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

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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 oxygen
produce carbon dioxide
release energy [3]

(b)

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

[2]

18 (a) C;
A;
B; [3]

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