UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper

for the guidance of teachers

0625 PHYSICS

0625/63   Paper 6 (Alternative to Practical), maximum raw mark 40

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1 **(a)** **(i)** pins P_3 and P_4 at least 5 cm apart   [1]

     (ii) normal correct position and at 90°   [1]

  (b) **(i)** **AB** drawn neatly and $r = 20° \pm 2°$ [1]

     (ii) $i = 32° \pm 2°$ and unit shown at least once and no contradiction   [1]

  (c) view bases of pins / keep line of sight low / view close to table   [1]

                                                     [Total: 5]

2 **(a)** 83 (°C)   [1]

  (b) 5460   [1]
     7140 and J at least once, not contradicted
     ecf θ_h from **(a)**   [1]

  (c)

     (i) no, difference too large   [1]

     (ii) any sensible suggestion involving heat loss to surroundings/ heat gained by
        container   [1]

  (d) ticks in boxes 3 and 4   [2]
     (–1 for any extra ticks in boxes 1, 2, 5 or 6 to minimum of 0
     if only two boxes ticked, 1 correct and 1 incorrect scores 1 mark)

                                                       [Total: 7]

3 **(a)** table:
     l in m   [1]
     V in V, I in A, R in Ω (words or symbols)   [1]
     R values 1.6875, 3.4375, 5.03125 (2 or more significant figures)   [1]
     R values consistent 2 or 3 significant figures   [1]

  (b) R (directly) proportional to l o.w.t.t.e.   [1]
     numerical example given, allow two ratios   [1]
     idea of within limits of experimental accuracy   [1]

  (c) prediction 10 → 10.35, no unit needed   [1]
     working shown   [1]

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(d) two from:
   wire gets hot / burns out
   meter damaged
   wire gets floppy / expands
   higher meter readings / readings off scale
   power source cuts out / fuses
   resistance of wire increases   [2]

                                                          [Total: 11]

4 (a) any one from:
      use of darkened room
      how to avoid parallax when taking readings
      moving lens back and forth to obtain clearest image
      mark at centre of lens holder
      place / secure ruler on the bench
      lens, object, screen perpendicular to the bench   [1]

   (b) correct graph:
       axes labelled and scales   [1]
       all plots correct to nearest ½ small square   [1]
       well-judged best-fit line   [1]
       thin line and small plots, ≤ ½ small square   [1]

   (c) both intercepts correct to ½ small square   [1]
       both between 6.4 and 7.0   [1]

                                                          [Total: 7]

5 (a) (i) h = 3.6, w = 3.4, d = 3.2 (cm) c.a.o.   [1]

      (ii) V = 39 OR 39.2 OR 39.17 OR 39.168 AND cm^3 ecf **(i)**   [1]
            ρ = 2.6 OR 2.63 OR 2.64, ignore significant figures and unit, ecf   [1]

   (b) (i) V_1 = 50 (cm^3)   [1]

      (ii) V_2 = 64 (cm^3)   [1]

      (iii) bottom of meniscus, direct vision   [1]

      (iv) V_s = 14 (cm^3) ecf **(i)(ii)**

      (v) ρ = 2.46, 2 or 3 significant figures AND g/cm^3 ecf **(iv)**   [1]

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(c) (i) two from:

difficulty of making perfect cuboid shape   o.w.t.t.e.

measuring cylinder readings only to nearest cm^3 o.w.t.t.e.

smaller mass so greater inaccuracy

volume of thread not taken into account

air bubbles in clay / uneven density distribution / clay may absorb water / some clay may stick to the knife   [2]

(ii) either method but with sensible matching reason   [1]

[Total: 10]