

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the May/June 2015 series**

### **5054 PHYSICS**

**5054/42**

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

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- 1 (a) (i) line marked from one shoe to same point on other shoe B1
- (ii) 40 to 90 cm OR 0.4 to 0.9 m max 2 sf unit required B1
- (iii)  $100/(a)(ii)$  in m OR  $10000/(a)(ii)$  in cm B1
- (b) (i) (push along ground and) count 100/200 clicks/turns B1
- (ii) sensible comment, e.g.  
length of step/stride may vary/each 'click' exactly  
50/100 cm/stride length only an estimate B1

[Total: 5]

- 2 (a) (i) 1.268 seen C1  
1.27 s c.a.o. unit required A1
- (ii) large variation in raw data/data to 2 d.p.  
time to fall varies B1
- (iii) allows time for parachute to inflate/larger times/more  
repeatable/minimises percentage error in the time/  
minimises the effect of (human) reaction error B1
- (iv)  $441(.0)\text{cm}^2$ , c.a.o. unit required correct precision B1
- (v) largest square from A4 sheet of paper/  
sheet 21 (cm) wide/if greater area used, it won't be a square B1
- (b)(i)(ii) 441 and 1.27 in table with no unit ecf (a)(i) B1  
400, 324, 256, 196, 144 c.a.o. ecf B1
- (iii) axes: correct way round, labelled quantity and unit B1  
scales: more than  $\frac{1}{2}$  grid, linear, not awkward B1  
no scales of 3, 7 etc.  
points plotted accurately within  $\frac{1}{2}$  small square B1  
best fit straight line drawn B1
- (iv) time needed to fall with no parachute B1

[Total: 13]

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<b>3</b>	<p>(a) correct circuit symbols all components in a series circuit</p> <p>(b) A and B labelled at ends of fixed resistor</p> <p>(c) y-shift c.a.o. no additions</p> <p>(d) (i) <math>3.2\text{ V} \pm 0.2</math> unit required</p> <p>(ii) dot moves up</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<b>[Total: 5]</b>
<b>4</b>	<p>(a) thermometer stopwatch / (stop-)clock / timer / watch</p> <p>(b) diagram of test tube containing water thermometer with bulb in water</p> <p>eye drawn level with <u>top of thread</u> in thermometer</p> <p>(c) temperature / temp / T / <math>\theta</math> AND time / t (or vice versa)</p> <p><math>^{\circ}\text{C}</math> / deg C / degree C AND second(s) / s / minutes / min</p> <p>(d) any two sensible points, e.g. timer close to test tube / see both together test tube in clamp stand thermometer in clamp stand thermometer with scale facing you two people with explanation (e.g. count down) clamp not obscuring the reading thermometer not touching the sides / bottom of test tube / <math>\frac{1}{3}</math> or <math>\frac{1}{2}</math> of thermometer immersed parallax avoided <u>qualified</u></p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B2</p>	<b>[Total: 7]</b>