

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

0625 PHYSICS

0625/62

Paper 6 (Alternative to 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) $x = 1.9$ (cm), 19 (mm) 0.019 (m), $y = 2.1$ (cm), 21 (mm), 0.021 (m)
- (b) unit in (a) seen at least once and correct, matching both figures
 evidence of x and y values from (a) $\times 10$ [1]
 $m_1 = 124$ OR 0.124 accept more sig. figs. [1]
 unit seen, g or kg to match figures [1]
- (c) $m_2 + m_3 = 99.4$ (g) [1]
- (d) two from:
 modelling clay remaining on knife/rule/fingers/lost in cutting
 more difficult to balance with smaller pieces
 more readings so more inaccuracies
 rounding errors in extra calculations
 difficult to find centre of misshapen cube
 modelling clay might not have uniform density [2]
- (e) mark centre of bottom of cube OR take readings at either side of cube [1]

[Total: 9]

- 2 (a) $\theta_h = 86$ (°C) [1]
- (b) cm^3 , °C [1]
 10, 20, 30, 40, 50, 60 [1]
- (c) graph:
 axes labelled and scales suitable
 plots to take up half grid [1]
 all plots correct to nearest $\frac{1}{2}$ small square [1]
 well-judged best-fit line [1]
 thin line and small plots [1]
- (d) any two from:
 same hot water temperature / initial temperature,
 constant room/surrounding temperature / other suitable named environmental condition
 constant cold water temperature
 same amount/rate of stirring
 time taken for transfer w.t.t.e. / poured at same time interval [2]

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- (e) any one from:
 avoidance of parallax explained (thermometer or measuring cylinder)
 wait for temperature to stabilise
 other suitable suggestion related to measurement

[Total: 10]

3 (a) $V = 0.8 \text{ (V)}$ [1]

(b) $V_A + V_B = 1.4 + \text{candidate's value for } V_A$, expect 2.2V [1]
 statement matching results, expect YES [1]
 justified referring to results [1]

(c) $R = 7.78$, to 2 or 3 significant figures and unit Ω [1]

(d) voltmeter correctly shown [1]

(e) good reason, e.g. [1]
 '1V scale better as V_A less than 1V' OR '10V scale acceptable to avoid changing since V_B and V_C larger than 1V'

[Total: 7]

4 (a) trace: [1]
 normal at 90° in correct position [1]
 C at 3.0 cm to left of L

(b) (i) & (ii) all lines neatly drawn in correct position [1]

(iii) table: [1]
 cm, $^\circ$, $^\circ$ [1]
i value in range 16–18 AND *r* value in range 17–19 [1]

(c) any two from: [2]
 thickness of lines
 thickness of pin holes/pins
 allow thickness of mirror o.w.t.t.e. e.g. 'two lines seen'

(d) any one from: [1]
 ensure pins vertical / view bases of pins / increase pin separation
 draw thin lines / use sharp pencil
 view protractor / rule perpendicularly o.w.t.t.e.
 mirror 90° to paper

[Total: 8]

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- 5 (a) l/mm , e/mm or in words
- (b) 1, 3, 5, 7, 11, 17
- (c) no [1]
larger loads produce bigger increases in extension OR increase between (successive) extensions not the same OR ratio W/e not the same [1]
- (d) clamp, spring and weight sensibly shown [1]
ruler close to spring or with suitable horizontal pointer or equivalent [1]

[Total: 6]