UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2008 question paper

5129 COMBINED SCIENCE

5129/02   Paper 2 (Theory), maximum raw mark 100

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.

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.

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1 **(a)** **(i)** tree / grass / flower

(ii) cow / snail / rabbit

(b) Box 2 = snail
Box 4 = hawk [2]

(c) Sun / sunlight (not light alone) [1]

(d) decomposer / bacteria / fungi [1]

(e) energy supply is limited
energy is used by the organisms ⎫
energy is lost at each stage ⎬ any 2
insufficient energy left (for another level) ⎭ [2]

2 **(a)** copper / Cu [1]

(b) potassium / K [1]

(c) iron / Fe [1]

(d) copper / Cu [1]

(e) zinc / Zn [1]

3 **(a)** **(i)** Q = It or 0.2 × 180
36 (0.6 gains 1 mark) [2]

(ii) V = IR or 7 × 0.2
= 1.4 [2]

(b) 0.6 / 2.0–**(a)(ii)** [1]

4 (a) limewater
milky / cloudy / white (precipitate)

(b) (i) $CH_4 = 16$
$CO_2 = 44$ [2]

(ii) $16 \rightarrow 44$
$\therefore 4 \rightarrow 44 \times 4/16 = 11$ g [2]
correct method from wrong numbers in **(b)(ii)** gains 2

5 (a) blue   pink [1]

(b) (i) transpiration [1]

(ii) upper surface has waxy layer
fewer / no stomata [2]
answer could be in terms of **lower surface**

(c) root hair
osmosis [2]

6 (a) reduction [1]

(b) conducts electricity
conducts heat
malleable
ductile   any 2
high density
high melting point
high boiling point [2]

(c) boils at 100 °C/boils at single temperature [1]

7 (a) (i) gravity / weight [1]

(ii) gravitational / potential [1]

(b) line is curved / not straight [1]

(c) $F = ma$ or $a = F/m$ or $300/80$
$= 3.75$
m/s^2 [3]

8   (a)   matt black is a better absorber / shiny is a better reflector

    (b) (i)   stays the same / no change / none

         (ii)   decreases / gets less / lowers   [1]

    (c)   microwaves and radiowaves (either order)   [2]

9   (a)   cuts / grinds food
         large pieces to smaller pieces   } any 2
         mixes food with saliva
         dissolves (soluble particles)   [2]

    (b)   secrete liquid / saliva
         secrete enzymes / amylase   } any 2
         lubricate / softens food
         enzymes convert starch to maltose / sugar   [2]

    (c)   bacteria
         cavities / enamel to dissolve / tooth decay   [2]

10 (a)   hydrogen / H^+ [1]

    (b) (i)   red   [1]

         (ii)   orange / yellow   [1]

    (c) (i) $Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$ [1]

         (ii)   magnesium carbonate
               magnesium hydroxide   } any 2
               magnesium oxide   [2]

11 (a)   like charges (repel)   [1]

    (b)   positive   [1]

12 frequency = Hz or s^{-1}
  period = s

13 (a) diagram showing 3 bonding pairs
  and one lone pair
  (if inner shell drawn it must be correct)   [2]

(b) 400–500 °C
  200–300 atm
  iron   [3]

(c) potassium
  phosphorus (either order)   [2]

14 (a) lack of (enough) food   [1]

(b)
lack of (enough) rain / water	plants die / crop fails
not enough light	no photosynthesis / growth
too much rain / water / floods	plants washed away / die
civil unrest / war	no one to tend crops
	or crops destroyed
earthquake / hurricane	food destroyed / lost

  cause and explanation gains 2 marks   [4]

15 (a) sinusoidal shape with
  both positive and negative values
  with two cycles shown   [3]

(b) increased speed of rotation
  stronger magnet   } any 1
  more turns in coil   [1]

16 (a) 0.1 × 30 = W × 0.2
  W = 0.15   [2]

(b) tips anticlockwise / iron rod goes down / left goes down
  iron rod attracted by the magnet   [2]

17 (a) (i) electronic structure drawn as 2 8

   (ii) +3

   (b) group 3
   forms a positive ion
   on the left of the Periodic Table   any 2
   trend across period is metal to non-metallic   [2]

   (c) protected by a layer of (aluminium) oxide
   OR oxide layer / on surface of metal   [2]

18 (a) A = testa
   B = cotyledon
   C = plumule
   D = radicle   [4]

   (b) water
   oxygen
   suitable / named temperature   [3]

19 (a) 26 – 14 = 12 cm^3 [2]
   (one correct reading from diagrams gains 1 mark)

   (b) 0.24 or **(a)**/50   [1]

20 (a) 5   [1]

   (b) extension = 10 (cm)
   load = 4   [2]