CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0625 PHYSICS

0625/63 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)** 22(.0) AND 88(.0) [1]

(b) units correct and consistent (symbols or words) [1]

(c) conclusion which matches the temperature changes [1]

(d) any two from: [2]
- volume / level of hot water
- initial temperature of hot water
- initial temperature of cold water
- same type of boiling tube
- room temperature / draughts / appropriate environmental condition

(e) any two improvements relating to apparatus: [2]
- lid on beaker
- insulation on beaker
- lid / cotton wool in boiling tube
- thinner / metal walls on tube
- all cold water in boiling tube below hot water level
- greater contact area of tube
- use of water bath

explanation matching first improvement, including: [1]
- reduces loss of thermal energy from beaker
- reduces loss of thermal energy from boiling tube
- better thermal conduction
- not affected by variation in hot water temperature

[Total: 8]

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2 **(a)** any one from: [1]
- clamp rule
- rule close to spring
- ensure rule vertical
- avoidance of parallax errors (explained)
- use of set square / fiducial aid

(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 straight line, single, thin, continuous line [1]

(c) value consistent with candidate's graph [1]

(d) **(i)** 8(.0) (cm) [1]

(ii) W = 1.4–1.7 (N) [1]
indication on graph which matches candidate's value [1]

(e) any one from: [1]
- data only to 2 sig. figs.
- cannot plot / read graph to that level of accuracy
- cannot read rule to that level of accuracy

[Total 10]

3 **(a)** **(i)** correct symbol for variable resistor AND ammeter [1]
correctly shown in series [1]

(ii) any one from: [1]
- distance between fan and blades
- length / area / width of blades / same blades
- direction / height of fan
- height of blades

(b) any two from: [2]
- length of blades
- width of blades
- number of blades
- mass of blades
- pitch / angle of blades
- angle of turbine

[Total: 5]

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4 **(a)** correct symbol for voltmeter AND shown connected in parallel [1]

(b) 3(.0)(V) AND 0.38(A) [1]

(c) arrows showing 2.8–3.0 V AND 0.76–0.78 A [1]

(d) R_1 = 7.9 (OR e.c.f.), R_2 = 3.8, R_3 = 2.7 [1]
correct unit (symbol or word) [1]
consistently 2 sig. figs. OR consistently 3 sig. figs. [1]

(e) **(i)** statement matches results with any relevant values quoted [1]
justification matching statement [1]

(ii) R_3 should be $^1/_3 \times R_1$ owtte [1]

[Total: 9]

5 **(a)** normal correct, through **N** [1]

(b) **(i)** line in correct place, **F**, labelled AND line and normal both thin, continuous and straight lines [1]

(ii)(iii) one measurement of *a* or *b* correct (*a* = 7.3, *b* = 4.1–4.2) AND unit of cm or mm [1]
both measurements correct AND unit of cm or mm [1]

(c) 1.7–1.8 AND no unit [1]

(d) any one from: [1]
- ensure pins are vertical / view bases of pins
- pins far apart (or > 5 cm)
- thin lines / sharp pencil / thin pins
- view from small angle (to normal)

(e) less reliable AND reference to smaller block depth owtte [1]
measuring smaller lengths gives greater (%) uncertainties owtte [1]

[Total: 8]

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