



GCSE

Additional Science A

General Certificate of Secondary Education

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

Mark Scheme for January 2012

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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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
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
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

- If a candidate alters his/her response, examiners should accept the alteration.
- 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 boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

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 boxes:

Always check the additional guidance.

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. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

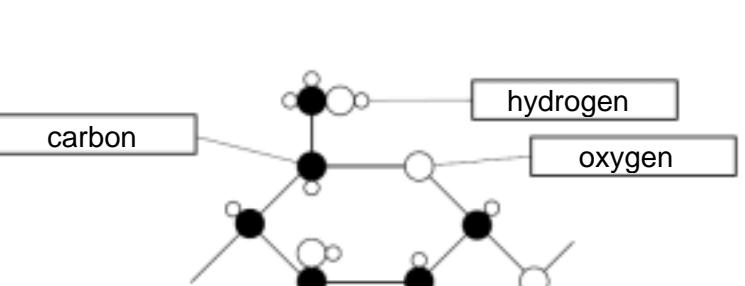
Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

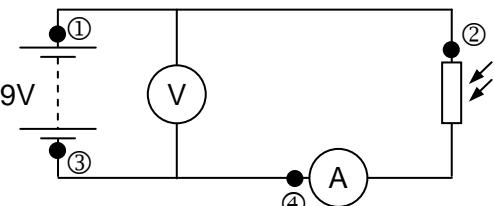
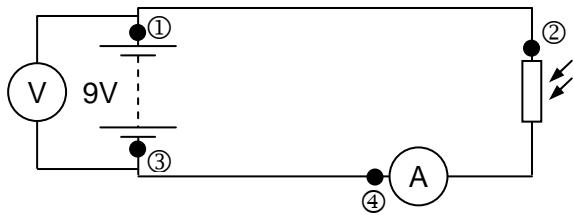
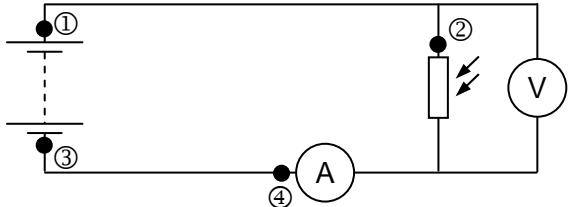
the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	✗	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	✗		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question		Answer	Marks	Guidance
1	(a)	2.6% 3.9% 25.8 29.7 33.6	1	
	(b)	carbon (large filled circle) hydrogen (small clear circle) oxygen (large clear circle)	2	all three correct = 2 marks one or two correct = 1 mark accept C for carbon, H for hydrogen and O for oxygen ignore numbers after symbols
				

Question		Answer			Marks	Guidance												
2	(a)	<table border="1"> <tr> <td>gas</td><td>element</td><td>compound</td></tr> <tr> <td>argon</td><td>✓</td><td></td></tr> <tr> <td>carbon dioxide</td><td></td><td>✓</td></tr> <tr> <td>nitrogen</td><td>✓</td><td></td></tr> </table>			gas	element	compound	argon	✓		carbon dioxide		✓	nitrogen	✓		1	all correct = 1 mark any extra ticks = 0 marks
gas	element	compound																
argon	✓																	
carbon dioxide		✓																
nitrogen	✓																	
	(b)				1													
	(c)	<table border="1"> <tr> <td>Sulfur compounds get into the air when volcanoes erupt.</td><td>1</td></tr> <tr> <td>Sulfur compounds in the air form acid rain, which ...</td><td>4</td></tr> <tr> <td>Some sulfur compounds get into the air when plants rot.</td><td>2</td></tr> <tr> <td>Plants take in some sulfur compounds from the soil.</td><td>3</td></tr> </table>			Sulfur compounds get into the air when volcanoes erupt.	1	Sulfur compounds in the air form acid rain, which ...	4	Some sulfur compounds get into the air when plants rot.	2	Plants take in some sulfur compounds from the soil.	3	2	all correct = 2 marks 3 or 2 correct = 1 mark				
Sulfur compounds get into the air when volcanoes erupt.	1																	
Sulfur compounds in the air form acid rain, which ...	4																	
Some sulfur compounds get into the air when plants rot.	2																	
Plants take in some sulfur compounds from the soil.	3																	
	(d)	giant lattice/structure OR macromolecular/lattice; covalent bonds; strong bonds OR large force / energy, needed to break bonds			3	accept correct description of giant lattice structure reject ionic / intermolecular accept description electrons shared between atoms accept harder to break accept molecules / particles as atoms reject ref. to (tight) packing												
		Total			7													

Question		Answer	Marks	Guidance
3	(a)	<p>Aluminium is too reactive.</p> <p>It would take too much carbon.</p> <p>Aluminium is not dense enough.</p> <p>It is less polluting to use electrolysis.</p>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1
	(b)	(i) aluminium oxide \rightarrow aluminium + oxygen	1	<p>aluminium and oxygen in either order</p> <p>aluminium oxide \rightarrow aluminium + oxide = 0 marks</p> <p>ignore symbols</p>
	(ii)	<p>aluminium at the positive electrode, oxygen at the negative electrode</p> <p>aluminium at the negative electrode, oxygen at the positive electrode</p> <p>both at the positive electrode</p> <p>both at the negative electrode</p>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1
	(iii)	electrolysis extraction oxidation reduction	1	
		Total	4	

Question		Answer	Marks	Guidance
4	(a)	 OR 	1	look for a circle with V inside connected to both ends of the battery as shown one terminal must be connected between 1 and 2 one terminal must be connected between 3 and 4 accept connected to both ends of the LDR  accept freehand straight lines accept V on its side or upside down reject line through symbol 
	(b) (i)	45 (.0) Ω	1	
	(ii)	increases increases decreases	2	all correct for = 2 marks (anything), decreases, increases for 1 mark (anything), increases, decreases for 1 mark (anything) can be a blank
		Total	4	

Question		Answer	Marks	Guidance
5	(a)	electrons	1	
	(b)	positive	1	
	(c)	Bess	1	
		Total	3	

6	(a)	iron	1	
	(b)	current in primary (circuit) core magnetises / has a magnetic field current in second(ary) (circuit)	3	<p>accept pd / voltage / electricity / electrons / charge ignore ref. to energy / power reject current in core</p> <p>accept pd / voltage / electricity / electrons / charge ignore ref. to energy / power reject current in core</p>
			Total	4

Question		Answer	Marks	Guidance
7	(a)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="flex: 1;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">wire</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">lamp</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">battery</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">resistor</div> </div> <div style="flex: 1;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">reduces electron flow</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">glows when electrons flow through</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">supplies the energy for electron flow</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">allows electrons to flow from one component to another</div> </div> </div>	2	all three correct = 2 marks one or two correct = 1 mark
	(b)	9 V	1	
		Total	3	

Question		Answer	Marks	Guidance						
8	(a)	<table border="1"> <thead> <tr> <th colspan="2">part of cell</th> </tr> </thead> <tbody> <tr> <td>where DNA is found</td><td>nucleus</td> </tr> <tr> <td>where proteins are produced</td><td>cytoplasm</td> </tr> </tbody> </table>	part of cell		where DNA is found	nucleus	where proteins are produced	cytoplasm	2	1 mark for each correct label
part of cell										
where DNA is found	nucleus									
where proteins are produced	cytoplasm									
	(b)	double bases two	2	3 correct = 2 marks 1 or 2 correct = 1 mark						
		Total	4							

9		<p>any three from:</p> <p>(use of) rooting powder / hormones;</p> <p>idea that, it / cutting, contains meristems;</p> <p>Idea that, it / cutting / meristem, contains unspecialised cells;</p> <p>(cells divide by) mitosis;</p> <p>they / unspecialised cells, can become specialised / turn into any type of cell or tissue or organ;</p> <p>named example of new tissue / organs e.g xylem / phloem / root / stem / leaf;</p>	3	<p>accept auxin</p> <p>ignore ref to (old) plant</p> <p>ignore ref to (old) plant</p> <p>do not allow meiosis</p> <p>ignore turn into any part of plant</p>
		Total	3	

Question		Answer	Marks	Guidance
10	(a)	19	1	
	(b)	38	1	
	(c)	Di; Charlie;	2	accept in either order 1 mark for each correct name
		Total	4	

11		<p>any three from:</p> <p>meiosis produces gametes / sex cells;</p> <p>cells produced by meiosis have half the number of chromosomes (as the original cell) / cells produced by mitosis have the same number of chromosomes (as the original cell);</p> <p>meiosis produces cells that are not (genetically) identical / mitosis produces cells (genetically) identical to each other;</p> <p>mitosis produces cells identical to the (parent / original) cell / meiosis produces cells that are not identical to the parent;</p> <p>mitosis produces 2 cells / meiosis produces 4 cells;</p> <p>idea that, cells produced by mitosis are used for growth / repair;</p>	3	<p>ignore to do with sex cells</p> <p>accept numbers of chromosomes if both numbers correctly given e.g. 46 and 23</p> <p>accept copy for idea of identical</p> <p>accept copy for idea of identical</p>
		Total	3	

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