CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0625 PHYSICS

0625/63 Paper 6 (Alternative to Practical), maximum raw mark 40

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NOTES ABOUT MARK SCHEME SYMBOLS & OTHER MATTERS

Brackets ( ) around words or units in the mark scheme are intended to indicate wording used to clarify the mark scheme, but the marks do not depend on seeing the words or units in brackets, e.g. 10 (cm) means that the mark is scored for 10, regardless of the unit given.

c.a.o. means “correct answer only”.

e.c.f. means “error carried forward”. This indicates that if a candidate has made an earlier mistake and has carried his incorrect value forward to subsequent stages of working, he may be given marks indicated by e.c.f. provided his subsequent working is correct, bearing in mind his earlier mistake. This prevents a candidate being penalised more than once for a particular mistake, but **only** applies to marks annotated “e.c.f.”

owtte means “or words to that effect”.

Underlining indicates that this must be seen in the answer offered, or something very similar.

OR / or indicates alternative answers, any one of which is satisfactory for scoring the mark.

AND indicates that both answers are required to score the mark.

Spelling Be generous with spelling and use of English. However, do not allow ambiguities.

Sig. figs. Candidates are expected to give answers to a suitable precision. The use of an inappropriate number of significant figures will be penalised where indicated in the mark scheme. Rounding errors will also be penalised.

Fractions Fractions are only acceptable where specified.

Extras If a candidate gives more answers than required, irrelevant extras are ignored; for extras which contradict an otherwise correct response, or are forbidden by the mark scheme, use right plus wrong = 0.

Ignore indicates that something which is not correct is disregarded and does not cause a right plus wrong penalty.

NOT indicates that an incorrect answer is not to be disregarded, but cancels another otherwise correct alternative offered by the candidate, i.e. right plus wrong penalty applies.

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1 **(a)** a_0 = 75.5 (cm) AND b_0 = 25.9 (cm), accept in mm [1]

matching unit [1]

(b) a_1 = 71.(0) AND b_1 = 32.9 [1]

d_A = 4.5 and d_B = 7.(0), allow ecf from earlier results [1]

(c) *M* value rounds to160 (g), allow ecf from **(b)** [1]

2 or 3 sig. figs. and unit: g [1]

(d) appropriate explanation, e.g.
- measure height (from bench)/distance from rule at two places
- line up with rule or suitable horizontal surface
- use of spirit level [1]

(e) repeat with different (sized) loops/different values (of d_A, d_B) [1]

any one from:
- (at least) 3 more sets of results and evaluate d_A:d_B
- plot a graph to (check if) a straight line through the origin [1]

[Total: 9]

2 **(a)** 21(°C) [1]

(b) *t* values correct: 30, 60, 90, 120, 150, 180, 210, 240, 270 [1]

(c) x_1 = 0.083 [1]

°C/s [1]

x_2 = 0.061 AND x_3 = 0.05(0) [1]

(d) prediction less than x_3 [1]

justification with specific mention of (average) cooling rate decreasing with time/temperature [1]

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(e) any two precautions relating to temperature measurement e.g: [2]
- stir before reading
- keep thermometer at same depth
- read thermometer 90° to scale/with reading at eye level
- wait until thermometer has stopped rising (at the start)
- thermometer in middle of water/not touching beaker

[Total: 9]

3 **(a)** correct symbol in parallel between crocodile clip and zero end of wire [1]

(b) R = 7.1(0), 6.22, 5.45, 4.7(0), 3.93 [1]

(c) Graph:
- axes labelled correctly, right way round and with units [1]
- suitable scales, plots occupying at least half grid in both directions [1]
- plots correct to within ½ small square [1]
- well-judged straight line, thin line, precise plots [1]

(d) **(i)** G present and triangle method seen on graph [1]

(ii) r in range 7.4 – 8.5 [1]

2 or 3 sig. figs. AND unit Ω / m [1]

[Total: 9]

4 **(a)** **(i)** f = 3.1 [1]

(ii) F = 15.5 allow ecf [1]

(b) F_1 = 15.6 allow ecf [1]

(c) F_2 = 15.7 [1]

statement matching results [1]

appropriate justification, including idea of within limits of experimental accuracy owtte [1]

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(d) appropriate precaution e.g: [1]

- carry out experiment in dark room/no direct (sun)light/bright lamp
- lens and object same height (above bench)
- lens, object and screen/mirror vertical/perpendicular
- move screen/lens back and forth/slowly to obtain sharp image
- fix/place rule on bench/clamp rule
- mark centre of lens on holder
- readings/expt repeated (and average taken)

[Total: 7]

5 (a) (i) $\theta = 30^{o}$ and 65° both to ± 2° [1]

(ii) suitable procedure e.g.: [1]

- use of plumb line
- measure from line of stand
- use of spirit level
- attach protractor behind solar panel

(b) any one reason from: [1]

- ambient light owtte
- zero error on meter

corresponding solution: [1]

- do experiment in complete darkness
- subtract zero reading (from each voltage measurement)

(c) any two aspects relating to apparatus e.g.: [2]

- same distance between panel and lamp
- lamp at same height
- panel at constant height
- same pd across lamp OR same current in lamp OR same brightness of lamp

[Total: 6]

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