

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the October/November 2014 series**

### **5054 PHYSICS**

**5054/41**

Paper 4 (Alternative to Practical), maximum raw mark 30

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1	(a)	any <b>one</b> from: measures two ends of ruler from the bench (same height) use of spirit level align with horizontal object e.g. windowsill allow answers on diagram e.g. ruler and set-square to measure height at two places check the strings are perpendicular to the metre rule with a set square	B1	[1]	
	(b)	(i)	at least one horizontal line drawn between A and B and x accurately labelled	B1	
		(ii)	measure from bench/support to <u>same point</u> on each bob/ensure the pendulum is not moving/explain how parallax error is avoided.	B1	[2]
	(c)	(i)	axes labelled quantity and unit	B1	
			scales linear	B1	
			points plotted accurately	B1	
			best fit curve drawn	B1	[4]
	(d)	(i)	observe both together/observe simultaneously	B1	
			(ii)	any <b>one</b> from: strings tangle bobs collide	B1
		(e)	(i)	15 ± 1 ecf from graph	B1
(ii)	15.484 15			C1 A1	
(iii)	If both values are the same – Yes, they are the same. If values are similar (±10%) – Yes + close enough/within experimental error If values differ (by more than 10%) – No + difference outside experimental error / they are too far apart		B1	[4]	
			[Total: 13]		
2	(a)	metre rule	B1	[1]	
	(b)	(i)	error in taking measurement due to position of observer	B1	
		(ii)	view from level with top of stool	B1	[2]
	(c)	(i)	metre rule upside down	B1	
			(ii)	62.175 or 62.18 or 62.17 or 62.22 seen 62.2 cm cao	C1 A1
			[Total: 6]		

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3 (a) place bulb in (pure) melting ice B1  
 place bulb above boiling water/in steam B1 [2]

(b) (i)  $2.85 \pm 0.1$  and  $12.1 \pm 0.1$  seen OR 1, 3.8 and 13 OR 2, 4.8 and 14 (all  $\pm 0.1$ )  
 answer in correct range without unit C1  
 answers in range 22.5 to 24.6 °C with unit A1

(ii) liquid expands uniformly/uniform bore B1 [3]

[Total: 5]

4 (a) Two methods can gain up to 5 marks.

1. cut wires method and line up horizontally (max 3 if less than 10 cuts)
2. wrap wire around a rod/ruler (max 3 if wound less than 10 times)

any other method – maximum 3 marks if viable

equipment used stated in account B1  
 how equipment is used B1  
 readings taken stated B1  
 how diameter is obtained B1  
 detail of accuracy B1 [5]

(b) micrometer B1 [1]

[Total: 6]