

**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 <u>and screen</u>	B1
	(b)	(i) $u$ marked correctly $D$ marked correctly	B1 B1
		(ii) 96.3 cm unit required	B1
		(iii) avoid parallax in <u>reading</u> (ruler)/view perpendicularly lens / screen close to ruler use darkened room check for zero error clamp ruler move screen ( <b>not</b> lens) backwards and forwards (until sharp image found) object <b>and</b> lens same height (above bench) object <b>and</b> lens <b>and</b> screen perpendicular to bench / vertical	B1
	(c)	(ii) axes correct way round, labelled quantity and unit scales linear, sensible points plotted accurately within $\frac{1}{2}$ small square neat crosses or small points (in circle) best fit smooth curve drawn	B1 B1 B1 B1
		(iii) 1. 39 to 41 (cm)	B1
		2. $20 \pm 2$ (cm)	B1
	(iv)	both values for $f$ <u>correctly</u> calculated and sensible comment	B1
			<b>[Total: 12]</b>
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
			<b>[Total: 5]</b>

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- 3 (a) metre rules laid end to end (from one wall to other)  
can accept from a diagram B1
- (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]