
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)	$5 \times$ (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
<u>Table</u>		
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 $90 \text{ g} \leq M \leq 100 \text{ g}$	B1
	even distribution of results, e.g. no change of mass $> 20 \text{ g}$	B1
	at least 5 results showing correct trend, L increases as M increases	B1
	L values in table to nearest mm or and M values to a maximum of 1 d.p	B1
<u>Graph</u>		
4(d)	axes labelled with units and correct orientation	B1
	suitable scale, not based on 3, 6, 7 etc. with plotted data occupying \geq half the grid in both directions	B1
	points plotted correctly	B1
	best fit fine straight line	B1
<u>Calculations</u>		
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