

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0625 PHYSICS

0625/62

Paper 6 (Alternative to Practical), 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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0625	62

- 1 (a) (i) $h = 2.5$, $w = 2.7$, and $d = 2.7$ [1]
- (ii) $V_A = 18.225 \text{ (cm}^3\text{)}$ to 2 or more sig. figs. ecf (i) [1]
- (iii) density = 3.22 g/cm^3 to 2 or 3 sig. figs. ecf (ii) [1]
unit needed, penalise additional sig. figs.
- (b) diagram showing blocks and rule correctly used – blocks touching the sphere, and rule spanning gap and touching blocks [1]
- (c) (i) $V_1 = 66 \text{ (cm}^3\text{)}$ [1]
- (ii) line of sight at right angles to measuring cylinder [1]
- (d) $V_B = 18 \text{ (cm}^3\text{)}$ ecf from candidate's V_1 [1]
- (e) any two from:
measuring cylinder not sensitive owtte
some clay left on fingers
cube not perfectly shaped/difficult to measure owtte
air bubbles clinging to modelling clay/within the modelling clay
volume of string
difficult to judge the bottom of the meniscus/bubble on meniscus [2]
ignore parallax
do not credit poor experimental practice e.g. spills or splashes

[Total: 9]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0625	62

- 2 (a) 19 (°C) cao [1]
- (b) table:
 cm³, °C [1]
 NOT C°, centigrade
- correct V values 10, 20, 30, 40, 50 [1]
- (c) lid/insulation/polystyrene cup/minimal time delay [1]
- (d) $R_1 = 2.(00)$ $R_2 = 1.4(3)$ [1]
 note: do not give the mark if using incorrect stopwatch reading e.g. 35.5 rather than 35.05
- cm³/s [1]
- (e) rate/flow is not constant [1]
- (f) any two from:
 room temperature/air conditioning
 initial/hot water temperature
 volume/quantity/amount of hot water
 cold water temperature
 intervals/time between adding volumes of water [2]
 ignore draughts/humidity/pressure

[Total: 9]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0625	62

- 3 (a) all units correct: m, V, A, Ω – symbols and/or words [1]
- (b) graph:
 axes correctly labelled and correct orientation [1]
 suitable scales, plots using more than half available axes [1]
 all plots correct to $\frac{1}{2}$ small square [1]
 good line judgement, thin, continuous, [1]
 note: do not allow 'blobs' greater than half square diameter
- (c) triangle method shown on graph [1]
 note: do not allow use of y/x if graph does not go to origin
- G using large triangle / half of candidate's line used [1]
 note: second mark can be given from coordinates used in equation if nothing shown on graph
- (d) R_1 value to 2 or 3 significant figures – ignore unit [1]
 note: this mark does not depend on actual value being correct
- R_1 in range 5.8 to 6.2 Ω
 OR accept $R_1 = G$ value if outside tolerance [1]
- [Total: 9]**
- 4 (a) refracted ray in correct position and at $20^\circ \pm 1$ [1]
- (b) emergent ray in correct position and approximately parallel with incident ray [1]
 note: allow a 3° tolerance
- all lines present and neat [1]
- (c) (i) P_3P_4 distance far apart, at least 5.0 cm [1]
- (ii) any two from:
 viewing bases of pins / ensure that pins are vertical/not bent
 large pin separations
 use of repeats
 use of thin pencil lines (or equivalent comment)
 close one eye (when aligning pins)
 use thin/sharp pins [2]
 ignore parallax error
 NOT dark room
- (d) idea of within / beyond limits of experimental accuracy [1]
- [Total: 7]**

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0625	62

- 5 (a) tape measure [1]
- (b) (i) symbols for ammeter, voltmeter and resistor (for copper wire) correct [1]
 note: accept in wrong places for this mark
- variable resistor or potential divider present with symbol [1]
 NOT if labelled “copper wire”
- ammeter in series and voltmeter in parallel with copper wire/resistor [1]
 note: do NOT award this mark if there is no power supply
- (ii) observe current shown on ammeter (ignore any reference to a voltmeter) [1]
 accept change variable resistor/use rheostat (to see if it then glows)
 accept ‘change current’ as meaning changing variable resistor
 ignore checking wires or changing power supply or use of a voltmeter
 accept connect lamp directly across supply
- (iii) no, deflection too small/range too large (owtte) [1]
 accept ‘scale’ for range
 accept suggestion of alternative maximum meter
 accept readings not precise enough/sensitivity not sufficient;
 accept accurate for precision, ignore misuse of ‘reliable’
 ignore ‘circuit voltage not large enough’

[Total: 6]