

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5054 PHYSICS

5054/42

Paper 4 (Alternative to Practical), maximum raw mark 30

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- 1 (a) use of distant object and screen B1
- (b) (i) u marked correctly B1
 D marked correctly B1
- (ii) 96.3 cm unit required B1
- (iii) avoid parallax in reading (ruler)/view perpendicularly
lens / screen close to ruler
use darkened room
check for zero error
clamp ruler
move screen (**not** lens) backwards and forwards (until sharp image found)
object **and** lens same height (above bench)
object **and** lens **and** screen perpendicular to bench / vertical B1
- (c) (ii) axes correct way round, labelled quantity and unit B1
scales linear, sensible B1
points plotted accurately within $\frac{1}{2}$ small square B1
neat crosses or small points (in circle) B1
best fit smooth curve drawn B1
- (iii) 1. 39 to 41 (cm) B1
2. 20 ± 2 (cm) B1
- (iv) both values for f correctly calculated and sensible comment B1

[Total: 12]

- 2 (a) pulling string tight and squashing ball
ball not spherical
sensible comment about marking string
holding string straight / taut to measure length B1
- (b) (i) method mark:
ball placed between two planes M1
- practical detail mark:
use a ruler / tape to measure A1
- (ii) any two from:
repeat and average
how planes made parallel described
not squash ball
avoid parallax in reading metre rule B2

[Total: 5]

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- 3 (a) metre rules laid end to end (from one wall to other) B1
can accept from a diagram
- (b) one end fixed against wall (however expressed) **and** measure to the opposite wall/the other side B1
- (c) (i) speed (of light) B1
length of device
position of laser/detector within the device
- (ii) can see what it is reflecting off/you can see it/I.R. cannot be seen/is not coloured
to make sure it is horizontal/level B1
- (iii) places it **touching wall** and pointing at opposite wall B1
- (iv) expensive
uses batteries/batteries run down/need recharging
needs clear line of sight/other objects might get in the way
laser hazard with eyes
some surfaces may not reflect the light B1

[Total: 6]

- 4 (a) circuit containing **one** cell and resistor, with ammeter in series B1
voltmeter in parallel with resistor/cell B1
- (b) (i) it matters which way round it is **connected**
so you can **connect** it the right way round B1
- (ii) ammeter terminal connected to –ve of cell labelled B B1
- (c) (i) 3(V), 4.5(V) and 6(V) B1
- (ii) four cells drawn in series B1
- (d) no change/same value **and** B1
resistance independent of voltage/depends only on the resistor
OR
resistance increases **and**
resistor becomes hot

[Total: 7]