## Cambridge International Examinations

Cambridge Ordinary Level

## PHYSICS

Paper 4 Alternative to Practical
May/June 2016
MARK SCHEME
Maximum Mark: 30

## Published

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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1 (a) (i) (clamp) may topple/fall/tilt/bend/turn/become less stable/become unbalanced/move clockwise (to the right)B1
(ii) sketch showing rod turned around the other way ..... B1
(b) (i) rule vertical (by eye) with two set squares correctly used ..... B1
(ii) height (above bench) at two places same ..... B1
(c) (i) use of vertical ruler/set square/plumb line ..... B1
(ii) 53 cao ..... B1
(d) (i) axes labelled quantity on both axes and unit on y-axis only and axes correct way round ..... B1
scales linear, not awkward, start from ( 0,0 ) ..... B1
points plotted accurately ..... B1
smooth best fit curve drawn ..... B1
(ii) $l \times N_{\text {av }}$ seen for one pair of values from graph or table ..... B1
two correct values of $x y$ calculated and not equal comment ..... B1
(iii) less card used ..... B1
can use just one piece of card o.r.a
2 (a) (i) P marked at centre of AB ..... B1
(ii) correct normal at P ..... B1
(iii) ray accurately drawn at $40^{\circ}$ to normal ..... B1
(b) use of ray box/pins/crosses/pencil dots to mark incident ray ..... B1
mark emergent ray with pins/crosses/pencil dots ..... B1
emergent ray drawn through crosses/dots to prism ..... B1
ray drawn through prism to join incident and emergent rays ..... B1

| Page 3 | Mark Scheme | Syllabus | Paper |
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3 (a) (i) 540 N c.a.o unit required B1
(ii) moving changes the reading so reading is steady/does not change/needle is stable B1
(iii) avoids parallax error (or described) B1
(b) (i) to get largest reading reading just before it changes/starts to move little time to take readingB1
(ii) to reach the box (so he can push it) B1

4 (a) apparatus just fits across diameter, and B1
(b) wind thread around cylinder B1
wind $n$ times where $3 \leq n \leq 10$ B1
measure length/of string B1
diameter $=/ / n \pi$
B1

