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

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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^2 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]

5 **(a)** increase surface area of tank   B1
blow air over surface/put in windy place   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) $1.52 = \sin 40°/\sin r$ M1
$\sin r = \sin 40°/ 1.52$ ($= 0.423$)   C1
$r = 25°$ A1   **3**

    (c) **(i)** 3×10^8 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(= λ /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]

9 **(a)** primary and secondary coils on iron core labelled   B1
      240 V a.c. to primary, 12 V a.c. to secondary   B1
      turns ratio shown or stated 20:1, stepdown   B1   **3**

    (b) **(i)**   must be constantly changing magnetic field   B1

        (ii)   magnetic field of primary passes through core to secondary   B1
            magnetic field of secondary cuts coil, induces output   B1   **3**

    (c) **(i)**   18 W   A1

        (ii)   540 J   A1   **2**
                                                           [8]

10 **(a)** bring rod close but not touching plate   M1
       touch metal plate with earth lead   M1
       remove lead and then rod   A1   **3**

    (b) **(i)**   Q = 20 (mA) x 15 (s)   C1
              = 0.30 C   A1

        (ii)   V = 20 (ma) x 10 (kΩ)   C1
              = 200 V   A1   **M3**
                                                           [6]

11 line1   into paper   B1
            positive or +2   B1
    line 2   out of paper or opposite of line 1   B1
            negative or -1   B1
    line 3   no deflection   B1
            no charge   B1   **6**
                                                           [6]