Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/41**

Paper 4 Alternative to Practical **October/November 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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is a registered trademark.

© UCLES 2017

Question	Answer	Marks
1(a)	any one of: ball will roll about / zero error on balance/ball has too small a mass/top pan balance only measures to 1(.0) g	**B1**
1(b)	put beaker on top pan balance and tare (zero)	**B1**
	add 10 balls to the beaker and read mass	**B1**
	divide by 10 / number of balls	**B1**
	or	
	find the mass of the empty beaker,	**B1**
	find mass with balls and subtract	**B1**
	divide by 10 / number of balls	**B1**

Question	Answer	Marks
2(a)	ball correctly drawn with bottom of ball level with 60 cm mark.	**B1**
2(b)	to find the approximate position so as to know where to place the eye / measuring device owtte	**B1**
2(c)(i)	not possible to be accurate to more than nearest cm / difficult to measure to this precision owtte	**B1**
2(c)(ii)	40.2 cm	**C1**
	40 cm	**A1**
2(d)(i)	table completed (no mark)	
2(d)(ii)	he needs to use a tape measure / tape / join meter rules together / other valid method	**B1**
	needs the help of another student to drop the ball for him.	**B1**

© UCLES 2017

Question	Answer	Marks
2(d)(iii)	axes labelled quantity **and** unit axes correct way round	**B1**
	scales linear, not awkward, start from (0,0)	**B1**
	points plotted accurately	**B1**
	smooth best fit curve drawn	**B1**
2(e)(i)	difficult to avoid (parallax) error so close to the floor owtte / bounces too quickly (to see) would have to lie down with head on floor.	**B1**
2(e)(ii)	correct reading from their graph	**B1**

Question	Answer	Marks
3(a)	correct thermistor symbol drawn between A and B.	**B1**
3(b)(i)	2.8 V cao	**B1**
3(b)(ii)	place the thermistor in (a beaker of melting) ice	**B1**
3(b)(iii)	$R_{\text{room temp}} = 790\ \Omega$ and $R_0 = 1800\ \Omega$ (1 mark if calculations correct but not 2 s.f.)	**B2**
3(b)(iv)	as temperature increases, resistance decreases or vice versa	**B1**

© UCLES 2017

Question	Answer	Marks
4(a)	5(.0) cm (± 0.1 cm)	**B1**
4(b)(i)	line drawn from P to meet AB – parallel to ST by eye and point C labelled	**B1**
4(b)(ii)	distance from ST measured at least once (other than at P) to get the same answer / correct use of set squares / dividers / protractors	**B1**
4(c)	correct line drawn and point R labelled.	**B1**
4(d)	θ =23° ± 1°	**B1**
4(e)	2.2 / sin (their value from d)	**B1**
4(f)	CF measured and sensible comment e.g. very close so they agree ecf their results.	**B1**

© UCLES 2017