**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**Cambridge Ordinary Level**

# MARK SCHEME for the October/November 2015 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.

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CAMBRIDGE
International Examinations

**1** **(a)** haematite [1]

**(b)** limestone decomposes to calcium oxide
calcium oxide reacts with the sand
forming slag [3]

**(c)** $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$ [1]

**(d)** potassium is more reactive than <u>carbon</u> [1]

**2** **(a)** 7 [1]

**(b)** distance = speed × time **or** 4 × 12
= 48 [2]

**(c)** straight line / constant gradient [1]

**(d)** kinetic [1]
gravitational / potential / gravitational potential [1]

**3** **(a)** removal from the body / organism
waste products of metabolism
toxic materials
} any 2 [2]

**(b)**

| name | produced | excreted by |
|---|---|---|
| carbon dioxide | (any) cell / tissue / organ | lung |
| water | (any) cell / tissue / organ | kidney / skin |
| urea | liver | kidney |

[6]

**4** **(a)** **(i)** 53.5
40 [2]

**(ii)** 80
2 ecf [(a)(ii) / 40] [2]

**(b)** making fertilisers / nitric acid [1]

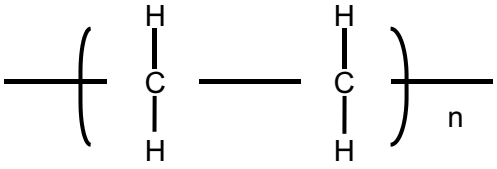
**(c)** 3 bonding pairs with the hydrogen atoms
1 lone pair on the nitrogen [2]

**5** F = ma **or** 1.5 × 1.8
= 2.7 [2]

**6** **(a)** **(i)** contains a carbon to carbon double bond [1]

**(ii)** small molecules / monomers
(chemically) joining / bonding
to form long chains } any 2 [2]

**(b)**




[2]

**7** **(a)** A = 18
B : 27 (**both required**) [1]

**(b)** **(i)** water moves into the cells
water more concentrated outside the cell
by osmosis / definition of } any 2 [2]

**(ii)** B had larger surface area than A
more osmosis could occur / more water absorbed [2]

**(c)** **(i)** haemoglobin [1]

**(ii)** cells burst / cell membrane ruptures
water moved into the cells by osmosis
haemoglobin released into water } any 1 [2]

**8** distillation
fractional distillation
filtrate
crystallisation
chromatography [5]

**9** ammeter
amperes / amps / A
charge [3]

**10** **(a)** neutral blue (**both required**)
live brown (**both required**) [2]

**(b)** earth [1]

**(c)** P = E / t **or** 180 000 / 120
= 1500
W (**unit independent**) [3]
(accept 180 000 / 2 = 90 000 for 1 mark)

**11** **(a)** **(i)** cervix = E

**(ii)** ovary = B

**(iii)** vagina = F [3]

**(b)** **(i)** transfers ovum to uterus
place where fertilisation occurs } any 1 [1]

**(ii)** place where implantation occurs / fetus develops [1]

**(c)** **(i)** chemical substance
produced by a gland
alters activity of a target organ } any 2 [2]

**(ii)** diet / malnutrition
emotional state / stress
concentrated exercise
pregnancy
menopause } any 1 [1]

**12** copper never attracted
iron attracted to both poles of magnet
permanent magnet attraction and repulsion [3]

**13** **(a)** **(i)** B

**(ii)** A [2]

**(b)** hydrogen [1]

**(c)** **(i)** Universal Indicator / litmus
goes red [2]

**(ii)** hydrogen and sulphate / $H^+$ and $SO_4^{2-}$ [1]

**14** **(a)** **(i)** move more slowly / move at angle / move sideways [1]

**(ii)** move upwards [1]

**(b)** needs changing current
changing magnetic field
a.c. provides changing current
(allow d.c. is constant current) } any 2 [2]

**15** anther / stamen
carpel
cotyledon
plumule
testa [5]

**16** **(a)** same element / number of protons
different number of neutrons / mass (nucleon) number [2]

**(b)** 2, 8, 5 [1]

**(c)** covalent
combination of two non-metals [2]

**17** **(a)** f= speed /wavelength **or** $3 \times 10^8 / 6 \times 10^{-11}$
$= 5 \times 10^{18}$ [2]

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

**(ii)** p-waves / sound [1]

**18** digestion
respiration
diffusion
sexual reproduction [4]

**19** **(a)** **(i)** 14 [1]

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

**(ii)** increases by 1/+1 [1]

**(c)** 3 half-lives **or** 3 × 5700
17 100 [2]