

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

5129 COMBINED SCIENCE

5129/02

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.

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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
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- 1 (a) 0.18 (ignore units) [1]
- (b) $V = IR$ or 50×0.03 or 10×0.15
 $= 1.5$ (V) [2]
- (c) $Q = It$ or $C = It$ or 0.15×300
 $= 45$
 C [3]
 0.75 C gains 2 marks, 0.75 gains 1 mark
 unit mark is independent of the numerical answer
- 2 (a) (i) blue / purple / indigo / violet [1]
- (ii) OH^- / hydroxide ion [1]
 ignore OH
- (b) pipette
 burette (do not accept biuret)
 neutral / neutralised [3]
- (c) (i) $(\text{NH}_4)_2\text{SO}_4$ [1]
- (ii) fertiliser [1]
- 3 (a) $v = d/t$ or speed = distance / time or $2.7 \times 10^8 / 24 \times 60 \times 60$
 3125 (m/s) [2]
 allow $2.7 \times 10^8 / 24 = 11\,250\,000$ for 1 mark
 allow $2.7 \times 10^8 / (24 \times 60) = 187\,500$ for 1 mark
- (b) $F = ma$ or $a = F/m$ or $45/200$
 $= 0.225$ (m/s²) [2]
- 4 (a) anther / stamen (ignore pollen grains)
 sepal
 ovary / carpel [3]
- (b) to attract insects
 for pollination [2]
- (c) anther / stamen / X [1]

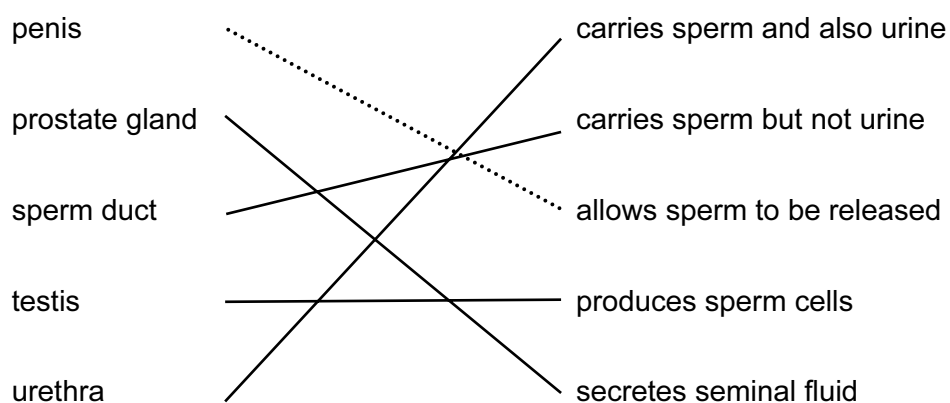
Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
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- 5 (a) liquid – irregular shape majority of particles touching
gas – random particles not touching [2]
- (b) melting
condensation [2]
- 6 (a) volume
density
length
resistance / resistivity
colour
e.m.f.
pressure } any 2 [2]
- (b) smaller range
constriction
retains reading
triangular cross section
narrow bore / tube
more sensitive
(ignore more accurate / narrower alone) } any two [2]
- (c) mercury would freeze / would be solid
or alcohol stays liquid / does not freeze
(ignore statement that mercury melts at -39°C) [1]
- 7 (a) (i) tubing [1]
- (ii) the water (in the beaker) [1]
- (iii) the starch
do not accept starch and amylase [1]
- (b) (amylase is an) enzyme
catalyses (breakdown of starch)
starch is broken down / digested
sugar / maltose diffuses into the water
tube is permeable (to maltose / sugar)
(allow correct description for diffusion) } any 3 [3]
- 8 (a) $E = Pt$ or energy = power $\times$ time or 1800×120
= 216 000
J [3]
3600 J gains 2 marks, 3600 gains 1 mark
- (b) neutral
earth ANY order [2]

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- 9** (a) oxygen [1]
- (b) hydrogen [1]
- (c) hydrogen [1]
- (d) carbon monoxide [1]
- (e) argon [1]
- 10** (a) (i) N S [1]
- (ii) S N [1]
- (b) current not changing / is constant / in one direction only
magnetic field not changing / is constant [2]
- 11** (a) two parents
(genetically) different offspring
fertilisation / fusion of gametes or nuclei
allow converse argument [2]

(b)



[4]

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- 12 (a)** 54 112 [2]
 5.4 11.2 [1]
 (accept both above divided by 10)
 5.6 [1]
 (accept above divided by 2)
 (correct answers always gain credit)
- (b)** oxidation / redox [1]
- 13 (a)** 46° [1]
- (b) (i)** $R.I. = \sin i / \sin r$ [1]
- (ii)** 28° (accept 27.79 to 28) [1]
- 14 (a)** gas A = hydrogen
 gas B = carbon dioxide
 liquid C = water
 gas D = water / steam [4]
- (b)** ethene contains a (carbon to carbon) double bond [1]
- (c)** speed up the reaction / lowers activation energy [1]
- 15 (a) (i)** loss of water [1]
- (ii)** through stomata
 in leaves [2]
- (b) (i)** 6 hours
 24 hours (accept 23.5 to 24) [2]
- (ii)** it will wilt / droop [1]
- 16 (a)** conduction / conduct / conductor [1]
- (b)** it has expanded [1]

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- 17 (a) (i) 8
10 [2]
- (ii) 2 electrons on inner ring and 6 electrons on outer ring [1]
- (b) same element / same number of protons
different number of neutrons / nucleon number
(ignore references to electrons) [2]
- (c) oxygen tents in hospital
(oxy-acetylene) welding
oxygen tanks for divers
steel manufacture
ignore breathing / saving lives / respiration / combustion
answers which relate to breathing must say 'how' or 'what' is done
} any two [2]
- 18 blood
gland
target organ
liver [4]
- 19 (a) $d = m / v$ or $5.4 / 1.8$
= 3.0
 g/cm^3
(correct answer with unit = 3 marks)
(unit mark independent of answer) [3]
- (b) 2.8 [1]
- 20 (a) large fish / fishermen [1]
- (b) mercury into water
absorbed by micro-organisms
(small) fish eat the micro-organisms [3]
- (c) because they eat fish [1]