UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

0625 PHYSICS

0625/22 Paper 2 (Core Theory), maximum raw mark 80

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

UNIVERSITY of CAMBRIDGE
International Examinations

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.

Significant figures Answers are acceptable to any number of significant figures ≥ 2, except if specified otherwise, or if only 1 sig. fig. 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.

1	**(a)**	water	B1	
	(b)	volume (of water) OR water level	B1	
	(c)	(the) stone	B1	
	(d)	volume (of water) e.c.f. from 2.	B1	
	(e)	subtracting 1st volume from 2nd volume (however expressed)	M1 A1	[6]
2	**(a)**	conduction	B1	
	(b)	conduction convection	B1 B1	
	(c)	radiation	B1	[4]
3		energy OR heat OR radiation OR IR ignore light from Sun heats water OR generates electricity	B1 B1 B1	[3]
4	**(a)** **(i)**	15 (m/s)	B1	
	(ii)	0 (m/s)	B1	
	(b) **(i)**	increasing OR accelerating	B1	
	(ii)	constant OR nothing	B1	
	(iii)	decreasing OR decelerating (however expressed)	B1	
	(c)	area of triangle OR area under graph OR appropriate equation of motion ½ × 30 × 5 75 (m)	C1 C1 A1	
	(d)	speed = distance/time in any form, letters, words, numbers 750/30 25 (m/s)	C1 C1 A1	[11]

5	**(a)**	**(i)**	X at correct distance behind mirror (by eye)	B1	
			X at same height as girl's eye (by eye)	B1	
		(ii)	line drawn from eye to bottom of mirror	M1	
			line at same angle as above (by eye) drawn from mirror to girl	A1	
			part from where line meets body down to floor, clearly indicated	B1	
	(b)		reflected portions of both first two waves starting where incoming portions meet harbour wall	B1	
			reflected portions parallel (by eye)	B1	
			reflected portions both at correct angle to wall (by eye)	B1	
			(if any extra waves shown –1 for each one incorrect)		[8]
6	**(a)**	**(i)**	increases	B1	
		(ii)	increases	B1	
		(iii)	decreases	B1	
	(b)		to allow for expansion (of concrete) OR to allow for contraction (of concrete) OR to avoid concrete cracking	M1	
			reference to temperature change/summer	A1	[5]
7	**(a)**		charge(s) OR electron(s) moving/flowing	M1 A1	
	(b)	**(i)**	conductor(s)	B1	
		(ii)	metal or any named metal	B1	
	(c)	**(i)**	insulator(s) ignore bad conductors	B1	
		(ii)	any sensible example of an insulating material	B1	[6]

8	**(a)**	series	B1	
	(b) **(i)**	anticlockwise current clearly indicated	B1	
	(ii)	voltmeter connected across R only	B1	
	(c) **(i)**	rheostat OR <u>variable</u> resistor	M1	
	(ii)	change resistance/current	A1	
	(d) **(i)**	1.5 (A)	B1	
	(ii)	R = V/I in any form 6/1.5 e.c.f. **(i)** 4 e.c.f. **(i)** Ω OR ohm(s)	C1 C1 A1 B1	
	(e)	battery OR cell	B1	[11]
9	**(a)**	can be switched off can be made (very) strong/variable	B1 B1	
	(b)	1000 turns AND iron core AND 3A –1 e.e.o.o.	B2	[4]
10	**(a)**	electromagnetic short OR small	B1 B1	
	(b)	film OR photograph OR charge coupled device (CCD)	B1	
	(c)	(highly) absorbed/stopped by bone NOT deflected/reflected little/no absorption by flesh OR penetrates/passes through flesh	B1 B1	
	(d)	photographic film badges behind screen when operating X-ray machine protective clothing minimise exposure } any 1	B1	[6]

11 **(a)** S_1 B1

(b) **(i)** current B1
filament hot B1
electrons gain energy C1
electrons gain enough energy to overcome forces/break free A1

(ii) thermionic emission B1

(c) anode becomes positive B1
anode attracts electrons B1
electrons travel/move across tube (to anode) B1 [9]

12 **(a)** would be stopped by carton/air B1

(b) would be unaffected/little affected (by carton/contents) B1

(c) strontium(-90) M1
idea of effectively constant strength
OR barium-139 would decay too quickly A1

(d) more B1
200 B1
more B1 [7]