

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

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1 (a) haematite [1]

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

(c) $\text{Fe}_2\text{O}_3 + 3\text{CO} \longrightarrow 2\text{Fe} + 3\text{CO}_2$ [1]

(d) potassium is more reactive than carbon [1]

2 (a) 7 [1]

(b) distance = speed \times 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]

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- 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)
- $$\left(\begin{array}{c} \text{H} \\ | \\ \text{---} \text{C} \text{---} \\ | \\ \text{H} \end{array} \text{---} \begin{array}{c} \text{H} \\ | \\ \text{---} \text{C} \text{---} \\ | \\ \text{H} \end{array} \right)_n$$
- [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]

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- 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 } any 2 [2]
alters activity of a target organ }
- (ii) diet / malnutrition }
emotional state / stress } any 1 [1]
concentrated exercise }
pregnancy }
menopause }
- 12 copper never attracted
iron attracted to both poles of magnet
permanent magnet attraction and repulsion [3]

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- 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) $f = \text{speed} / \text{wavelength}$ or $3 \times 10^8 / 6 \times 10^{-11}$
 $= 5 \times 10^{18}$ [2]
- (b) (i) gamma [1]
- (ii) p-waves / sound [1]

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- 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]