

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) 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]

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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 < 3.0V and to at least 1d.p. [1]

currents all < 1.50A 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 $\frac{1}{2}$ grid
- [1]
- plots correct to $\frac{1}{2}$ 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]