**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

## 0653 COMBINED SCIENCE

**0653/62** Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

**(ii)** tube **1** 0.2 g ;
tube **2** 0.3 g ;
tube **3** 1.0 g ;
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 10 mins ; [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]**