

Question	Answer	Marks	Further Information
1	<p>when nitrate ions and magnesium ions are both present the (barley seedlings) have the greatest dry mass</p> <p>nitrate ions have a greater effect on the dry mass than magnesium ions / ora</p> <p>nitrate ions are needed to make proteins</p> <p>magnesium ions are needed to make chlorophyll</p>	4	<p>each correct answer = 1 mark</p> <p>Accept the seedling with just nitrate ions grows more than the seedling with just magnesium ions / ora</p> <p>Accept nitrate ions are needed to make DNA or amino acids</p> <p>Accept magnesium ions are needed for photosynthesis</p>

Question	Answer	Marks	Further Information
2(a)(i)	concentration (of acid)	1	
2(a)(ii)	(dependent variable) volume of gas (how it is measured) water level in measuring cylinder	1	both answers correct for the mark
2(a)(iii)	any two from (same) mass (of calcium carbonate) (same) particle size or same surface area (of calcium carbonate) (same) temperature (same) volume (of acid)	1	both answers correct for the mark Do not accept (same) concentration of acid
2(b)	(safety risk) acid is corrosive (how to control the risk) wear eye protection	2	each correct answer = 1 mark Accept acid can burn skin or eyes or acid can irritate skin or eyes or acid can harm skin or eyes Accept wear gloves

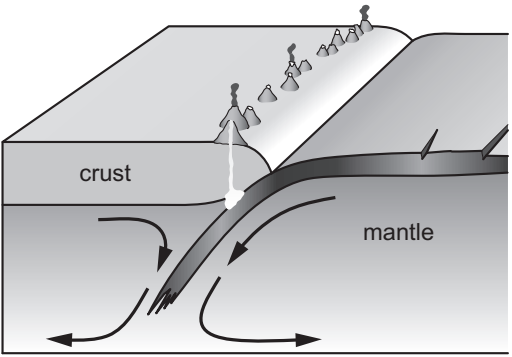
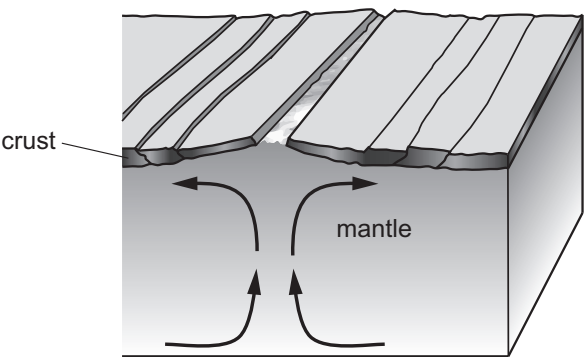
Question	Answer	Marks	Further Information
3(a)	100 (Hz)	1	no tolerance
3(b)	90 000 (Hz) or (range is from) 1000 (Hz) to 90 000 (Hz)	1	Accept between 80 000 and 99 000 (Hz) Accept between 80 000 and 99 000 (Hz) for the value of 90 000 (Hz) no tolerance on the value of 1000 (Hz)
3(c)(i)	increases the pitch	1	Accept higher pitch Note answer must be comparative
3(c)(ii)	increases the loudness or increases the volume	1	Accept louder sound Note answer must be comparative
3(d)(i)	4 (times)	1	
3(d)(ii)	2 (times)	1	Accept waveform A has twice the frequency of waveform B

Question	Answer	Marks	Further Information
4(a)(i)	decreases	1	
4(a)(ii)	line of best fit extended to the x-axis correct year read from the line to the nearest year	2	each correct answer = 1 mark
4(a)(iii)	any two from variation within the species (idea of) best adapted survive or (idea of) competition advantageous adaptations passed on to offspring	2	each correct answer = 1 mark Accept survival of the fittest
4(b)(i)	(increases) there are more females to produce offspring (decreases) there will be fewer males to mate with the females	2	each correct explanation = 1 mark
4(b)(ii)	(effect on the population) decreases (no marks) (reason 1) (idea of) the nesting sites will be flooded (reason 2) the offspring will drown or the offspring will have insufficient oxygen to respire	2	increase = 0 marks for the question each correct reason= 1 mark

Question	Answer	Marks	Further Information
5(a)	<p>correct substitution of numbers into formula or $340 \div 38$</p> <p>correct division, e.g. 8.947368</p> <p>correct answer 8.9</p>	3	<p>Accept 8.9 with or without working = 3 marks</p> <p>Accept 8.947368 with or without working = 2 marks</p> <p>correct construction of formula mass \div volume or $340 \div 38$</p> <p>correct division using their values from substitution</p> <p>Accept truncated answers or incorrect rounding</p>
5(b)	<p>(substance) B</p> <p>(explanation) (idea of) lowest density or density much lower than others or has a very low density</p>	2	<p>each correct answer = 1 mark</p> <p>Accept density of gas usually less than solids or liquids</p>

Question	Answer	Marks	Further Information
6	<p>any three from</p> <p>(water) particles gain energy from skin</p> <p>more energetic (water) particles escape (from surface of skin or to air)</p> <p>less energetic (water) particles remain (on skin)</p> <p>thermal energy transfers from body or skin</p>	3	<p>each correct answer = 1 mark</p> <p>Accept molecules for particles throughout</p> <p>Accept faster molecules escape</p> <p>Accept slower (water) particles remain</p> <p>Accept heat for thermal energy</p> <p>Accept evaporation is endothermic as an extra marking point</p>

Question	Answer	Marks	Further Information
7(a)		4	<p>all five correct = 4 marks</p> <p>three or four correct = 3 marks</p> <p>two correct = 2 marks</p> <p>one correct = 1 mark</p> <p>if two lines from one process to different descriptions = 0 marks for that process</p>
7(b)	photosynthesis	1	

Question	Answer	Marks	Further Information
8(a)	tectonic plates	1	
8(b)(i)		1	arrow heads must be in the correct direction on all arrows drawn
8(b)(ii)		1	arrow heads must be in the correct direction on all arrows drawn Accept a full convection current
8(c)(i)	(idea of) they follow the same pattern or active volcanoes are found where the boundaries of the floating rocks or tectonics plates are located	1	
8(c)(ii)	no boundaries near South Africa	1	

Question	Answer	Marks	Further Information
9(a)	copper nitrate	1	
9(b)	(idea that) mass of reactants is the same as mass of products or no loss or gain of mass during the reaction	1	
9(c)	(name) covalent bond (description) shared pair of electrons	2	each correct answer = 1 mark

