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

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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)** $(NH_4)_2SO_4$ [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/s^2) [2]

4 **(a)** anther / stamen (ignore pollen grains)
sepal
ovary / carpel [3]

(b) to attract insects
for pollination [2]

(c) anther / stamen / X [1]

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
} any two [2]
(ignore more accurate / narrower alone)

(c) mercury would freeze / would be solid
or alcohol stays liquid / does not freeze [1]
(ignore statement that mercury melts at –39°C)

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 <u>diffuses</u> into the water
tube is <u>permeable</u> (to maltose / sugar)
} any 3 [3]
(allow correct description for diffusion)

8 **(a)** $E = Pt$ **or** energy = power × time **or** 1800 × 120
= 216 000
J [3]
3600 J gains 2 marks, 3600 gains 1 mark

(b) neutral
earth ANY order [2]

9 **(a)** oxygen [1]

(b) hydrogen [1]

(c) hydrogen [1]

(d) carbon monoxide [1]

(e) argon [1]

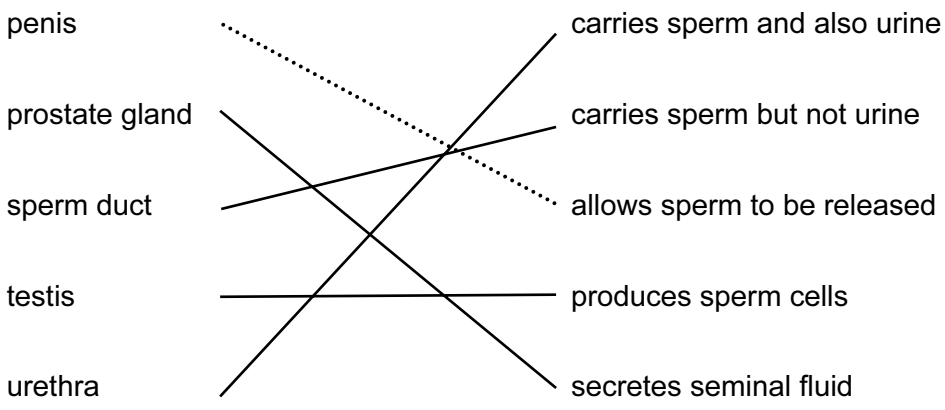
10 **(a)** **(i)** N S [1]

(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]

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]

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 [2]
(ignore references to electrons)

(c) oxygen tents in hospital
(oxy-acetylene) welding
oxygen tanks for divers
steel manufacture } any two [2]
ignore breathing / saving lives / respiration / combustion
answers which relate to breathing must say 'how' or 'what' is done

18 blood
gland
target organ
liver [4]

19 (a) d = m / v **or** 5.4 / 1.8
= 3.0
g/cm^3 [3]
(correct answer with unit = 3 marks)
(unit mark independent of answer)

(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]