CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0625 PHYSICS

0625/23   Paper 2 (Core Theory), maximum raw mark 80

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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NOTES ABOUT MARK SCHEME SYMBOLS & OTHER MATTERS

B marks   are independent marks, which do not depend on any other marks. For a B mark to be scored, the point to which it refers must actually be seen in the candidate's answer.

M marks   are method marks upon which accuracy marks (A marks) later depend. For an M mark to be scored, the point to which it refers **must** be seen in a candidate's answer. If a candidate fails to score a particular M mark, then none of the dependent A marks can be scored.

C marks   are compensatory method marks which can be scored even if the points to which they refer are not written down by the candidate, provided subsequent working gives evidence that they must have known it. e.g. if an equation carries a C mark and the candidate does not write down the actual equation but does correct working which shows he knew the equation, then the C mark is scored.

A marks   are accuracy or answer marks which either depend on an M mark, or which are one of the ways which allow a C mark to be scored.

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."

e.e.o.o.   means "each error or omission".

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 (J) means that the mark is scored for 10, regardless of the unit given.

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 marks.

o.w.t.t.e.   means "or words to that effect".

Spelling   Be generous about spelling and use of English. If an answer can be understood to mean what we want, give credit.

Significant figures

     Answers are acceptable to any number of significant figures $\geqslant 2$, except if specified otherwise, or if only 1 significant figure is appropriate.

Units   Incorrect units are not penalised, except where specified. More commonly, marks are allocated for specific units.

Fractions   These are only acceptable where specified.

Extras   Ignore extras in answers if they are irrelevant; if they contradict an otherwise correct response or are forbidden by mark scheme, use right + wrong = 0

Ignore   Indicates that something which is not correct is disregarded and does not cause a right plus wrong penalty.

Not/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.

Work which has been crossed out, but not replaced, should be marked as if it had not been crossed out.

1 (a) 54 (s)   B1

(b) (Speed =) distance / time in any form   C1

     405 / 54   C1

     7.5   A1

     m/s   B1

(c) (i) greater than at y   B1

     (ii) greater than average speed   B1   [7]

2

	shape	molecular arrangement	
(a) solid	fixed	fixed position	B2
(b) liquid	fill from bottom		B1
(c) gas		move around, far apart	B1

     [4]

3 <u>renewable</u>

     any 2 from hydroelectricity, solar, tidal, wind   B2

     <u>non-renewable</u>

     any two from coal, oil, nuclear   B2   [4]

     If more than two boxes ticked in a column –1 for each error

4 (a) (i) 34 (cm^3)   C1
34 (cm^3)   C1
42 (cm^3)   C1
8 (cm^3)   A1

(ii) 1. balance (accept spring balance) OR newtonmeter
OR scale**s** NOT scale   B1
2. $D = M/V$ in any form   C1
21.2 / his 8   C1
2.65 e.c.f.   A1
g / cm^3 B1

(b) (i) rule(r) OR <u>vernier/digital</u> calipers IGNORE just calipers   B1

(ii) measure diameter / radius / c.s.a.   B1
use cylinder formula (need not be quoted) to calculate   B1
OR
measure mass   B1
use density from (a) in $V = M/D$ B1 [11]

5 (a) (i) <u>angle</u> of reflection   B1

(ii) 1. 45(°)   B1
2. 45(°) with correct ° symbol at least once   B1

(iii) ray shown in correct position, by eye   B1

(b) mirror shown perpendicular to reflected ray, by eye   B1 [5]

6 (a) (i) conduction   B1

(ii) convection   B1

(b) idea of heat lost at same rate as heat supplied   B1

(c) (i) boiling   B1

(ii) steam   B1 [5]

7 (a) reflection / sound coming back / sound heard for 2nd time   M1
off <u>an</u> object   A1

(b) DIAGRAM
source of sound and large obstacle   B1
distance shown as $\geqslant$ 150 m   B1
DESCRIPTION
make (loud) sound and listen   B1

(c) (i) distance between source of sound and obstacle
NOT just "distance"   B1
time between making sound and hearing echo
NOT just "time"   B1

     (ii) speed = distance/time   B1
clear that "there and back" has been taken into account   B1   [9]

8 (a) conventional circuit diagram with two lamps in parallel   B1
switch in correct position alongside power supply   B1
correct symbols for lamps and switch used   B1

(b) $V = IR$ in any form OR V/I C1
12 / 1.6   C1
7.5   A1
ohm(s) OR Ω B1

(c) L_2 has blown, however expressed
OR L_2 is loose   NOT L_2 is missing/stolen/fallen out   B1

(d) (i) blows   B1

     (ii) nothing / doesn't light / off
NOT turns off   B1

     (iii) nothing / doesn't light / off
NOT turns off   B1   [11]

9 **(a)** N S N   B1

   (b) **(i)**

	switch closed	switch open	
soft iron	magnetised	loses its magnetism	both B1
steel	magnetised	keeps its magnetism	both B1

     (ii) attractive force   B1

    (iii) the one with the soft iron core OR L.H.one   B1

    (iv) can be switched on & off OR can be stronger   B1   [6]

10 **(a)** rub / rubbing   M1
        with dry cloth   A1

   (b) **(i)** negative OR –   B1

     (ii) opposite charges attract   B1

   (c) horizontal arrow to L, starting or ending on sphere   B1

   (d) swings / moves away / to R OR idea of repulsion   B1   [6]

11 **(a)** neutron 0   2000 m B2
        proton +1   2000 m B2

   (b) 92   B1
        146   B1
        92   no e.c.f.   B1   [7]

12 (a) 37.5 ± 0.4 s   B1

(b) 3   B1

(c) his(a) / his(b)   C1
    in range 12 to 13   OR   his value calculated correctly   A1

(d) curve above existing line at all points and roughly parallel   B1   [5]