

# **Additional Science A**

General Certificate of Secondary Education

Unit **A216/01**: Modules B5, C5, P5 (Foundation Tier)

## **Mark Scheme for January 2013**

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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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### Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
<u>words</u>	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	credit alternative wording / or words to that effect
ORA	or reverse argument

Available in scoris to annotate scripts:

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt

	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

### Subject-specific Marking Instructions

- a. Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).
- b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

*e.g. for a one-mark question where ticks in the third and fourth boxes are required for the mark:*

*This would be worth  
1 mark.*

*This would be worth  
0 marks.*

*This would be worth  
1 mark.*

- c. The list principle:  
If a list of responses greater than the number requested is given, 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, e.g. 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.

## d. Marking method for tick-box questions:

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses and other markings. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses. Credit should be given according to the instructions given in the guidance column for the question. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

e.g. if a question requires candidates to identify cities in England:

Edinburgh	<input type="checkbox"/>
Manchester	<input type="checkbox"/>
Paris	<input type="checkbox"/>
Southampton	<input type="checkbox"/>

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
<b>Score:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

## e. For answers marked by levels of response:

i. **Read through the whole answer from start to finish**

ii. **Decide the level** that **best fits** the answer – match the quality of the answer to the closest level descriptor

iii. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

iv. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

Quality of Written Communication skills assessed in 6-mark extended writing questions include:

- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

Question		Answer	Marks	Guidance
1	(a)	rain (onto land) (1)  (idea of water/rain) dissolves salt/picks up salt/washes salt (1)  (salt) taken by rivers/streams (to the sea) (1)  idea of erosion (in correct context).(1)	3	<b>ignore</b> rocks fall into the sea/corrosion  <b>ignore</b> salt evaporated and form clouds  <b>ignore</b> rocks rot  <b>accept salt</b> (ignore rocks) goes into the sea
	(b) (i)	6	1	<b>accept</b> C <sub>6</sub>
	(ii)	12	1	<b>accept</b> H <sub>12</sub>
	(c)	bacteria in the roots of some plants <input checked="" type="checkbox"/> bacteria in the soil <input type="checkbox"/> eating <input type="checkbox"/> decomposers <input type="checkbox"/>	1	
<b>Total</b>			<b>6</b>	

Question		Answer	Marks	Guidance
2	(a)	E	1	
	(b)	D	1	
	(c)	A	1	
	(d)	B	1	
<b>Total</b>			<b>4</b>	

Question		Answer	Marks	Guidance
3	(a)	electrolytes	1	
	(b)	<p><b>any three from</b></p> <p>bubbles/fizzes/red-brown/smell;</p> <p>reference to bromine OR lead formation at electrodes; to the <b>correct</b> electrode;</p> <p>lead collects at the <b>bottom</b>;</p>	3	<p><b>accept</b> reference to electrodes (even if incorrect electrode is stated)</p> <p><b>accept</b> bromine formed at anode/positive electrode = 2 OR <b>accept</b> lead formed at cathode/negative electrode = 2</p> <p><b>accept</b> formed = collects <b>ignore</b> stays at bottom</p>
<b>Total</b>			<b>4</b>	

Question		Answer	Marks	Guidance
4	(a)	<p style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> </p> <p>All three resistors have the same current.</p>	1	
	(b)	voltage (1)	1	
	(c)	(i)	1	
		(ii)	1	
	(d)	power (1)	1	
<b>Total</b>			<b>5</b>	



Question		Answer	Marks	Guidance
5	(a)	generator	1	
	(b)	<p><b>any two from</b></p> <p>spin the magnet faster (1);</p> <p>use a stronger magnet/ add another magnet (1);</p> <p>have more coils/turns (of wire) (1);</p> <p>put some iron in the coil (1);</p> <p>move the magnet closer/inside the coil (1)</p>	2	<p><b>do not</b> apply list principle; give marks for any valid different points.</p> <p><b>accept</b> 'spin faster' or 'move it faster'</p> <p><b>reject</b> 'bigger magnet'</p> <p><b>reject</b> 'coil(s) closer together'</p> <p><b>ignore</b> bigger coil</p> <p><b>accept</b> metal = iron</p>
	(c)	B	1	
	(d)	<p>There is now a current in the coil.</p> <p style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> </p>	1	
<b>Total</b>			<b>5</b>	

Question		Answer	Marks	Guidance
6	(a)	0.06	1	
	(b)	charge temperature	1 1	
	(c)	C	1	
<b>Total</b>			<b>4</b>	

Question		Answer	Marks	Guidance
7	(a)	C (1)	1	if no answer given, check the table
	(b)	<p>meiosis (1)</p> <p>idea that (gametes have) 39 chromosomes/haploid/half the chromosomes (1)</p> <p>links (gamete fusion) to zygote/embryo OR (gametes fuse) to give full number/diploid/double the number of chromosomes / (returns to)78 chromosomes (1)</p>	3	<p><b>accept</b> mis-spelling of meiosis (ie but not if a 'T' is present) <b>accept</b> 'reduction division' instead of meiosis.</p> <p><b>NB</b> unless stated otherwise, assume that the candidate is referring to gametes as the product of cell division.</p> <p><b>ignore</b> 'cells/chromosomes split in half' <b>allow</b> 'half the genetic information' <b>reject</b> 78 + 78 chromosomes = 156 (no ecf applied) <b>ignore</b> 'gametes double the number of chromosomes' <b>ignore</b> 'half the chromosomes from each parent' in the context of this marking point <b>ignore</b> twice as many chromosomes are produced when the gamete forms <b>NB</b> references to fusing and to halving must be in the correct context.</p>
		<b>Total</b>	<b>4</b>	

Question		Answer	Marks	Guidance
8	(a)	cytoplasm/ribosome	1	
	(b)	nucleus	1	
	(c)	double two four	2	3 correct = 2 marks 1 or 2 correct = 1 mark
	(d)	<p>Genes that are not needed are switched off.</p> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1	
<b>Total</b>			<b>5</b>	

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

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