CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0625 PHYSICS

0625/51 Paper 5 (Practical Test), 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.

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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 (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)(i)(ii) mark recorded between 85 and 60 cm, with matching x value [1]

(iii) y value < 40 cm, x and y with correct unit [1]

(iv) W correct (N) [1]

(b) (i) sensible position for X [1]

(ii)–(iv) $a = x + 5$; $b = 10 \pm 4$; $c = y$ [1]

(v)–(vii) $cW = (aP - bQ) \pm 10\%$ [1]

correct unit: N cm [1]

(c) statement matches results (expect YES, owtte) [1]

justified with reference to results; must include the idea of being close enough to be within limits of experimental accuracy [1]

(d) difficulty in achieving balance OR difficulty in positioning load in correct position due to markings being covered by the load [1]

[Total: 10]

2 (a) (i) sensible value for θ [1]

(ii) Table:
temperatures decreasing with final difference not more than first difference [1]

evidence of temperatures to 1 °C or better [1]

(b) 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]

(c) (i) statement to match graph line [1]

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

[Total: 10]

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3 **(a)** **(i)** V to at least 1 dp and < 4 V [1]

I to at least 2 dp and < 1 A [1]

(ii) R_S calculated correctly [1]

(b) lamps in parallel [1]

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

(c) **(i)** V and I recorded with correct units with correct PD, current and resistance units [1]

(ii) R_P to 2 or 3 significant figures [1]

(iii) R_S / R_P ratio calculated correctly and > 1 [1]

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

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

[Total: 10]

4 Ray-trace:

- normal at 90º and in correct position [1]
- first angle of incidence = 30º ± 1º and GH in correct position ± 2 mm [1]
- all lines present and neat, both sets, in approximately the correct positions [1]
- first P_1P_2 distance ⩾ 5 cm [1]

(h) a and b correct to ± 2 mm [1]

c and d correct to ± 2 mm and correct unit [1]

(i) n correct, no unit, 2 or 3 significant figures [1]

(j) complete set of sensible readings [1]

both n values 1.4 – 1.6 [1]

(k) 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]

[Total: 10]

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