Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/31**

Paper 3 Practical Test **October/November 2017**

MARK SCHEME

Maximum Mark: 30

Published

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Question	Answer	Marks
1(b)(i)	correct description of one oscillation in relation to the rod	**B1**
1(b)(ii)	T_1 in the range 9.0 to 16.0 s with at least one repeat measurement and average correctly calculated with correct unit	**B1**
1(b)(iii)	T_1 calculated correctly to 2 / 3 s.f. with unit seen somewhere for T or t	**B1**
1(c)	$T_2 < T_1$	**M1**
1(d)	ratio calculated correctly with no unit and in the range 0.67 to 0.75	**A1**
	for Q1 penalise incorrect notation for time once	
	apply unit penalty once in the question	

Question	Answer	Marks
2(a)	V_1 in the range 3.0 (V) to 4.5 (V) to 0.1 (V) or better, with unit	**B1**
2(b)	**(i)** $V_2 < V_1$ to 0.1 V or better with consistent correct unit seen here or in **(a)** or **b(ii)** **and** **(ii)** $V_3 < V_2$ to 0.1 V or better with consistent correct unit seen here or in **(a)** or (**b)(i)**	**B1**
2(c)(i)	correct plots and best fit line	**B1**
2(c)(ii)	correct trend in results: V reduces as the concentration of the solution increases	**B1**
	V reduces as the volume of blue liquid is increased / concentration of the solution increases **wtte** **or ecf :** statement relating volume and concentration consistent with the candidate's results	**B1**

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Question	Answer	Marks
3(a)	vertical check by alignment with a vertical reference line or use of a set square between the rule and the bench	**B1**
3(b)(i)	x in the range 15.0 to 35.0 cm measured to the nearest mm with unit	**B1**
3(b)(ii)	height from the bottom of the ball to the ramp or height between two common points on the ball	**B1**
3(b)(iii)	lift the sphere / ball vertically / upwards out of the sand tray (without disturbing the sand)	**B1**
3(b)(iv)	x from at least two readings correctly averaged	**B1**

Question	Answer	Marks
4	**Preliminary results**	
4(a)	x_0 in the range 15.0 to 25.0 cm measured to nearest mm with unit	**B1**
4(c)	look down from vertically above the measuring cylinder and see that there is water all away around the clay cylinder **or** displace the clay cylinder vertically and see that it oscillates in the measuring cylinder	**B1**
4(d)	s in the range 6.0 cm to 10.0 cm measured to the nearest mm with unit	**B1**
4(e)	new s larger than value of s obtained for **4(d)**	**B1**
	$x < x_0$ by about 2 cm measured to nearest mm with unit	**B1**
Table		
4(f)	table with headings(quantities) and units and results from **(a)**, **(d)** and **(e)** included	**B1**
	range of x values , largest is x_0 and smallest $\leqslant$ 4.0(but not zero)	**B1**
	at least 5 sets of results showing a general trend of s increasing as x decreases	**B1**
	approximately linear increase in s as x decreases	**B1**

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Question	Answer	Marks
Graph		
4(d)	axes labelled with units and correct orientation	**B1**
	suitable scale, not based on 3, 6, 7 etc. with plotted data occupying ⩾ half the grid in both directions	**B1**
	points plotted correctly and all points plotted	**B1**
	best fit fine **straight line**	**B1**
Calculations		
4(e)	use of two points that are on the straight line	**M0**
	correct calculation of *G with the correct sign*	**A1**
	from a triangle that uses more than half the drawn line with answer to 2 / 3 s.f.	**A1**

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