

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

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

### **5054 PHYSICS**

**5054/41**

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

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- 1 (a) (i) use of set-square described [B1]  
 use of plumb line  
 line up with vertical object in room  
 use of spirit level with explanation
- (ii) bottom of ball AND some explanation [B1]  
 e.g. bottom of ball hits bench  
 H measured to bottom of ball  
 so that the whole ball falls through H
- (iii) line from bench to level with bottom of ball ecf (a) (ii) [B1]
- (iv) eye drawn level with bottom of ball ecf (a) (ii),(iii) [B1]
- (v) **any two** correct answers, e.g. [B2]  
 ball moving  
 ball not close to ruler  
 difficult to drop and observe  
 bounce height varies  
 difficult to position eye at correct position
- (b) (i) 66.7, 60.3, 54.0, 40.3, 26.7, 13.3 cao [B1]
- (ii) axes: correct way round, labelled quantity and unit [B1]  
 scales: more than  $\frac{1}{2}$  grid, linear, not awkward [B1]  
 points plotted accurately within  $\frac{1}{2}$  small square [B1]  
 best fit straight line drawn [B1]
- (iii) one value calculated [B1]  
 two values calculated AND some comment  
 eg values close so relationship holds [B1]

[Total marks: 13]

- 2 (a) (i) distance between divisions changes (with depth) [B1]
- (ii) measures small amounts (more accurately) [B1]  
 larger range of readings
- (b) (i) water level drawn at 7.5 mm [B1]
- (ii) sensible comment, e.g. [B1]  
 difficult to hold correctly  
 gauge may be tipped  
 rain sticks to walls of container
- (c) (i) so you can see the water [B1]
- (ii) hold it upright in the ground [B1]  
 more stable  
 stays in position

[Total marks: 6]

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- 3 a correct experiment described [M0]  
i.e. must be refraction
- ray box OR pins AND [B1]  
protractor AND ruler AND  
any one from  
(plain) paper / board / (sharp) pencil
- mark ray in air on both sides of block with pins or crosses [B1]
- written** description of: [B1]  
join points in air to block (both sides) and  
(remove block to) draw ray in block
- correct angles measured and labelled on diagram [B1]  
or described if no diagram drawn
- accuracy mark: e.g. [B1]  
repeats described anywhere  
fine pencil  
pins far apart  
bottom of pins  
large angles  
vary angle of incidence

[Total marks: 5]

- 4 (a) (i) correct circuit symbols for single cell, ammeter, variable resistor [B1]  
all three in series [B1]
- (ii) ammeter [B1]  
variable resistor/rheostat/potentiometer  
stopwatch/stop-clock/clock  
ALL THREE correct
- (iii) off scale of 0.1 A meter **and** [B1]  
10 A scale deflection too small
- (iv) reduce resistance (of variable resistor) (as current decreases) [B1]
- (b) cell/rheostat/wire becomes hot [B1]

[Total marks: 6]