

## **MARK SCHEME for the October/November 2012 series**

### **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.

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

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- 1 (a) (i) and (ii)  $l_0 = 2.0$  and  $l_1 = 6.1$  [1]
- (iii)  $e_1 = 4.1\text{cm}$  unit required ecf from 1(a)(i) and 1(a)(ii) [1]
- (iv) Correct calculation for  $k = 24/24.4$  ecf from 1(a)(iii) [1]  
Unit g/cm [1]
- (b) (i) Appropriate method (can be written and/or in diagram)  
e.g. measure half width of mass either side of 40 cm/mark centre of mass [1]
- (ii) and (iii)  $e_2$  seen and  $M = 190\text{ g}$  (no ecf) unit required for  $M$  [1]  
2 or 3 significant figures [1]
- (c) Any two from:  
rule bends  
mass not exactly at 40 cm  
mass may slip  
end of rule may slip  
hook not directly above 0 cm  
spring extension not uniform/owtte  
proportional limit exceeded  
mass irregular/C of G not at centre [2]
- [Total: 9]**
- 2 (a) 23 seen in correct place in table [1]
- (b) (i) Units all correct (symbols or words) [1]
- (ii)  $10^\circ\text{C}$  (or ecf from 2(a)) and  $23^\circ\text{C}$  [1]
- (iii) Statement matching temperature changes (expect 'black') with supporting comparative comment [1]
- (iv) Statement matching results (expect 'Yes') [1]  
Figures from table matching correct statement [1]  
and time interval mentioned at least once [1]

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- (c) Any one from:  
 same (type of) lamp/same brightness  
 same distance/height  
 same (type of) thermometer  
 same area of card  
 same thickness of card  
 good contact between card and thermometer (owtte)  
 same start temperature/allow thermometer to cool  
 allow lamp to cool [1]

- Appropriate matching explanation:  
 power output may not be the same (owtte)  
 different intensity of radiation (owtte)  
 respond differently/different heat capacity  
 different surface area to absorb radiant heat (owtte)  
 different rate of conduction (owtte)  
 rate of rise different at different temperatures  
 heating starts at different times [1]

[Total: 8]

- 3 (a) Correct symbol for voltmeter [1]  
 In parallel with lamp [1]

- (b) (i) Units all correct [1]  
 (ii) R values correct (10, 14, 18, 21) [1]  
 Consistent 2 or 3 significant figures in R column [1]

- (c) Statement matches results (expect 'No') [1]  
R figures quoted appropriately and matching statement [1]  
 Mention of brightness related to temperature [1]

[Total: 8]

- 4 (a) (i) and (ii)  $u = 7.0 \text{ cm}$  and  $v = 5.2 \text{ cm}$  (or equivalent in mm) [1]  
 (iii)  $u = 0.350$  and  $v = 0.260$  in table (ecf) to 3 sf [1]

- (b) Correct  $\frac{1}{u}$  (2.86(ecf)) and  $\frac{1}{v}$  (1.67, 2.55, 3.85 (ecf), 4.50, 5.10 ) [1]

- (c) Axes labelled (including units) and appropriate scales [1]  
 Plots correct to  $\frac{1}{2}$  small square [1]  
 Well judged straight line [1]  
 Thin line and small plots [1]

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(d) (i) and (ii)  $p$  and  $q$  values there and matching graph [1]

(e) (i) and (ii)  $f$  within range 0.145 to 0.155 [1]  
 2 or 3 significant figures and appropriate unit [1]

**[Total: 10]**

5 (a) Discard 53 cm value [1]  
 Add remaining values together and divide by 4 [1]

(b) 75% [1]

(c) Greater than [1]  
 Height of release less but bounces to same height (owtte) [1]

**[Total: 5]**