

**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.

|        |                                |          |       |
|--------|--------------------------------|----------|-------|
| Page 2 | Mark Scheme: Teachers' version | Syllabus | Paper |
|        | IGCSE – May/June 2011          | 0625     | 22    |

## 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 <b>must</b> 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 <b>only</b> 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 $\geq 2$ , 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.   |

| Page 3 | Mark Scheme: Teachers' version | Syllabus | Paper |
|--------|--------------------------------|----------|-------|
|        | IGCSE – May/June 2011          | 0625     | 22    |

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

| Page 4 | Mark Scheme: Teachers' version | Syllabus | Paper |
|--------|--------------------------------|----------|-------|
|        | IGCSE – May/June 2011          | 0625     | 22    |

|  |  |  |     |  |
|--|--|--|-----|--|
| <b>5</b>   | <b>(a) (i)</b>   | X at correct distance behind mirror (by eye)                   | B1  |  |
|  |  | X at same height as girl's eye (by eye)                        | B1  |  |
|  | <b>(ii)</b>  | 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>(b)</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] |  |
| <b>6</b>   | <b>(a)</b>   | <b>(i)</b> increases   | B1  |  |
|  |  | <b>(ii)</b> increases  | B1  |  |
|  |  | <b>(iii)</b> decreases   | B1  |  |
| <b>(b)</b>   | to allow for expansion (of concrete)<br>OR to allow for contraction (of concrete)<br>OR to avoid concrete cracking<br>reference to temperature change/summer | M1   |     |  |
|  |  | A1   | [5] |  |
| <b>7</b>   | <b>(a)</b>   | charge(s) OR electron(s)<br>moving/flowing                     | M1  |  |
|  |  |  | A1  |  |
| <b>(b)</b>   | <b>(i)</b> conductor(s)  | B1   |     |  |
|  | <b>(ii)</b> metal or any named metal   | B1   |     |  |
| <b>(c)</b>   | <b>(i)</b> insulator(s) ignore bad conductors  | B1   |     |  |
|  | <b>(ii)</b> any sensible example of an insulating <u>material</u>  | B1   | [6] |  |

| Page 5 | Mark Scheme: Teachers' version | Syllabus | Paper |
|--------|--------------------------------|----------|-------|
|        | IGCSE – May/June 2011          | 0625     | 22    |

- 8 (a) series B1
- (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]

| Page 6 | Mark Scheme: Teachers' version | Syllabus | Paper |
|--------|--------------------------------|----------|-------|
|        | IGCSE – May/June 2011          | 0625     | 22    |

|   |  |    |     |
|---|--|----|-----|
| <b>11 (a)</b> S <sub>1</sub>  |  | B1 |     |
| <b>(b) (i)</b> current  |  | B1 |     |
| filament hot  |  | B1 |     |
| electrons gain energy   |  | C1 |     |
| electrons gain enough energy to overcome forces/break free          |  | A1 |     |
| <b>(ii)</b> thermionic emission                                     |  | B1 |     |
| <b>(c)</b> anode becomes positive                                   |  | B1 |     |
| anode attracts electrons  |  | B1 |     |
| electrons travel/move across tube (to anode)                        |  | B1 | [9] |
| <b>12 (a)</b> would be stopped by carton/air                        |  | B1 |     |
| <b>(b)</b> would be unaffected/little affected (by carton/contents) |  | B1 |     |
| <b>(c)</b> strontium(-90)   |  | M1 |     |
| idea of effectively constant strength                               |  |    |     |
| OR barium-139 would decay too quickly                               |  | A1 |     |
| <b>(d)</b> more   |  | B1 |     |
| 200   |  | B1 |     |
| more  |  | B1 | [7] |