

## **MARK SCHEME for the May/June 2013 series**

### **0625 PHYSICS**

**0625/52**

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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- 1 (a) table:  
correct  $d$  values 5.(0), 10.(0) [1]  
 $x$  and  $y$  values present, first  $(x + y) < 46$ , second  $< 41$  [1]  
all  $x$  and  $y$  values to nearest mm [1]
- (b) (i)  $M$  values both correct – penalise incorrect rounding, 3 or 4 sig. figs. only [1]  
(ii) g / grams seen at least once [1]  
(iii) correct average  
(ignore sig. figs., but rounding must be correct) [1]
- (c)  $M$  values same to within 5 g [1]
- (d) any two from:  
centre of mass of rule not at 50.0 cm / non-uniform rule  
mass X not uniform / of varying density  
difficulty in obtaining balance (o.w.t.t.e.) / slips on pivot / mass X not exactly 100 g  
/pan has mass [2]
- (e) one from:  
mark line through centre of the mass  
use position of edges of mass on rule [1]
- [Total: 10]**
- 2 (a) sensible value of  $\theta_c$  ( $< 40$  ( $^{\circ}\text{C}$ )) [1]
- (b) decreasing  $\theta$  values (allow one pair of identical values)  
evidence of  $\theta$  to at least nearest  $1^{\circ}\text{C}$  [1]  
[1]
- (c)  $\theta_H$  value sensible ( $> 60^{\circ}\text{C}$ ), ignore unit [1]
- (d) (i)  $\theta_1$  lower than  $\theta_H$  [1]  
(ii)  $\theta_2$  lower than  $\theta_1$  and correct unit seen once in (a) – (d) [1]
- (e) estimate reasonable fit with readings (must use table readings  $\Delta\theta$ , or use  $\theta_1$  or  $\theta_2$ ) [1]  
estimate given using sensible method [1]

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- (f) two from:  
 room temperature / other environmental conditions  
initial hot water temperature  
initial cold water temperature  
 amount/mass/volume of hot water  
 time delay on adding cold water / same time for cooling [2]

[Total: 10]

- 3 (a) – (d) table:  
*h* values present and in cm [1]  
 1/*h* values correct [1]

- (e) graph:  
 axes correctly labelled [1]  
 suitable scales [1]  
 all plots correct to ½ small square [1]  
 good line judgement, thin continuous line [1]

- (f) triangle method used and shown [1]  
 using at least half of line [1]

- (g)  $f = 14 - 16$  (cm) [1]  
*f* to 2 or 3 significant figures with unit [1]

[Total: 10]

- 4 (a) (i)  $V_1$  to at least 1 d.p. and  $< 1V$  [1]  
 $I$  to at least 2 d.p. and  $< 1A$  [1]

(ii) correct calculation of  $R_1$  [1]

(ii) (iv)  $V_2$  and  $V_3$  both  $< 1V$  [1]

(v) correct calculation and unit seen in (a) [1]

(b) (i) correct symbols for lamp, voltmeter [1]

correct parallel circuit (including voltmeter) [1]

(ii) (iii) (iv)  $V_P$  and  $I_T$  recorded,  $R_P < R_1$  [1]

(c) statement matches results and idea of within/beyond limits of experimental accuracy / too far apart / too close together  
 ù 10 % no, < 10 % yes [1]

(d) brighter [1]

[Total: 10]