RECOGNISING ACHIEVEMENT

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

a. If a candidate alters his/her response, examiners should accept the alteration.

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 boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

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.

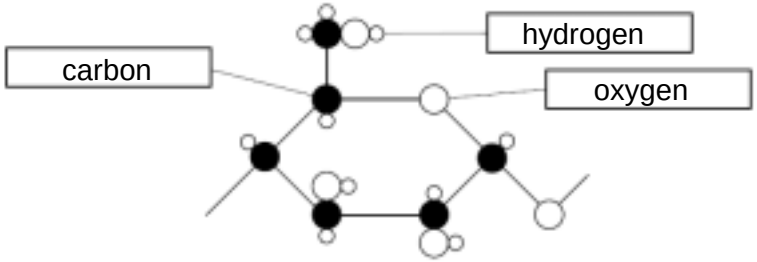
If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.
If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.
Credit should be given for each box correctly ticked. 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 <u>should be blank</u> (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** (circled) **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
			Total	**3**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2</td><td>(a)</td><td></td><td>
<table>
<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>
</td><td>1</td><td>all correct = 1 mark
any extra ticks = 0 marks</td></tr>
<tr><td></td><td>(b)</td><td></td><td>  </td><td>1</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td>
<table>
<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>
</td><td>2</td><td>all correct = 2 marks
3 or 2 correct = 1 mark</td></tr>
<tr><td></td><td>(d)</td><td></td><td>giant lattice/structure OR macromolecular/lattice;

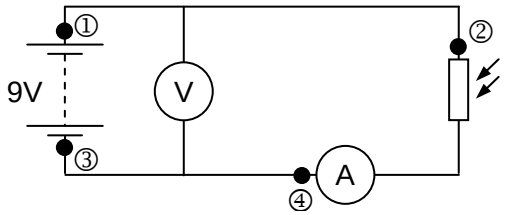
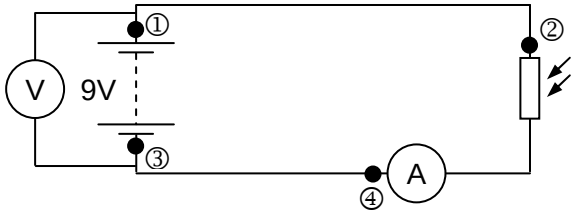
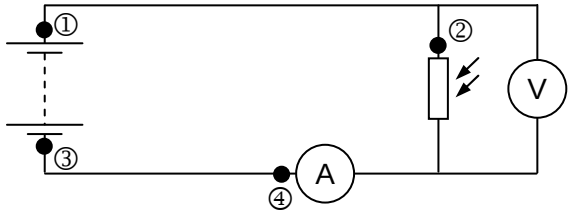
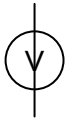
covalent bonds;

strong bonds OR large force / energy, needed to break bonds</td><td>3</td><td>accept correct description of giant lattice structure

reject ionic / intermolecular
accept description electrons shared between atoms

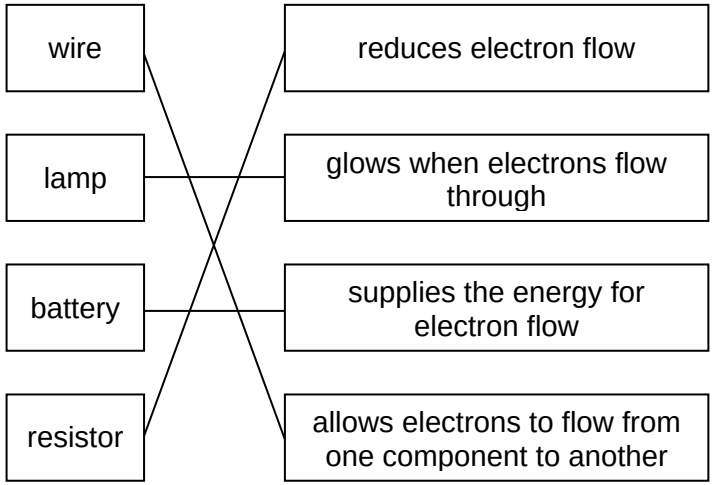
accept harder to break
accept molecules / particles as atoms
reject ref. to (tight) packing</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>7</td><td></td></tr>
</table>

Question			Answer	Marks	Guidance
3	(a)		Aluminium is too reactive. ✓ It would take too much carbon. Aluminium is not dense enough. It is less polluting to use electrolysis.	1	
	(b)	(i)	aluminium oxide ➔ aluminium + oxygen	1	aluminium and oxygen in either order aluminium oxide ➔ aluminium + oxide = 0 marks **ignore** symbols
		(ii)	aluminium at the positive electrode, oxygen at the negative electrode aluminium at the negative electrode, oxygen at the positive electrode ✓ both at the positive electrode both at the negative electrode	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	**accept** pd / voltage / electricity / electrons / charge **ignore** ref. to energy / power **reject** current in core **accept** pd / voltage / electricity / electrons / charge **ignore** ref. to energy / power **reject** current in core
			Total	**4**	

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

9			**any three from:** (use of) rooting powder / hormones; idea that, it / cutting, contains meristems; Idea that, it / cutting / meristem, contains unspecialised cells; (cells divide by) mitosis; they / unspecialised cells, can become specialised / turn into any type of cell or tissue or organ; named example of new tissue / organs e.g xylem / phloem / root / stem / leaf;	3	 **accept** auxin **ignore** ref to (old) plant **ignore** ref to (old) plant **do not allow** meiosis **ignore** turn into any part of plant
			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			**any three from:** meiosis **produces** gametes / sex cells; 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); meiosis produces cells that are not (genetically) identical / mitosis produces cells (genetically) identical to each other; mitosis produces cells identical to the (parent / original) cell / meiosis produces cells that are not identical to the parent; mitosis produces 2 cells / meiosis produces 4 cells; idea that, cells produced by mitosis are used for growth / repair;	3	 **ignore** to do with sex cells **accept** numbers of chromosomes if **both** numbers correctly given e.g. 46 and 23 **accept** copy for idea of identical **accept** copy for idea of identical
			Total	**3**	

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