## CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

## MARK SCHEME for the October/November 2013 series

## **5054 PHYSICS**

5054/42

Paper 4 (Alternative to Practical), 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 October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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			GCE O LEVEL – October/November 2013	5054	42	
1	(a)	(i)	measuring force just before it jumps reading meter and pulling magnet at same time force varies/not constant		B1	[1]
		(ii)	sensible suggestion, e.g. use of two people explained pull slowly repeat			
			video newton meter		B1	[1]
	(b)	5.5	± 0.1 N unit required		B1	[1]
	(c)	(i)	axes: correct way round, labelled quantity and unit (on	y-axis only)	B1	
			scales: linear, not awkward x-axis: e.g. $2 \text{ cm} \equiv 1$ y-axis: e.g. $2 \text{ cm} \equiv 1 \text{ N}$		B1	
			points plotted accurately within ½ small square neat crosses or small points (in circle)		B1	
			smooth curve of best fit drawn		B1	[4]
		(ii)	increasing <i>n</i> decreases <i>F</i> inverse relationship		B1	[1]
	(d)	sca	wton meter not sensitive enough ale too big			
			change/same reading ding/force is too small (for this meter)/no force		B1	[1]
	(e)	(i)	new paper/second expt (thicker) as force smaller (or repaper that gives 3.0 N force	everse argument)	B1	[1]
		(ii)	more sensitive more readings larger values for <i>F</i>		B1	[1]
	(f)	yes	s + aluminium non-magnetic		B1	[1]
2	(a)		gram showing paper and plain mirror  s incident and reflected rays OR four roughly correct pi	าร	B1	
		2 pi	ins placed on incident ray		B1	
		pins	s or image (of pins) viewed in/through mirror		B1	
		line	es drawn <b>and</b> angles <i>i</i> and <i>r</i> <b>measured</b> to normal		B1	[4]

Mark Scheme

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Syllabus

Paper

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	GCE O LEVEL – October/November 2013 5054	42		
view pins pins repe	v bottom of pins vertical far apart, e.g. greater than 5 cm eat for different angles/repeat experiment	B1	[1]	
(i) 0.9	V cao (unit required)	B1	[1]	
	·	B1	[1]	
(iii) saı	me value/0.9 V and needle to right	B1	[1]	
e.m. run ( volta curre	f./voltage too small down quickly/small amount of energy age not steady ent too small	B1	[1]	
(i) 1. :	2.7 (V) ecf 3 × <b>(a)(i)</b>	B1 B1	[1] [1]	
` '		B1 B1	[1] [1]	
measu	res all ten together and divides by ten	B1		
in a betw 5 or mo how en use	groove veen two rulers ore in a line shown touching each other ds are marked, e.g. of blocks	B1	[3]	
measui	ring all 10 and averaging	(B1)		
set squ circumf strin	ares/blocks with one marble rence from: g/paper rolled round marble then $\div$ $\pi$	(B1)		
(i) 16	.8(0) mm / 1.68(0) cm cao (unit required)	B1	[1]	
(ii) dia	meter (of same marble) measured more than once in different direction(s)	B1	[1]	
	view pins repershare  (i) 0.9  (ii) crowding sensible e.m. run of volta currorresis  (i) 1.2  (ii) 1.2  measure how sto in a betw 5 or more alternamethod measure techniques set squadricum ink of the correction	<ul> <li>(ii) crocodile clips tight connections explained, e.g. wrap wire and tape</li> <li>(iii) same value/0.9 V and needle to right</li> <li>sensible suggestion, e.g. e.m.f./voltage too small run down quickly/small amount of energy voltage not steady current too small resistance too large</li> <li>(i) 1. 2.7 (V) ecf 3 × (a)(i) 2. correct wiring in series and connected to voltmeter</li> <li>(ii) 1. 0.9 (V) ecf = (a)(i) 2. correct wiring in parallel and connected to voltmeter</li> <li>measures all ten together and divides by ten how stops marbles moving, e.g. in a groove between two rulers</li> <li>5 or more in a line shown touching each other</li> <li>how ends are marked, e.g. use of blocks correct use of set squares</li> <li>alternative methods: methods of measuring one marble can score max. 2</li> <li>measuring all 10 and averaging</li> <li>technique, e.g. set squares/blocks with one marble circumference from: string/paper rolled round marble then ÷ π ink dot on marble and roll then ÷ π</li> <li>(i) 16.8(0) mm / 1.68(0) cm cao (unit required)</li> </ul>	GCE O LEVEL - October/November 2013       5054       42         sensible suggestion, e.g.         view bottom of pins         pins vertical         pins vertical         pins far apart, e.g. g. greater than 5 cm         repeat for different angles/repeat experiment         shape pencil         (ii) 0.9 V cao (unit required)       B1         (iii) crocodile clips         tight connections explained, e.g. wrap wire and tape         B1         sensible suggestion, e.g.         e.m.f./voltage too small         read of suggestion, e.g.         e.m.f./voltage too small         result of suggestion, e.g.         g. m.f./voltage too small         resistance too large         (i) 1.2.7 (V) ccf 3 × (a)(i)         2.         (ii) 1.0.9 (V) ecf = (a)(i)         2.         measures all ten together and divides by ten         B1         how stops marbles moving, e.g.         in a groove         between two rulers <td co<="" td=""></td>	

Mark Scheme

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Syllabus

Paper