



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

### 0625 PHYSICS

0625/63

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) (i) pins  $P_3$  and  $P_4$  at least 5 cm apart [1]  
(ii) normal correct position and at  $90^\circ$  [1]
- (b) (i) **AB** drawn neatly and  $r = 20^\circ \pm 2^\circ$  [1]  
(ii)  $i = 32^\circ \pm 2^\circ$  and unit shown at least once and no contradiction [1]
- (c) view bases of pins / keep line of sight low / view close to table [1]

[Total: 5]

- 2 (a)  $83^\circ\text{C}$  [1]
- (b) 5460 [1]  
7140 and J at least once, not contradicted  
ecf  $\theta_h$  from (a) [1]
- (c)
- (i) no, difference too large [1]  
(ii) any sensible suggestion involving heat loss to surroundings/ heat gained by container [1]
- (d) ticks in boxes 3 and 4 [2]  
(–1 for any extra ticks in boxes 1, 2, 5 or 6 to minimum of 0  
if only two boxes ticked, 1 correct and 1 incorrect scores 1 mark)

[Total: 7]

- 3 (a) table: [1]  
*l* in m [1]  
*V* in V, *I* in A, *R* in  $\Omega$  (words or symbols) [1]  
*R* values 1.6875, 3.4375, 5.03125 (2 or more significant figures) [1]  
*R* values consistent 2 or 3 significant figures [1]
- (b) *R* (directly) proportional to *l* o.w.t.t.e. [1]  
numerical example given, allow two ratios [1]  
idea of within limits of experimental accuracy [1]
- (c) prediction  $10 \rightarrow 10.35$ , no unit needed [1]  
working shown [1]

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- (d) two from:  
 wire gets hot / burns out  
 meter damaged  
 wire gets floppy / expands  
 higher meter readings / readings off scale  
 power source cuts out / fuses  
 resistance of wire increases [2]

[Total: 11]

- 4 (a) any one from:  
 use of darkened room  
 how to avoid parallax when taking readings  
 moving lens back and forth to obtain clearest image  
 mark at centre of lens holder  
 place / secure ruler on the bench  
 lens, object, screen perpendicular to the bench [1]

- (b) correct graph:  
 axes labelled and scales [1]  
 all plots correct to nearest  $\frac{1}{2}$  small square [1]  
 well-judged best-fit line [1]  
 thin line and small plots,  $\leq \frac{1}{2}$  small square [1]

- (c) both intercepts correct to  $\frac{1}{2}$  small square [1]  
 both between 6.4 and 7.0 [1]

[Total: 7]

- 5 (a) (i)  $h = 3.6, w = 3.4, d = 3.2(\text{cm})$  c.a.o. [1]  
 (ii)  $V = 39$  OR  $39.2$  OR  $39.17$  OR  $39.168$  AND  $\text{cm}^3$  ecf (i) [1]  
 $\rho = 2.6$  OR  $2.63$  OR  $2.64$ , ignore significant figures and unit, ecf [1]

- (b) (i)  $V_1 = 50(\text{cm}^3)$  [1]  
 (ii)  $V_2 = 64(\text{cm}^3)$  [1]  
 (iii) bottom of meniscus, direct vision [1]  
 (iv)  $V_s = 14(\text{cm}^3)$  ecf (i)(ii)  
 (v)  $\rho = 2.46$ , 2 or 3 significant figures AND  $\text{g/cm}^3$  ecf (iv) [1]

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- (c) (i) two from:  
 difficulty of making perfect cuboid shape o.w.t.t.e.  
 measuring cylinder readings only to nearest  $\text{cm}^3$  o.w.t.t.e.  
 smaller mass so greater inaccuracy  
 volume of thread not taken into account  
 air bubbles in clay / uneven density distribution / clay may absorb water / some  
 clay may stick to the knife [2]
- (ii) either method but with sensible matching reason [1]

**[Total: 10]**