

MARK SCHEME for the May/June 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 May/June 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 – May/June 2013 | 5054 | 42 |

- 1 (a) accurate horizontal line from object to centre of lens
and labelled u or 15 cm B1 [1]
- (b) (i) move screen (along ruler) B1 [1]
(ii) raise object B1 [1]
- (c) (i) 45.1 cm cao unit required B1 [1]
(ii) 30.1 cm ecf (c)(i) – 15.0 B1 [1]
- (d) (i) 15.0 and (c)(ii) inserted into top line of table B1 [1]
(ii) axes: correct way round, labelled quantity and unit B1
scales: more than $\frac{1}{2}$ grid, linear, not awkward B1
y-axis e.g.: 2 cm \equiv 5 cm x-axis e.g.: 2 cm \equiv 5 cm
points plotted accurately within $\frac{1}{2}$ small square B1
neat crosses or small points (in circle)
smooth curve of best fit drawn B1 [4]
- (e) any two from:
repeat (the measurement of v) and average
avoid parallax in **reading** ruler **or**
eye line/line of sight perpendicular to scale/reading **or**
lens or screen close to ruler **or**
mark centre of lens on base of holder
use of set-square described
check for zero error on ruler
use darkened room
clear explanation of focussing
e.g. move screen from left, then from right
move through focussed image from both directions, then stop B2 [2]
- (f) 9.8 to 10.0 cm ecf graph unit required B1 [1]

[Total: 13]

| Page 3 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------------|----------|-------|
| | GCE O LEVEL – May/June 2013 | 5054 | 42 |

| | | | | | | |
|---|-----|--|--|---|-------------------|-----|
| 2 | (a) | (i) | line from (5, 500) to (15, 1000) line to (22, 1000) or line horizontal for 7 minutes at 1000 m line to (25, 1500) | B1 B1 B1 | [3] | |
| | | (ii) | 1500 m or 1.5 km cao unit required | B1 | [1] | |
| | | (b) | use of pedometer measure one pace and count paces tape measure with repeated use described use of trundle wheel | B1 | [1] | |
| | (c) | find/measure gradient and where steepest/largest gradient | B1 | [1] | | |
| | | | | | [Total: 6] | |
| 3 | (a) | (i) | using measuring cylinder measuring cylinder stated initial reading + immerse object new reading + find difference | using displacement can measuring cylinder stated fill can to spout + immerse object find volume of water collected | B1 B1 B1 | [3] |
| | | | (ii) | sensible suggestions e.g. repeat (measurement of volume) and average avoid parallax reading measuring cylinder or eye line/line of sight perpendicular to scale/reading view level with lower meniscus avoid splashing | B1 | [1] |
| | | | (b) | mass cao and balance | B1 | [1] |
| | | | | | [Total: 5] | |

| Page 4 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------------|----------|-------|
| | GCE O LEVEL – May/June 2013 | 5054 | 42 |

- 4 (a) (i) circuit diagram containing only solar cell, voltmeter and switch in series B1 [1]
- (ii) voltmeter terminals to wrong terminals of cell
current in voltmeter in wrong direction
voltmeter has polarity B1
- reverse connections to voltmeter
reverse connections to cell
connect red/+ve terminal of voltmeter to red/+ve terminal of cell B1 [2]
- (iii) needle drawn from centre to 0.96 V B1 [1]
- (b) (movement of) head/body reduces amount of light falling on solar cell
head/body not between window (light source) and cell B1
- sensible suggestion e.g.
position of solar cell/other light sources considered B1 [2]

[Total: 6]