

Cambridge Lower Secondary Checkpoint

SCIENCE

0893/01

Paper 1

April 2024

MARK SCHEME

Maximum Mark: 50

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 End of Series Report. Cambridge will not enter into discussions about these mark schemes.

This document has **16** pages. Any blank pages are indicated.

Question	Answer	Marks	Further Information
1(a)	root hair xylem transpiration	3	each correct answer = 1 mark Note root on its own is not sufficient Accept evaporation or evapotranspiration or diffusion or evatranspiration
1(b)	nitrate(s)	1	Accept suitable plant mineral, e.g. iron Accept nitrogen or phosphorus or phosphate or potassium or calcium Ignore magnesium or protein
Question	Answer	Marks	Further Information
2(a)	C	1	Accept carbon, but symbol takes precedence
2(b)	2.8.8.1	1	Accept correct dot-and-cross diagram Accept K2 L8 M8 N1

Question	Answer	Marks	Further Information
3(a)	Density is the mass per unit volume of a substance.	1	more than one box ticked = 0 marks Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
3(b)	(the oil) floats on water (the oil is) less dense than water or (the oil) has a density less than 1 g/cm^3	2	each correct answer = 1 mark Accept oil and water do not mix or oil and water do not form a solution Accept ora if water specified

Question	Answer	Marks	Further Information
4(a)(i)	X and Y or XY	1	Accept either order Accept labels on diagram, but answer on answer line takes precedence
4(a)(ii)	gamete(s)	1	Ignore sex cells Ignore reproductive cells Do not accept zygote or germ cells or fertilized egg
4(b)	diet or drugs or genetic disorders	1	Accept any reasonable answer, e.g. disease or substance abuse or vitamin deficiencies or breathing difficulties or excess weight or diabetes or pre-eclampsia or abnormal blood pressure or alcohol or nutrients consumed or minerals or folic acid or caffeine or drinking coffee or gene(tic) Ignore smoking Note food consumption or drinking is not sufficient

Question	Answer	Marks	Further Information																	
5(a)	<table border="1"> <thead> <tr> <th rowspan="2">plates</th> <th colspan="2">direction of tectonic plate movement</th> </tr> <tr> <th>away from each other</th> <th>towards each other</th> </tr> </thead> <tbody> <tr> <td>Nazca and South American</td> <td></td> <td>✓</td> </tr> <tr> <td>Indo-Australian and Pacific</td> <td></td> <td>✓</td> </tr> <tr> <td>Indo-Australian and Antarctic</td> <td>✓</td> <td></td> </tr> <tr> <td>South American and African</td> <td>✓</td> <td></td> </tr> </tbody> </table>	plates	direction of tectonic plate movement		away from each other	towards each other	Nazca and South American		✓	Indo-Australian and Pacific		✓	Indo-Australian and Antarctic	✓		South American and African	✓		2	<p>all four correct = 2 marks</p> <p>two or three correct = 1 mark</p> <p>one correct = 0 marks</p> <p>Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence</p>
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5(b)	Most volcanoes are along the boundaries of tectonic plates.	1	<p>more than one box ticked = 0 marks</p> <p>Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence</p>																	
Question	Answer	Marks	Further Information																	
6(a)	<p>anomalous result circled at (5,65)</p> <p>smooth curve of best fit drawn excluding anomalous point at (5,65)</p>	2	<p>each correct answer = 1 mark</p> <p>Do not accept dot-to-dot lines drawn with a ruler</p> <p>Accept ecf from incorrect anomalous result</p> <p>Ignore any extrapolation of the curve of best fit</p>																	
6(b)	dependent on the curve drawn any value between 59 and 61 (cm ³)	1	Accept correct value from learner's graph within ± half a small square																	

Question	Answer	Marks	Further Information
7(a)	temperature measures how hot or cold something is or heat energy (causes the water to boil)	1	Accept the flame transfers heat energy Accept it is given heat or it is given (thermal) energy
7(b)	conduction	1	

Question	Answer	Marks	Further Information
8(a)	respiration or combustion or decomposition	1	Accept burning or decay or rotting or decompose
8(b)	decomposition	1	Accept decay or decompose Ignore decomposers or named decomposers
8(c)	feeding	1	Accept eating or consumption or nutrition
8(d)	photosynthesis	1	

Question	Answer	Marks	Further Information
9(a)	5	1	
9(b)	<p>any two from</p> <p>(volcanic activity) leads to climate change</p> <p>carbon dioxide produced</p> <p>(resulting in) global warming</p> <p>ocean acidification or acid rain</p>	2	<p>each correct answer = 1 mark</p> <p>Accept (more) greenhouse gases made</p> <p>Accept increased temperature</p> <p>Accept produces sulfur dioxide</p> <p>Additional extra marking points</p> <p>Note animals or plants killed is not sufficient</p> <p>Accept habitats destroyed or habitats damaged or habitats disrupted or environment destroyed</p> <p>Accept tsunamis</p>

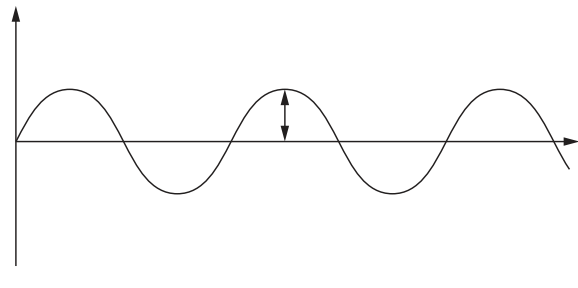
Question	Answer	Marks	Further Information
10(a)	<p>sulfuric (acid)</p> <p>magnesium (carbonate)</p>	2	<p>each correct answer = 1 mark</p> <p>Accept H₂SO₄, but name takes precedence</p> <p>Do not accept sulfur acid or sulfic acid or sulfuric acid</p> <p>Accept MgCO₃, but name takes precedence</p>
10(b)	<p>filter (the mixture)</p> <p>slowly evaporate the (filtrate) or boil away half of the filtrate or leave solution to crystallise</p>	2	<p>each correct answer = 1 mark</p> <p>Accept filtration</p> <p>Ignore reference to heating reaction mixture before filtering off zinc carbonate</p> <p>Note the filtering to remove zinc carbonate must be before the evaporating step</p> <p>Note must be an idea of a slow process to give the mark for evaporation</p> <p>Accept partial evaporation or heating until first appearance of crystals or heat to get a saturated solution</p> <p>Note crystallise on its own is not sufficient</p> <p>Do not accept idea of heating to dryness as a fast process or evaporating to dryness as a fast process or heating filtrate in oven</p>

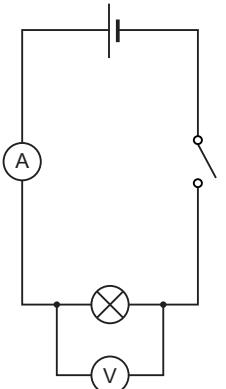
Question	Answer	Marks	Further Information
11(a)	created (or) destroyed	1	both correct either order for the mark Accept made (or) destroyed Accept formed (or) destroyed
11(b)	20 (J)	1	

Question	Answer	Marks	Further Information
12		1	Accept any line showing a decrease from 65 to the x-axis at a time less than 65 millions of years ago

Question	Answer	Marks	Further Information
13(a)	species genes	2	each correct answer = 1 mark
13(b)(i)	no (no mark) not all characteristics are changed randomly or some are repaired before being passed onto next generation or yes (no mark) not all characteristics stay the same or some characteristics can be changed (by natural selection)	1	Note mark is for the explanation Accept (some) characteristics do not change
13b(ii)	secondary sources or use a different species (other than cress)	1	Accept scientific journals or internet or search for similar investigations Accept use animals instead of plants or use a different animal or use a different plant for species Accept study the genes of cress seeds in a historical seed bank or do the experiment for many generations Note do the experiment for a longer time is not sufficient

Question	Answer	Marks	Further Information
14(a)	<p>any two from</p> <p>(powder has) a larger surface area</p> <p>(powder has) more exposed particles (of magnesium)</p> <p>more collisions</p>	2	<p>each correct answer = 1 mark</p> <p>Accept (powder) has a wider surface or (powder) has more surface</p> <p>Note more particles available to react is not sufficient</p> <p>Accept more hits (between particles) or more contacts (between particles)</p> <p>Ignore collide faster</p> <p>Accept more collisions per second or collisions more often or more chance of collision or more frequent collisions or greater collision rate = 2 marks</p>
14(b)	<p>particles have more energy or particles move faster</p> <p>more collisions</p>	2	<p>each correct answer = 1 mark</p> <p>Accept more hits (between particles) or more contacts (between particles)</p> <p>Ignore collide faster</p> <p>Accept more energetic collisions or more successful collisions or more collisions per second or collisions more often or more chance of collision or more frequent collisions or greater collision rate = 2 marks</p>

Question	Answer	Marks	Further Information
15(a)	increases	1	Accept higher (frequency) or larger (frequency) or bigger (frequency)
15(b)		1	Accept position of arrow on any crest or trough Note if more than one arrow then all arrows must be correct
Question	Answer	Marks	Further Information
16(a)	The Earth collided with a smaller planet. The debris from the impact formed the Moon.	1	more than one answer ticked = 0 marks Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
16(b)	to give reliable data or to have a range of observations or to identify anomalous results	1	Accept to identify a trend or have a greater variety of observations Do not accept accuracy or fair test

Question	Answer	Marks	Further Information
17(a)	<p>ammeter symbol in series</p> <p>voltmeter symbol in parallel across the lamp only</p> 	2	<p>each correct answer = 1 mark</p> <p>D not accept line through ammeter symbol</p> <p>Do not accept line through the voltmeter symbol</p> <p>Ignore electrical connector symbols</p> <p>Ignore extra components</p> <p>Note if there is not a complete circuit = maximum of 1 mark</p>
17(b)	do not leave the switch on for too long or have a smaller current	1	<p>Accept open the switch (immediately) after taking the readings</p> <p>Accept switch the lamp off</p> <p>Accept use a lower voltage</p> <p>Accept add a (variable) resistor or increase the resistance (in the circuit)</p>

Question	Answer	Marks	Further Information
17(c)	measure the current when the lamp is cold and when the lamp is hot	1	<p>Note the answer must either change the current and measure the temperatures or change the temperatures and measure the current</p> <p>Accept measuring the temperature with different currents</p> <p>Note switch on and record the current after different amounts of time is not sufficient since no reference to temperature</p>