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.

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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.

<u>underlining</u> indicates that this <u>must</u> 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.

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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]

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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) M1
OR to avoid concrete cracking
reference to temperature change/summer A1 [5]

7 **(a)** charge(s) OR electron(s) M1
moving/flowing 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 <u>material</u> B1 [6]

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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 C1
6/1.5 e.c.f. **(i)** C1
4 e.c.f. **(i)** A1
Ω OR ohm(s) B1

(e) battery OR cell B1 [11]

9 **(a)** can be switched off B1
can be made (very) strong/variable B1

(b) 1000 turns AND iron core AND 3A –1 e.e.o.o. B2 [4]

10 **(a)** electromagnetic B1
short OR small B1

(b) film OR photograph OR charge coupled device (CCD) B1

(c) (highly) absorbed/stopped by bone NOT deflected/reflected B1
little/no absorption by flesh OR penetrates/passes through flesh B1

(d) photographic film badges
behind screen when operating X-ray machine
protective clothing
minimise exposure
} any 1 B1 [6]

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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]

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