where just tips one way then the other / words to that effect	1
1(b)(ii)	$a = 22(.0)$ and $b = 19.6$	1
	both to nearest mm	1
1(c)(i)	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 <u>and</u> precise plots	1
	well-judged STRAIGHT line <u>and</u> thin line	1
1(c)(ii)	G present and use of triangle method seen <u>on graph</u>	1
1(d)	M in range 100 to 400 <u>with</u> unit of g	1
1(e)	No, as (mass of clay) increases / changes mass of metre ruler or Yes, as (mass of clay) only a small % of mass of metre ruler / owtte	1

Question	Answer	Marks
2(a)	correct voltmeter symbol in parallel with PQ	1
2(b)	$V = 3.1$	1
	$I = 0.12$	1
2(c)(i)	R values correct (25.8 / ecf, 13.2, 3.02)	1
	R values to consistent 2 or consistent 3 significant figures	1
2(c)(ii)	units (V, A, Ω)	1
2(d)(i)	values of R_A , R_B and R_C ROUNDING to (8.6, 8.8, 9.1)	1
2(d)(ii)	statement matching values of R_A , R_B and R_C	1
	justification <u>referencing values</u> and 'limits of experimental accuracy'	1
2(e)(i)	correct circuit symbol for variable resistor	1
2(e)(ii)	suitable advantage e.g. easy to obtain range of values/ can easily set current to chosen values	1

Question	Answer	Marks
3(a)	one precaution from: (lamp), object and lens at same height / lens and screen perpendicular(to bench) / fix metre rule to bench	1
3(b)(i)	move screen slowly / back and forth	1
3(b)(ii)	$v_1 = 8(.0)$ (cm)	1
	$V_1 = 80$ / ecf (cm)	1
3(c)(i)	$h_o = 1.2$ (cm) <u>and</u> $h_i = 4.8$ (cm)	1
3(c)(ii)	correct calculation of M (4.0 / ecf) <u>and</u> no unit	1
3(d)	$f_1 = 16(.0$ cm)	1
3(e)	any one valid difficulty (e.g. hand or ruler gets in way of light)	1
	one improvement to overcome the difficulty (e.g. translucent screen (and measure from back) / fix grid to screen)	1
3(f)	$f_2 = 15.4$ <u>and</u> cm seen at least once in (d) or (f) and not contradicted	1
3(g)	valid suggestion <u>with</u> reason e.g: f_2 as f_1 has <u>smaller measurements</u> (i.e. h_o and h_i) (and so % uncertainties larger)	1

Question	Answer	Marks
4	MP1 apparatus: thermometer <u>and</u> stopwatch	1
	MP2 method: measure independent variable measure initial and final temperatures measure time	1
	MP3 repeat for new value of independent variable	1
	MP4 control variable: one (explicitly stated) from: volume of water, initial temperature	1
	MP5 table: MUST be appropriate for method with: columns, with <u>correct</u> units, for independent and dependent variables any other quantity mentioned must have correct units	1
	MP6 analysis: compare readings in the table to see if change in insulation thickness produces change in (rate of) temperature change (owtte), plot line graph (with axes specified)	1
	MP7 additional point (one from): at least 5 sets of data taken, repeat for each value of independent variable <u>and</u> take average correct description of how to calculate rate of cooling from results	1