

## UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

### MARK SCHEME for the May/June 2006 question paper

#### 0625 PHYSICS

0625/03

Paper 3, maximum raw mark 80

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do 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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- 1 (a) point 8,12 identified B1  
 straight line joining 0,0 and 8,12 B1  
 straight line joining 8,12 and 20,12 B1 3
- (b) acceleration = change in v/change in t or 12/8 etc C1  
 = 1.5 m/s<sup>2</sup> A1 2
- (c) distance = area under graph between t = 20 and t = 25 C1  
 = 24 m to 28 m A1 2
- (d) F = ma or 4000 x 1.2 C1  
 = 4800 N A1 2
- (e) more passengers got on (so mass increased)  
 driver pressed accelerator less (so force decreased)  
 more traffic or going uphill any two lines B2 2  
 [11]
- 2 any closed triangle or parallelogram C1  
 forces in correct directions relative to each other C1  
 correct resultant indicated C1  
 resultant 7.7 N to 8.1 N A1 4  
 scale stated B1  
 resultant vertically upwards B1 2  
 [6]
- 3 (a) work = force x distance C1  
 = force of gravity/weight x (vertical) distance/height A1 2
- (b) (i) work = (100 x 8) = 800 J A1  
 A1 2  
 (ii) power = (800/5) = 160 W  
 (iii) increases the k.e. of the water (ignore heat/sound) B1 1  
 [5]
- 4 (a) on surface/throughout; no bubbles/bubbles; all temps./b.p.;  
 s.v.p. < at. pressure; svp = at. pressure any two B2 2
- (b) energy/work to separate molecules B1  
 (against) forces of attraction between water molecules B1 2  
 (to break bonds C1)  
 The k.e./speed of the molecules does not increase B1 1
- (c) Wt = mL or 120 x 1 = 0.05 x L C1  
 L = 120/0.05 C1  
 L = 2400 J/g A1 3  
 [8]

Page 3	Mark Scheme	Syllabus	Paper
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- 5** (a) increase surface area of tank  
blow air over surface/put in windy place B1 B1 **2**
- (b) (i) capillary tube longer or liquid with lower expansivity B1
- (ii) capillary tube thinner/finer or liquid with higher expansivity  
or bigger bulb B1 **2**
- (c)  $p_1v_1 = p_2v_2$  or  $1 \times 10^5 \times 150 = p_2 \times 50$  C1  
 $p_2 = 3 \times 10^5$  (Pa) A1 **2**  
**[6]**
- 6** (a) red ray refracted away from normal B1  
violet ray refracted more than red ray in prism B1  
violet ray further refracted from red ray to screen B1 **3**
- (b)  $1.52 = \sin 40^\circ / \sin r$  M1  
 $\sin r = \sin 40^\circ / 1.52$  (= 0.423) C1  
 $r = 25^\circ$  A1 **3**
- (c) (i)  $3 \times 10^8$  m/s A1
- (ii) same as (i) A1 **2**  
**[8]**
- 7** (a) Longitudinal or pressure waves B1 **1**
- (b) a correct C marked B1  
a correct R marked B1 **2**
- (c) oscillation/vibration/backwards and forwards M1  
along PY (consider pressure waves as alternative) A1 **2**
- (d) wavelength =  $340/200$  C1  
 $PX(= \lambda/2) = 0.85$  m A1 **2**  
**[7]**
- 8** (a)  $I = W/V$  or  $9/6$  C1  
 $I = 1.5$  A A1 **2**
- (b) (i) 8 ohm A1
- (ii) 6 V A1 **2**
- (c) (i) brightness decreases/dimmer B1
- (ii) resistance of circuit greater B1  
current through lamp falls B1 **3**
- (d) (i) 4 ohm A1
- (ii) 4 ohm A1 **2**  
**[9]**

Page 4	Mark Scheme	Syllabus	Paper
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- 9 (a) primary and secondary coils on iron core labelled  
240 V a.c. to primary, 12 V a.c. to secondary  
turns ratio shown or stated 20:1, stepdown B1 B1 B1 **3**
- (b) (i) must be constantly changing magnetic field B1
- (ii) magnetic field of primary passes through core to secondary  
magnetic field of secondary cuts coil, induces output B1 B1 **3**
- (c) (i) 18 W A1
- (ii) 540 J A1 **2**  
**[8]**
- 10 (a) bring rod close but not touching plate  
touch metal plate with earth lead  
remove lead and then rod M1 M1 A1 **3**
- (b) (i)  $Q = 20 \text{ (mA)} \times 15 \text{ (s)}$   
 $= 0.30 \text{ C}$  C1 A1
- (ii)  $V = 20 \text{ (mA)} \times 10 \text{ (k}\Omega\text{)}$   
 $= 200 \text{ V}$  C1 A1 **M3**  
**[6]**
- 11 line1 into paper  
positive or +2 B1 B1
- line 2 out of paper or opposite of line 1  
negative or -1 B1 B1
- line 3 no deflection  
no charge B1 B1 **6**  
**[6]**