CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5129 COMBINED SCIENCE

5129/21 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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

CAMBRIDGE
International Examinations

1 amino acids
liver
urine
excretion [4]

2 **(a)** alkali metals [1]

(b) decreases/goes down [1]

(c) lighted splint
explodes with a pop (result dependent on test) [2]

(d) **(i)** $2Rb + Cl_2 \rightarrow 2RbCl$ [1]

(ii) ionic [1]

3 **(a)** Q = It **or** 0.8 × 600 [1]
= 480 [1]
C (unit mark independent) [1]
8 scores 1

(b) kinetic [1]

(c) speed = distance/time **or** 4.8/1.5
= 3.2 [2]

4 **(a)** sin *i*/sin *r* **or** sin 22/sin 15 [1]
= 1.4 OR 1.45 OR 1.447 [1]

(b) 68 [1]

(c) 3×10^8 /300 000 000 [1]

5 **(a)** food chain A
cow = herbivore, primary consumer
human = carnivore, secondary consumer

food chain B
human = herbivore, primary consumer [6]

(b) **(i)** 1%

(ii) 10%; [2]

(c) more energy/protein reaches the human in B than A
in A energy is lost in supporting the cow
example of energy loss (respiration/movement/excretion) } any 1 [2]

6 **(a)** two bonding pairs
two lone pairs [2]

(b) 34 78 [2]
3.4 7.8 (divide by 10) [1]
1.95 (divide by 4) [1]

7 **(a)** ammonium chloride
potassium hydroxide (accept correct formula) [2]

(b) potassium hydroxide (accept correct formula) [1]

(c) sulphur dioxide (accept correct formula) [1]

(d) calcium carbonate (accept correct formula) [1]

8 **(a)** opposite charges attract [1]

(b) all same charge **or** they repel [1]

9 **(a)** **(i)** increases/doubles [1]

(ii) increases/doubles [1]

(b) no alternating/changing current
no changing magnetic field
no induced e.m.f. } any 2 [2]

10 **(a)** B = combustion/burning
C = photosynthesis
D = nutrition/feeding/eating/digestion/ingestion
E = respiration [4]

(b) **(i)** glucose
oxygen (either order)
carbon dioxide [3]

(ii) night and day [1]

11 **(a)** 31, 38, 31 [3]

(b) same number of electrons in outer shell or same electronic structure [1]

(c) gallium/Ga [1]

12 **(a)** diagram includes rule and spring balance/newton meter/weights [2]

(b) straight line up to 2.5 N
then a curve [2]

(c) 12 [1]

13 **(a)** 3 [1]

(b) R = V/I **or** 1.5/3 **or** 1.5/(a) [1]
= 0.5 [1]

14 **(a)** **(i)** ball expands [1]

(ii) ring contracts [1]

(b) wood is poor conductor/good insulator [1]

15 (a) (i) yeast/enzymes (do not accept other catalysts)
anaerobic/no oxygen (ignore air)
25 – 40ºC [3]

(ii) 2, 2 [1]

(b) addition/hydration [1]

(c) (i) contains double bond [1]

(ii) (brown to) colourless/decolourises [1]

16 (a) 60 × 0.8/1.2 [1]
= 40 [1]

(b) P = E/t **or** 150/1.25 [1]
= 120 [1]

17 (a) use <u>oxygen</u>
produce <u>carbon dioxide</u>
release energy [3]

(b)

carbon monoxide	poisonous	} any linked
sulphur dioxide	acid rain	
oxides of nitrogen	acid rain	

[2]

18 (a) <u>C;</u>
<u>A;</u>
<u>B;</u> [3]

(b) stomach
(chemical) digestion (of proteins)
storage of food (preventing constant ingestion)
mechanical digestion/increase of surface area/volume } any 1
mixing of food with (gastric) secretions
sterilisation of food/killing bacteria on food
absorption of small molecules e.g. glucose/alcohol [1]

ignore reference to providing acid pH for optimum enzyme action

pancreas
secretion of enzymes/protease/lipase/amylase
secretion is alkaline/neutralise acidity of gastric contents } any 1
accept produces insulin/glucagon [1]

ileum
secretion of enzymes/protease/lipase/maltase
(accept any correct enzyme)
absorbs digested materials/provides large surface area for peristalsis } any 1 [1]

colon
absorption of water
peristalsis
production of mucus (for lubrication) } any 1 [1]

(c) (i) line labelled X ending on the liver [1]

(ii) bile emulsifies fats
increases surface area (available for enzyme action)
fats digested more rapidly (by lipase)
bile is alkaline/neutralises gastric contents } any 3 [3]

19 (a) 137 [1]

(b) 56 [1]