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**PHYSICS****5054/42**

Paper 4 Alternative to Practical

**May/June 2016**

MARK SCHEME

Maximum Mark: 30

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**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)  $l \times N_{av}$  seen for one pair of values from graph **or table** B1
- two correct values of  $xy$  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 reading B1
- (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 =  $l / n\pi$  B1