



**Cambridge Assessment International Education**  
Cambridge Ordinary Level

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**PHYSICS**

**5054/32**

Paper 3 Practical Test

**October/November 2017**

MARK SCHEME

Maximum Mark: 30

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**Published**

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This document consists of **4** printed pages.

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

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

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

Question	Answer	Marks
4	<b><u>Preliminary results</u></b>	
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	<b>B1</b>
4(a)(ii)	displace the rule from its horizontal / original / starting position and see that it returns to its horizontal / original / starting position	<b>B1</b>
4(a)(iii)	L in the range 4.0 cm to 8.0 cm measured to the nearest mm with unit	<b>B1</b>
4(b)	new L > L from <b>(a) (iii)</b> and measured to the nearest mm with unit and M = 20(.0) (g)	<b>B1</b>

Question	Answer	Marks
<b><u>Table</u></b>		
4(c)	table with headings and units and results from <b>(a)(iii)</b> ( $M=0$ ) and <b>(b)</b> ( $M=20$ ) included	<b>B1</b>
	at least one result with $90 \text{ g} \leq M \leq 100 \text{ g}$	<b>B1</b>
	even distribution of results, e.g. no change of mass $> 20 \text{ g}$	<b>B1</b>
	at least 5 results showing correct trend, $L$ increases as $M$ increases	<b>B1</b>
	$L$ values in table to nearest mm <b>or</b> and $M$ values to a maximum of 1 d.p	<b>B1</b>
<b><u>Graph</u></b>		
4(d)	axes labelled with units and correct orientation	<b>B1</b>
	suitable scale, not based on 3, 6, 7 etc. with plotted data occupying $\geq$ half the grid in both directions	<b>B1</b>
	points plotted correctly	<b>B1</b>
	best fit fine <b>straight line</b>	<b>B1</b>
<b><u>Calculations</u></b>		
4(e)	use of two points that are on the straight line	<b>M0</b>
	correct calculation of $G$	<b>A1</b>
	from a triangle that uses more than half the drawn line with answer to 2 / 3 s.f.	<b>A1</b>