



Cambridge IGCSE™

PHYSICS**0625/62**

Paper 6 Alternative to Practical

October/November 2023

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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This document consists of **9** printed pages.

Question	Answer	Marks
1(a)(i)	$t = 14.21$	1
1(a)(ii)	$T = 1.42(1)$	1
1(a)(iii)	$T^2 = 2.02$	1
1(a)(iv)	cm, s, s	1
	s^2	1
1(b)	calculate T^2 / d (or reciprocal of this)	1
	judge if (close enough to be considered) equal	1
	OR compare the T^2 and d values judge if the second value is (close enough to) double the first value	
	OR plot a graph of T^2 against d (if directly proportional) it will be a <u>straight line passing through the origin</u>	
1(c)	at least three values <u>between</u> 10 (cm) and 100 (cm)	1

Question	Answer	Marks
1(d)	diagram to show (correct use of) a horizontal aid (e.g., a set-square / ruler)	1
	matching wording OR measure the diameter of the bob with two blocks and a ruler / micrometer divide by 2 to find the radius and add this on to the length of the string OR measure to the top and the bottom of the bob find the average	1
1(e)	reduces the <u>effect</u> of (reaction) timing errors / reduces the percentage error / uncertainty / the (reaction time) error is spread over 20 oscillations	1

Question	Answer	Marks
2(a)(i)	$I = 0.34 \text{ (A)}$	1
2(a)(ii)	$V = 1.2 \text{ (V)}$	1
2(b)(i)	R values correct	1
	all R given to a consistent 2 or all to a consistent 3 significant figures	1
2(b)(ii)	cm, V, Ω	1
2(c)	axes labelled with quantity and unit	1
	suitable scales (occupying at least $\frac{1}{2}$ the grid)	1
	plots correct to $\pm \frac{1}{2}$ small square <u>and</u> precise plots	1
	good best-fit line judgement, thin, continuous line	1
2(d)	(triangle) method shown clearly on graph using at least $\frac{1}{2}$ of candidate's line between extreme plots – either $\Delta R \geq 1.5$ or $\Delta V \geq 0.6$	1
	gradient = 2.8 to 3.2 inclusive	1

Question	Answer	Marks
3(a)	22(.0) (°C)	1
3(b)(i)	0, 30, 60, 90, 120, 150, 180	1
3(b)(ii)	s, °C	1
3(c)(i)	$\Delta\theta_1 = 23$ (°C) ignore any minus signs given in this part	1
3(c)(ii)	$\Delta\theta_8 = 73$ (°C)	1
3(c)(iii)	$\Delta\theta_2 = 7$ (°C) and $\Delta\theta_T = 50$ (°C)	1
3(d)(i)	statement matches results (expect YES)	1
	justification matches statement with <u>numbers correctly quoted</u>	1
3(d)(ii)	take additional readings at times beyond 180 s	1
	for at least another 180 s / until the temperature is close to room temperature or stops decreasing	1
3(e)	59–63 (°C) inclusive	1

Question	Answer	Marks
4	MP1 labelled diagram <u>diagram</u> with lens between object and screen, and filter anywhere between the illuminated object and the lens or between the source of illumination and the object, with a least 1 label	1
	MP2 method <u>move</u> object / lens / screen to obtain focused / sharp / clear image	1
	MP3 measure / record / find / calculate / note u and v	1
	MP4 calculate / determine / find the focal length	1
	MP5 repeat with different colours / filters	1
	MP6 table table with clear columns for (filter) colour, u and v AND with appropriate units	1
	MP7 how to reach conclusion plot <u>bar chart</u> of focal length and colour OR compare results to see <u>if / how</u> the change of colour affects the focal length OR compare results to determine the effect of a change in colour on the focal length	1

Additional graph notes:

- NOTE: – The principle to apply here is ‘could I draw a significantly better line, using these points, under examination conditions?’ If the answer is definitely ‘yes’, do not award the mark.
- NOTE: – If candidate’s scale consists of actual readings at equal intervals this will produce a perfect straight line! The only marks available in this case are the first (axes right way round and labelled) So maximum 1.
If axes are wrong way round, the other 3 marks are still available.