

Chemistry A

General Certificate of Secondary Education

Unit **A321/01**: Modules C1, C2, C3 (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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
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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.

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

This would be worth 1 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"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

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

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, eg 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, eg 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	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Answer	Marks	Guidance												
1	(a)	(i)	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td>It is well outside the range of the other measurements.</td><td>✓</td></tr> </table>							It is well outside the range of the other measurements.	✓	1					
It is well outside the range of the other measurements.	✓																
		(ii)	<table border="1"> <tr><td>It would make the best estimate less accurate.</td><td>✓</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td>It is likely to have resulted from an error in measurement.</td><td>✓</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	It would make the best estimate less accurate.	✓					It is likely to have resulted from an error in measurement.	✓					2	
It would make the best estimate less accurate.	✓																
It is likely to have resulted from an error in measurement.	✓																
	(b)	(i)	64 to 68 (1)	1	allow reverse (68 to 64)												
		(ii)	attempts to calculate a mean/average (1) 66 (1)	2	66 on its own scores 2 marks												

Question		Answer	Marks	Guidance
1	(c)	<p>measurements for town B are higher (than town A) (1)</p> <p>town B has cars (in centre) but Town A does not (1)</p> <p>statement linking the two e.g. correlation / causal link (1)</p>	3	<p>town B has more carbon/particulates</p> <p>allow town B has more cars</p> <p>if no mention of town A or B max 1</p> <p>allow reverse argument</p> <p>ignore references to pollution that do not mention carbon/particulates</p>
Total			9	

Question			Answer	Marks	Guidance
2	(a)		5 (1) 4 (1)	2	one mark for each correct number
	(b)		3 8 10 (1)	1	all three required
	(c)		carbon (1) and carbon monoxide (1)	2	either order allow carbon particulates but do not allow particulates
			Total	5	

Question			Answer	Marks	Guidance
3	(a)		hydrogen carbon (1)	1	both required, either order
	(b)	(i)	polymerisation	1	
		(ii)	any two from: small molecules/monomers; join/bond/combine together; to make long chains (2)	2	
	(c)	(i)	suitable article eg tennis racquet (1) old material (1) new material (1)	3	do not allow 'plastic' as a new material both materials must be consistent with question e.g. wood; carbon fibre
		(ii)	problem with old material (1) reason why new material better eg easy to break; carbon fibre stronger than wood (1)	2	answers must be linked to the materials mentioned in c(i) ignore cost argument
			Total	9	

Question			Answer	Marks	Guidance
4	(a)	(i)		3	all four correct = 3 marks two or three correct = 2 marks one correct = 1 mark two lines from or to one box negates that box from scoring marks
		(ii)	added to fats/oils (1) (fats and oils) become rancid/deteriorate/have short shelf life / prevents going rancid/deterioration (1) (antioxidants) prevent reaction with oxygen / prevents oxidation (1)	3	allow foods high in fat/oil e.g. butter/cheese do not allow idea of rotting/decay/bacterial attack allow to prolong shelf life / stop 'going off' if contradiction e.g. prevents oxidation and prevents mould, this mark is lost
	(b)		absorbed blood rise blood (3)	3	all 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark in the fourth blank allow urine instead of blood
Total				9	

Question			Answer	Marks	Guidance
5	(a)		they kill pests / insects (1) that would attack / eat the crop (1)	2	allow 'destroys' pests do not allow 'stops' as an alternative for 'kills'
	(b)	(i)	Mary	1	
		(ii)	Stan	1	
		(iii)	Tania	1	
Total				5	

Question			Answer	Marks	Guidance														
6	(a)		D (1) F (1)	2															
	(b)		<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td>Trees can be grown to get more wood.</td><td style="text-align: center;">✓</td></tr> <tr><td> </td><td> </td></tr> <tr><td>uPVC is made from chemicas in crude oil...</td><td style="text-align: center;">✓</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> <div style="display: flex; justify-content: flex-end; margin-top: 10px;"> (1) (1) </div>					Trees can be grown to get more wood.	✓			uPVC is made from chemicas in crude oil...	✓					2	
Trees can be grown to get more wood.	✓																		
uPVC is made from chemicas in crude oil...	✓																		

Question		Answer	Marks	Guidance								
6	(c)	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>The forces of attraction between polymer chains...</td><td>✓ (1)</td></tr><tr><td></td><td></td></tr></table>					The forces of attraction between polymer chains...	✓ (1)			1	
The forces of attraction between polymer chains...	✓ (1)											
		Total	5									

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