

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]