

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.

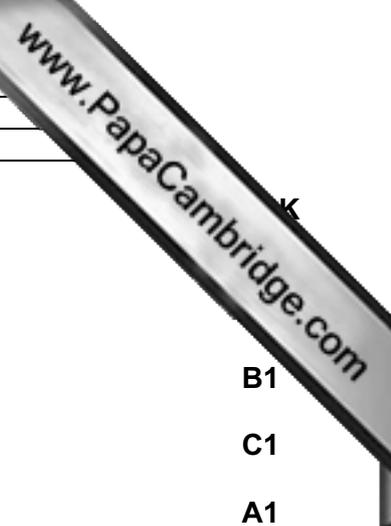
Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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.

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

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- 1 (a) 8.5 (cm)
- (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)
wind causes large force on side of truck) any 2 **B1,B1**
vehicle liable to blow over)
[4]
- 4 (a) 40 or 160 **B1**
- (b) 720 **B1**
- (c) $W = F \times d$ **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 **A1**
i.e. 60 gets C1, C1, A1 and 120 gets C1, C1, A0)
W OR watt OR J/s **B1**

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- 5 (a) level in tube lower, or equivalent
- (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 $\pm 2\text{mm}$ and
4 squares away $\pm 2\text{mm}$ 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

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bottom compass pointing to L

- 9 (a)** 1 correct C
 2 correct C1
 4 correct A1
- (b)** **(i)** all 6 components shown in series (any order) B1
 ecf from **(a)** for symbols
- (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)** $10 \times 4 \times 6.5$ C1
 $260 \text{ (cm}^3\text{)}$ 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]

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- 11 (a)** electrons
- (b)** A
- (c) (i)** D
- (ii)** idea of detecting electrons/making spot visible
- (d)** deflects them
- (e)** no air OR no molecules OR no particles OR “nothing”
to stop/slow down/absorb the electrons/cathode rays
- 12 (a) (i)** time taken for (B0 for half the time)
activity/count-rate/mass etc.
to decrease to half original value
- (ii)** radiation due to surroundings
- (b) (i)** 80 – 25
55 cao
- (ii)** 1. 27.5 ecf
2. 52.5 ecf
- (iii)** 15 ± 1 ecf
- (iv)** background remains, even when source has decayed
- (v)** curve to the left of existing one
flattening out at 25 count/min
- [7]
- [12]