

NOVEMBER 2001

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 80

SYLLABUS/COMPONENT : 0625/02

**PHYSICS
(CORE)**



| | | | |
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NOTES ABOUT MARK SCHEME SYMBOLS

- 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 allow a C mark to be scored.
- c.a.o. means "correct answer only"
- e.c.f. means "error carried forward" i.e. if a candidate has made an earlier mistake and has carried his incorrect value forward, 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 answer, 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 indicates alternative answers, any one of which is satisfactory for scoring the marks.

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| QUESTION | SCHEME | TARGET GRADE | MARK |
|---|---|--------------|----------|
| 1 (a) | 16 (cm) | F | B1 |
| | (b) 16/8 e.c.f. | C | C1 |
| | 2 (cm) e.c.f. | C | A1 |
| | | | 3 |
| 2 | wider base | F | B1 |
| | idea of lowering C of M (however expressed) | C | B1 |
| | e.g. heavier base, make it shorter | | |
| | | | 2 |
| 3 (a) | heat it | F | B1 |
| | (b) increases | F | B1 |
| | (c) any suitable example | F | B1 |
| | (d) any suitable example | C | B1 |
| | | | 4 |
| 4 (a) | ray refracted down | F | M1 |
| | parallel to incident ray (by eye) | C | A1 |
| | (b) (i) T.I.R. shown | C | M1 |
| | correct angle (by eye) if wrong but labelled 50°, then ✓ | C | A1 |
| | (ii) ray strikes surface at more than C.A. | C | A1 |
| | (c) straight on at first surface | F | M1 |
| | straight on at second surface | F | A1 |
| | | | 7 |
| 5 (a) | should be refraction at first surface (however expressed) | F | B1 |
| | should be dispersion at first surface (however expressed) | C | B1 |
| | (b) (i) thermometer / thermocouple / bolometer / hand / | F | B1 |
| | thermopile / thermistor / thermochromic paper (any one) / | | |
| | goggles | | |
| | <u>NOT</u> I.R. detector | | |
| | (ii) I. R. shown above red | C | B1 |
| (c) any two from radio (or TV), microwave, ultra-violet (or UV), x-rays, γ -rays (NOT cosmic) | 2F | B1, B1 | |
| | | | 6 |

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| QUESTION | SCHEME | TARGET GRADE | MARK |
|----------------|--|--------------|----------------------------|
| 6 (a) | bar magnet held at each end of rod, stated somewhere or clearly implied (ALLOW "side" rather than "end") | C | B1 |
| (i) | magnet won't attract / repel (either end) | F | B1 |
| (ii) | magnet attracts <u>both ends</u> | F | B1 |
| (iii) | magnet <u>repels</u> (one end) OR "the one left after the others are identified" | F | B1 |
| (b) (i) | iron (allow ferromagnetic) | F | B1 |
| (ii) | electricity / current (in coil) connect to battery NOT current through core | F | B1 |
| (iii) | switch off current OR equiv. NOT switch off electromagnet NOT demagnetise | F | B1 |
| | | | 7 |
| 7 (a) | mention of a fault / short-circuit large current NOT increased current overheating of cables fire any two NOT damage NOT explosion | 2F | B1, B1 |
| (b) | (electric) shock water conducts / transfers electricity (NOT "water and electricity don't mix") ALLOW "water is a good conductor" | F C | B1 B1 |
| (c) | possible short circuit OR possible (electric) shock | C | B1 |
| | | | 5 |
| 8 (a) | some indication that <u>nucleus</u> changes any particle emitted becomes a different atom / nucleus / nuclide / element | C F C | B1 B1 B1 |
| (b) (i) | 5 (min) | F | B1 |
| (ii) | 4 OR 20/his half-life correctly evaluated | C | B1 |
| (iii) | 25 ± 5....nothing else | C | B1 |
| (c) | 0 2 2 1 0 0 NOT -1 accept a dash as a zero | F, C F, C | B2 (-1 eeo) B2 (-1 eeo) |
| | | | 10 |

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| QUESTION | SCHEME | TARGET GRADE | MARK | |
|----------|---|--|----------|-----------|
| 9 | (a) (i) (milli)ammeter OR multimeter <u>set to amp / current range</u> | F | B1 | |
| | (ii) A e.c.f. | F | B1 | |
| | (iii) voltmeter OR multimeter <u>set to volt / p.d. range</u> condone incorrect spelling | F | B1 | |
| | (iv) V e.c.f. | F | B1 | |
| | (b) (i) | resistor | F | M1 |
| | | ALLOW resistance variable RHEOSTAT gets M1, A1 NOT potentiometer | F | A1 |
| | (ii) | vary current OR vary p.d. <u>across R</u> NOT vary resistance OR vary readings (on meters) | C | B1 |
| | (c) (i) | find gradient OR choose one point <u>and</u> use p.d./current | F | B1 |
| | | (ii) correct figures from graph seen or implied | F | B1 |
| | | 5 e.c.f. (but NOT from wrong formula) | F | B1 |
| | (d) (i) | Ω OR ohm | C | B1 |
| | | greater | F | B1 |
| | | (ii) straight line through origin greater slope e.c.f. from (i) mark to his (i) ALLOW new graph on p11; mark by eye | F C | M1 A1 |
| | | | | 14 |
| 10 | (a) (i) | aluminium | F | M1 |
| | | greatest density OR "because mass incr. as density incr." | F | A1 |
| | (ii) | aluminium OR his (a) (i) | F | B1 |
| | (iii) | aluminium OR his (a) (i) | F | B1 |
| | (b) | A | C | M1 |
| | | smallest area | C | A1 |
| | (c) (i) | small area OR "because pressure incr. as area decr." great pressure (on sand) | C F | B1 B1 |
| | | (ii) any sensible suggestion involving larger area in contact with sand (must involve chair and sand) | F | B1 |
| | | | 9 | |
| 11 | (a) | temperature NOT °C ACCEPT boiling point (of water) | F | B1 |
| | (b) | mercury OR alcohol OR pentane | F | B1 |
| | (c) | 100-100.1 | F | B1 |
| | | °C NOT C° or C special cases 373K B2 212°F B2 | F | B1 |
| | (d) | stays the same OR "nothing" | C | B1 |
| | (e) | ice | F | M1 |
| | | pure OR melting | C | A1 |
| | | any detail of sensible apparatus | C | A1 |
| | | | | 8 |

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| QUESTION | SCHEME | TARGET GRADE | MARK |
|------------|--|--------------|------|
| 12 (a) (i) | bigger temperature difference (idea of) | C | B1 |
| (ii) | the glass is thin OR the <u>window</u> is a good conductor OR because it isn't double-glazed | F | B1 |
| (b) | sum of figures quoted, seen | F | C1 |
| | 4 150 000 (J/hour) | C | A1 |
| (c) | convection radiation through roof /ceiling through floor draughts opening door / window | F | B1 |
| | ANY one | | |
| | NOT switching on air conditioning | | |