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**COMBINED SCIENCE****5129/22**

Paper 2 Theory

**October/November 2016**

MARK SCHEME

Maximum Mark: 100

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**Published**

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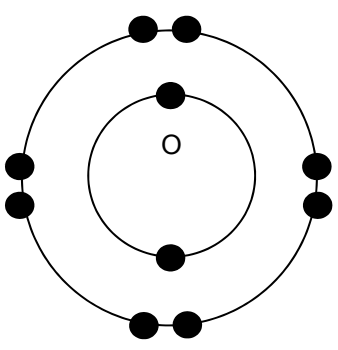
Page 2	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(a)	5.91	1
1(b)	$d = m/v$ or 24/2.5 9.6	2

Question	Answer	Mark
2(a)(i)	<b>C</b> = pancreas <b>D</b> = small intestine	2
2(a)(ii)	<i>acid</i> <b>B</b> <i>bile</i> <b>A</b>	2
2(b)	any <b>two</b> from <ul style="list-style-type: none"> <li>• enzyme / biological catalyst</li> <li>• acts on / breaks down starch</li> <li>• converts it to maltose / glucose</li> </ul>	2
2(c)	any <b>two</b> from <ul style="list-style-type: none"> <li>• emulsifies fats</li> <li>• produces large surface area</li> <li>• for enzyme activity / speeds up fat digestion</li> </ul>	2

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Question	Answer	Mark
3(a)	0.043	1
3(b)(i)	0 to 10	1
3(b)(ii)	$F = ma$ or $0.043 \times 0.4$ 0.0172	2
3(b)(iii)	$15 \times 4$ 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

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
5	<u>toxic</u> <u>aerobic respiration</u> <u>liver</u> <u>kidneys</u> <u>amino acids</u>	<b>5</b>

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

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

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

<b>Question</b>	<b>Answer</b>	<b>Mark</b>
9	<p>The diagram shows a matching exercise. On the left, there are five empty rectangular boxes. On the right, there are five empty rectangular boxes. Lines connect the boxes as follows: the top-left box connects to the second box from the top on the right; the second-left box connects to the top box on the right; the third-left box connects to the third box from the top on the right; the fourth-left box connects to the bottom box on the right; and the fifth-left box connects to the fourth box from the top on the right. The top and bottom boxes on the right are shaded light brown.</p>	<b>5</b>

Page 6	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark															
10(a)	<table border="1"> <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>		metal	non-metal	melting point	high	low	malleability	yes / malleable	no / brittle	electrical conductivity	yes / conducts	no / insulator	type of oxide	basic / alkaline	acidic	4
	metal	non-metal															
melting point	high	low															
malleability	yes / malleable	no / brittle															
electrical conductivity	yes / conducts	no / insulator															
type of oxide	basic / alkaline	acidic															
10(b)	strength / low density resistance to corrosion	2															

Question	Answer	Mark
11(a)(i)	0.5	1
11(a)(ii)	0.25	1
11(b)	any <b>two</b> from <ul style="list-style-type: none"> <li>• <u>more</u> turns (on electromagnet)</li> <li>• <u>decrease</u> resistance (in circuit)</li> <li>• <u>increase</u> current</li> <li>• <u>increase</u> voltage</li> </ul>	2

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
12(a)	sun	<b>1</b>
12(b)	tree small bird / beetle / hawk moth / caterpillar	<b>3</b>
12(c)	any <b>three</b> from <ul style="list-style-type: none"> <li>• energy is lost (at each trophic level)</li> <li>• as heat / during movement / in urine or faeces</li> <li>• only small proportion of energy available for next (trophic) level</li> <li>• insufficient energy available from top consumers to support a higher trophic level</li> </ul>	<b>3</b>

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

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

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

<b>Question</b>	<b>Answer</b>	<b>Mark</b>
16	alkali one electron hydroxide <b>and</b> hydrogen / H <sub>2</sub> more	<b>4</b>



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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	<i>contains seeds</i> C <i>produces pollen</i> B <i>protects flower</i> D	3

Question	Answer	Mark
19(a)(i)	hydroxide	1
19(a)(ii)	8 – 10	1
19(b)	nitric acid	1
19(c)	any <b>one</b> from <ul style="list-style-type: none"> <li>• phosphorus</li> <li>• potassium</li> </ul>	1

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>
20(a)	alpha, beta and gamma alpha	<b>2</b>
20(b)	${}^4_2\text{He}$	<b>2</b>