Cambridge Assessment International Education
Cambridge Ordinary Level

PHYSICS **5054/32**

Paper 3 Practical Test **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.

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Question	Answer	Marks
1(a)(i)	t_1 in the range 6.0 (s) to 10.0 (s) using at least one repeat measurement with correct average	**B1**
1(a)(ii)	T_1 calculated correctly to 2 / 3 s.f. with consistent correct unit seen somewhere in **(a)** or **(b)**	**B1**
1(b)	$t_2 > t_1$ **and** $T_2 > T_1$	**M1**
1(c)	ratio calculated correctly with no unit and in the range 1.34 to 1.48	**A1**
1(d)	referring to their % difference calculated in **(i) and** sensible comment made. e.g. agrees because % difference is small (<5%) does not agree because % difference large (>10%) for 5–10% accept either argument	**B1**

Question	Answer	Marks
2(a)(i)	V_1 in the range 3.0 (V) to 4.5 (V) to 0.1 (V) or better	**B1**
2(a)(ii)	$V_2 < V_1$ to 0.1 V or better with consistent correct unit seen here or in **(i)**	**B1**
2(b)	correct calculation of resistance of X values	**M1**
	resistance for the ice and water mixture in range of 1.5 times to 4.0 times that of room temperature	**A1**
2(c)	as the temperature increases the resistance of X decreases **owtte**. **or** statement consistent with the candidate's results	**B1**

Question	Answer	Marks
3(b)(i)	*x* measured to the nearest mm with unit	**B1**
3(b)(ii)	lift the sphere vertically / upwards out of the sand tray (without disturbing the sand)	**B1**
3(b)(iii)	*x* from at least two readings correctly averaged	**B1**
3(c)(i)	5 × **(b)(i)** or **(b)(iii)** answer	**B1**
3(c)(ii)/(iii)	new *x* present, **and** larger than **(b)(iii)** **and** valid conclusion and comparison of values in **(c)(i)** and **(c)(ii)** based on student's results	**B1**

Question	Answer	Marks
4	**<u>Preliminary results</u>**	
4(a)(i)	measured height above the bench at two places and made sure that they were the same / aligned with horizontal surface in the laboratory	**B1**
4(a)(ii)	displace the rule from its horizontal / original / starting position and see that it returns to its horizontal / original / starting position	**B1**
4(a)(iii)	*L* in the range 4.0 cm to 8.0 cm measured to the nearest mm with unit	**B1**
4(b)	new *L* > *L* from **(a) (iii)** and measured to the nearest mm with unit and M = 20(.0) (g)	**B1**

Question	Answer	Marks
Table		
4(c)	table with headings and units and results from **(a)(iii)** (M=0) and **(b)** (M=20) included	**B1**
	at least one result with 90 g ⩽ *M* ⩽ 100 g	**B1**
	even distribution of results, e.g. no change of mass > 20 g	**B1**
	at least 5 results showing correct trend, *L* increases as *M* increases	**B1**
	L values in table to nearest mm **oe** and *M* values to a maximum of 1 d.p	**B1**
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	**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*	**A1**
	from a triangle that uses more than half the drawn line with answer to 2 / 3 s.f.	**A1**