UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0625 PHYSICS

0625/63 Paper 6 (Alternative to Practical), maximum raw mark 40

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1 **(a)** **(i)** pins P_3 and P_4 at least 5 cm apart [1]

(ii) normal correct position and at 90° [1]

(b) **(i)** **AB** drawn neatly and $r = 20° \pm 2°$ [1]

(ii) $i = 32° \pm 2°$ and unit shown at least once and no contradiction [1]

(c) view bases of pins / keep line of sight low / view close to table [1]

[Total: 5]

2 **(a)** 83 (°C) [1]

(b) 5460 [1]
7140 and J at least once, not contradicted
ecf θ_h from **(a)** [1]

(c)

(i) no, difference too large [1]

(ii) any sensible suggestion involving heat loss to surroundings/ heat gained by container [1]

(d) ticks in boxes 3 and 4 [2]
(–1 for any extra ticks in boxes 1, 2, 5 or 6 to minimum of 0
if only two boxes ticked, 1 correct and 1 incorrect scores 1 mark)

[Total: 7]

3 **(a)** table:
l in m [1]
V in V, I in A, R in Ω (words or symbols) [1]
R values 1.6875, 3.4375, 5.03125 (2 or more significant figures) [1]
R values consistent 2 or 3 significant figures [1]

(b) R (directly) proportional to l o.w.t.t.e. [1]
numerical example given, allow two ratios [1]
idea of within limits of experimental accuracy [1]

(c) prediction 10 → 10.35, no unit needed [1]
working shown [1]

(d) two from:
wire gets hot / burns out
meter damaged
wire gets floppy / expands
higher meter readings / readings off scale
power source cuts out / fuses
resistance of wire increases [2]

[Total: 11]

4 **(a)** any one from:
use of darkened room
how to avoid parallax when taking readings
moving lens back and forth to obtain clearest image
mark at centre of lens holder
place / secure ruler on the bench
lens, object, screen perpendicular to the bench [1]

(b) correct graph:
axes labelled and scales [1]
all plots correct to nearest ½ small square [1]
well-judged best-fit line [1]
thin line and small plots, ≤ ½ small square [1]

(c) both intercepts correct to ½ small square [1]
both between 6.4 and 7.0 [1]

[Total: 7]

5 **(a)** **(i)** $h = 3.6$, $w = 3.4$, $d = 3.2$ (cm) c.a.o. [1]

(ii) $V = 39$ OR 39.2 OR 39.17 OR 39.168 AND cm^3 ecf **(i)** [1]
$\rho = 2.6$ OR 2.63 OR 2.64, ignore significant figures and unit, ecf [1]

(b) **(i)** $V_1 = 50\,(cm^3)$ [1]

(ii) $V_2 = 64\,(cm^3)$ [1]

(iii) bottom of meniscus, direct vision [1]

(iv) $V_s = 14\,(cm^3)$ ecf **(i)(ii)**

(v) $\rho = 2.46$, 2 or 3 significant figures AND g/cm^3 ecf **(iv)** [1]

(c) (i) two from:
difficulty of making perfect cuboid shape o.w.t.t.e.
measuring cylinder readings only to nearest cm^3 o.w.t.t.e.
smaller mass so greater inaccuracy
volume of thread not taken into account
air bubbles in clay / uneven density distribution / clay may absorb water / some clay may stick to the knife [2]

(ii) either method but with sensible matching reason [1]

[Total: 10]