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

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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.

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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

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4	**(a)**	**(i)**	34 (cm^3)	C1	
			42 (cm^3)	C1	
			8 (cm^3)	A1	
		(ii)	**1.** balance (accept spring balance) OR newtonmeter OR scales 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 vernier/digital 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)**	angle 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]

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7 **(a)** reflection / sound coming back / sound heard for 2nd time — M1
off an object — A1

(b) DIAGRAM
source of sound and large obstacle — B1
distance shown as ⩾ 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]

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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]

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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]

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