MARK SCHEME for the October/November 2010 question paper

for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/62   Paper 6 (Alternative to Practical), maximum raw mark 60

UNIVERSITY *of* CAMBRIDGE
International Examinations

1 **(a)** **(i)** 5.4 g ;
    5.(0) g ;   [2]

    (ii) tube **1** 0.2 g ;
       tube **2** 0.3 g ;
       tube **3** <u>1.0 g</u> ;
       tube **4** 0.8 g ; (1 mark each, (ecf))   [4]

 (b) pineapple ; (allow ecf)
    (protein) lost greatest mass ;   [2]

 (c) set up (weighed) protein with acid (instead of juice) ;
    check for loss in / change of mass after <u>10 mins</u> ;   [2]

                           [Total: 10]

2 **(a)** **(i)** correct symbols for ammeter and lamp shown in circuit ;;   [2]

    (ii) it is metallic / metal ;   [1]

 (b) any mention of use of a magnet ;   [1]

 (c) **(i)** heat the mixture ;
       diagram or mention of suitable apparatus, e.g. test-tube or metal container ; [2]

    (ii) heat gives energy (so that atoms react) ;   [1]

    (iii) exothermic ;   [1]

 (d) suitable property mentioned ;
    result with iron sulfide ;   [2]
    (e.g. magnetic + non-magnetic / melting point + high mpt / electrical conductivity +
    non-conductor)

                           [Total: 10]

3 **(a)** **(i)** 8.6 cm (+/– 0.1 cm) ;   [1]

      (ii) 6.2 cm (+/– 0.1 cm) ;   [1]

      (iii) 8.6 / 6.2 = 1.4 (1.39) (no penalty for using more decimal points) (ecf) ;   [1]

  (b) **(i)** r_3 = 49 degrees (+/– 2 degrees) ;
          r_4 = 76 degrees ;   [2]

      (ii) sine r_3 = 0.75 /
          sine r_4 = 0.97 (ecf) (one or both correct) ;   [1]

      (iii) both points correct (+/– half square) **and** straight line drawn through the
          origin ;   [1]

      (iv) x- and y- distances used marked on the graph ;
          gradient = 1.5 (ecf) ;   [2]

  (c) (value **(b)(iv)** is more accurate)
     it is derived from several values instead of just one / owtte / very difficult to
     measure through glass block ;   [1]

                                                                                   [Total: 10]

4 **(a)** **(i)** still air   1.8 cm ;
          windy air   14.7 cm ;   [2]

      (ii) 1.4 cm ;
          14.4 cm ;   [2]

      (iii) 1.4 / 4 = 0.35 ; (ecf)
          14.4 / 4 = 3.6 ; (ecf)   [2]

  (b) moving air / the wind takes water (vapour) away from leaf ;
     (gradient between inside and outside of leaf maintained) therefore more
     <u>evaporation</u> occurs / owtte ;   [2]

  (c) **(i)** prevents air from entering stem / prevents air lock ;   [1]

      (ii) water on leaves would block stomata (and prevent evaporation) ;   [1]

                                                                                    [Total: 10]

5 **(a)** solution **A**   effervescence / bubbling / gas given off
         solution **B**   no change / no reaction / no bubbles / dissolves
         solution **C**   no change / no reaction / no bubbles / dissolves
         solution **D**   effervescence / bubbling / gas given off
         1 mark if lines **A** and **D** correct ;
         1 mark if lines **B** and **C** correct ;   [2]

     (b) solution **A**   nitric acid or potassium nitrate
         solution **B**   sodium chloride or hydrochloric acid
         solution **C**   nitric acid or potassium nitrate
         solution **D**   sodium chloride or hydrochloric acid
         1 mark if lines **A** and **C** correct ;
         1 mark if lines **B** and **C** correct ;   [2]

     (c) solution **A** is nitric acid
         solution **B** is sodium chloride
         solution **C** is potassium nitrate
         solution **D** is hydrochloric acid ;;;
         (all 4 correct 3 marks, 3 correct 2 marks, 2 correct 1 mark)   [3]

     (d) add sodium hydroxide solution and aluminium foil and warm ;
         test gas evolved using red litmus or by smell ;
         litmus turns blue / ammonia is given off ;
         or carry out flame test ;
         lilac flame seen ; (for a max of 2 marks)   [3]

                                                 [Total: 10]

6 **(a)** any dimensions to give an area of 5 cm^2 e.g. 5 cm × 1 cm ; [1]

(b) 0.75 A, 0.90 A (second decimal point **must** be shown) ; [2]

(c) (he increases the resistance so that) the current is decreased / cannot get through
the resistor / owtte ; [1]

(d) four points plotted +/– half square ;
straight line drawn ; [2]

(e) the hook / pan has a mass / owtte ; [1]

(f) soft iron loses its magnetism when the current is switched off ;
but steel does not / owtte / steel retains its magnetism ; [2]

(g) current could leak from the wire (through the iron) / owtte / prevent short circuit / no
shock if touched ; [1]

[Total: 10]