MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

0625 PHYSICS

0625/05   Paper 5 (Practical), 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.

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1 **(a)** d value 1.5–3.5 (cm) and h value 12.0–16.0 (cm)   [1]
           diagram showing method   [1]
           correct calculation of V_e [1]

    (b) mass of tube 20–35 (g)   [1]

    (c) V_i recorded and correct calculation of density   [1]

    (d) V_1, V_2 and (V_2–V_1) present, V_1 150–200 and $V_2 > V_1$ [1]
           m_2 20–35 (g) (no ecf)   [1]
           volumes in cm^3, masses in g   [1]

    (e) V_3 present, ρ values same to within 0.5 g/cm³   [1]
           correct unit and 2/3 sf   [1]

[Total: 10]

2 **(a)–(d)**
        t in s θ in °C   [1]
        t values 0, 30, 60, 90, 120, 150, 180   [1]
        Thermometer **A**, temperatures decreasing   [1]
        Thermometer **B**, temperatures decreasing   [1]
        Thermometer **B**, temperatures decreasing less rapidly   [1]
        Evidence of temperatures to 1°C   [1]

    (e) Statement matches readings   [1]
           Justified by reference to readings
           comparison given of drops in temperature with numbers   [1]

    (f) Any two from:
           same starting temperature
           constant room temperature
           carry out at same time
           same thermometer (words to that effect)
           same thermometer positions
           same time intervals   [2]

[Total: 10]

3 **(d)** I in A to 2 d.p. < 2 A [1]

(a)–(h)
Table:
correct x values (0.1, 0.3, 0.5, 0.7, 0.9) [1]
V values all < 2.5 V and to at least 1 d.p. [1]
R values correct [1]

(i) Graph:
Axes labelled and scales suitable [1]
All plots correct to ½ square [1]
Well judged line, continued to an axis [1]

(j) Statement proportional (words to that effect, including as x increases, R increases)
Justification straight line through origin [1]

(k) Clear indication of method on graph [1]
Correct value to ½ square [1]

[Total: 10]

4 **(a)–(g)**
Table:
correct u values 25.0 (cm), 45.0 (cm) [1]
u and v in cm [1]
v values 35–40 and 20–25 [1]
f values consistent 3 or more significant figures [1]
f in cm [1]

(h) correct average value for f [1]
2/3 significant figures [1]
average f 14–16 cm [1]

(i) Any one statement (1) with matching explanation (1) from:
use of darkened room; to see image clearly   (1 + 1)
slowly moving screen back and forth; to get clear image   (1 + 1)
clamp rule or place on bench; to obtain accurate distance measurements   (1 + 1)
avoid parallax; looking perpendicularly at rule   (1 + 1)
lining up of object and lens; to obtain clear image   (1 + 1)
mark centre of lens on block; to obtain accurate distance measurement   (1 + 1)
ensure lens vertical; to obtain clear image   (1 + 1)
object and lens same height from bench; to obtain clear image   (1 + 1) [2]

[Total: 10]