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**SCIENCE**

**1113/01**

Paper 1

**April 2017**

MARK SCHEME

Maximum Mark: 50

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**IMPORTANT NOTICE**

Mark Schemes have been issued on the basis of **one** copy per Assistant examiner and two copies per Team Leader.

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 Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

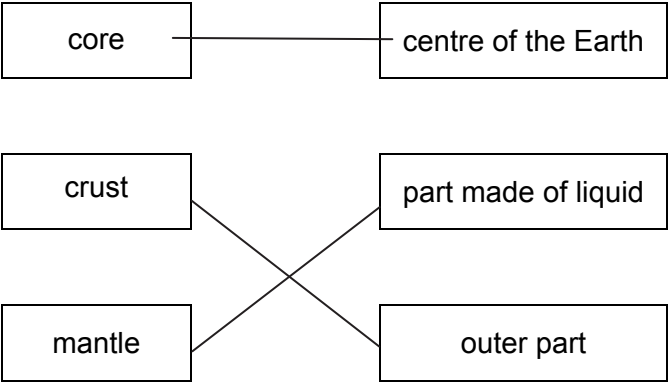
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.




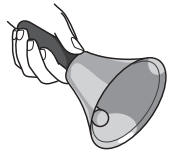





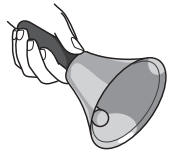





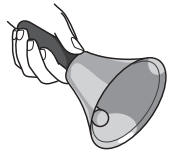


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This document consists of **10** printed pages.

Question	Answer	Marks	Further Information																		
<p><b>1(a)</b></p>	<table border="1"> <thead> <tr> <th>structure</th> <th>plant cell</th> <th>animal cell</th> </tr> </thead> <tbody> <tr> <td>nucleus</td> <td>(✓)</td> <td>(✓)</td> </tr> <tr> <td>cell wall</td> <td>✓</td> <td></td> </tr> <tr> <td>cytoplasm</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>cell membrane</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>vacuole</td> <td>✓</td> <td></td> </tr> </tbody> </table>	structure	plant cell	animal cell	nucleus	(✓)	(✓)	cell wall	✓		cytoplasm	✓	✓	cell membrane	✓	✓	vacuole	✓		<p><b>2</b></p>	<p>all <b>four</b> rows correct = 2 marks</p> <p><b>two</b> or <b>three</b> rows correct = 1 mark</p> <p><b>one</b> row correct = 0 marks</p>
structure	plant cell	animal cell																			
nucleus	(✓)	(✓)																			
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<p><b>1(b)</b></p>	<table border="1"> <thead> <tr> <th>name</th> <th>letter</th> <th>function</th> </tr> </thead> <tbody> <tr> <td>cell wall</td> <td>A</td> <td>where photosynthesis happens</td> </tr> <tr> <td>chloroplast</td> <td>B</td> <td>where chemical reactions occur</td> </tr> <tr> <td>cytoplasm</td> <td>C</td> <td>contains genetic information</td> </tr> <tr> <td>nucleus</td> <td>D</td> <td>rigid to support the cell</td> </tr> </tbody> </table>	name	letter	function	cell wall	A	where photosynthesis happens	chloroplast	B	where chemical reactions occur	cytoplasm	C	contains genetic information	nucleus	D	rigid to support the cell	<p><b>4</b></p>	<p><i>name and letter linkage</i></p> <p><b>three</b> correct links = 2 marks</p> <p><b>one</b> or <b>two</b> correct = 1 mark</p> <p><i>letter and function linkage</i></p> <p><b>three</b> correct links = 2 marks</p> <p><b>one</b> or <b>two</b> correct = 1 mark</p>			
name	letter	function																			
cell wall	A	where photosynthesis happens																			
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Question	Answer	Marks	Further Information								
2(a)	<p style="text-align: center;"><b>Earth's structure</b>                      <b>description</b></p> 	<b>2</b>	all <b>three</b> correct = 2 marks <b>one</b> or <b>two</b> correct = 1 mark								
2(b)	igneous metamorphic	<b>2</b>	each answer = 1 mark either order								
2(c)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">crystal</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">fossil</td> <td style="text-align: center; padding: 5px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">mineral</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">rock</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> </table>	crystal	<input type="checkbox"/>	fossil	<input checked="" type="checkbox"/>	mineral	<input type="checkbox"/>	rock	<input type="checkbox"/>	<b>1</b>	if more than one tick = 0 marks
crystal	<input type="checkbox"/>										
fossil	<input checked="" type="checkbox"/>										
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Question	Answer	Marks	Further Information						
3	<table border="1"> <tbody> <tr> <td> light</td> <td> thermal</td> <td> thermal</td> </tr> <tr> <td> sound</td> <td> sound</td> <td> kinetic</td> </tr> </tbody> </table>	 light	 thermal	 thermal	 sound	 sound	 kinetic	3	<p><b>six</b> correct = 3 marks</p> <p><b>four</b> or <b>five</b> correct = 2 marks</p> <p><b>two</b> or <b>three</b> correct = 1 mark</p> <p><b>Accept</b> heat for thermal</p> <p><b>Ignore</b> kinetic with reference to the hand bell</p>
 light	 thermal	 thermal							
 sound	 sound	 kinetic							

Question	Answer	Marks	Further Information
4(a)	parallel	1	
4(b)(i)	ammeter	1	
4(b)(ii)	current / amps	1	<b>Accept</b> rate of flow of charge
4(c)	7.5 (amps)	1	<b>Accept</b> any number in the range 7.2 – 7.8 <b>Ignore</b> incorrect units
4(d)	7.5 (amps) / same as A <sub>1</sub>	1	<b>Accept</b> same as answer in (c) <b>Ignore</b> incorrect units

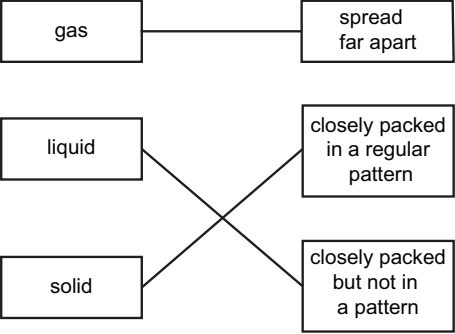
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Question	Answer	Marks	Further Information						
<b>5(a)</b>	<b>A</b> = lungs <b>B</b> = liver <b>C</b> = small intestine / ileum <b>D</b> = kidney	<b>4</b>	each answer = 1 mark  <b>Accept</b> duodenum						
<b>5(b)</b>	<table border="1"> <thead> <tr> <th>how the blood changes as it passes through the organ</th> <th>letter</th> </tr> </thead> <tbody> <tr> <td>The concentration of nutrients <b>increases</b>.</td> <td><b>C</b></td> </tr> <tr> <td>The concentration of carbon dioxide <b>decreases</b> and the concentration of oxygen <b>increases</b>.</td> <td><b>A</b></td> </tr> </tbody> </table>	how the blood changes as it passes through the organ	letter	The concentration of nutrients <b>increases</b> .	<b>C</b>	The concentration of carbon dioxide <b>decreases</b> and the concentration of oxygen <b>increases</b> .	<b>A</b>	<b>2</b>	<b>Accept</b> correct names small intestine for C lungs for A  if name and letter given, mark only letter
how the blood changes as it passes through the organ	letter								
The concentration of nutrients <b>increases</b> .	<b>C</b>								
The concentration of carbon dioxide <b>decreases</b> and the concentration of oxygen <b>increases</b> .	<b>A</b>								

Question	Answer	Marks	Further Information
6(a)(i)	<p style="text-align: center;">reactants                          products</p> <p style="text-align: center;"><b>water + carbon dioxide → glucose + oxygen</b></p>	2	reactants = 1 mark products = 1 mark <b>Accept</b> carbohydrate / sugar instead of glucose. <b>Ignore</b> starch <b>Accept</b> correct formulae or mix of words and formulae but names take precedence $H_2O + CO_2 \rightarrow C_6H_{12}O_6 + O_2$
6(a)(ii)	3 cm <sup>3</sup>	1	answer must include unit
6(b)(i)	more carbon dioxide available (for plant) / breath contains carbon dioxide	1	<b>Accept</b> CO <sub>2</sub>
6(b)(ii)	move the lamp closer / more lamps / brighter bulbs  because this  provide more light / increases light intensity	2	<b>Accept</b> increase temperature = 1 mark  <b>Accept</b> because enzymes work faster / more collisions / particles move faster = 1 mark  <b>Ignore</b> use more pond weed

Question	Answer	Marks	Further Information
7(a)	(type of salt) solution / (different metal salt) solutions	1	<b>Ignore</b> different metals
7(b)	volume / amount of solution / size of nail / time nail left in / temperature / concentration of solution	1	<b>Accept</b> type of nail / amount of iron
7(c)	sodium is more reactive than iron / sodium is higher up in the reactivity series	1	<b>Accept</b> reverse argument

Question	Answer	Marks	Further Information
8		3	<p><b>six</b> correct = 3 marks</p> <p><b>four</b> or <b>five</b> correct = 2 marks</p> <p><b>two</b> or <b>three</b> correct = 1 mark</p>

Question	Answer	Marks	Further Information
9(a)	solid	1	
9(b)		1	all correct = 1 mark
9(c)	<p><b>any two from</b></p> <p>particles gain energy / (some) particles have more kinetic energy / (some) particles move faster</p> <p>particles have overcome attraction between them / (idea that) forces between particles have been broken</p> <p>particles have spread further apart (in the gas phase)</p>	2	<p><b>Accept</b> evaporation / water changes to a gas / water changes to water vapour</p> <p><b>Do not accept</b> water boils</p> <p><b>Accept</b> particles diffuse into the air</p> <p><b>Accept</b> (water) molecules instead of particles</p> <p>at least one mark should be associated with particles</p>



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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Further Information</b>
<b>10(a)</b>	K	<b>1</b>	<b>Accept</b> potassium <b>Accept</b> Fr
<b>10(b)</b>	H	<b>1</b>	<b>Accept</b> hydrogen
<b>10(c)</b>	<i>Cl</i>	<b>1</b>	<b>Accept</b> chlorine
<b>10(d)</b>	aluminium	<b>1</b>	<b>Ignore</b> Al

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Question	Answer	Marks	Further Information										
11(a)	<p><b>any two from</b></p> <p>eye protection / safety glasses</p> <p>use small(er) masses / use light(er) masses</p> <p>stand away from the table / stand away from the masses / do the experiment on the floor / wear sturdy shoes</p> <p>attach the masses to the wooden block</p> <p>make sure the forcemeter is firmly attached</p>	2	<p><b>Accept</b> weight rather than mass</p>										
11(b)	<table border="1"> <thead> <tr> <th>material</th> <th>(forcemeter reading in N)</th> </tr> </thead> <tbody> <tr> <td><b>A</b></td> <td><b>2.4</b></td> </tr> <tr> <td><b>B</b></td> <td><b>1.7</b></td> </tr> <tr> <td><b>C</b></td> <td><b>3.2</b></td> </tr> <tr> <td><b>D</b></td> <td><b>0.7</b></td> </tr> </tbody> </table>	material	(forcemeter reading in N)	<b>A</b>	<b>2.4</b>	<b>B</b>	<b>1.7</b>	<b>C</b>	<b>3.2</b>	<b>D</b>	<b>0.7</b>	2	<p>all figures in the table = 1 mark</p> <p>correct heading for first column = 1 mark</p> <p>materials can be in any order but the numbers must be correct for each material</p>
material	(forcemeter reading in N)												
<b>A</b>	<b>2.4</b>												
<b>B</b>	<b>1.7</b>												
<b>C</b>	<b>3.2</b>												
<b>D</b>	<b>0.7</b>												
11(c)	repeat the measurements / take more measurements	1	<p><b>Accept</b> (double) check the result</p> <p><b>Accept</b> use a wider range of masses / use different masses</p> <p><b>Do not accept</b> use more accurate devices</p> <p><b>Ignore</b> get more accurate data</p> <p><b>Ignore</b> use more / different materials</p>										