**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

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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)** $\rho_2$ to 2 / 3 sig. figs. [1]

**(c)** $\rho_{AV}$ 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. $\rho$ greater as mass reading larger / $\rho$ 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]

$\theta$ for 200 $cm^3$ decreasing [1]

$\theta$ for 100 $cm^3$ decreasing and evidence of $\theta$ 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]

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**(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]

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**(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]**

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