CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0625 PHYSICS

0625/53 Paper 5 (Practical Test), maximum raw mark 40

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)(ii)** m_1 and m_2 present and in g and V_1 in cm^3 [1]

(iii) $m_2 > m_1$ [1]

(iv) 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 present and V_2 present with $V_2 > V_1$ [1]

(iii) correct calculation of V_3 [1]

(iv) ρ_2 to 2 / 3 sig. figs. [1]

(c) ρ_{AV} in range 0.9 to 1.1 (or 900 to 1100) [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)** units correct in symbols or words, s, °C, °C [1]

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

θ for 200 cm^3 decreasing [1]

θ for 100 cm^3 decreasing and evidence of θ to at least 1 °C [1]

larger / same change over 180 s for 100 cm^3 [1]

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

(d) statement matching temperature changes
(accept 'no significant difference' if appropriate) [1]

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

(e) 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: 10]

3 **(a)(b)(c)** p.d.s all < 3.0 V and to at least 1d.p. [1]

currents all < 1.50 A and to at least 2 d.p. [1]

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

(e) **(i)** *R* calculations correct [1]

correct unit seen at least once and not contradicted [1]

consistent 2 or consistent 3 sig. figs. for *R* [1]

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

(f) 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]

(g) **(i)** correct circuit symbol (rectangle with strike-through arrow **only**) [1]

(ii) X shown in series circuit (not between crocodile clips) [1]

[Total: 10]

4 **(a)** all *w* and *h* present and both increasing [1]

(b) **(i)** correct *s* calculations [1]

(ii) appropriate reason e.g.
- *w* and *h* not the same (need reference to square shape)
- 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]

(c) 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]

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

(e) 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]