CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0625 PHYSICS

0625/53 Paper 5 (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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1 **(a)** $m < 250$ [1]
V_1 value = m [1]
unit cm^3 [1]

(b) V_2 within 10% of V_1 [1]

(c) d_1, d_2, h all present and $d_1 > d_2$ [1]
D calculation correct to at least 1 d.p. [1]
V_3 calculated correctly and > V_1 and V_2 and 2 or 3 significant figures only [1]

(d) method 2 – any one from:
some water left in cup/spilt
measuring cylinder not read at eye level/perpendicularly/bottom of meniscus
parallax explained [1]

method 3 – any one from:
d_1 not at liquid level
d_1 and d_2 not inside diameters
difficult to measure h (because of sloping side)
h not measured at eye level/perpendicularly/parallax explained [1]

(e) mass of cup / zero reading on balance [1]

[Total: 10]

2 **(a)** units correct (symbols or words) [1]
times correct (0, 30, 60, 90,120,150,180) [1]
θ beaker **A** and θ beaker **B** decreasing [1]
θ to at least 1°C [1]
smaller/same change in 180 s in beaker **B** compared to **A** [1]

(b) statement matching temperature changes (accept 'no significant difference' if justified)
and justification matching statement (comparison of temperature changes) [1]
including specific mention of temperature change in same time [1]

(c) appropriate condition relating to comparison, any one from:
same size/thickness of beaker
same volume of water
same initial temperature
same room temperature / appropriate environmental condition
same time for cooling [1]

(d) any sensible alteration e.g.:
put lid on/cover top of **A**
extra experiment without insulation or lid / take lid off **B** [1]

matching explanation e.g.:
most thermal energy loss by convection o.w.t.t.e.
have only changed one factor o.w.t.t.e. [1]

[Total: 10]

3 **(a)** potential differences all < 2.5 V and to at least 1 d.p. [1]
currents all < 1.50 A and to at least 2 d.p. [1]

(b) axes labelled, with units [1]
appropriate scales (plots occupying at least ½ grid) [1]
plots correct to ½ square [1]
best-fit line and thin, neat line, neat plots [1]

(c) **(i)** triangle method seen on graph [1]
large triangle (at least 1/2 candidate's line) [1]

(ii) $R = M$ and < 2.0 [1]
2 or 3 significant figures and unit Ω (symbol or word) [1]

[Total: 10]

4 **(a)** **(i)** ray trace:
normal correct [1]
CD at 20° within1° and equivalent reflected line in correct place [1]
CD at 30° within 1° and equivalent reflected line in correct place [1]
all lines thin and neat [1]
$P_1 – P_2$ pin separation at least 5 cm [1]

table:
$\theta = 40^\circ$ and 60° within 2° (e.c.f. from candidate's α) [1]

(j) definite statement matching results (expect YES but allow e.c.f. if difference >10%)
and justification matching statement
(expect 'within the range of experimental accuracy' o.w.t.t.e.) [1]
values from results shown/used (correctly w.r.t. statement) [1]

(k) any two suitable precautions:
thin lines / fine pencil
view protractor perpendicularly / parallax explained
lines through centre of pin holes
pins well separated
pins vertical/not bent/viewed at base
place mirror so that reflecting surface is on line o.w.t.t.e. [2]

[Total: 10]