

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**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.
- 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  $\geq 2$ , 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
- (b) volume (of water) OR water level B1
- (c) (the) stone B1
- (d) volume (of water) e.c.f. from 2. B1
- (e) subtracting M1  
1st volume from 2nd volume (however expressed) A1 [6]
- 2 (a) conduction B1
- (b) conduction B1  
convection B1
- (c) radiation B1 [4]
- 3 energy OR heat OR radiation OR IR ignore light B1  
from Sun B1  
heats water OR generates electricity 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 C1  
 $\frac{1}{2} \times 30 \times 5$  C1  
75 (m) A1
- (d) speed = distance/time in any form, letters, words, numbers C1  
750/30 C1  
25 (m/s) A1 [11]

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- 5 (a) (i)** X at correct distance behind mirror (by eye)  
X at same height as girl's eye (by eye)
- (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 material B1 [6]

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- 8 (a) series
- (b) (i) anticlockwise current clearly indicated B1  
(ii) voltmeter connected across R only B1
- (c) (i) rheostat OR variable 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  
 $\Omega$  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 } any 1  
protective clothing }  
minimise exposure } B1

[6]

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- 11 (a) S<sub>1</sub>
- (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]