CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

## MARK SCHEME for the May/June 2014 series

## **5054 PHYSICS**

5054/31

Paper 3 (Practical Test), maximum raw mark 30

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



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	Page 2		Mark Scheme	Syllabus	Paper	
			GCE O LEVEL – May/June 2014	5054	31	
1	(a)	a) measured the height above the bench in two places (and adjusted to get the same value)/aligned with horizontal surface in the laboratory, e.g. windowsill				
	(b)	<i>l</i> = 48	.0 <u>+</u> 0.2 cm, and $h_2 > h_1$		M1	
		all me	ere	A1		
	(c)	correc ( <i>h</i> ₂ ap	It calculation to find $h$ and $x$ , using sensible values of $h$ proximately 60 cm and $h_1$ approximately 40 cm)	$h_1, h_2$ and $l$	M1	
		sensit	ble <i>M</i> in the range 30g to 70g to 2 or 3 significant figur	es with unit	A1 <b>[5]</b>	
2	(a) diagram with more than half the numbers shown as inverted and la		and laterally inve	rted B1		
		image object	is real (focussed on a screen)/inverted/laterally inve	rted/dimmer than	the B1	
	(b)	(i) s	pacing found by measuring across more than one divis	sion.	B1	
<ul> <li>(ii), (iii) <i>m</i> numerically each</li> <li>or <i>m</i> found from</li> <li>or single <i>s</i> in the</li> </ul>		(iii) m o o	r numerically equal to <i>s</i> (ignore presence of unit) <b>r</b> <i>m</i> found from $\frac{v}{u}$ <b>r</b> single <i>s</i> in the middle.			
		а	<b>nd</b> <i>v</i> in the range 78.0 cm to 85.0 cm		M1	
		(iv) f	n the range 13.5 cm to 16.5 cm with unit.		A1 <b>[5]</b>	
3	(a)	$V_1$ in t	he range 0.90 V to 2.20 V to 0.1 V or better and unit		B1	
		$I_1$ in the range 30 mA to 85 mA to 0.01 A or better and unit				
	(b)	correc	t calculation of power with unit		B1	
	(c)	V <sub>2</sub> les	s than $V_1$ and $I_2$ greater than $I_1$ with units		B1	
	(d)	correc	et calculation of power (ignore unit)		MO	
		power total r is sim	<ul> <li>is larger because:</li> <li>esistance decreases (and voltage is similar)/current i</li> <li>ilar/parallel arrangement so power is dissipated in each</li> </ul>	ncreases and volt ch resistor.	age A1 <b>[5]</b>	

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	Page 3		Mark Scheme Syllabus		Paper	
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4	Tab	<u>ole</u>				
	(b)	table wit	h units for $\theta$ and $t$		B1	
	(c)	at least 5	5 points with correct shaped curve		B1	
		at least one attempt at temperature measurement to better than 1 °C				
		at least 8 (good va	$^3$ good values recorded and values taken up to 6 mi lues are $\pm 1^\circ\text{C}$ from examiners best line)	nutes	B1 <b>[4]</b>	
	<u>Gra</u>	aph				
	(d)	axes lab (allow e.	elled with units and correct orientation c.f. from wrong unit in table but not no units)		B1	
		suitable scale, not based on 3, 6, 7, etc. with plotted data occupying $\geq$ half the page in both directions				
		two points plotted correctly – check the two points furthest from the line this mark can only be scored if the scale is easy to follow (points must be within ½ small square of the correct position)		B1		
		best fit fi	ne line and fine points or crosses	e and fine points or crosses to be no greater than the thickest lines on the grid)		
	<u>Ca</u>	culations	<u>}</u>			
	(e)	tangent	drawn to curve at t = 180 s		B1	
		use of a	triangle with a base > 180s that uses a tangent whi	ch is a straight line	B1	
		correct c	alculation (ignore significant figures and unit)		B1	
	(f)	<i>M</i> in the	range 65g to 85g		B1	
	(g)	correct s	ubstitution with sensible <i>m</i>		M1	
		correct c	alculation and consistent unit (W or J/min)		A1	
	(h)	stir the v thermom (provideo	water/eye level with meniscus on measuring cylir neter not touching beaker/thermometer fully imn d results seen)	nder or thermomet nersed/take avera	er/ age B1 <b>[7]</b>	