

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5129 COMBINED SCIENCE

5129/22

Paper 2 (Theory), maximum raw mark 100

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Page 2	Mark Scheme	Syllabus	Paper
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- 1 (a) (i) nitrogen / N /
(nitrate) ions dissolved in soil water
absorbed by roots / root hair cells
by diffusion / active transport
} any 2
explanation is independent [1]
[2]
- (ii) enzyme
accept amylase / correct named plant enzyme / valid protein type [1]
- (b) (only green) plants carry out photosynthesis
plants produce food / named foods / producers
animals / humans eat plants / consumers
eat animals that have eaten plants
plants produce oxygen
animals need oxygen
(oxygen) for respiration
} any 3 [3]
- 2 (a) alkali metals [1]
- (b) (i) 2 2 2 [1]
- (ii) blue / purple [1]
- (c) ignites / burns / purple flame
more vigorous / faster reaction
melts
moves across surface faster
} any 2
it = potassium [2]
- 3 (a) mass
weight
field [3]
- (b) density [1]
- 4 (a) make food pieces smaller
increases surface area of the food
mixes food with saliva / salivary amylase
softens food
dilutes food (water in saliva)
makes food easier to swallow
} any 2
mark the two parts as whole [2]

Page 3	Mark Scheme	Syllabus	Paper
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- (b) (i) food particles stuck between teeth
bacteria in mouth act on food
produce acid
which attacks/dissolves enamel/tooth surface } any 3 [3]

- (ii) removes food particles/plaque from teeth
accept antiseptic properties of sap from twig (kills bacteria)
less bacterial growth
less acid (in mouth)
less food for bacteria } any 1 [2]

- 5 (a) (i) 64
(ii) 34 [2]

- (b) 48
2.4 ecf [(b)/20] [2]

- (c) (i) combustion of (sulfur-containing) hydrocarbon fuels/fossil fuels
allow volcanoes/volcanic eruptions
fuels/hydrocarbons alone are insufficient [1]

- (ii) acid rain
erosion of buildings etc.
destruction of aquatic life/plant life } any 1 [2]

- 6 (a) (i) $\sin i / \sin r$ or $\sin 75 / \sin 37$
= 1.61
allow answer in range 1.60 to 1.62 [2]

- (ii) increases [1]

- (b) both rays converge [1]
both meet on central line [1]

- 7 (a) sperm duct = B
testis = E
urethra = D [3]

- (b) (i) deposits semen/sperm in the vagina/near cervix
do not allow urination

- (ii) adds (alkaline) liquid to semen/sperm
produces seminal fluid
do not allow produces sperm } any 1 [2]

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- 8 (a) (i) protons and neutrons
electrons (all three required) [1]
- (ii) protons and electrons (both required) [1]
- (iii) electrons protons (both required) [1]
- (iv) electrons lost (both required) [1]
- (b) 99
155 [2]
- 9 (a) completes circuit
correct symbol (tip and tail outside box) [1]
- (b) (i) $V = IR$ or 4×0.13
 $= 0.52$ [2]
- (ii) 0.98 or 1.5 – (b)(i) [1]
- 10 (a) (i) loss of water (vapour)
through stomata [2]
- (b) **change**
add water (to soil around plant)
put the plant in reduced light/darkness
reduce the temperature
increase humidity
protect plant from draughts
explanation
so that the rate of transpiration is less than or equal to the
rate of uptake of water [2]
- 11 (a) particles randomly arranged and not touching
minimum of three particles [1]
- (b) more energy / moving faster
random / free movement
allow converse for solid [2]
- (c) freezing
ignore solidifying
evaporation / boiling / vaporisation [2]

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- 12 (a)** distance = speed \times time **or** 0.04×1400
 = 56 [2]
 depth = 28 (allow ecf) [1]
- (b) (i)** no. of complete oscillations / waves per second [1]
- (ii)** wavelength = speed / frequency **or** $1400 / 20\,000$
 = 0.07
 m (unit independent) [3]
- 13** oxygen
 haemoglobin
 antibodies
 phagocytosis
 blood clotting [5]
- 14 (a)** 3 bonding pairs with hydrogen
 1 lone pair [2]
- (b) (i)** hydroxide ion / OH^- [1]
- (ii)** pH 8–10 [1]
- (c)** $(\text{NH}_4)_2\text{SO}_4$ [1]
- 15 (a)** length / density
 pressure
 e.m.f.
 colour
 resistance } any 2 [2]
- (b)** size of the bore / the bore / size of bulb [1]
- (c) (i)** radiation [1]
- (ii)** conduction [1]
- (d)** better / good absorber of heat / thermal radiation [1]
- (e)** heated air expands
 becomes less dense
 rises / convection } any 2 [2]

Page 6	Mark Scheme	Syllabus	Paper
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- (f) sound has a longer wavelength / lower frequency
 sound cannot pass through vacuum
 sound is longitudinal
 infra-red is electromagnetic
allow converse for infra-red

} any 1

[1]

- 16 (a) contains carbon to carbon double bond

[1]

- (b) limewater
 turns milky

[2]

- (c) bromine

[1]

- (d) many monomers / small molecules
 chemically bonded / joined together
 to form long chains / large molecule / macromolecule

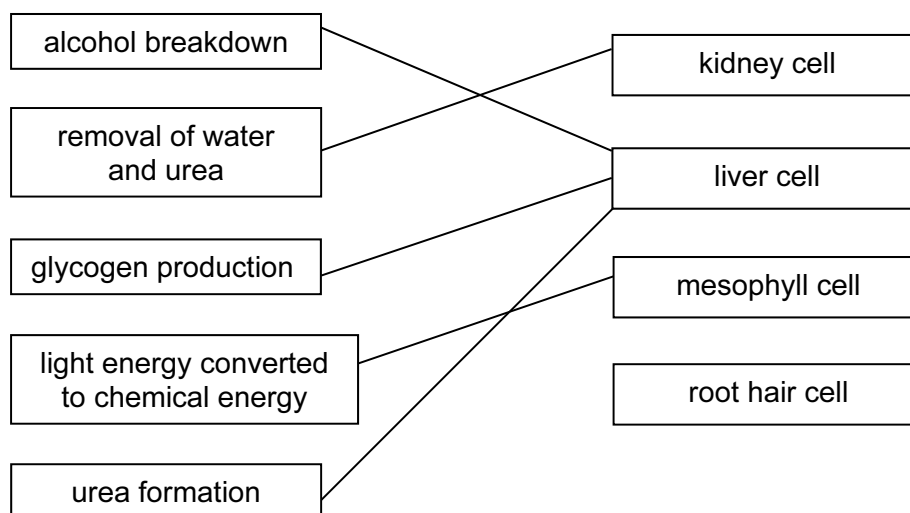
} any 2

[2]

- 17 4 2
 234 90

[4]

18



[5]

[Total: 100]