**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

# MARK SCHEME for the November 2005 question paper

## 0625 PHYSICS

**0625/03 Paper 3 (Extended) maximum raw 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.

CIE is publishing the mark schemes for the November 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

| | | | | |
|---|---|---|---|---|
| 1 | (a) | force of gravity on a mass or mg<br>mass/volume | B1<br>B1 | [2] |
| | (b) (i) | hang object from spring balance, reading in N taken<br>divide reading in N by 10 or g | B1<br>B1 | |
| | (iii) | volume of water in cylinder or fill overflow can to top<br>add object find increase in volume or measure overflow volume<br>{no credit for mass unless not scored in (i) and no credit for density = mass/ volume unless not scored in a) } | B1<br>B1 | [4] |
| | (c) (i) | 2N<br>left | B1<br>B1 | |
| | (ii) | F = ma or 2 = 0.5 a<br>a = 4.0 m/s$^2$ | C1<br>A1 | [4]<br>Total [10] |
| 2 | (a) | upwards force = downwards force or no resultant force<br>opposing moments equal or A.C.M. = C. M. | B1<br>B1 | [2] |
| | (b) | 30 x spring balance reading = 40 x 6.0 or equivalent<br>spring balance reading = 8.0 N | C1<br>A1 | [2] |
| | (c) | 0.5 N<br>downwards | B1<br>B1 | [2]<br>Total [6] |
| 3 | (a) | P = hdg or 2 x 1000 x 10<br>= 20 000 N/m$^2$ or Pa | C1<br>A1 | [2] |
| | (b) | p = f/a or 20 000 = 50/a<br>a = 0.0025 m$^2$ | C1<br>A1 | [2] |
| | (c) | potential energy of the water<br>converted to kinetic energy of water through outlet (and heat) | B1<br>B1 | [2]<br>Total[6] |
| 4 | (a) | turn on heater and wait until water starts dripping in beaker<br>empty beaker & replace, start watch<br>stop watch & remove beaker at same time<br>record time<br>find and record mass of water in beaker | B1<br>B1<br>B1<br>B1<br>B1 | [M4] |
| | (b) | 60 x t = 120 x 340<br>t = 680 s | C1<br>A1 | [2] |
| | (c) (i) | ice gains heat from surroundings/ice falls through funnel | B1 | |
| | (ii) | lag or fit lid to funnel/place gauze in funnel bottom | B1 | [2]<br>Total [8] |

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| | | | | |
|---|---|---|---|---|
| 5 | (a) (i) | random | B1 | |
| | (ii) | hit and rebound | B1 | [2] |
| | (b) (i) | increase or further apart | B1 | |
| | (ii) | increase or move faster | B1 | [2] |
| | (c) (i) | random, fast in gas to vibration in solid | B1 | |
| | (ii) | long way apart in gas to very close or touching | B1 | [2]<br>Total [6] |
| 6 | (a) | Sound reflects off wall | B1 | [1] |
| | (b) | 400 Hz | B1 | [1] |
| | (c) | $\lambda$ = v/f or = 330/400<br>= 0.83 m | C1<br>A1 | [2] |
| | (d) | vibration/oscillation along line of/direction of wave | B1 | [1]<br>Total [5] |
| 7 | (a) (i) | two approximately correct reflections<br>evidence of projecting back to image or use of equal distance from the mirror, object and image | B1<br>B1 | |
| | (ii) | virtual<br>any one of upright, same size, same distance from mirror | B1<br>B1 | [4] |
| | (b) (i) | ray 1 correct<br>ray 2 correct<br>image correctly located | B1<br>B1<br>B1 | |
| | (ii) | eye symbol to right of lens | B1 | [4]<br>Total [8] |
| 8 | (a) | force is produced<br>on any charge placed in the field | B1<br>B1 | [2] |
| | (b) | at least 3 parallel, straight lines plate to plate, ignore end effect<br>at least one correct arrow, none wrong | B1<br>B1 | [2] |
| | (c) | q = It or 0.06 = I x 30<br>I = 0.002 A or 2 mA | C1<br>A1 | [2] |
| | (d) | E = Vit<br>= 1500 x 0.008 x 10<br>= 120 J | C1<br>C1<br>A1 | [3]<br>Total [9] |

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| | | | | |
|---|---|---|---|---|
| 9 | (a) | correct symbol<br>correct labels | B1<br>B1 | [2] |
| | (b) (i) | low, OFF or 0 | | |
| | (ii) | low, OFF or 0 need both correct | B1 | [1] |
| | (c) (i) | need 4 boxes correct for 2 marks, -1 for e.e.o.e. | B2 | |
| | (ii) | no change | B1 | [3]<br>Total [6] |
| 10 | (a) (i) | a.c. input causes constantly changing current through coil<br>magnetic field formed in or around coil<br>constantly changing magnetic field | B1<br>B1<br>B1 | [M2] |
| | (ii) | (changing) magnetic field transferred to secondary coil | B1 | |
| | (iii) | (changing) magnetic field cuts secondary coil<br>induces e.m.f. | B1<br>B1 | [3] |
| | (b) | more turns on secondary (than on primary) | B1 | [1] |
| | (c) | no transfer of magnetic field from primary to secondary | B1 | [1] |
| | (d) | Vp.Ip = Vs. Is or 100 x 0.4 = 200 x Is<br>Is = 0.2 A | C1<br>A1 | [2]<br>Total [9] |
| 11 | (a) | $\beta$-source and detector suitably arranged<br>deflecting plates suitably arranged<br>additional detail e.g. slit or collimator, vacuum chamber, circuit connected to deflecting plates | B1<br>B1<br>B1 | [3] |
| | (b) | at least 3 readings at right angles beyond & perp. to the plates<br>one near +ve, one near –ve and one in centre | M1<br>A1 | [2] |
| | (c) | highest reading near +ve plate | B1 | [1] |
| | (d) | electrons negatively charged, attracted to +ve | B1 | [1]<br>Total [7] |

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