

MARK SCHEME for the October/November 2012 series

0625 PHYSICS

0625/63

Paper 6 (Alternative to Practical), maximum raw mark 40

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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°C (or ecf from 2(a)) and 23°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]