



GCSE

# Additional Science A (Twenty First Century)

General Certificate of Secondary Education **J631**

## Mark Schemes for the Units

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**January 2009**

**J631/MS/R/09J**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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# Guidance for Examiners

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Each separate marking point is indicated by a (1) at the end of that marking point.
4. Abbreviations, annotations and conventions used in the detailed Mark Scheme:

ORA = or reverse argument

NOT = point that is not given credit

AW/owt/e = alternative wording/or words to that effect: allow any expression that is clearly equivalent

/ = alternative and acceptable answers for the same marking point

point = point must be present to gain the mark

(description) = description which need not be present to gain the mark

E.g.

mark scheme shows 'work done in lifting / (change in) gravitational potential energy'

work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

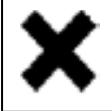
5. If a candidate alters his/her response, examiners should accept the alteration.
6. The list principle: if a list of responses greater than the number requested is given, you work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, i.e. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.
7. If an answer is crossed out but not replaced, mark the crossed out answer.

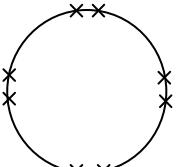
**A215/01 Modules B4, C4, P4 Foundation**

Question		Expected Answers	Marks	Rationale
1	(a)	<p>He will sweat less <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>He will start to shiver <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	2	1 mark for each correct choice more than 2 choices, each extra choice loses 1 mark
	(b)	(i)		<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>core body temperature is below 35 °C <input checked="" type="checkbox"/> (1)</p>
		(ii)	3	1 mark for each choice <b>allow</b> any clear indication of correct choice more than 3 choices, then each extra choice loses 1 mark
			<b>Total</b>	<b>6</b>

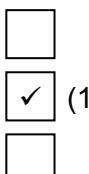
Question		Expected Answers	Marks	Rationale						
2	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>C</td><td>F</td><td>B</td><td>D</td><td>A</td><td>E</td></tr> </table>	C	F	B	D	A	E	4	<p>C before F = 1 mark      F before B = 1 mark      B before D = 1 mark      D before A = 1 mark</p> <p><b>accept</b> any clear indication of response .eg numbers at the side of the letters in the question</p>
C	F	B	D	A	E					
	(b) (i)	<p>to replace water lost by sweating</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/> (1)</td> <td><input type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input checked="" type="checkbox"/> (1)	<input type="checkbox"/>	1	more than one tick = 0 marks			
<input type="checkbox"/>	<input checked="" type="checkbox"/> (1)	<input type="checkbox"/>								
	(ii)	kidney (1)	1	<p>any clear indication of correct response = 1 mark      more than one response = 0 marks</p>						
	(iii)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>increase in urine volume</td> <td>decrease in urine volume</td> </tr> <tr> <td>A</td> <td>B C D</td> </tr> </table>	increase in urine volume	decrease in urine volume	A	B C D	2	<p>all 4 correct = 2 marks      2 or 3 correct = 1 mark      1 response correct = 0 marks</p> <p><b>ignore</b> letters appearing in both columns  <b>allow</b> names of substances instead of letters      any letter written on the middle line is wrong</p>		
increase in urine volume	decrease in urine volume									
A	B C D									
		<b>Total</b>	<b>8</b>							

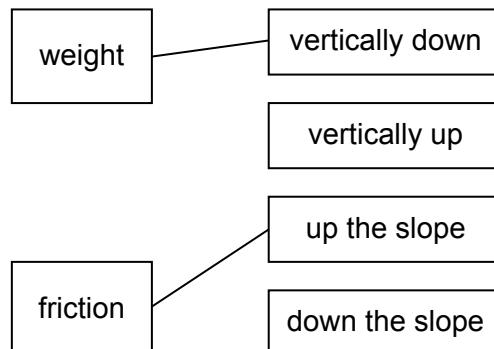
Question		Expected Answers	Marks	Rationale
3	(a)	<p>to kill microbes in the water <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	<p>OO      ●● C      D (1)</p>	1	both required for 1 mark any clear indication of correct response = 1 mark
	(c)	<p>sodium chloride</p> <p>potassium chloride</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	2	<p>if more than two lines are drawn each extra line loses 1 mark 1 mark for each correct line any clear indication of correct response eg formula written in or underneath the name boxes</p>

Question		Expected Answers	Marks	Rationale								
3	(d)	   <table border="1"> <tr> <td>flammable</td> <td>keep away from naked flames</td> </tr> <tr> <td>toxic</td> <td>wear protective clothing</td> </tr> <tr> <td>irritant</td> <td>do not swallow or inhale</td> </tr> <tr> <td></td> <td>evacuate the area</td> </tr> </table>	flammable	keep away from naked flames	toxic	wear protective clothing	irritant	do not swallow or inhale		evacuate the area	4	mark each side independently  left hand side: if more than three lines are drawn each extra line cancels one correct line three lines correct = 2 marks two lines correct = 1 mark one line correct = 0 marks  right hand side: if more than three lines are drawn each extra line cancels one correct line three lines correct = 2 marks two lines correct = 1 mark one line correct = 0 marks
flammable	keep away from naked flames											
toxic	wear protective clothing											
irritant	do not swallow or inhale											
	evacuate the area											
	(e)	bromine (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks								
		<b>Total</b>	<b>9</b>									

Question		Expected Answers	Marks	Rationale
4	(a)	D (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	A (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	8 electrons in outer shell any arrangement e.g.  (1)	1	any clear indication of correct response = 1 mark spacing of the 8 electrons is irrelevant the same symbol does not have to be used for all 8 electrons eg 7 crosses and 1 dot gets the mark
Total		3		

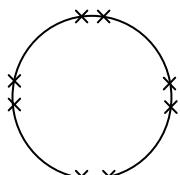
5	(a)	some copper has got into the flame	<input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1	more than one response = 0 marks
	(b)	C (1)		1	<b>accept</b> any clear indication of response more than one response = 0 marks
Total		2			

Question		Expected Answers	Marks	Rationale
6	(a)	100/8 (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	C (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	equal to (1) opposite (1)	2	both correct = 2 marks one correct = 1 mark
	(d)	to increase the time it takes ...  	1	any clear indication of correct response = 1 mark more than one response = 0 marks
		<b>Total</b>	<b>5</b>	

7	(a)	weight (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	$600 \times 20$ (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	gravitational potential (1) momentum (1)	2	both correct = 2 marks one correct = 1 mark
	(d)		1	both lines correct = 1 mark of more than two lines drawn = 0 marks
		<b>Total</b>	<b>5</b>	

Question		Expected Answers	Marks	Rationale
8	(a)	<p>when the ball is moving upwards</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	<p>increases</p> <p>decreases</p> <p>increases</p> <p>stays the same</p>	3	<p>four correct = 3 marks</p> <p>three correct = 2 marks</p> <p>two correct = 1 marks</p> <p>one correct = 0 marks</p>
		<b>Total</b>	<b>4</b>	

# A215/02 Modules B4, C4, P4 Higher

Question		Expected Answers	Marks	Rationale
1	(a) (i)	D (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(ii)	A (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	8 electrons in outer shell any arrangement e.g.  (1)	1	any clear indication of the correct response = 1 mark spacing of the 8 electrons is irrelevant the same symbol does not need to be used for all 8 electrons e.g. 7 crosses and 1 dot gets the mark
		<b>Total</b>	<b>3</b>	

2	(a)	C (1)	1	any clear indication of the correct response = 1 mark more than one response = 0 marks
	(b)	C and E (1)	1	either order
		<b>Total</b>	<b>2</b>	

Question			Expected Answers	Marks	Rationale
3	(a)	(i)	Salma (1)	1	more than 1 choice = 0 marks
		(ii)	Julia (1)	1	more than 1 choice = 0 marks
	(b)		NaBrO <sub>3</sub> (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	(i)	OC <sub>7</sub> (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
		(ii)	left side: 4 (1) right side: 2 (1)	2	mark each side of the equation independently <b>allow</b> O <sub>2</sub> in the <b>right</b> hand box as an alternative to 2, ignoring any other numbers
	(d)		2ClO <sub>2</sub> [aq] → Cl <sub>2</sub> [g] + 2O <sub>2</sub> [g]	3	all species correct = 1 mark i.e. Cl <sub>2</sub> and O <sub>2</sub> on the right hand side balanced = 1 mark all state symbols = 1 mark
			<b>Total</b>	<b>9</b>	

Question		Expected Answers						Marks	Rationale
4	(a)	<input type="checkbox"/> C <input type="checkbox"/> F <input type="checkbox"/> B <input type="checkbox"/> D <input type="checkbox"/> A <input checked="" type="checkbox"/> E						4	C before F = 1 mark F before B = 1 mark B before D = 1 mark D before A = 1 mark <b>accept</b> any clear indication of response e.g. numbers at the side of the letters in the question
	(b)	<input type="checkbox"/> <input type="checkbox"/> ... best at an optimum temperature. <input checked="" type="checkbox"/> (1) <input type="checkbox"/> ... stop working at high temperatures. <input checked="" type="checkbox"/> (1)						2	if more than 2 choices, deduct 1 mark for each extra choice
	(c)	dilate (1) increases (1) increases (1) vasodilation (1)						4	only one choice allowed per sentence
		<b>Total</b>						10	

Question		Expected Answers	Marks	Rationale												
5	(a)	<p>To keep the cell contents ...</p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	1	any clear indication of correct response = 1 mark more than one response = 0 marks												
5	(b)	<table border="0"> <tr> <td>blood salt concentration rises</td> <td>more ADH is secreted</td> <td>a small amount of concentrated urine is made</td> </tr> <tr> <td>blood salt concentration falls</td> <td>less ADH is secreted</td> <td>a small amount of dilute urine is made</td> </tr> <tr> <td>blood sugar concentration rises</td> <td></td> <td>a large volume of concentrated urine is made</td> </tr> <tr> <td>blood sugar concentration falls</td> <td></td> <td>a large volume of dilute urine is made</td> </tr> </table>	blood salt concentration rises	more ADH is secreted	a small amount of concentrated urine is made	blood salt concentration falls	less ADH is secreted	a small amount of dilute urine is made	blood sugar concentration rises		a large volume of concentrated urine is made	blood sugar concentration falls		a large volume of dilute urine is made	2	mark each side independently 1 mark for 2 correct lines on LHS 1 mark for 2 correct lines on RHS more than two lines drawn on a side = 0 marks for that side
blood salt concentration rises	more ADH is secreted	a small amount of concentrated urine is made														
blood salt concentration falls	less ADH is secreted	a small amount of dilute urine is made														
blood sugar concentration rises		a large volume of concentrated urine is made														
blood sugar concentration falls		a large volume of dilute urine is made														

Question		Expected Answers	Marks	Rationale
5	(c)	<p>A process that reverses ...</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/></p>	1	any clear indication of correct response = 1 mark more than one response = 0 marks
		<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Rationale
6	(a)	<p>when the ball is moving upwards</p> <p><input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1) <input type="checkbox"/></p>	1	any clear indication of correct response = 1 mark more than one response = 0 marks
		increases decreases increases stays the same	3	four correct = 3 marks three correct = 2 marks two correct = 1 mark one correct = 0 marks
		<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Rationale
7	(a)	200 N (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(b)	B (1)	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	driving counter driving counter	2	treat as two pairs of responses both pairs correct = 2 marks only one pair correct = 1 mark
	(d)	It increases the duration ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1	any clear indication of correct response = 1 mark more than one response = 0 marks
		<b>Total</b>	<b>5</b>	

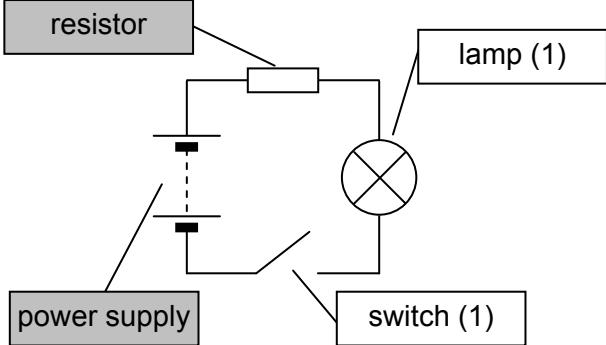
Question		Expected Answers	Marks	Rationale
8	(a)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">gravitational potential energy</div> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 5px;">kinetic energy</div> <div style="border: 1px solid black; padding: 5px;">heat energy</div> </div> </div>	1	<b>allow</b> kinetic and heat energy either way round all 3 required for 1 mark <b>allow</b> GPE for gravitational potential energy
	(b)	$\frac{7800}{650} \quad (1)$	1	any clear indication of correct response = 1 mark more than one response = 0 marks
	(c)	Bess (1)	1	any clear indication of correct response = 1 mark e.g. 12m/s more than one response = 0 marks
	(d)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">weight</div> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 5px;">vertically up</div> <div style="border: 1px solid black; padding: 5px;">up the slope</div> </div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">reaction</div> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 5px;">vertically down</div> <div style="border: 1px solid black; padding: 5px;">down the slope</div> </div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">friction</div> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 5px;">at right angles to the slope</div> </div> </div>	2	three correct lines = 2 marks two correct lines = 1 mark one or no correct lines = 0 marks
		<b>Total</b>	<b>5</b>	

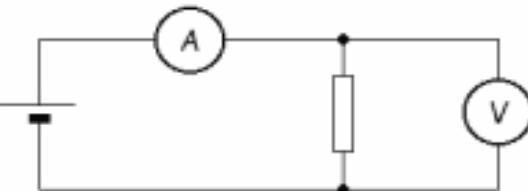
# A216/01 Modules B5, C5, P5 Foundation

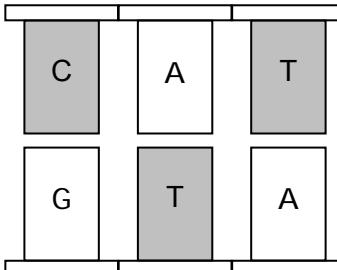
Question		Expected Answers					Marks	Rationale																				
1	(a)	<table border="1"> <thead> <tr> <th>substance</th><th>atmos</th><th>bio</th><th>hydro</th><th>litho</th></tr> </thead> <tbody> <tr> <td>liquid water</td><td></td><td></td><td>✓</td><td></td></tr> <tr> <td>sand</td><td></td><td></td><td></td><td>✓</td></tr> <tr> <td>CO<sub>2</sub> gas</td><td>✓</td><td></td><td></td><td></td></tr> </tbody> </table>					substance	atmos	bio	hydro	litho	liquid water			✓		sand				✓	CO <sub>2</sub> gas	✓				2	mark each row separately all rows correct = 2 marks two rows correct = 1mark  one or no row correct = 0 marks
substance	atmos	bio	hydro	litho																								
liquid water			✓																									
sand				✓																								
CO <sub>2</sub> gas	✓																											
	(b)	Thomas (1) Ruth (1)					2	either order if answer lines blank, <b>accept</b> any clear indication of correct answers																				
		<b>Total</b>					4																					

2	A		B (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	B		A (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	C		D (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	D		E (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
			<b>Total</b>	4	

Question		Expected Answers	Marks	Rationale
3	(a)	<p>electrons move through the copper wires</p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	1	
	(b) (i)	<p>A    C    E    B    D</p>	2	<p>A anywhere before C C anywhere before E E anywhere before B</p> <p>all correct = 2 mark 2 correct = 1 mark 1 or 0 correct = 0 marks</p>
	(ii)	CDA	1	
	(c)	<p>Gold is a good electrical conductor</p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p>Gold does not corrode</p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	2	
		<b>Total</b>	<b>6</b>	

Question		Expected Answers	Marks	Rationale
4	(a)		2	1 mark for each if boxes blank, <b>accept</b> any clear indication of correct answer for each box <b>allow</b> bulb or light for lamp
	(b)	series (1) current (1)	2	if answer lines blank, <b>accept</b> any clear indication of correct word for each space
	(c)	<p>It reduces the flow of charge through the circuit</p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	1	
		<b>Total</b>	<b>5</b>	

Question		Expected Answers	Marks	Rationale									
5	(a)		2	A = 1 mark V = 1 mark if circles blank, accept any clear indication of correct answer for each circle									
	(b)	voltage (1)	1										
	(c)	<table border="1"> <tr> <td>decrease</td> <td>increase</td> <td>stays same</td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> </table>	decrease	increase	stays same		✓			✓		2	mark each row separately 1 mark for each correct row
decrease	increase	stays same											
	✓												
	✓												
Total		5											
6	(a)	<p>The joule is a very small amount of energy</p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	1										
	(b) (i)	2.1 x 3 x 8 (1)	1	accept "50.4" if response not clear									
	(ii)	Alan (1)	1	if answer line blank, accept any clear indication allow $\frac{6}{2.1 \times 3} \times 100$ instead of 'Alan'									
	(c)	charge (1)	1	if answer line blank, accept any clear indication of correct letter									
Total		4											

Question		Expected Answers	Marks	Rationale
7	(a)	<p>genes are made of DNA</p> <p>DNA is a set of instructions for making proteins</p>	2	
	(b)		2	all correct = 2 marks one or two correct = 1 mark
	(c)	<p>Genes that are not needed are switched off</p>	1	
		<b>Total</b>	5	

Question		Expected Answers	Marks	Rationale				
8	(a)	<table border="1"> <tr> <td>mitosis</td> <td>meiosis</td> </tr> <tr> <td>A D E</td> <td>B C</td> </tr> </table>	mitosis	meiosis	A D E	B C	2	<p>allow any order of responses within a column. do not mark any letter which appears in both columns</p> <p>all correct = 2 marks 4 or 3 correct = 1 mark 1 or 2 correct = 0 marks</p>
mitosis	meiosis							
A D E	B C							
		<table border="1"> <tr> <td>B</td> <td>D</td> <td>C</td> <td>A</td> </tr> </table>	B	D	C	A	2	<p>D anywhere before C = 1 mark C anywhere before A = 1 mark repeated letters, apply strictly as above, e.g. ACA =1 mark</p>
B	D	C	A					
		<b>Total</b>	<b>4</b>					

Question			Expected Answers	Marks	Rationale
9	(a)	(i)	phototropism (1)	1	
		(ii)	allows plants to get more light <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/>	1	
	(b)	(i)	some plant cells are unspecialised <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/>  unspecialised cells turn into root cells <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	2	
		(ii)	It is a complete plant that is a clone of the parent plant. <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/>	1	
			<b>Total</b>	<b>5</b>	

## A216/02 Modules B5, C5, P5 Higher

Question		Expected Answers	Marks	Rationale
1	(a)	B (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	(s)	A (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	(d)	D (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
	(f)	E (1)	1	if answer line blank, <b>accept</b> any clear indication of correct
		<b>Total</b>	4	

2	(a)		<table border="1"> <thead> <tr> <th>element</th><th>very common</th><th>smaller amounts</th></tr> </thead> <tbody> <tr> <td>carbon</td><td>✓</td><td></td></tr> <tr> <td>hydrogen</td><td>✓</td><td></td></tr> <tr> <td>nitrogen</td><td>✓</td><td></td></tr> <tr> <td>oxygen</td><td>✓</td><td></td></tr> <tr> <td>phosphorus</td><td></td><td>✓</td></tr> <tr> <td>sulfur</td><td></td><td>✓</td></tr> </tbody> </table>	element	very common	smaller amounts	carbon	✓		hydrogen	✓		nitrogen	✓		oxygen	✓		phosphorus		✓	sulfur		✓	2	<b>accept</b> nitrogen in either column (so ignore nitrogen row) do <b>not</b> allow any other response which appears in both columns remaining 5 rows correct = 2 marks 4 correct = 1 mark 3 or less correct scores = 0 marks  <b>OR</b> (ignoring Nitrogen line) no errors = 2 marks 1 error = 1 mark 2 or more errors = 0 marks
element	very common	smaller amounts																								
carbon	✓																									
hydrogen	✓																									
nitrogen	✓																									
oxygen	✓																									
phosphorus		✓																								
sulfur		✓																								
(b)	(i) 'H' approximately above the vertical line (1)																									
1	the 'H' must be a capital letter <b>allow</b> 'H1' but not 'H1' do <b>not</b> allow alterations elsewhere in the formula																									
	(ii) C <sub>3</sub> H <sub>7</sub> O <sub>2</sub> NS (1)																									
1	numbers MUST be either smaller or subscripted <b>allow</b> elements in any order so long as their subscripts are correct <b>accept</b> C <sub>3</sub> H <sub>7</sub> O <sub>2</sub> N <sub>1</sub> S <sub>1</sub> ( <b>reject</b> C <sub>3</sub> H <sub>7</sub> O <sub>2</sub> N1S1) the subscripts on N <sub>1</sub> and S <sub>1</sub> are not normally used, but are not incorrect, so the mark can be awarded																									
(iii)	C (1)																									
<b>Total</b>	5																									

Question		Expected Answers	Marks	Rationale
3	(a)	<p>electrons move between ions in the lattice</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	1	
	(b)	[l], [l], [l], [g]	1	accept upper case letters, do not accept words (eg "gas", "liquid", "liq")
	(c)	3, 2, 2	1	boxes must contain numbers only
	(d)	<p>Gold is less reactive than copper.</p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>Gold holds its outer electrons quite weakly.</p> <p><input checked="" type="checkbox"/> (1)</p>	2	if answer line blank, accept any clear indication of correct letter if only 2 responses given, and one or both is then crossed out, mark both responses
		<b>Total</b>	<b>5</b>	

Question		Expected Answers	Marks	Rationale
4	(a)	<p>The closed switch allows charge to flow through the lamp</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p>	1	
	(b)	current (1) moving stationary (1)	2	first line correct = 1 mark second line correct = 1 mark allow oscillating instead of stationary
	(c)	$3.0 \times 1.5$ (1)	1	
	(d)	the resistor keeps the current in the lamp at the correct value	1	
		<b>Total</b>	<b>5</b>	

Question		Expected Answers	Marks	Rationale
5	(a)	The joule is a very small amount of energy <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1	
	(b) (i)	$2.1 \times 3 \times 8$ (1)	1	<b>accept</b> "50.4" if response not clear
	(ii)	Alan (1)	1	if answer line blank, <b>accept</b> any clear indication <b>allow</b> $\frac{6}{2.1 \times 3} \times 100$ instead of 'Alan'
	(c)	charge (1)	1	if answer line blank, <b>accept</b> any clear indication of correct letter
		<b>Total</b>	4	

Question		Expected Answers	Marks	Rationale									
6	(a)	0.36 W (1)	1										
	(b)	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>decrease</td> <td>increase</td> <td>stays the same</td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> </table>	decrease	increase	stays the same		✓			✓		1	both rows correct = 1 mark
decrease	increase	stays the same											
	✓												
	✓												
	(c)	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>decrease</td> <td>increase</td> <td>stays the same</td> </tr> <tr> <td></td> <td></td> <td>✓</td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> </table>			decrease	increase	stays the same			✓		✓	
decrease	increase	stays the same											
		✓											
	✓												
	(ii)	<p>Both resistors have the same potential difference across them</p> <p>both resistors have the same current</p>	2	<p>both ticks correct = 2 marks one correct = 1 mark</p> <p>if more than two ticks: (6 rows correct = 2 marks) 5 rows correct = 1 mark 4 rows correct = 0</p>									
		<b>Total</b>	<b>5</b>										

Question		Expected Answers		Marks	Rationale				
7	(a)	<table border="1"> <tr> <td>mitosis</td> <td>meiosis</td> </tr> <tr> <td>A D E</td> <td>B C</td> </tr> </table>		mitosis	meiosis	A D E	B C	2	<p>allow any order of responses within a column do <b>not</b> mark any letter which appears in both columns</p> <p>all correct = 2 marks 4 or 3 correct = 1 mark 1 or 2 correct = 0 marks</p>
mitosis	meiosis								
A D E	B C								
		<table border="1"> <tr> <td>B</td> <td>D</td> <td>C</td> <td>A</td> </tr> </table>		B	D	C	A	2	<p>D anywhere before C = 1 mark C anywhere before A = 1 mark repeated letters apply strictly as above, e.g. ACA = 1 mark</p>
B	D	C	A						
		<b>Total</b>		4					

Question		Expected Answers	Marks	Rationale
9		meristems (1) auxins (1) clones (1)	3	must be in correct order
		<b>Total</b>		3

Question		Expected Answers	Marks	Rationale
10		<p>Up to the eight cell stage ... <input type="checkbox"/></p> <p>Specialised cells can ... <input checked="" type="checkbox"/></p> <p>Some genes in the nucleus ... <input type="checkbox"/></p> <p>Both embryonic and adult ... <input checked="" type="checkbox"/></p>	3	<p>7 or 6 correct = 3 marks</p> <p>5 or 4 correct = 2 marks</p> <p>3 correct = 1 mark</p> <p>2 or 1 correct = 0 marks</p>
		<b>Total</b>	<b>3</b>	

# A217/01 Modules B6, C6, P6 Foundation

Question		Expected Answers	Marks	Rationale
1	(a)	radio (1)	1	<b>accept</b> any other clear indication of correct response e.g. tick, underlined etc
	(b)	decreases (1) reflect (1) increases (1)	3	more than one response for each marking point = 0 marks <b>accept</b> any other clear indication of correct response e.g. linking line
	(c)	infrared (1)	1	<b>accept</b> any other clear indication of correct response e.g. tick, underlined etc.
		<b>Total</b>	5	

2	(a)	<table border="1"> <tr> <td></td><td>M</td><td></td><td>V</td><td>UV</td><td>X</td><td></td></tr> </table> (1)		M		V	UV	X		1	<b>ignore</b> other responses in the 3 remaining boxes UV must appear only once more than one response = 0 marks <b>accept</b> other clear responses in the UV box eg. tick	
	M		V	UV	X							
	(b)	Bess (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, linking line etc								
	(c)	<table border="1"> <tr> <td>intensity</td> <td>the rate at which photons are absorbed</td> </tr> <tr> <td>frequency</td> <td>the number of waves emitted per second</td> </tr> <tr> <td></td> <td>the rate at which energy is delivered by photons</td> </tr> <tr> <td></td> <td>the number of photons emitted per second</td> </tr> </table>	intensity	the rate at which photons are absorbed	frequency	the number of waves emitted per second		the rate at which energy is delivered by photons		the number of photons emitted per second	2	both lines correct for (2) one line correct for (1)  more than one line from a single box – deduct one mark
intensity	the rate at which photons are absorbed											
frequency	the number of waves emitted per second											
	the rate at which energy is delivered by photons											
	the number of photons emitted per second											

Question		Expected Answers	Marks	Rationale
2	(d)	longitudinal transverse	empty space air	2 all 4 correct = 2 marks 2 or 3 correct = 1 mark 1 or 0 correct = 0 marks
		<b>Total</b>		<b>6</b>

3	(a)	wavelength (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, linking line, underlined etc
	(b)	B (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, linking line, underlined etc
	(c)	interference (1) in step (1) increases (1)	3	more than one response for a single marking point = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, underlined etc
		<b>Total</b>		<b>5</b>

4	(a)	(i)	C (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, underlined, ring or linking line to dotted line or diagram etc
		(ii)	B (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, underlined etc
		(b)	as an electrical impulse <input type="checkbox"/> (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. cross, shaded or linking line etc

Question		Expected Answers	Marks	Rationale
4	(c)	<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>C</span> <span>B</span> <span>A</span> <span>D</span> </div>	2	B anywhere before A = 1 mark A anywhere before D = 1 mark
	(d)	a receptor (1) an effector (1)	2	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. linking line
Total			7	

5		<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>remembering the three times table</span> <span>simple reflex</span> </div> <div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>a baby grasping his mother's finger</span> <span>learning by experience</span> </div> <div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>putting on a coat when cold</span> <span>learning by repetition</span> </div>	2	all three lines correct = 2 marks two or one line correct = 1 mark more than one line from a single box, deduct one mark
Total			2	

Question		Expected Answers	Marks	Rationale
6	(a)	<p>Edward's short term memory has been damaged.</p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>Remembering his school friends is a long term memory.</p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	2	<p>more than two responses, deduct 1 mark</p> <p><b>accept</b> any other clear indication of correct response e.g. crosses, shading, linking lines etc</p>
	(b)	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>cerebral cortex <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	1	<p>more than one response = 0 marks</p> <p><b>accept</b> any other clear indication of correct response e.g. cross, shading, linking line etc</p>
		<b>Total</b>	3	

Question		Expected Answers	Marks	Rationale
7	(a)	6 g (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, underlined etc
	(b)	Elizabeth (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, linking line etc
	(c)	25 % (1)	1	more than one response = 0 marks <b>accept</b> any other clear indication of correct response e.g. tick, underlined etc
<b>Total</b>		<b>3</b>		
8	(a)	carbon dioxide (1) sodium chloride (1)	2	phonetically correct answers = 2 marks <b>not</b> sodium chlorine or carbon oxygen
	(b)	<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="border: 1px solid black; padding: 2px;">E</span> <span style="border: 1px solid black; padding: 2px;">B</span> <span style="border: 1px solid black; padding: 2px;">A</span> <span style="border: 1px solid black; padding: 2px;">C</span> <span style="border: 1px solid black; padding: 2px;">D</span> <span style="border: 1px solid black; padding: 2px;">F</span> </div>	2	A anywhere before C C anywhere before D D anywhere before F  all stages correct = 2 marks 2 or 3 stages correct = 1 mark 1 or 0 stages correct = 0 marks
	(c)	i A and E (1)	1	more than two responses = 0 marks any order
		ii C and D (1)	1	more than two responses = 0 marks any order
<b>Total</b>		<b>6</b>		

Question		Expected Answers			Marks	Rationale						
9	(a)	chemical used up	chemical produced	catalyst								
		nitrogen hydrogen	ammonia	iron	2	<p>all 3 boxes correct = 2 marks  2 boxes correct = 1 mark  1 or 0 boxes correct = 0 marks  <b>or</b>  <b>accept</b> iron in all 3 = 1 mark</p> <table border="1"> <tr> <th>chemical used up</th> <th>chemical produced</th> <th>catalyst</th> </tr> <tr> <td>nitrogen hydrogen iron</td> <td>ammonia iron</td> <td>iron</td> </tr> </table>	chemical used up	chemical produced	catalyst	nitrogen hydrogen iron	ammonia iron	iron
chemical used up	chemical produced	catalyst										
nitrogen hydrogen iron	ammonia iron	iron										
	(b)	change in pressure (1)			1	<p>more than one response = 0 marks  <b>accept</b> any other clear indication of correct response e.g. tick, underlined etc</p>						
	(c)	<p>use a lower pressure</p> <p>re-cycle unreacted gases</p> <p>less waste to dispose of</p> <p>less acid rain is made</p> <p>vessels don't have to be as strong</p> <p>less damage to the ozone layer</p> <p>less space is needed for the factory</p>			2	<p>both lines correct = 2 marks  one line correct = 1 mark  more than one line from a single box, deduct one mark</p>						
		<p><b>Total</b></p>			5							

## A217/02 Modules B6, C6, P6 Higher

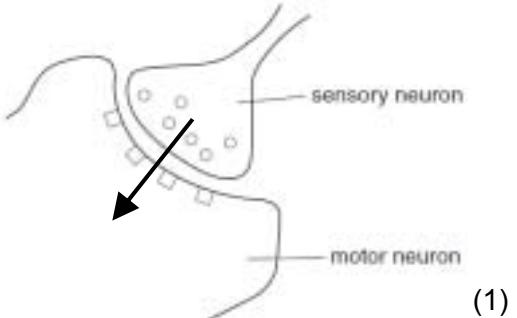
Question		Expected Answers	Marks	Rationale
1	(a)	<input type="checkbox"/> M <input type="checkbox"/> V <input type="checkbox"/> UV <input type="checkbox"/> X <input type="checkbox"/> (1)	1	<b>ignore</b> other responses in the 3 remaining boxes UV must appear only once more than one response = 0 marks <b>accept</b> other clear responses in the UV box eg. tick
	(b)	Bess (1)	1	
	(c)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           intensity         </div> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           frequency         </div> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           the rate at which photons are absorbed         </div> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           the number of waves emitted per second         </div> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           the rate at which energy is delivered by photons         </div> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);">           the number of photons emitted per second         </div> </div> </div>	2	correct pattern = 2 marks one mistake = 1 mark  a mistake is: <ul style="list-style-type: none"> <li>• a missing line</li> <li>• a line in the wrong place</li> <li>• an extra line</li> </ul>
		<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Rationale
2	(a)	wavelengths (1)	1	allow frequencies
	(b)	diffraction (1)	1	
	(c)	<div style="border: 1px solid black; display: inline-block; width: 150px; height: 50px; vertical-align: middle; text-align: center; line-height: 50px;"> <span style="border: 1px solid black; padding: 2px;">B</span>           <span style="border: 1px solid black; padding: 2px;">C</span>           <span style="border: 1px solid black; padding: 2px;">A</span>           <span style="border: 1px solid black; padding: 2px;">E</span> </div>	3	starts with B = 1 mark ends with E for = 1 mark second and third C then A = 1 mark
Total			5	

3	(a)		<table border="1" style="border-collapse: collapse; width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">statement</th><th style="width: 50%;">true or false</th></tr> </thead> <tbody> <tr> <td>dish increases the intensity</td><td>true</td></tr> <tr> <td>signals strongly absorbed</td><td>false</td></tr> <tr> <td>the dish removes noise</td><td>false</td></tr> <tr> <td>dish is made of metal</td><td>true</td></tr> </tbody> </table>	statement	true or false	dish increases the intensity	true	signals strongly absorbed	false	the dish removes noise	false	dish is made of metal	true	2	all four correct = 2 marks three or two correct = 1 mark allow T and F, but not ticks, crosses or gaps
statement	true or false														
dish increases the intensity	true														
signals strongly absorbed	false														
the dish removes noise	false														
dish is made of metal	true														

Question		Expected Answers	Marks	Rationale
	(b)	Andrew (1)	1	
	(c)	<p>radio</p> <p>sound</p> <p>infrared</p> <p>uv</p> <p>waves are used in optical fibres</p> <p>their photons are easily diffracted in the glass</p> <p>their photons travel faster than the others through the glass</p> <p>their photons don't carry enough energy to damage the glass</p> <p>their photons travel a long way through the glass before being absorbed</p>	2	<p>correct pattern = 2 marks one mistake = 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing line</li> <li>• a line in the wrong place</li> <li>• an extra line</li> </ul>
		Total	5	

Question		Expected Answers				Marks	Rationale																				
4	(a)		<table border="1"> <thead> <tr> <th>structures</th> <th>only CNS</th> <th>only PNS</th> <th>both CNS and PNS</th> </tr> </thead> <tbody> <tr> <td>brain</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>motor neuron</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>sensory neuron</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>spinal cord</td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>				structures	only CNS	only PNS	both CNS and PNS	brain	✓			motor neuron		✓		sensory neuron			✓	spinal cord	✓			<p>all four rows correct (2) any two or three rows correct (1) a correct row has only one tick in the correct place accept any unambiguous response</p>
structures	only CNS	only PNS	both CNS and PNS																								
brain	✓																										
motor neuron		✓																									
sensory neuron			✓																								
spinal cord	✓																										
<table border="1"> <tr> <td>C</td> <td>B</td> <td>A</td> <td>D</td> </tr> </table>					C	B	A	D																			
C	B	A	D																								
<table border="1"> <tr> <td>Total</td> <td></td> <td></td> <td></td> </tr> </table>					Total																						
Total																											
							4																				

Question		Expected Answers	Marks	Rationale
5	(a)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">synapse</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">axon</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">fatty sheath</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">increases the speed of transmission</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">transmits a nerve impulse as an electrical signal</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">gap between two adjacent neurons</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">detects a nerve impulse and responds to it</div> </div>	3	<p>correct pattern for (3) one mistake for (2) two mistakes for (1)</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing line</li> <li>• a line in the wrong place</li> <li>• an extra line</li> </ul>
	(b)	 <p style="text-align: center;">(1)</p>	1	<p><b>accept</b> an arrow (anywhere) pointing from top to bottom and right to left</p>

Question		Expected Answers	Marks	Rationale
5	(c)	<p>Ecstasy blocks the sites where serotonin is removed.</p> <p>The serotonin concentration increases, which enhances mood.</p>	2	<p>correct pattern = 2 marks one mistake for = 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing tick</li> <li>• a tick in the wrong place</li> <li>• an extra tick</li> </ul>
		<b>Total</b>	<b>6</b>	

Question		Expected Answers	Marks	Rationale
	(b)	<p>cerebral cortex</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	1	correct pattern = 1 mark
	(c)	<p>keeping hold of a hot plate</p> <p>simple</p> <p>producing saliva when a bell rings</p> <p>modified</p> <p>a baby grasping his mother's finger</p> <p>conditioned</p>	2	<p>correct pattern = 2 marks one or two mistakes = 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing line</li> <li>• a line in the wrong place</li> <li>• an extra line</li> </ul>
6	(a)	<p>There is a pattern in the notes that he can recognise</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p>Repeating the same action makes new pathways in the brain</p> <p><input checked="" type="checkbox"/> (1)</p>	2	<p>correct pattern = 2 marks one mistake = 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing tick</li> <li>• a tick in the wrong place</li> <li>• an extra tick</li> </ul>
		<b>Total</b>	<b>5</b>	

Question		Expected Answers	Marks	Rationale
7	(a)	change in pressure (1)	1	
	(b)	<div style="display: flex; justify-content: space-between;"> <div style="flex: 1;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">use a lower pressure</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">re-cycle unreacted gases</div> </div> <div style="flex: 1;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">less waste to dispose of</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">less acid rain is made</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">vessels don't have to be as strong</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">less damage to the ozone layer</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">less space is needed for the factory</div> </div> </div>	2	<p>correct pattern = 2 marks one mistake = 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing line</li> <li>• a line in the wrong place</li> <li>• an extra line</li> </ul>
		Total	3	

Question		Expected Answers	Marks	Rationale
8	(a)	2 NaHCO <sub>3</sub> 2 H <sub>2</sub> O 2 CO <sub>2</sub>	2	first one correct= 1 mark last two correct= 1 mark
	(b)	0.2 (g) (1)	1	
	(c)	D (1) F (1)	2	any order
	(d)	less than 95 % (1)	1	
	(e)	84 (g) (1)	1	
	(f) (i)	0.035 (1)	1	
	(ii)	7 (1)	1	
	(iii)	the collision frequency between acid and the solid is less <input checked="" type="checkbox"/> (1)	1	correct pattern = 1 mark
		<b>Total</b>	<b>10</b>	

# Grade Thresholds

General Certificate of Secondary Education  
 Additional Science A (Specification Code J631)  
 January 2009 Examination Series

## Unit Threshold Marks

Unit		Maximum Mark	A*	A	B	C	D	E	F	G	U
A215/01	Raw	42	N/A	N/A	N/A	27	23	20	17	14	0
	UMS	34	N/A	N/A	N/A	30	25	20	15	10	0
A215/02	Raw	42	30	26	21	17	13	11	N/A	N/A	N/A
	UMS	50	45	40	35	30	25	23	N/A	N/A	N/A
A216/01	Raw	42	N/A	N/A	N/A	26	22	19	16	13	0
	UMS	34	N/A	N/A	N/A	30	25	20	15	10	0
A216/02	Raw	42	34	30	25	21	16	13	N/A	N/A	N/A
	UMS	50	45	40	35	30	25	23	N/A	N/A	N/A
A217/01	Raw	42	N/A	N/A	N/A	25	21	17	13	9	0
	UMS	34	N/A	N/A	N/A	30	25	20	15	10	0
A217/02	Raw	42	34	30	25	20	15	12	N/A	N/A	N/A
	UMS	50	45	40	35	30	25	23	N/A	N/A	N/A

## Specification Aggregation Results

Overall threshold marks in UMS (ie after conversion of raw marks to uniform marks)

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J631	300	270	240	210	180	150	120	90	60	0

The cumulative percentage of candidates awarded each grade was as follows:

	A*	A	B	C	D	E	F	G	U	Total No. of Cands
J631	13.6	36.4	45.5	72.7	90.9	100.0	100.0	100.0	100.0	22

For a description of how UMS marks are calculated see:

[http://www.ocr.org.uk/learners/ums\\_results.html](http://www.ocr.org.uk/learners/ums_results.html)

Statistics are correct at the time of publication.

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