CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 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.

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)** 3.1 cm (31 mm), unit required [1]

(b) table:
s, s [1]
31.(0) e.c.f. **(a)** [1]
1.12 c.a.o. [1]

(c) statement matches results (expect NO) [1]
justification using idea of within or beyond limits of experimental accuracy (o.w.t.t.e.) [1]

(d) straight line / constant gradient [1]
through the origin [1]

(e) has no effect [1]

[Total: 9]

2 **(a)** 78 °C c.a.o. unit needed [1]

(b)(c) both thermometer readings correct 69, 61 [1]
correct differences 9, 17 allow e.c.f. [1]

(d) order matches results (expect D, B, C, A) allow e.c.f. [1]

(e) any two from:
room temperature (or other environmental condition)
initial (hot) water / starting temperature (accept initial temperature)
volume / mass / amount / level of (hot) water
same type / thickness / material / size / volume of beaker
time delays during operations [2]

(f) same time of cooling for each experiment [1]

[Total: 7]

3 **(a)** **(i)** 0.30 A c.a.o. unit needed (accept 0.3 A) [1]

(ii) table:
0.40 (accept 0.4) [1]
1.33 (e.c.f. **(a)(i)**) accept any significant figures > 1 and recurring decimal [1]

(b) graph:
axes correctly labelled [1]
suitable scales (*x* axis 2 cm = 0.2 m/0.25 m) [1]
all plots correct to ½ small square [1]
good line judgement [1]
thin continuous line, carefully plotted points not large 'blobs' [1]

(c) *l* correct to ½ square – must see evidence on graph paper
condone no / incorrect unit, ignore significant figures [1]

(d) 9.5 to 10.5 (Ω) ignore significant figures [1]

[Total: 10]

4 **(a)** **(i)(ii)** u = 25(mm), v = 42(mm) [1]

(iii)(iv) uv = 1050(mm^2), $u + v$ = 67(mm) allow e.c.f. [1]

(v) f_1 = 15.7(mm) 2 or 3 significant figures only allow e.c.f. [1]

(b) **(i)(ii)** uv = 1050(mm^2), $u + v$ = 67(mm), c.a.o.

(iii) f_2 = 15.7(mm) accept any significant figures [1]

(c) statement matches results (expect YES) [1]
justification in terms of within or beyond limits of experimental accuracy (o.w.t.t.e.)
accept values are <u>equal</u> without mention of experimental accuracy [1]

(d) any two from:
use of darkened room / brighter lamp / no other lights
mark position of centre of lens on holder
place metre rule on bench (or clamp in position)
ensure object and (centre of) lens are same height (from the bench)
lens / object / screen vertical/perpendicular to bench
repeat (and average)
move <u>lens</u> slowly (backwards and forwards when focusing) [2]

(e) image drawn inverted [1]

[Total: 9]

5 **(a)** **(i)** x = 7.0 cm / 70 mm unit needed, accept 6.95 to 7.0 cm [1]

(ii) y = 3.3 cm / 33 mm unit needed, c.a.o., accept 3.30 cm [1]

(b) **(i)** 6.5(N) ignore unit [1]

(ii) 0.28 N / cm^2 (0.0028 N / mm^2, 2800 N/m^2 or Pa) e.c.f.
unit needed, ignore significant figures [1]

(c) any one from:
outline is larger than block / thickness of pencil line
zero error on forcemeter
precision with which the ruler can be read
precision of forcemeter / large gaps on scale
block not of uniform thickness/length [1]

[Total: 5]