Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

SCIENCE **0893/01**

Paper 1 **April 2023**

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.

General guidelines on marking

Many descriptive answers can be expressed in a variety of ways. Professional judgement can be used in these cases, providing it matches the marking points and further information in the mark scheme.

Answers may have words spelt incorrectly. Credit is normally given for phonetically correct answers, unless the word has a scientifically different meaning. For example, where the answer should be antennae, credit will be given for antena but not for anthen (too close to anther).

Only the science is being assessed so answers do not need to be grammatically correct. Significant figures will be indicated in the question or in the mark scheme.
Unless specified all marking points are independent.

Annotations and abbreviations

/ **or**	alternate responses for the same marking point
( ) brackets	the words or units in brackets do not need to be stated, for example, (recycles or releases or provides) minerals = minerals scores the mark
Underline	exact word is required
Accept	an acceptable response
Do not accept	indicates an incorrect response that would contradict another otherwise correct alternative
Ignore	indicates an irrelevant answer that is not creditworthy. Full marks can still be achieved even with answers that are ignored.
Note	provides extra information when necessary
ecf	error carried forward; marks are awarded if an incorrect response has been carried forward from earlier working, provided the subsequent working is correct
ora	or reverse argument; for example, as mass increases, volume increases could be written as mass decreases, volume decreases

Question	Answer	Marks	Further Information
1(a)	kidney ureter urethra	**3**	each correct answer = 1 mark **Accept** nephron **Accept** ureta **or** uretur **Do not accept** uretra **or** uretha **or** urether **or** urater **or** urethera **Accept** ureathra **or** urethera **Do not accept** urether **or** uretha **or** urathra
1(b)	urea	**1**	**Accept** any indication of correct answer, e.g. ticking, underlining or circling, but answer line takes precedence

Question	Answer	Marks	Further Information
2(a)(i)	(density =) $\frac{\text{mass}}{\text{volume}}$	**1**	**Accept** mass ÷ volume **Accept** m/v **Ignore** g/cm^3
2(a)(ii)	7.87 (g/cm^3)	**1**	**Accept** 7.9 **or** 7.872 **Ignore** any unit in answer **Note no ecf** from **(a)(i)**
2(b)	**C** **and** has a (very) low density	**1**	**both** correct for the mark **Accept** any indication of correct answer, e.g. ticking, underlining or in explanation, but circling takes precedence **Accept** has the lowest density **Note** a density below 1 is **not** sufficient **Note** it is the lowest is **not** sufficient – must mention density or dense in answer **Ignore** it is the lightest

Question	Answer	Marks	Further Information
3(a)	plastic	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
3(b)(i)	(idea that) shiny surface reflects thermal energy back into the liquid	**1**	**Accept** they are good reflectors (of thermal energy) **Accept** reflect radiation **Ignore** reflects light **Ignore** reference to absorbing **Ignore** silver is a good conductor
3(b)(ii)	convection **cannot** take place conduction **cannot** take place	**2**	each correct answer = 1 mark **Accept** conduction and convection in any order **Do not accept** radiation **cannot** take place max 1 mark for the question

Question	Answer	Marks	Further Information
3(c)	(liquid) cools down **or (**temperature) decreases high(er) energy particles (near the surface of the liquid) escape (into the air) (average) energy of the remaining particles decreases	**3**	each correct answer = 1 mark **Accept** (idea that) temperature becomes low **or** becomes colder **or** results in a low temperature **Note** temperature is cold is **not** sufficient **Accept** fast(er) moving particles escape **or** high(er) energy particles evaporate **Accept** particles that evaporate take some energy with them **or** particles use energy to evaporate **Do not accept** answers that refer to heat particles having more energy or moving faster **Accept** energy of the particles in the liquid decreases **or** slow moving particles left in liquid **or** low energy particles left in liquid **Accept** evaporation is an endothermic process as additional marking point **Ignore** ideas about conduction and convection **Ignore** answers that refer to hot particles and cold particles

Question	Answer	Marks	Further Information
4(a)	tectonic plates	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
4(b)	(the earthquakes) occur at the plate boundaries **or** (the earthquakes) happen at the edges of the pieces of crust	**1**	**Accept** earthquakes happen when the plates collide **or** occur at places where tectonic plates meet **Ignore** earthquakes happen at fault lines
4(c)(i)	(idea that) the coastlines fit together (like a jigsaw puzzle)	**1**	**Accept** coastlines have a complementary shape **or** coastlines combine together like a jigsaw puzzle **Accept** continents fit together **or** tectonic plates fit together **Ignore** after many years the continents no longer fit together **Ignore** countries fit together **Do not accept** have the same shape
4(c)(ii)	**any two from** magma moves **or** magma flows convection currents (in the mantle) (convection currents **or** magma movements) drag/pull the continents **or** drag/pull the tectonic plate (apart or together)	**2**	each correct answer = 1 mark **Ignore** continents move **Accept** convection currents in mantle **or** convection currents of magma = 2 marks **Note** tectonic plates move is **not** sufficient

Question	Answer	Marks	Further Information
5(a)	covalent (pair of) shared electrons	**2**	each correct answer = 1 mark **Note** ionic bond = 0 marks for the question
5(b)	(chlorine atom) gains one electron (to make a chloride ion)	**1**	**Note** assume answer refers to a chlorine atom **Accept** gains an electron **Do not accept** chloride gains an electron
5(c)	attraction between positive and negative ions	**1**	**Accept** electrostatic attraction (between ions) **Note** by an ionic bond is **not** sufficient **Do not accept** reference to intermolecular forces

Question	Answer	Marks	Further Information
6(a)	**B** (and) **D**	**2**	each correct answer = 1 mark **Accept** either order **Accept** palisade (and) guard cell, but letter takes precedence **Accept** any indication of the correct answer, e.g. ticking, underlining or circling on the diagrams, but answer line takes precedence
6(b)(i)	**any one from** magnesium will make plants green **or** magnesium makes the plant's green pigment **or** magnesium will make chlorophyll lack of magnesium will reduce plant growth lack of magnesium will result in yellow (leaves)	**1**	**Note** answers must specifically refer to either the presence or the absence of magnesium **Accept ora** **Accept** if magnesium not present the plants are not green **Ignore** without magnesium there is no photosynthesis **or** without magnesium the rate of photosynthesis decreases
6(b)(ii)	(acts as a) control **or** (idea of) to be able to compare (the seedlings with or without specific nutrients)	**1**	**Accept** (idea of) to see the differences

Question	Answer	Marks	Further Information
6(c)	(idea of) smaller in size **or** reduced growth **or** fewer leaves (idea of) less protein made	**2**	each correct answer = 1 mark **Accept** less nitrogen to make protein **or** no nitrates to make protein **or** less amino acids made **Ignore** plants will die **or** no growth **Ignore** reference to colour of the leaves **Ignore** reference to carbohydrate
6(d)	carbohydrate **or** glucose	**1**	**Accept** oxygen **or** starch **Accept** chlorophyll

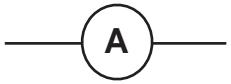
Question	Answer	Marks	Further Information
7	(similarity) they have the same amplitude (difference) waveform **B** has a higher frequency than waveform **A** / **ora**	**2**	each correct answer = 1 mark **Accept** they have the same loudness **or** same volume **Accept** waveform **B** has a higher pitch (than waveform **A**) / **ora** **Accept** waveform **B** has a shorter wavelength (than waveform **A**) / **ora**

Question	Answer	Marks	Further Information
8(a)	(rock) asteroid (soil) Earth **or** crust (hole) crater	**2**	**all three** correct = 2 marks **one** or **two** correct = 1 mark
8(b)	(strength) **any one from** helps to visualize asteroid collisions which you cannot see normally can investigate relationship between size/speed/height of asteroid and crater size can investigate relationship between size/speed/height of asteroid and distance travelled by debris (idea that) it is very easy to do (idea that) it is easy to repeat (idea that) it shows how craters are formed	**2**	correct strength = 1 mark **Accept** (idea that) provides an understanding about what happens during an asteroid collision **Accept** the model is easy to understand **Accept** the model can be used with different sizes of rocks/asteroids **Accept** can see what happens when an asteroid hits the Earth surface **Accept** simulates a real event **Accept** can accurately represent an asteroid collision

Question	Answer	Marks	Further Information
8(c)	(limitation) **any one from** difficult to make it a fair test, e.g. rocks not all the same size/mass rocks may hit the bottom of the container **or** soil may not be deep enough rocks are (much) smaller than real asteroids **or** forces are (much) smaller than for real asteroids cannot represent the real speed of an asteroid hitting the Earth does not show other consequences of impact, e.g. dust formation the Earth's surface is not just made of soil	**2**	correct limitation = 1 mark **Accept** (idea that) model cannot be done on a large scale **Accept** (idea that) does not investigate what happens when an asteroid hits oceans **Accept** (idea that) cannot tell you about a collision of a large asteroid **Accept** does not (fully) represent the force at which an asteroid hits the Earth **Accept** (idea that) there is a limited drop height **Ignore** it is inaccurate is **not** sufficient but **accept** inaccurate that is qualified, e.g. cannot be scaled up accurately

Question	Answer	Marks	Further Information
9(a)	(causes) a decrease **or** decline	**1**	**Accept** it goes down **or** drops **or** falls **Ignore** extinction **or** killed
9(b)	**A** (no mark) **any two from** smaller population size of foxes compared to rabbits larger population rise seen at the start in rabbit or prey when population of foxes decreases, the rabbit population will increase **or** when population of rabbit declines, the population of foxes will also decline	**2**	**B** ticked = 0 marks for the question each correct answer = 1 mark **Accept** change in line **A** is bigger than change in line **B** **Accept ora** **Accept ora** **Accept** (idea that) fox population rises **after** rabbit population rises = 2 marks **Accept** (idea that) predator population rises **after** prey population rises = 2 marks **Accept** (idea that) fox population declines **after** rabbit population declines = 2 marks **Accept** (idea that) predator population declines **after** prey population declines = 2 marks **Accept** change in line **B** is always after change in line **A** = 2 marks

Question	Answer	Marks	Further Information
10(a)	filtration **or** filtering	**1**	**Accept** use filter paper **Do not accept** sieving **or** strainer
10(b)	evaporation **or** evaporate the mixture	**1**	**Accept** heat **or** heating **or** boil off water **Accept** leave in a hot place **Ignore** crystallization
10(c)	(metal) zinc (acid) (dilute) hydrochloric acid	**1**	**both** correct for the mark **Accept** Zn **or** HCl but name takes precedence

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>11(a)</td><td> 
</td><td>1</td><td>Accept symbol drawn on diagram, but answer space takes precedence if symbol drawn there

Do not accept a line through the ammetersymbol</td></tr>
<tr><td>11(b)</td><td><table>
<tr><th>switch R</th><th>switch S</th><th>switch T</th><th>lamp J</th><th>lamp K</th><th>lamp L</th></tr>
<tr><td>(closed)</td><td>(open)</td><td>(open)</td><td>(off)</td><td>off</td><td>off</td></tr>
<tr><td>(open)</td><td>(closed)</td><td>(closed)</td><td>off</td><td>(off)</td><td>off</td></tr>
<tr><td>closed</td><td>open</td><td>closed</td><td>(on)</td><td>(off)</td><td>(on)</td></tr>
</table></td><td>3</td><td>each correct row = 1 mark</td></tr>
<tr><td>11(c)</td><td>in parallel (with lamp J)</td><td>1</td><td>Accept annotations added to the diagram may help the award of the mark

Accept description of parallel e.g. need to connect one end of the meter before the lamp and one after the lamp</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>12(a)</td><td>(electronic, top pan, lever-arm) balance</td><td>1</td><td>Accept scale(s)

Ignore weighing</td></tr>
<tr><td>12(b)</td><td><table><tr><th>time in minutes</th><td>(loss in mass in g)</td></tr><tr><td>0</td><td>0.0 or 0</td></tr><tr><td>1</td><td>0.8</td></tr><tr><td>2</td><td>1.1</td></tr><tr><td>3</td><td>1.2</td></tr><tr><td>4</td><td>1.5</td></tr></table></td><td>2</td><td>left hand column labelled time in minutes and numbers entered = 1 mark

Accept start for 0 minutes

right hand column correct with no units in body of table and masses matched against the correct time = 1 mark</td></tr>
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