**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

# MARK SCHEME for the November 2005 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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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| | | | MARK |
|---|---|---|---|
| 1 | (a) | 8.5 (cm) | B1 |
| | (b) | 19.0 OR 19 (± 0.1) (cm) | B1 |
| | (c) | his **(b)** – his **(a)** | C1 |
| | | his correct subtraction | A1 |
| | | | [4] |
| 2 | (a) | distance/time | C1 |
| | | 25/2 | C1 |
| | | 12.5 | A1 |
| | | m/s | B1 |
| | (b) | less OR decreased OR slowing down | B1 |
| | (c) | more than ecf | B1 |
| | | | [6] |
| 3 | (a) | skate | M1 |
| | | small area (in contact with ice) | A1 |
| | (b) | large area )<br>wind causes large force on side of truck ) any 2<br>vehicle liable to blow over ) | B1,B1 |
| | | | [4] |
| 4 | (a) | 40 or 160 | B1 |
| | (b) | 720 | B1 |
| | (c) | W = F x d | C1 |
| | | 720 x 0.2 | C1 |
| | | 144 | A1 |
| | | J OR joule | B1 |
| | (d) | his**(c)**/1.2 | C1 |
| | | his**(c)**/1.2 correctly evaluated | C1 |
| | | 0.5 x his**(c)**/1.2 correctly evaluated<br>i.e. 60 gets C1, C1, A1 and 120 gets C1, C1, A0) | A1 |
| | | W OR watt OR J/s | B1 |
| | | | [10] |

**5** **(a)** level in tube lower, or equivalent **B1**

**(b)** air has expanded (could be scored in **(a)**, but not twice)
OR Kinetic Theory application to pressure **B1**

**(c)** any sensible comment **B1**
e.g. limited temp range, air bubbles out of tube, slow acting, large volume of air, change in air pressure, no scale

**[3]**

**6** **(a)** **(i)** current (in coil) **B1**

magnetic field (around coil) **B1**

**(ii)** magnetised OR attract **B1**

**(b)** current zero at first (even if only at origin) **B1**

horizontal first part **B1**

vertical rise somewhere **B1**

horizontal final part **B1**

**[7]**

**7** **(a)** three rays parallel and horizontal **B1**

**(b)** **(i)** both principal foci marked **B1**

**(ii)** refraction at mid-line, then through F **B1**
(allow 2 surface refractions if lead back to mid-line)

**(iii)** ray through F to mid-line, then parallel **B1**
(allow as **(ii)**)

**(iv)** image drawn between axis and intersection, perpendicular to axis C **B1**
(condone no labelling)

drawing accuracy mark for image 2 squares tall ± 2mm and
4 squares away ± 2mm **B1**

**[6]**

**8** **(a)** **(i)** iron OR steel OR any ferromagnetic material **B1**
(B0 if magnetised stated)

**(ii)** 1. nothing ecf from **(i)** **B1**
2. nothing **B1**

**(b)** L.H. compass pointing to R **B1**

top compass pointing to L **B1**

bottom compass pointing to L **B1**

**[6]**

**9** **(a)** 1 correct **C1**

2 correct **C1**

4 correct **A1**

**(b)** **(i)** all 6 components shown in series (any order)
ecf from **(a)** for symbols **B1**

**(ii)** voltmeter connected across cell, either our diag or his **B1**

**(iii)** both **B1**

**(iv)** 0.5 **B1**

**(v)** current stops OR ammeters read zero OR other bulb goes out **B1**

**[8]**

**10** **(a)** 10 x 4 x 6.5 **C1**

260 ($cm^3$) **A1**

**(b)** D = M/V in any form, words, letters, numbers, mixed **C1**

250/his V ecf if written down **C1**

0.961538 any no. of sig figs ecf **C1**

0.96 ecf **A1**

$g/cm^3$ unless inconsistent with his figures **B1**

**[7]**

**11** **(a)** electrons **B1**

**(b)** A **B1**

**(c)** **(i)** D **B1**

**(ii)** idea of detecting electrons/making spot visible **B1**

**(d)** deflects them **B1**

**(e)** no air OR no molecules OR no particles OR "nothing" **B1**

to stop/slow down/absorb the electrons/cathode rays **B1**

**[7]**

**12** **(a)** **(i)** time taken for (B0 for half the time) **B1**

activity/count-rate/mass etc. **B1**

to decrease to half original value **B1**

**(ii)** radiation due to surroundings **B1**

**(b)** **(i)** 80 – 25 **C1**

55 cao **A1**

**(ii)** 1. 27.5 ecf **B1**

2. 52.5 ecf **B1**

**(iii)** 15 ± 1 ecf **B1**

**(iv)** background remains, even when source has decayed **B1**

**(v)** curve to the left of existing one **B1**

flattening out at 25 count/min **B1**

**[12]**