CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0625 PHYSICS

0625/61 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)** x = 1.4 (cm) or 14 (mm) or 0.014 (m)
AND y = 2.6 (cm) or 26 (mm) or 0.026 (m) [1]

correct unit for x and y [1]

(b) X and Y both 10 × x and y, ecf **(a)** [1]

W = 1.08 (N), to 2 or more significant figures (ecf allowed) [1]

(c) sensible position indicated for Z, between pivot and centre of rule [1]

(d) statement matches results
(expect Yes, ecf from **(b)** only if difference >10%) [1]

justified with reference to results; must include idea of being close enough to be within limits of experimental accuracy, ecf **(b)** [1]

(e) difficulty in achieving balance OR difficulty in positioning load exactly, e.g. load covers rule markings or uncertainty about position of centre of mass of load [1]

[Total: 8]

2 **(a)** 85 (recorded in table) [1]

(b) s, °C [1]

(c) Graph:
- axes correctly labelled, right way round and with units [1]
- suitable scales, plots occupying at least half grid in both directions [1]
- all plots correct to within ½ small square [1]
- good best-fit line judgement [1]
- single, thin, continuous line [1]

(d) **(i)** decreases owtte, no ecf [1]

(ii) statement justified by reference to the graph [1]

[Total: 9]

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3 (a) (i) $V = 1.8$ [1]

$I = 0.25$ AND both units correct, V and A [1]

(ii) R_S calculated correctly, e.c.f. **(i)**, expect 7.2 (Ω) [1]

(b) (i) lamps in parallel and ammeter in a correct position [1]

voltmeter in correct position, with rest of circuit and symbols correct [1]

(ii)(iii) $R_P = 3.3$ or 3.33 with unit Ω and 2 or 3 significant figures AND R_S/R_P calculated [1]

(c) (i) voltage or p.d., accept current [1]

(ii) adjust power supply OR add resistor / variable resistor [1]

[Total: 8]

4 (a) (i) normal at centre of AB and through block [1]

(ii) GH parallel to AB AND 6 cm ± 2 mm above AB [1]

(iii) $i = 30° \pm 2°$ to left of normal [1]

(b) P_1P_2 distance ≥ 5.0 cm [1]

(c) line KE correct, single and straight, emergent ray through P_3 and P_4 [1]

(d) $a = 3.3 – 3.7$ (cm); $b = 6.8 – 7.2$ (cm); $c = 4.0 – 4.4$ (cm); $d = 1.4 – 1.8$ (cm) [1]

n in range 1.2–1.5, no unit, 2 or 3 significant figures [1]

(e) any one from:
- large pin separation
- ensure pins are vertical
- view bases of pins
- drawing thin lines / use a sharp pencil
- use thin pins [1]

(f) ray box near start of incident ray or anywhere on incident ray; pointing in correct direction [1]

[Total: 9]

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5 **(a)** use of $T^2 = 4\,s^2$ [1]

correct method shown clearly on graph [1]

l = 0.99 (m) cao OR ecf 0.49 if $T^2 = 2\,s^2$ used [1]

(b) reduce (percentage) uncertainty OR reduce (the effect of) error due to starting/stopping [1]

(c) **(i)** 5 – 10 [1]

(ii) minimum not less than 10 g; maximum not more than 1000 g; maximum must be at least double the minimum [1]

[Total: 6]

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