

**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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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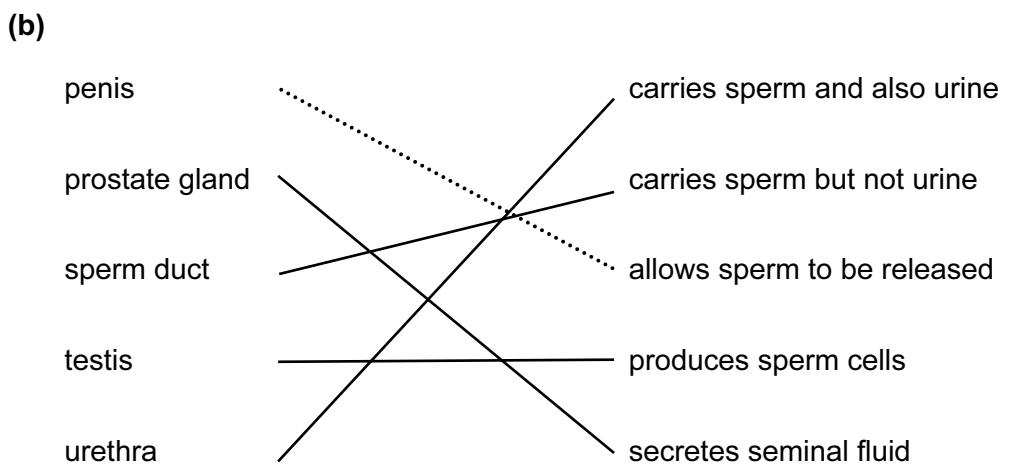
- 1 (a) 0.18 (ignore units)
- (b)  $V = IR$  or  $50 \times 0.03$  or  $10 \times 0.15$   
= 1.5 (V) [2]
- (c)  $Q = It$  or  $C = It$  or  $0.15 \times 300$   
= 45  
C [3]  
0.75 C gains 2 marks, 0.75 gains 1 mark  
unit mark is independent of the numerical answer
- 2 (a) (i) blue / purple / indigo / violet [1]
- (ii)  $\text{OH}^-$  / 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/s<sup>2</sup>) [2]
- 4 (a) anther / stamen (ignore pollen grains)  
sepal  
ovary / carpel [3]
- (b) to attract insects  
for pollination [2]
- (c) anther / stamen / X [1]

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- 5 (a) liquid – irregular shape majority of particles touching  
 gas – random particles not touching
- (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  $-39^{\circ}\text{C}$ ) [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  $1800 \times 120$   
 = 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
- (b) hydrogen
- (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]



[4]

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- 12 (a)** 54                                112  
5.4                                        11.2  
(accept both above divided by 10)  
5.6  
(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
- (ii) 2 electrons on inner ring and 6 electrons on outer ring
- (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  $5.4 / 1.8$   
 $= 3.0$   
 $\text{g/cm}^3$   
(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]