CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2014 series

5054 PHYSICS

5054/42 Paper 4 (Alternative to Practical), maximum raw mark 30

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 (a) (i) correct length clearly marked [B1]

(ii) **any one from** [B1]
rod moves in the water
does not float vertically
sides of the beaker obstruct
clear explanation of why parallax error occurs here

(iii) Practical method stated, e.g. [C1]
1. mark water level on stick
2. mark scale on stick
3. **ruler** held in clamp / close to beaker / close to rod
4. length measured using a caliper

Clear practical detail, e.g. [A1]
1. + remove and measure
2. + before placing in water / note water level
3. + view perpendicularly / subtract two readings
4. + depth measurer on caliper

(b) (i) axes labelled quantity and unit [B1]

scales linear *y*-axis: 2 cm ≡ 1 cm [B1]
x-axis: 2 cm ≡ 2

points plotted accurately within ½ small square [B1]

best fit straight line drawn [B1]

(ii) negative gradient / decreases as *N* increases inverse relationship [B1]

$\Delta N \propto \Delta l$ linear / straight line / constant gradient [B1]

(iii) 11 [B1]

(c) **any one from**
same mass / weight [B1]
mass / weight increases by same amount each time
fair test / fair comparison

[12]

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2 **(a)** current cao [B1]

(b) **any one from** [B1]
(low resistance) does not decrease current (much)
high resistance would decrease the current
(low resistance) ammeter reads a large(r) value (than high R ammeter)
current is high(er)
very little p.d. across it

(c) 0.67 A cao [B1]

(d) **any one from** [B1]
no parallax error
needle does not stick
easier to read / measure (current)
easier to change range
lower resistance

(e) **(i)** **current** is same in series circuit / no junctions / single loop [B1]

(ii) **any one from** [B1]
meters not identical / exactly the same
zero error in meter
different calibration / calibration error

[6]

3 **(a)** **(i)** normal correct at P [B1]

(ii) angle r correct ± 1° [B1]

(b) **(iii)** 2.8 ± 0.1 cm [B1]
6.9 ± 0.1 cm unit required on at least **one** response

(v) 5.3 ± 0.1 (cm) [B1]
8.2 ± 0.1 (cm)

(vi) 1.6 or ecf correct ratio calculated no unit [B1]

(c) emergent ray drawn parallel to incident ray and **labelled L** [B1]

[6]

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4 (a) (i) (V =) $l \times$ w $\times$ h seen [B1]

7.6 cm and 2.6 cm and 1(.0) cm seen [B1]

height or volume / 10 [B1]

2.0 cm^3 cao unit required [B1]

(ii) any one from [B1]
makes thickness of one slide / height / volume / density / result more accurate
slides are thin
slides may vary in thickness
gives average value for thickness of one slide

(b) scales / balance [B1]

[6]

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