Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

COMBINED SCIENCE **5129/22**

Paper 2 Theory **October/November 2016**

MARK SCHEME

Maximum Mark: 100

Published

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

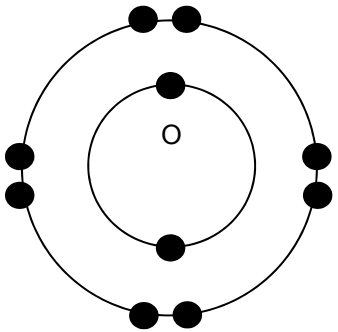
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

Question	Answer	Mark
1(a)	5.91	**1**
1(b)	d = m / v **or** 24 / 2.5 9.6	**2**

Question	Answer	Mark
2(a)(i)	**C** = pancreas **D** = small intestine	**2**
2(a)(ii)	*acid* **B** *bile* **A**	**2**
2(b)	any **two** from • enzyme / biological catalyst • acts on / breaks down starch • converts it to maltose / glucose	**2**
2(c)	any **two** from • emulsifies fats • produces large surface area • for enzyme activity / speeds up fat digestion	**2**

Question	Answer	Mark
3(a)	0.043	**1**
3(b)(i)	0 to10	**1**
3(b)(ii)	$F = ma$ **or** 0.043×0.4 0.0172	**2**
3(b)(iii)	15×4 60	**2**

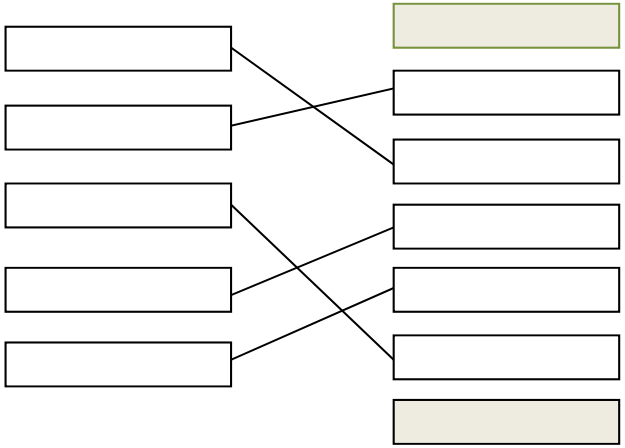
Question	Answer	Mark
4(a)(i)	85	**1**
4(a)(ii)	170 32 4.25	**3**
4(b)(i)		**1**
4(b)(ii)	O^{2-}	**1**
4(c)	acetylene	**1**

Question	Answer	Mark
5	toxic aerobic respiration liver kidneys amino acids	**5**

Question	Answer	Mark
6(a)	**A** = copper carbonate **B** = sulfuric acid **C** = water **D** = magnesium	**4**
6(b)	filtration	**1**
6(c)	limewater goes milky / cloudy / white precipitate	**2**

Question	Answer	Mark
7(a)	transfer of energy In the same direction as the vibration	**2**
7(b)	$v = f\lambda$ **or** 6×0.9 $= 5.4$	**2**

Question	Answer	Mark
8(a)	RI = sin *i* / sin r sin 30 / sin 19 or 0.5 / 0.326 (= 1.54)	**2**
8(b)	line labelled W to the right of the refracted ray for glass and inside the line where the ray passes straight through	**1**

Question	Answer	Mark
9		**5**

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th></tr>
<tr><td>10(a)</td><td>
<table>
<tr><td></td><td>metal</td><td>non-metal</td></tr>
<tr><td>melting point</td><td>high</td><td>low</td></tr>
<tr><td>malleability</td><td>yes / malleable</td><td>no / brittle</td></tr>
<tr><td>electrical conductivity</td><td>yes / conducts</td><td>no / insulator</td></tr>
<tr><td>type of oxide</td><td>basic / alkaline</td><td>acidic</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>10(b)</td><td>strength / low density
resistance to corrosion</td><td>2</td></tr>
</table>

Question	Answer	Mark
11(a)(i)	0.5	**1**
11(a)(ii)	0.25	**1**
11(b)	any **two** from • more turns (on electromagnet) • decrease resistance (in circuit) • increase current • increase voltage	**2**

Question	Answer	Mark
12(a)	sun	1
12(b)	tree small bird / beetle / hawk moth / caterpillar	3
12(c)	any **three** from • energy is lost (at each trophic level) • as heat / during movement / in urine or faeces • only small proportion of energy available for next (trophic) level • insufficient energy available from top consumers to support a higher trophic level	3

Question	Answer	Mark
13(a)	molecule / compound containing carbon and hydrogen only	2
13(b)(i)	8 5 6	1
13(b)(ii)	limited supply of oxygen	1
13(c)(i)	contains carbon to carbon double bond	1
13(c)(ii)	addition ethane	1

Question	Answer	Mark
14	by the same / positive charge placed at **P** (like charges) repelled	**2**

Question	Answer	Mark
15(a)	stomata are on underside of leaves stomata on **L** are blocked / covered by the grease water vapour cannot escape from **L**	**3**
15(b)	no stomata on upper surface stomata are not blocked / covered in both **N** and **M**	**2**

Question	Answer	Mark
16	alkali one electron hydroxide **and** hydrogen / H_2 more	**4**

Question	Answer	Mark
17(a)	light kinetic	**2**
17(b)(i)	no change	**1**
17(b)(ii)	move apart	**1**
17(c)	V = IR **or** I = V / R **or** I = 1.5 / 3 0.5 A	**3**

Question	Answer	Mark
18	*contains seeds* **C** *produces pollen* **B** *protects flower* **D**	**3**

Question	Answer	Mark
19(a)(i)	hydroxide	**1**
19(a)(ii)	8 – 10	**1**
19(b)	nitric acid	**1**
19(c)	any **one** from • phosphorus • potassium	**1**

Question	Answer	Mark
20(a)	alpha, beta and gamma alpha	**2**
20(b)	$^{4}_{2}He$	**2**