CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0625 PHYSICS

0625/62 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)(ii) *M* values 112.3, 113.5 (to 3 or 4 sig. figs **only)** [1]
g at least once, not contradicted (symbols or words) [1]

(iii) 113 or 112.9 or correct average of candidate's values (ignore sig. figs) [1]

(b) 114 (g) c.a.o. [1]

(c) any two from:
centre of mass of rule not at 50.0 cm
mass X not uniform / of varying density
reference to difficulty in obtaining balance implied o.w.t.t.e.
mass of pan
mass not exactly 100 g [2]

(d) one from:
mark line through the centre of the mass (can award from diagram)
use position of edges of mass on rule
[1]

[Total: 7]

2 (a) θ_C = 19 (^oC) [1]

(b) s, ^oC, symbols or words [1]

(c) 12 cm^3 (unit needed) [1]

(d) 40–50 (cm^3), (expect 42 cm^3 e.c.f. **(c)**) [1]
estimate given to nearest 1 cm^3 only and sensible method [1]

(e) two from:
room / surrounding temperature / other environmental condition
<u>initial</u> hot water temperature
<u>initial</u> cold water temperature
volume / mass / amount of hot water
time delay on adding cold water / same time for cooling [2]

[Total: 7]

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3 **(a)** **(i)** V_1 = 0.7 (V) [1]
I = 0.45 (A) [1]

(ii) R_1 = 1.56 or 1.6 (Ω) e.c.f. **(i)** [1]

(b) V_2 = 0.6 (V) and V_3 = 0.5 (V) c.a.o. [1]

(c) 1.8 (V) e.c.f. V_1, V_2, V_3 [1]

(d) correct symbols for ammeter, lamp, voltmeter [1]
correct parallel circuit with ammeter and voltmeter correctly connected [1]

(e) statement matches candidate's results and idea of within/beyond limits of experimental accuracy or that values are too far apart / too different [1]

(f) brighter [1]

[Total: 9]

4 **(a)** 1.925, 1.800, 1.670, 1.570, 1.410, 1.275 (2 or more sig. figs.) [1]
all *T* values consistently to 2 or 3 significant figures [1]

(b) any one from:
gives a more accurate value of *T*
gives an average value (of *T*)
reduces (effect of) human reaction error
reaction time less significant
T too small / oscillations are too quick / bob swings too fast [1]

(c) avoidance of parallax error explained [1]

(d) blocks arranged parallel either side of bob and touching bob [1]
rule correctly placed, touching the blocks and spanning the gap [1]

[Total: 6]

5 **(a)** axes correctly labelled [1]
suitable scales (at least half the grid used) [1]
all plots correct to ½ small square [1]
good line judgement [1]
thin continuous line and fine plots [1]

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

(c) f = 14.0 – 16.0 (cm) [1]
f to 2 or 3 significant figures with unit [1]

(d) any two from:
darkened room / brighter lamp / no other lights
(centre of) lens and object same vertical height from bench
mark block at centre of lens
clamp rule or place on bench
lens, object and screen are vertical / perpendicular to bench
repeat the measurements
move the screen backwards and forwards (to get sharpest image) [2]

[Total: 11]

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