CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0625 PHYSICS

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

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1 **(a)(i)(ii)** $m_1 = 40.68$ (g) and $m_2 = 113.60$ (g)
correct answer only (not 40:68, 113:60) [1]

(iii) $V_1 = 72$ (cm^3) correct answer only [1]

(iv) ρ_1 with unit of g/cm^3 or kg/m^3 seen in **(a)**, **(b)** or **(c)** and not contradicted
(unit must match value) [1]

(b)(i)(ii) $m_3 = 15.47$ (g) and $V_2 = 88$ (cm^3) correct answer only [1]

(iii) $V_3 = 16$ (cm^3) / ecf [1]

(iv) ρ_2 to 2 / 3 sig. figs. [1]

(c) ρ_{AV} 0.99(1) (g/cm^3) **or** 991 / 990 (kg/m^3) **or** ecf from **(a)** and **(b)** [1]

(d) any one from:
- take reading perpendicularly / at right angles to scale
- read bottom of meniscus
- other suitable precaution [1]

(e) appropriate source of inaccuracy, other than in **(d)**
e.g. balance not at zero / test-tube catches on side of measuring cylinder [1]

matching effect on ρ with explanation
e.g. ρ greater as mass reading larger / ρ greater as volume smaller [1]

[Total: 10]

2 **(a)(b)** 87 and 89, both correct answer only [1]

(c) units correct in symbols or words, s, °C, °C [1]

t values correct 0, 30, 60, 90, 120, 150, 180 [1]

(d) appropriate pattern which fully matches results
e.g. rate of temperature drop greater at start than at end
NOT stated pattern which partly matches results [1]

(e) statement matching temperature changes
(expect 'Yes' but accept 'No' or 'no significant difference' if ecf) [1]

justification referring to results and involving comparative change in temperature
with specific mention of in the same time [1]

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(f) any two from:
- room temperature / external temperature (but not outside temperature) / environmental factor such as draughts / sunshine
- initial water temperature / start temperature
- same amount of stirring / wait same time before reading
- keep thermometer at same depth
- same size/thickness / material / surface area of beaker
- same volumes of water [2]

[Total: 8]

3 (a)(b) 2.8 [1]

0.9(0) [1]

units both correct, symbols or words, V, A [1]

(c) (i) 3.1(1) / ecf, 2.0 / 1.95, 1.0(0) penalise rounding errors [1]

correct unit seen once and not contradicted [1]

(ii) statement matches results (expect 'Yes' but allow 'No' if ecf >10%)
with matching and correct justification (which refers to figures)
(e.g. 'within limits of experimental accuracy' owtte for 'Yes' or 'too different' for 'No') [1]

(d) any one from:
- switch off between readings
- only switch on for short time
- use smaller currents / p.d.s
- suitable means of dissipating thermal energy [1]

[Total: 7]

4 (a) correct symbols for ammeter and variable resistor (rectangle with diagonal strike-through arrow **only**) [1]

correct series circuit [1]
accept use of potential divider symbol **only** if correctly shown in parallel circuit

(b) (i) 8.24 and 12.36 correct answer only [1]

(ii) expect 'Yes' but allow ecf for incorrect *M* values [1]

appropriate justification referring to figures [1]

[Total: 5]

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5 (a) (i) $w = 2.6$ to 2.5 and $h = 2.5$ to 2.4 [1]

(ii) $s = 2.6$ or correct rounding from candidate's values [1]

(iii) appropriate reason e.g.
- w and h not always the same (NOT 'increase at different rates') (need reference to square shape – NOT just 'distorted')
- difficult to measure shadows / edges not distinct
- card might not be perpendicular / card might be tilted
- lamp is not a point source
- improve reliability [1]

(b) axes labelled with quantity and unit [1]

scales appropriate, plots covering at least ½ grid [1]

plots correct to ½ small square [1]

well judged curve [1]

thin, continuous line, precise plots [1]

(c) large gap between plots for 25 and 15 cm
allow gaps becoming larger / to ensure curve is consistent [1]
NOT 'more plots, more accurate', 'make line more accurate'

(d) any suitable reason e.g.
- shadow would be too big (for screen)
- difference between w and h becomes larger
- shadows become less distinct / more blurred / too distorted [1]

[Total: 10]

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