

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2013 series

5054 PHYSICS

5054/41

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 May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2013	5054	41

1	(a) (i)	1.046 or 1.05 seen 1.05 s cao unit required	C1 A1	[2]
	(ii)	large difference in raw data/ reaction time has large variation	B1	[1]
	(iii)	one drops, one times synchronise/countdown or signal explained	B1 B1	[2]
	(b) (i)	axes: correct way round, labelled quantity and unit scales: more than $\frac{1}{2}$ grid, linear, not awkward e.g. y-axis: 2 cm \equiv 0.1 s x-axis: 2 cm \equiv 2 points plotted accurately within $\frac{1}{2}$ small square neat crosses or small points (in circle) smooth curve of best fit drawn	B1 B1 B1	[4]
	(ii)	$x \times y$ seen with substitution of one set of values from table or graph two values calculated and not equal comment 'two values of t same in table so $x \times y$ not constant' scores 2/2	B1 B1	[2]
	(c)	sensible suggestion, e.g. holds arm horizontal stands in same place and uses a marker in front of mirror and uses image	B1	[1]
	(d)	mass or weight cao	B1	[1]
	(e)	changes surface area/air resistance cases will not stack	B1	[1]
	(f)	heavier so air resistance has little/same effect smaller % change in mass due to uncertainty in timing/height	B1	[1]
	[Total: 15]			

Page 3	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2013	5054	41

- 2 (a) (i) 1. three resistors drawn in series B1 [1]
2. $470\ \Omega$ cao unit required B1 [1]
- (ii) three resistors drawn in parallel B1 [1]
- (b) $180\ \Omega$ cao unit required B1 [1]
- [Total: 4]**
- 3 (a) $22(.0)^{\circ}\text{C}$ unit required B1 [1]
- (b) (i) all the oil is heated/
all oil below water surface/
uniform heating of oil B1 [1]
- (ii) temperature rises
then falls B1
B1 [2]
- (iii) avoid parallax error/good explanation
reads top of meniscus
aligns scale with liquid column B1 [1]
- (c) smooth concave curve B1
asymptotes to above zero B1 [2]
- [Total: 7]**
- 4 freely suspends lamina from hole B1
correct use of plumb-line shown on diagram B1
line marked on lamina B1
repeated from different hole and find where lines cross B1 [4]
- alternative experiments:
balancing on a ruler can score points 1, 3 and 4 (max. 3)
finding balance point by trial and error on a pin (max. 1)
- [Total: 4]**