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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.
1 (a) (i) C [1]
   (ii) B [1]
   (iii) E [1]
   (iv) C [1]
   (v) D [1]
   (vi) A [1]

   (b) (i) electrons
       atoms [1]
       (ii) 1st box from left ticked [1]

2 (a) (i) iron $\rightarrow$ nickel $\rightarrow$ zinc $\rightarrow$ aluminium [1]
   (ii) too reactive / takes too much energy / too high temperature needed [1]
   (iii) bauxite [1]

   (b) (i) air
       limestone
       allow calcium carbonate [1]
       (ii) 3 (CO)
            2 (Fe)
            apply listing for extra incorrect additions to equation [1]
       (iii) carbon dioxide
            loses oxygen
            allow oxidation number of carbon in carbon dioxide decreases
            allow carbon gains electrons
            ignore electrons gained unqualified
       (iv) poisonous / toxic
            ignore harmful [1]
       (v) takes in heat / energy (from surroundings)
            allow temperature of the reaction mixture / surroundings falls
            allow temperature goes down [1]

(c) (i) mixture of metals / mixture of metal with non-metal OR carbon [1]
       (ii) any suitable e.g. for car bodies / bridges / girders / railings etc.
            allow e.g. nuts / bolts / bullets / chains / hinges / knives / pipes / magnets / road signs /
            wire (for fences) / cans etc.
            ignore for building without qualification [1]
3 (a) (i) 80 (%)  
allow 79–81  
(ii) any two of:  
carbon dioxide / argon / neon / xenon  
allow helium / radon / water vapour  
reject hydrogen

(b) (i) decreases / gets less / gets lower  
(ii) increases / gets more / greater

(c) any suitable use e.g. electrical conductor / electrical wiring / saucepans  
not wires unqualified

(d) electrolyte is soluble copper salt / named soluble copper salt e.g. copper sulfate  
the spoon is the cathode / the copper rod is the anode  
accept implication of this e.g. the positive ions move to the spoon  
spoon gets coated with copper / spoon becomes brown

4 (a) (i) carbon dioxide  
allow CO₂

(ii) any one of:  
• room temperature OR temperature quoted from 20–40°C /  
ignore low temperature / high temperature  
• yeast / enzymes / zymase  
ignore catalyst alone  
ignore microbes / viruses / bacteria  
• absence of oxygen / anaerobic  
• pH 7 / pH near neutral

(b) (i) H – O – H  
not H₂O  

H
H

H – C – C – O – H  

allow – OH in place of – O – H  
not C₂H₅OH

(ii) aqueous bromine / bromine water  
alow bromine / aqueous (acidified) potassium permanganate  
turns colourless / decolourises  
ignore goes clear
(c) carbon dioxide
   water

(d) homologous
    similar
    functional

5
(a) diamond: covalent (bonding)
    giant structure allow macromolecule
    chlorine: any two of:
    • molecule
    • covalent
    • diatomic

(b) C₆Cl₁₂

(c) (i) green / yellow green / light green
       reject bluish-green / yellow alone

(ii) allow values between 2.5–4.0 (actual = 3.12)

(iii) increases
       reject decreases then increases

(d) (i) iodine
    allow I₂
    potassium bromide
    allow KBr

(ii) chlorine is more reactive than bromine / bromine is less reactive than chlorine / ignore chlorine is higher in the group
    reject chloride / chloride is more reactive than bromide

(e) ionic compounds soluble AND molecular not (soluble)
    (both needed for mark)
    ionic compounds conduct electricity when molten / in (aqueous) solution
    AND molecular ones do not
    (both needed for mark)
6 (a) any three of:
- add excess iron to sulfuric acid /
- filter off (excess) iron /
- concentrate filtrate / iron sulfate solution OR heat filtrate to crystallisation point
  allow heat filtrate so that some of water evaporated
  allow leave on windowsill for water to evaporate / allow water to evaporate
  ignore heat filtrate without qualification
- filter off crystals / pick out crystals /
- dry crystals with filter paper

(b) (i) oxidation number / iron forms 2+ ions
  allow charge on the iron ion

(ii) add (aqueous) sodium hydroxide
  green
  precipitate

(iii) water was given off / iron sulfate lost water / dehydration (reaction)

(iv) double headed arrow / equilibrium sign

(c) (i) turns red / pink
  bubbles / effervescence
  allow iron disappears / tube gets hot / solution turns light green
  ignore hydrogen given off / gas given off

(ii) so plants can grow better / so crops can grow better / plants cannot grow well in alkaline conditions

(iii) pH 8

(iv) calcium oxide / lime / limestone / chalk / calcium carbonate
  allow slaked lime
7 (a) (i) any value between 15–35 seconds [1]

(ii) any three of: [3]
• particles escape from (ammonium) carbonate or solid allow particles evaporate from (ammonium) carbonate /
• diffusion /
• particles are in random motion /
• particles gradually mix up (with air particles) /
• particles spread out everywhere /
• particles collide with air particles /

(b) 96 [1]

(c) (i) nitrogen phosphorus potassium (1 mark for each) [3]
NPK = 2 marks

(ii) 3rd box down ticked [1]

(d) 330 (g) [1]

[Total: 80]