

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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## MARK SCHEME for the October/November 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.

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Page 2	Mark Scheme	Syllabus	Paper
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- 1 (a) (i) vertical arrow/line by eye from bench to sphere B1 [1]  
(ii) sensible suggestion, e.g. mark (on track) B1 [1]
- (b) (i) correct shape path drawn from end of channel to floor B1 [1]  
(ii) horizontal arrow/line from end of channel to where candidate's line meets floor B1 [1]
- (c) sensible suggestion, e.g.  
sphere lands in tray of sand/mark made on floor  
use of second person clearly explained  
paint/stain on the sphere to leave mark on floor B1 [1]
- (d) 66 cao (no unit required) B1 [1]
- (e) (i) **yes +** sensible suggestion, e.g.  
no horizontal velocity/falls straight down  
**no +** sensible suggestion, e.g.  
systematic error explained/size of sphere B1 [1]
- (ii) axes: correct way round, labelled quantity and unit B1  
scales: linear, sensible  
x-axis: e.g. 2 cm  $\equiv$  5 cm y-axis: e.g. 2 cm  $\equiv$  10 cm B1  
points plotted accurately within  $\frac{1}{2}$  small square  
neat crosses or small points (in circle) B1  
smooth curve of best fit drawn B1 [4]
- (iii) **not correct +** statement, e.g. line not straight B1 [1]
- 2 (a) (i) card falls further (before catching it)  
misses card  
increases reaction time B1 [1]
- (ii) less distance fallen  
low(er) number B1 [1]
- (b) (i) 5 cm cao (unit required) B1 [1]  
(ii) 0.17(32) s cao (unit required) B1 [1]  
(iii) 1. mark time (and position) on card B1 [1]  
2. at least two lines with increasing separation  
line at 15 cm point on card labelled 0.17 s B1 [1]

Page 3	Mark Scheme	Syllabus	Paper
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- 3 (a) (i) correct normal drawn B1 [1]
- (ii)  $42^\circ \pm 1^\circ$  B1 [1]
- (b) (i) so pins stand up  
so not to damage bench B1 [1]
- (ii) pins far apart  
pins more than 5 cm apart  
P2 near left hand edge of board/at end of L  
P2 near edge of paper B1 [1]
- (iii) to be above line  
cannot line up pins otherwise or  
can only use base of pins B1 [1]
- (c) pins on emergent ray mentioned B1
- pins too close  
will not fit on paper  
block too near edge  
emergent ray too short B1 [2]
- 4 (a) circuit containing power supply, resistor, ammeter in series B1
- voltmeter across resistor B1
- means of varying current, e.g.  
variable resistor  
change additional resistor  
variable power supply  
change/add cells  
use of potentiometer B1
- use of  $V = IR$  and average  
 $I-V$  graph and find  $R$  B1 [4]
- (b) can be credited in (a) if seen  
sensible suggestion, e.g.  
check zero on meters  
contacts tight / clean wires  
avoid parallax in reading meters  
keep current low  
switch off between readings  
use more sensitive meter B1 [1]