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Cambridge Ordinary Level

PHYSICS

5054/42

Paper 4 Alternative to Practical

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MARK SCHEME

Maximum Mark: 30

Published

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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. / <u>large</u> 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 <u>effect</u> 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 <u>starting</u> / 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 <u>equal times</u> – largest drop is the poorest insulator (or reverse argument) / compare times for <u>equal temperature drops</u> – longest time is the best insulator (or reverse argument) / plot graphs to compare temperature drops in <u>equal times</u> / <u>compare gradients</u> – steepest graph is the poorest insulator (or reverse argument)	B1

Question	Answer	Marks
4(a)	2. <u>0</u> (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)	$4(.0) \pm 0.2$ (cm)	B1
4(d)(ii)	(d)(i) $\div 2$	B1
4(d)(iii)	expect YES <u>and</u> 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