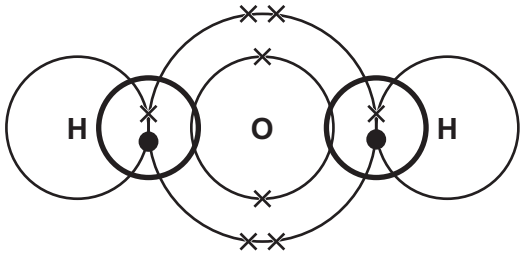
Question	Answer	Marks	Further Information
1(a)(i)	**any two from** (same) temperature (same) age of plant (same) light intensity / number of hours of light (same) concentration of carbon dioxide (same) pH of liquid	**2**	each correct answer = 1 mark **Accept** (same) amount of light **Ignore** (same) volume of liquid **or** (same) type of plant **or** (same) species of plant **or** (same) initial height of plant
1(a)(ii)	type of nutrients (in the liquid)	**1**	**Accept** the liquid
1(b)(i)	yes circled (no marks) fewer leaves **or** least growth	**1**	if no circled = 0 marks
1(b)(ii)	**D**	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence

Question	Answer	Marks	Further Information
2(a)	molecule	**1**	
2(b)	correct covalent pair of electrons circled e.g.  	**1**	**Do not accept** if circle is around any of the non-bonding electrons
2(c)	by adding 2 electrons	**1**	

Question	Answer	Marks	Further Information
3(a)	carbon dioxide + water → (glucose) + oxygen	**1**	**Accept** reactants in either order
3(b)	chloroplasts	**1**	**Do not accept** chlorophyll
3(c)	chlorophyll	**1**	**Do not accept** chloroplasts
3(d)	photosynthesis needs light **or** photosynthesis does **not** happen in the dark	**1**	

Question	Answer	Marks	Further Information
4(a)	density = mass ÷ volume **or** d = m ÷ v	**1**	
4(b)	2.17 g / cm^3	**2**	2.17 g / cm^3 with or without working = 2 marks 2.17 with or without working = 1 mark correct unit = 1 mark **Accept** 2.2 **Accept** 2.173913 **or** correctly rounded to at least two significant figures.

Question	Answer	Marks	Further Information
5(a)	0.2 (A)	**1**	
5(b)	0.1 (A)	**1**	
5(c)	(resistance =) voltage ÷ current **or** (resistance =) 12 ÷ 0.3 40 Ω	**3**	40 Ω with or without working = 3 marks 40 with or without working = 2 marks correct equation or substitution = 1 mark correct unit = 1 mark **Accept** (resistance =) V ÷ I
5(d)	cell **or** battery of cells	**1**	**Accept** batteries **or** resistors **in parallel**

Question	Answer	Marks	Further Information
6(a)	**any one from** location of earthquakes (on edges of plates) (idea of) jigsaw appearance of the coastlines of different continents	**1**	**Accept** example of jigsaw appearance e.g. jigsaw appearance of coastline of Africa and South America **Accept** coastlines of continents are complementary **Do not accept** coastlines have the same shape **Ignore** location of volcanoes
6(b)	**any one from** fossil record alignment of magnetic material in the crust location of volcanoes	**1**	**Accept** answers from mark scheme for **(a)** not given as an answer in **(a)** **Accept** same fossils found in different continents (far away from each other)

Question	Answer	Marks	Further Information
7(a)	**any three from** warm water expands **or** warm water becomes less dense warm water rises cold water replaces the warm water convection current is formed / circular flow until all the water is an equal temperature	**3**	each correct answer = 1 mark **Ignore** ideas about conduction and radiation
7(b)(i)	no circled (no marks) (idea that) repeat results are not close together	**1**	if yes circled = 0 marks for the question
7(b)(ii)	**any one from** insulate the beaker place heater fully into the water stir the water add a lid	**1**	**Do not accept** repeat **Accept** use a temperature probe **Accept** move thermometer away from the side of the beaker so it is not touching it

Question	Answer	Marks	Further Information
7(c)	line from 100 °C falling at faster rate with decreasing gradient **and** ending at 20 °C	**1**	

Question	Answer	Marks	Further Information
8	a collision Earth planet	**3**	each correct answer = 1 mark

Question	Answer	Marks	Further Information
9	<table><tr><td colspan="2"></td><td colspan="4">female</td></tr><tr><td colspan="2"></td><td colspan="2">X</td><td colspan="2">X</td></tr><tr><td rowspan="2">male</td><td>X</td><td>XX</td><td>girl</td><td>XX</td><td>girl</td></tr><tr><td>Y</td><td>XY</td><td>boy</td><td>XY</td><td>boy</td></tr></table>	**2**	**all four** correct = 2 marks **two** or **three** correct =1 mark **one** correct = 0 marks **Accept** YX for XY

Question	Answer	Marks	Further Information
10(a)	(idea that) no more bubbles (of hydrogen) **or** solid zinc left in bottom of beaker	**1**	
10(b)	filtration **or** filtering	**1**	**Ignore** sieving
10(c)	**any two from** **M1** (heat) to make a concentrated solution **or** to make a saturated solution **or** until first appearance of crystals or solid **M2** let (hot) solution cool **or** leave hot solution to evaporate (for a few days) **M3** filter off crystals **M4** wash crystals with a small amount of cold water and leave to dry **or** dry crystals between filter paper	**2**	each correct answer = 1 mark **Note** heat solution until all water evaporates **or** boil solution until all water evaporates = 0 marks for the question **Accept** for **M1** evaporate/heat to get half of the volume of solution **Accept** for **M1** heat solution until first appearance of crystals **Accept** for **M1** evaporate water from solution until a saturated solution is made **Accept** for **M1** leave to evaporate in a warm place **Accept** for **M3** and **M4** pick out crystals and dry between pieces of filter paper = 2 marks

Question	Answer	Marks	Further Information
11	Solid **D** floats in liquid **A** and floats in liquid **C**. Solid **D** floats in liquid **A** and sinks in liquid **B**.	**2**	each correct tick = 1 mark **three** boxes ticked = 1 mark maximum **four** or **more** boxes ticked = 0 marks **Accept** any indication of the correct answer e.g. circling or underlining, but ticking takes precedence

Question	Answer	Marks	Further Information
12	**any two from** (idea that) might be biased (idea that) might be incorrect (idea that) not be written by experts	**2**	each correct answer = 1 mark

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>13(a)</td><td><table><tr><td>(time in minutes)</td><td>volume of gas in cm^3</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>25</td></tr><tr><td>2</td><td>40</td></tr><tr><td>3</td><td>48</td></tr><tr><td>4</td><td>52</td></tr></table></td><td>2</td><td>correct heading = 1 mark

correct insertion of numbers = 1 mark

Note if units in body of table, accept correct numbers but do not award heading mark

Accept correct rows in any order</td></tr>
<tr><td>13(b)</td><td>wear goggles or gloves</td><td>1</td><td>Ignore use lab coat or facemask</td></tr>
<tr><td>14</td><td>(idea that) drop the ball from different heights and measure the depth of the crater

and

any one from
repeat each drop height

use appropriate apparatus, e.g. ruler

(idea of) controlling variables, e.g. depth of sand, dampness of sand, ball used</td><td>2</td><td>each correct answer = 1 mark</td></tr>
</table>

Question	Answer	Marks	Further Information
15	**any three from** (idea that) the changes to the horse are due to genetic changes over time (idea that) present day horses do **not** need to escape from other animals (so do **not** need 4 toes) (idea that) present day horses do **not** all live in areas with soft, wet ground (so do **not** need 4 toes) (idea that) present day horses can now eat harder food (so have developed hard teeth) (idea that) present day horses do **not** need to be small to hide (as are not escaping other animals)	**3**	each correct answer = 1 mark