Cambridge Assessment International Education

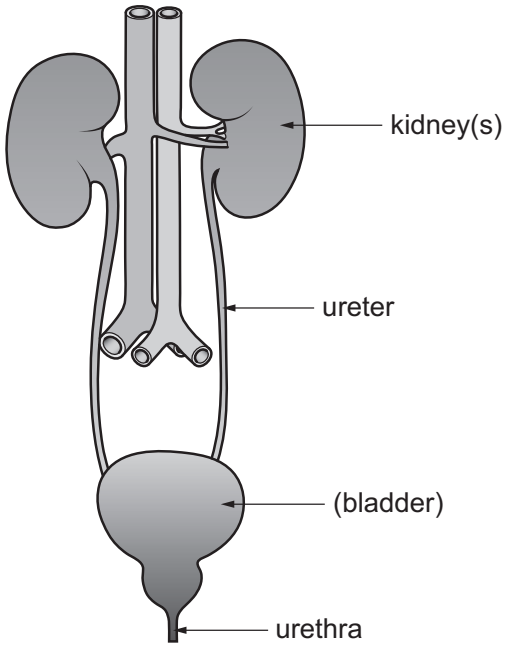
Science

Stage 9

Paper 1 **2023**

Cambridge Lower Secondary Progression Test

Mark Scheme

Question	Answer	Marks	Further Information
1(a)		3	each correct answer = 1 mark
1(b)	filters the blood **or** removes urea from the blood	1	**Ignore** cleans the blood **Accept** removes waste products from the blood **Accept** correct named waste products

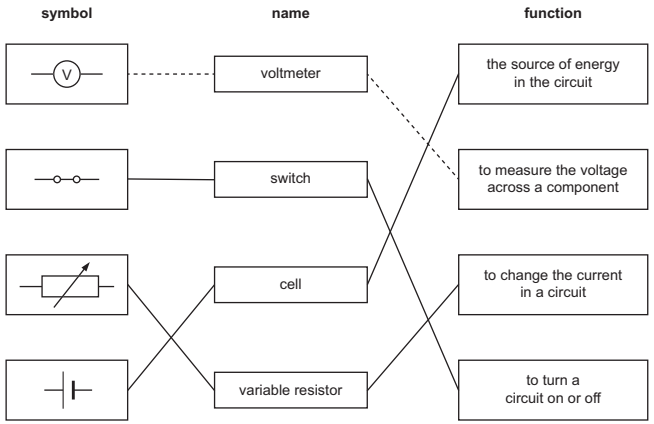
Question	Answer	Marks	Further Information
2(a)(i)	A*l*	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
2(a)(ii)	C*l* gains an electron	**2**	each correct answer = 1 mark **Accept** (ion) has 1 more electron than the atom
2(a)(iii)	Li **and** K	**1**	**both** needed in any order for the mark
2(b)	attraction between ions (attraction between) oppositely charged ions **or** positive and negative ions	**2**	each correct answer = 1 mark **Accept** electrostatic attraction between ions = 2 marks

Question	Answer	Marks	Further Information
3(a)	heat is the amount of (thermal) energy in an object temperature is how hot an object is **or** temperature is how cold an object is	**2**	each correct answer = 1 mark
3(b)(i)	thermometer	**1**	**Accept** temperature probe
3(b)(ii)	(idea that) the temperature has increased the most	**1**	**Accept** the black container has reached the highest temperature **Accept** shiny silver container increased the least **Accept** (except at start) the temperature is always higher (at the same time)
3(b)(iii)	black (container) is a better absorber (of radiation)	**1**	**Accept** shiny or silver object is a worse absorber **Accept** black (container) reflects less radiation **Note** answer must be comparative
3(c)	Thermal energy travels through the metal container by **conduction**. The particles in the metal gain thermal energy and **vibrate** more. As energy passes through the metal the particles **collide** with each other.	**2**	**all three** correct = 2 marks **one** or **two** correct = 1 mark **Accept** to and fro **or** move back and forth **Accept** collide for vibrate **Accept** hit **or** bump **or** knock

Question	Answer	Marks	Further Information
4	The Moon formed in another part of the Solar System and was later captured by Earth's gravity. ☐ The Moon was formed at the same time as the Earth was formed. ☐ The Moon formed when Earth hit another smaller planet, the debris collected in an orbit around the Earth. ✓ The Earth was spinning so fast that some material broke off and began to orbit the Earth. ☐	**1**	more than **one** box ticked = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence

Question	Answer	Marks	Further Information
5(a)	metal / is there a displacement reaction? zinc / (yes) magnesium / **yes** copper / **no** iron / **no**	**1**	**all three** correct = 1 mark
5(b)	zinc + iron sulfate → zinc sulfate + iron	**2**	correct reactants in any order = 1 mark correct products in any order = 1 mark
5(c)	(idea that) iron sulfate is used up in the first reaction	**1**	

Question	Answer	Marks	Further Information
6(a)(i)	root hair (cells)	**1**	
6(a)(ii)	xylem	**1**	
6(a)(iii)	transpiration	**1**	**Accept** diffusion **or** evaporation
6(b)(i)	9 (g)	**1**	**Accept** answer written near question, but answer in table takes precedence
6(b)(ii)	(idea of) to stop water loss (from the surface of the water in the conical flask) **or** to stop evaporation (of water from the conical flask)	**1**	**Do not accept** to stop water loss from the plant shoot **or** evaporation from the plant shoot
6(b)(iii)	the balance is more precise	**1**	**Accept** the results are more precise **Do not accept** results are more accurate

Question	Answer	Marks	Further Information
7		**3**	**all six** lines correct = 3 marks **four** or **five** lines correct = 2 marks **two** or **three** lines correct = 1 mark **one** correct = 0 marks if **two** lines to (or from) **one** box and **one** is incorrect, then both lines are incorrect

Question	Answer	Marks	Further Information
8(a)	fertilisation	**1**	
8(b)	**any two from** half the sperm has Y (chromosome) **or** half the sperm has X (chromosome) if the sperm which has a Y chromosome fertilizes the egg the offspring will be male if the sperm which has an X chromosome fertilizes the egg the offspring will be female	**2**	each correct answer = 1 mark **Accept** so 50% offspring are male because XY **Accept** so 50% offspring are female because XX
8(c)	(idea that) offspring inherit genes from both parents	**1**	**Ignore** offspring inherit different chromosomes

Question	Answer	Marks	Further Information
9(a)	**any two from** mass extinction (of dinosaurs/animals) climate change **or** long term cooling of the Earth's temperature tsunami wildfires	**2**	each correct answer = 1 mark **Accept** (idea of) increase in temperature near impact
9(b)	**any two from** all their results for each ball are similar the mean for each ball is similar to their results there are no anomalous results	**2**	each correct explanation = 1 mark

Question	Answer	Marks	Further Information
10(a)	The rate of this reaction is increased by increasing the concentration or the **temperature** of the dilute sulfuric acid One other way of increasing the rate of this reaction is to increase the **surface area** of the magnesium	**2**	each correct sentence = 1 mark **Ignore** concentration
10(b)	evaporation	**1**	**Accept** crystallisation **or** heating **Do not accept** filtration **or** distillation **or** sieving

Question	Answer	Marks	Further Information
11(a)	$(\text{resistance}) = \frac{\text{voltage}}{\text{current}}$ **or** $(\Omega) = \frac{V}{I}$ **or** $\frac{3.0}{0.025}$ 120 (Ω)	**2**	correct formula **or** evidence of correct substitution = 1 mark **Accept** 120 with or without working = 2 marks **Ignore** incorrect unit
11(b)	**any two from** this is a parallel circuit (idea that) current divides at the junction (idea that) current joins up after going through the lamps	**2**	each correct answer = 1 mark

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>12(a)</td><td>Nebulae are clouds of dust and gas

New stars are formed in some nebulae called stellar nurseries</td><td>2</td><td>each correct sentence = 1 mark

Accept dust and gas in either order

Accept hydrogen or helium for gas</td></tr>
<tr><td>12(b)</td><td>
<table>
<tr><th colspan="3"></th><th>star type</th></tr>
<tr><td rowspan="2">1</td><td>star colour is blue or blue to white</td><td>go to 2</td><td></td></tr>
<tr><td>star colour is not blue or blue to white</td><td>go to 3</td><td></td></tr>
<tr><td rowspan="2">2</td><td>mean mass is 60 times greater than the mass of the Sun</td><td>Lactera</td><td>(O)</td></tr>
<tr><td>mean mass is 3.2 times greater than the mass of the Sun</td><td>Sirius</td><td>A</td></tr>
<tr><td rowspan="2">3</td><td>mean mass is greater than the mass of the Sun</td><td>Capella</td><td>G</td></tr>
<tr><td>mean mass is less than the mass of the Sun</td><td>go to 4</td><td></td></tr>
<tr><td rowspan="2">4</td><td>mean radius is about half that of the Sun</td><td>Antares</td><td>M</td></tr>
<tr><td>mean luminosity is about half that of the Sun</td><td>Arcturus</td><td>K</td></tr>
</table>
</td><td>2</td><td>all four correct = 2 marks

two or three correct = 1 mark

one correct = 0 marks</td></tr>
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