UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

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, which would have considered the acceptability of alternative answers.

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1 **(a)** correct symbol
in parallel with 6Ω resistor

(b) **(i)** V = IR (or equivalent) or 0.2 × 6
= 1.2
V (unit independent) [3]

(ii) 9 [1]

2 **(a)** magnesium **and** aluminium / Mg and A*l*
metals [2]
(answers are independent)

(b) blue / purple / violet
red / orange / yellow [2]

(c) same number of / 2 electrons in outermost shell [1]
(allow valence electrons)

3 **(a)** **(i)** 0 and 1 [1]

(ii) 2 and 3 [1]

(iii) 3 and 4 [1]

(b) iris / circular and/or radial muscles [1]

(c) a line which remains above the drawn line throughout [1]
(can be along initial line but must not increase)

(d) retina [1]

4 **(a)** 27 [1]

(b) electron / e [1]

(c) 32 [1]

(d) an indication of 2 half lives
= 11 400 [2]
2 × 5700 with incorrect answer = 1 mark

5 liver
amino acids
kidneys
liver [1]

6 **(a)** neutralisation [1]

(b) 17
80 [2]

(c) (17 × 2) / 80
= 0.425 kg / 425 g [2]
(ecf from 6b))

7 **(a)** matt / black is a better emitter / radiator (of thermal radiation)
or shiny / white is a poorer emitter / radiator [1]

(b) conduction [1]

(c) convection
heated air expands
heated air is less dense } any one [1]

8 **(a)** filter
add chlorine
sedimentation } any two [2]

(b) remove solids / insoluble particles / dirt
kill bacteria / micro-organisms
solids settle to the bottom [2]

9 **(a)** X = palisade / mesphyll
Y = (lower) epidermis [2]

(b) spongy mesophyll [1]

(c) by diffusion
through stomata [2]

(d) diffusion over short distance / easily diffuse
light penetrates to all parts / more light readily absorbed [2]

10 **(a)** no yes no yes
4 = 2 marks 3 = 1 mark

(b) **(i)** plastic [1]

(ii) iron / Fe [1]

11 **(a)** haematite / magnetite [1]

(b) **(i)** 3 2 3 [1]
(allow correct multiples)

(ii) removal of oxygen / gain of electrons / lower oxidation state [1]

(iii) coke / carbon burns to form carbon dioxide
carbon dioxide reacts with carbon
carbon reacts with oxygen = 1 mark [2]

(c) too reactive / more reactive than iron / carbon [1]

12 **(a)** **(i)** 60

(ii) 8 (ignore any sign) [2]

(b) oscillation / disturbance / displacement / motion of particles
perpendicular to the direction / motion of the wave [2]

13 **(a)** break down of large pieces to small pieces /
crush / tear / grind food
increase surface area
mix food with saliva / enzymes
make swallowing easier } any two
(ignore references to chewing / digestion) [2]

(b) B (correctly identified)
fewer decayed teeth / less decay [1]

(c) **Town B :**
eat less sugar
have better dental care / more clinics / dentists
brush teeth more
visit dentist more regularly
use more mouthwash } any two
eat more fruit and vegetables
better education [2]

accept converse in terms of town A

14 **(a)** infra red / ir

(b) radio [1]

(c) 300 000 000 / 3×10^8 [1]

15 **(a)** carbon dioxide

plants animals [3]

(b) X = photosynthesis
Y = respiration
Z = decay / decomposition / (bacterial) respiration [3]

16 **(a)** D [1]

(b) B [1]

(c) C [1]

17 **(a)** time = distance / speed or 0.8 / 0.2
4.0 [2]

(b) work = force × distance or 4 × 0.8
3.2
J / joules (unit independent) [3]

18 **(a)** carbon dioxide
water / steam (any order) [2]

(b) carbon monoxide
poisonous / toxic / correct description of mode of action [2]

(c) same general formula [1]
similar **chemical** properties
gradation in **physical** properties } any one
formulae differ by CH_2 [1]

19 **(a)** potential / gravitational
kinetic / movement

(b) 0.5 [1]

20 **(a)** **(i)** any date from Feb 28 to Mar 5 [1]

(ii) any date from Mar 10 to Mar 17 [1]

(b) **(i)** 28 days / 4 weeks [1]

(ii) age / menopause
stress / emotional state / anxiety
diet / malnutrition / starvation
pregnancy / breast feeding
exercise
genetic factors / inheritance
} any 2 [2]

21 **(a)** fermentation / anaerobic respiration [1]

(b) **(i)** provides enzymes [1]

(ii) prevents oxidation of ethanol / formation of ethanoic acid [1]

(c) (fractional) distillation [1]

(d) correct structure of ethanol [1]