CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0625 PHYSICS

0625/62 Paper 6 (Alternative to Practical), maximum raw mark 40

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NOTES ABOUT MARK SCHEME SYMBOLS AND 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 (J) 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 or she may be given marks indicated by e.c.f. provided his or her subsequent working is correct, bearing in mind his or her 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 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 about spelling and use of English. However, do not allow ambiguities, e.g. spelling which suggests confusion between reflection / refraction / diffraction or thermistor / transistor / transformer.

Significant figures Answers are generally acceptable to any number of significant figures ≥ 2, except where the mark scheme specifies otherwise.

Fractions These are only acceptable where specified.

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)(i)(ii) x = 40 mm / 4(.0) cm AND y = 19 mm / 1.9 cm
both with correct unit [1]

(iii) 40(.0) AND 19(.0) in first line of table [1]

(b) graph:
- axes both correctly labelled, right way round and with units [1]
- suitable scales [1]
- all plots correct to within ½ small square [1]
- good best-fit line judgement, single, thin, continuous line [1]

(c) triangle method using at least half candidate's line, shown on graph [1]

G = 0.41–0.52 (2–3 sig. figs. only) [1]

(d) **P** = 20–500 g [1]
Q = 2 × **P** (exactly) OR Q = **P**/G [1]

[Total: 10]

2 (a) θ_1 = 82 (°C) [1]

(b) (i) s, °C, °C [1]

(ii) 10, 20, 30, 40, 50, 60 [1]

(c)(i)(ii) $\Delta\theta_1$ = 39 (°C) AND $\Delta\theta_2$ = 8 (°C) [1]

(iii) temperature θ_2 at time t = 0 less than θ_1 [1]

(d) view thermometer at right angles [1]

(e) any one from:
- room temperature / other environmental factor
- volume / mass / quantity / amount of hot water
- initial temperature of the hot water
- initial temperature of the cold water
- initial temperature of the water [1]

[Total: 7]

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3 (a) (i) V_1 = 2(.0) (V) [1]
I_1 = 0.32 (A) [1]

(ii) R_1 = 6.25 (Ω) OR e.c.f. **(i)** AND correct units V, A, Ω in **(i)** and **(ii)** [1]

(b) correct arrangement of resistors [1]
correct position for voltmeter AND correct circuit symbols AND correct labelling of resistors **A**, **B** and **C** [1]

(c) (i) 3.0 / 3.04 / 3.043 (Ω) [1]

(ii) 2.1 / 2.05 / 2.06 / 2.07 / 2.08 OR e.c.f. AND no unit [1]

(d) statement matches results [1]
justification including the idea of within (or beyond) the limits of experimental accuracy [1]

[Total: 9]

4 (a)(i)(ii) ray-trace:
- normal drawn at centre of **MR** [1]
- incident ray at 30° (± 1°) [1]
- incident ray 8.0 cm long [1]

(b) P_1P_2 distance ⩾ 5 cm apart [1]

(c) (i) all lines correctly drawn AND all lines single, thin, continuous lines [1]

(ii) r = 27(°)–30(°) [1]

(d) any two from:
- ensure pins are vertical / view bases of pins
- pins far apart (or ⩾ 5 cm)
- thin lines / sharp pencil / thin pins [2]

(e) any one from:
- thickness of mirror / mirror glass silvered at back surface
- thickness of pins
- difficulty in lining up pins (and their images exactly) [1]

[Total: 9]

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5 **(a)** (human) reaction time [1]

(b) ruler or metre rule [1]
repeat for different diameters around the hole [1]

(c) any two from:
- size / mass / weight / volume / diameter / density of ball
- size of the sand grains / type of sand / nature of the sand
- dampness / depth of sand [2]

[Total: 5]

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