

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

**MARK SCHEME for the November 2004 question paper**

**0625 PHYSICS**

**0625/02**

**Paper 2 (Theory), maximum mark 80**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.



**Grade thresholds** taken for Syllabus 0625 (Physics) in the November 2004 examination.

|             | maximum mark available | minimum mark required for grade: |    |    |    |
|-------------|------------------------|----------------------------------|----|----|----|
|             |                        | A                                | C  | E  | F  |
| Component 2 | 80                     | N/A                              | 55 | 47 | 40 |

The threshold (minimum mark) for B is set halfway between those for Grades A and C.  
The threshold (minimum mark) for D is set halfway between those for Grades C and E.  
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grade A\* does not exist at the level of an individual component.

November 2004

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK: 80**

**SYLLABUS/COMPONENT: 0625/02**

**PHYSICS**  
**Theory**



|        |                       |          |       |
|--------|-----------------------|----------|-------|
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| Question                                       | Scheme   | Target Grade | Mark      |
|--|--|--------------|-----------|
| 1 (a)  | 96   | F            | B1        |
|  | (b) top left eye circled   | F            | B1        |
|  | (c) 100 – 96 e.c.f.  | F            | C1        |
|  | 4 e.c.f.   | F            | C1        |
|  | 4/80 e.c.f.  | F            | C1        |
|  | 0.05 e.c.f.  | F            | <u>A1</u> |
|  |  |              | <u>6</u>  |
| 2 (a)  | (i) 21   | F            | B1        |
|  | (ii) 1 increases   | F            | B1        |
|  | 2 falls )  | F            | B1        |
|  | ) both e.c.f.  |              |           |
|  | 3 rises )  |              |           |
|  | (b) (i) same   | C            | B1        |
| (ii) greater (accept comparison of directions) | C  | <u>B1</u>    |           |
|  |  |              | <u>5</u>  |
| 3 (a)  | (i) 0.6 x 0.5 x 0.2  | F            | C1        |
|  | 0.06   | F            | A1        |
|  | m <sup>3</sup>   | C            | B1        |
|  | (ii) mass/volume   | F            | C1        |
|  | 7.2/his(i)   | F            | C1        |
|  | 120 e.c.f.   | F            | A1        |
|  | kg/m <sup>3</sup>  | C            | B1        |
|  | (b) (i) "greater than" ticked  | C            | B1        |
|  | (ii) Because of the air in the corrugated cardboard  | C            | <u>B1</u> |
|  |  |              |           |
| 4 (a)  | (i) chemical )<br>internal OR heat OR thermal ) any 2<br>but also accept )<br>nuclear OR kinetic OR potential for <b>one</b> of the<br>marks | 2F           | B1,<br>B1 |
|  | (ii) radiation   | F            | B1        |
|  | (b) (i) K.E. OR kinetic OR motion  | C            | B1        |
|  | (ii) conduction  | F            | B1        |
|  | (iii) 1 gravitational OR P.E. OR potential OR<br>position  | F            | B1        |
|  | 2 chemical/fuel/food   | C            | <u>B1</u> |
|  |  |              |           |

| Page 2 | Mark Scheme           | Syllabus | Paper |
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|  |                 |   |  |                          |
|--|-----------------|---|--|--------------------------|
| <b>5</b>   | <b>(a)</b>      | bright specks OR (smoke) particles OR dots<br>NOT molecules, NOT air particles  | F  | <b>B1</b>                |
|  |                 | something moving (however expressed)  | F  | <b>M1</b>                |
|  |                 | rapidly OR randomly OR zig-zag  | F  | <b>A1</b>                |
|  | <b>(b)</b>      | air molecules OR air particles (NOT just “air”)   | C  | <b>M1</b>                |
|  |                 | collisions between smoke particles and air<br>mols/particles  | C  | <b>A1</b>                |
|  |                 | invisible )<br>fast moving ) any 2<br>random )  | 2C   | <b>B1,<br/>B1</b>        |
|  | <b>(c)</b>      | Idea of faster movement or more jerky movement  | F  | <b><u>B1</u></b>         |
| <b><u>8</u></b>  |                 |   |  |                          |
| <b>6</b>   | <b>(a)</b>      | aluminum  | F  | <b>B1</b>                |
|  |                 | copper  | F  | <b>B1</b>                |
|  |                 | gold  | F  | <b>B1</b>                |
|  | <b>(b)</b>      | insulator NOT non-conductor   | F  | <b>B1</b>                |
|  | <b>(c)</b>      | <b>(i)</b> copper OR aluminum OR gold   | F  | <b>B1</b>                |
|  |                 | <b>(ii)</b> any of the insulators   | F  | <b>B1</b>                |
|  | <b>(d)</b>      | convection  | F  | <b>B1</b>                |
|  | <b>(e)</b>      | intelligent mention of convection currents<br>(accept “to make sure always covered by water”<br>NOT “heat rises”)         | C  | <b><u>B1</u></b>         |
|  | <b><u>8</u></b> |   |  |                          |
|  | <b>7</b>        | <b>(a)</b>  | <b>(i)</b> speed = distance/time in any form | F                        |
| correct substitution in his equation OR 1600/5<br>320 c.a.o. |                 |   | F  | <b>C1</b>                |
|  |                 |   | F  | <b>A1</b>                |
| <b>(ii)</b>  |                 | light travels instantaneously/very fast OR<br>reference to reaction time<br>NOT just faster than sound                    | C  | <b>B1</b>                |
|  |                 | <b>(b)</b> explosion heard sooner/less than 5s )<br>second sound/echo/reflection (from ) any 2<br>rock face )<br>louder ) | 2C   | <b>B1,<br/><u>B1</u></b> |
| <b><u>6</u></b>  |                 |   |  |                          |

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|            |            |  |   |             |                  |           |
|------------|------------|--|---|-------------|------------------|-----------|
| <b>8</b>   |            | repulsion  | F   | B1          |                  |           |
|            |            | repulsion  | F   | B1          |                  |           |
|            |            | attraction   | F   | B1          |                  |           |
|            |            | attraction   | C   | B1          |                  |           |
|            |            | attraction   | C   | <u>B1</u>   |                  |           |
|            |            |  |   | <u>5</u>    |                  |           |
| <b>9</b>   | <b>(a)</b> | <b>(i)</b>   | 3 )<br>3 ) both                                   | F           | B1               |           |
|            |            | <b>(ii)</b>  | 10 + 10<br>20                                     | F           | C1<br>A1         |           |
|            | <b>(b)</b> | <b>(i)</b>   | 1   | 1.5A ticked | F                | B1        |
|            |            |  | 2   | 3A OR 3.0A  | C                | B1        |
|            |            | <b>(ii)</b>  | 5Ω  | ticked      | C                | <u>B1</u> |
|            |            |  |   |             |                  |           |
| <b>10</b>  | <b>(a)</b> |  | electrons   | F           | B1               |           |
|            |            |  | neutrons OR atoms                                 | F           | B1               |           |
|            | <b>(c)</b> |  | electrons   | F           | B1               |           |
|            |            |  | electrons   | F           | B1               |           |
|            | <b>(e)</b> |  | protons   | C           | B1               |           |
|            |            |  | neutrons  | C           | B1               |           |
|            | <b>(f)</b> |  | protons   | C           | B1               |           |
|            |            |  | neutrons  | C           | <u>B1</u>        |           |
|            |            |  |   | <u>8</u>    |                  |           |
| <b>11</b>  | <b>(a)</b> | <b>(i)</b>   | A or E  | F           | B1               |           |
|            |            | <b>(ii)</b>  | CE or AC or 2.5 cm                                | F           | B1               |           |
|            | <b>(b)</b> |  | real )<br>)                                       |             |                  |           |
|            |            |  | inverted ) mark in pairs using $\sqrt{x} + x = 0$ | 2f, 1C      | B1,<br>B1,<br>B1 |           |
|            |            |  | enlarged )  |             |                  |           |
| <b>(c)</b> |            | any ray from O' to I' refracting at mid-line of lens or refractions at both surfaces | F   | <u>B1</u>   |                  |           |
|            |            |  |   | <u>6</u>    |                  |           |

|               |                              |                 |              |
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|           |            |             |                             |          |                  |
|-----------|------------|-------------|-----------------------------|----------|------------------|
| <b>12</b> | <b>(a)</b> | <b>(i)</b>  | line from B to intersection | <b>F</b> | <b>B1</b>        |
|           |            | <b>(ii)</b> | dot at printed intersection | <b>F</b> | <b>B1</b>        |
|           | <b>(b)</b> |             | L.H. ornament               | <b>C</b> | <b>M1</b>        |
|           |            |             | lower C of M                | <b>C</b> | <b>A1</b>        |
|           | <b>(c)</b> |             | block A                     | <b>F</b> | <b>M1</b>        |
|           |            |             | narrower/smaller base       | <b>F</b> | <b><u>A1</u></b> |
|           |            |             |                             |          | <b><u>6</u></b>  |

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|        |                       |          |       |
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## NOTES ABOUT THE MARK SCHEME SYMBOLS

- B marks** are independent mark, 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 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.
- un.pen.** means "unit penalty". An otherwise correct answer will have one mark deducted if the unit is wrong or missing. This **only** applies where specifically stated in the mark scheme. Elsewhere, incorrect or missing units are condoned.
- OR/or** Indicates alternative answers, any one of which is satisfactory for scoring the marks.