CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0625 PHYSICS

0625/53 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) (i) and (ii) l_o and l_1 clearly in cm/mm <u>and</u> $l_1 > l_o$

(iii) Correct value for e_1 from **1(a)(i)** & **1(a)(ii)**

(iv) Correct calculation for k (allow ecf) [1]
Unit g/cm or g/mm consistent with e_1 [1]

(b) (i) Appropriate method (can be written and/or in diagram)
e.g. <u>measure</u> half width of mass either side of 40 cm/<u>mark</u> centre of mass [1]

(ii), (iii) and (iv) $l_2 > l_3$ and e_2 calculated [1]

(v) M within range (180 – 220 g) (no ecf) [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/owtte
any other valid cause of inaccuracy [2]

[Total: 10]

2 (a) Units <u>all</u> correct (symbols or words) [1]
t values inserted (0, 60, 120, 180, 240) [1]
θ for white card increasing [1]
θ for black card increasing at greater rate than θ for white card [1]

(b) (i) <u>Both</u> temperature changes correct [1]

(ii) Statement matching temperature changes (expect 'black')
with supporting <u>comparative</u> comment [1]

(iii) Statement matching results (expect 'Yes' but allow ecf) [1]
<u>Figures</u> from table supporting correct statement
and <u>time interval</u> mentioned [1]

(c) Any one from:
same (type of) lamp/same brightness
same distance/same 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 <u>matching</u> 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: 10]

3 (a) Correct symbol for voltmeter   [1]
Connected in parallel with lamp   [1]

(b) and **(c)** Units all correct (symbols or words)   [1]
All p.d.s < 7.0 V <u>and</u> to at least 1 d.p.   [1]
currents all < 1.00 A <u>and</u> to at least 2 d.p.   [1]
R calculations correct   [1]
Consistent 2 or 3 significant figures in *R* column   [1]

(d) Statement matches results (expect 'No')   [1]
<u>R figures</u> quoted appropriately and matching statement   [1]
Mention of <u>brightness related to temperature</u>   [1]

[Total: 10]

4 **(a) and (b)** Values of v in metres
To 3 significant figures
Correct values for $\underline{1}$ (consistent with v values in table)
v

(c) Axes labelled (including units) and appropriate scales [1]
Plots correct [1]
Well judged straight line [1]
Thin line and fine plots [1]

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

(e) (i) and (ii) f within range 13.0 to 17.0 (or equivalent m/mm) [1]
2 or 3 significant figures <u>and</u> appropriate unit [1]

[Total: 10]