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

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1 (a) (i) $h = 2.5$, $w = 2.7$, and $d = 2.7$ [1]

(ii) $V_A = 18.225$ (cm^3) to 2 or more sig. figs. ecf **(i)** [1]

(iii) density = 3.22 $\underline{g/cm^3}$ 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) $V_1 = 66$ (cm^3) [1]

(ii) line of sight at right angles to measuring cylinder [1]

(d) $V_B = 18$ (cm^3) 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]

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2 **(a)** 19 (°C) cao [1]

(b) table:
cm^3, °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

cm^3 / 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]

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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 ½ 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°±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]

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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]

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