Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

PHYSICS **5054/42**

Paper 4 Alternative to Practical **May/June 2017**

MARK SCHEME

Maximum Mark: 30

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)	bottom of ball drawn level with the zero mark on the ruler	**B1**
1(b)(i)	0.626 / 0.63 seen	**C1**
	0.63 s correct answer only	**A1**
1(b)(ii)	data to 2 d.p. / large variation in raw data	**B1**
1(c)(i)	5.04 (m / s^2) 2 / 3 s.f. only	**B1**
1(c)(ii)	longer time / sufficient time (to fall)	**B1**
	reduces percentage error in the time / reduces the effect of (human) reaction error	**B1**

Question	Answer	Marks
2(a)(i)	correct symbol and parallel connection with lamp P	**B1**
2(a)(ii)	2.4 (V) correct answer only	**B1**
2(b)(ii)	I = 0.31 (A) correct answer only	**B1**
2(b)(iii)	there is a current in the circuit / lamp P is lit	**B1**
2(b)(iv)	p.d. too small (to make it glow) / much less than working voltage / lamp P takes most of the voltage	**B1**

Question	Answer	Marks
3(a)	(hot) water in beaker, take temperature (at regular intervals) as it cools / take temperature after a fixed time / measure the time for a fixed temperature drop	**B1**
	repeat with different insulators	**B1**
3(b)	any one of constant room temperature same starting / initial temperatures same beaker same volume / mass / amount of hot water same times (of cooling) same temperature drop same thickness of insulator	**B1**
3(c)	2 / 3 sets of insulator, (change in) temperature / °C, time / s or minutes	**B1**
3(d)	compare temperature drops in equal times – largest drop is the poorest insulator (or reverse argument) / compare times for equal temperature drops – longest time is the best insulator (or reverse argument) / plot graphs to compare temperature drops in equal times / compare gradients – steepest graph is the poorest insulator (or reverse argument)	**B1**

Question	Answer	Marks
4(a)	2.0 (cm) correct answer only	**B1**
4(b)(i)	2.3 (cm) correct answer only	**B1**
4(b)(ii)	(edges of) shadow curved / not distinct / (shadow of) ruler / hand / person gets in the way / shadow is of variable height	**B1**
4(c)	axes labelled quantity and unit and axes correct way round	**B1**
	x axis scale linear, not awkward, starts from (0,0)	**B1**
	points plotted accurately	**B1**
	smooth best fit curve drawn	**B1**
4(d)(i)	4(.0) ± 0.2 (cm)	**B1**
4(d)(ii)	(d)(i) ÷ 2	**B1**
4(d)(iii)	expect YES and values very close / nearly the same / close enough / within limits of experimental error / < 10%	**B1**
4(e)(i)	correct value from sensible extrapolation	**B1**
4(e)(ii)	shadow becomes too big **to fit on screen** / becomes more blurred / off the scale of the graph	**B1**
4(f)	changing *D* changes the height of the shadow / to make it (a) fair (test) / a fair comparison	**B1**