



GCSE

Chemistry A

General Certificate of Secondary Education A321/01

Unit 1: Modules C1, C2, C3 (Foundation Tier)

Mark Scheme for June 2010

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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

Additional Guidance within any mark scheme takes precedence over the following guidance.

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. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= 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	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

5. Annotations:

The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt not given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

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

7. 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 0 marks.

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 one mark.

Put ticks (✓) in the two correct boxes.

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

This would be worth one mark.

8. 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.

9. 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

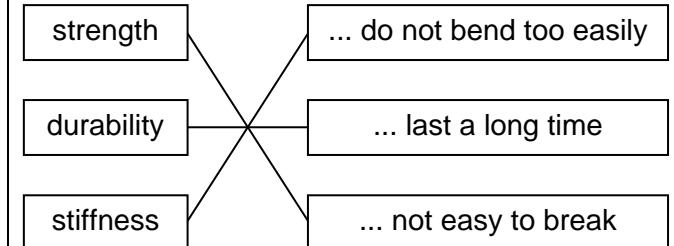
Edinburgh	
Manchester	
Paris	
Southampton	

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		Expected Answers	Marks	Additional Guidance
1	a i	<p>gases breathed out by animals <input type="checkbox"/></p> <p>the burning of fuels ... <input checked="" type="checkbox"/> (1)</p> <p>the spreading of fertiliser ... <input type="checkbox"/></p>	[1]	
	ii	oxygen (1) water (1)	[2]	
	iii	nitrogen dioxide (1) NO_2 (1)	[2]	
	b	<p>There was a decrease ... <input type="checkbox"/></p> <p>More cars and power stations ... <input checked="" type="checkbox"/> (1)</p> <p>There was an increase ... <input type="checkbox"/></p> <p>More cars were fitted ... <input type="checkbox"/></p> <p>More power stations were fitted ... <input checked="" type="checkbox"/> (1)</p> <p>More people changed ... <input type="checkbox"/></p>	[2]	
	c	<p>people living near ... <input type="checkbox"/></p> <p>people working in ... <input type="checkbox"/></p> <p>the Government ... <input checked="" type="checkbox"/> (1)</p> <p>the companies supplying ... <input type="checkbox"/></p>	[1]	
		Total	[8]	

Question		Expected Answers	Marks	Additional Guidance															
2	a	i any two from: it enables an average/mean to be calculated; it allows outliers to be identified (and discarded); it allows for differences in samples / it allows for errors in equipment / it allows for errors in technique / one measurement may be in error;	[2]	do not allow it increases the reliability/accuracy of the results allow it increases the reliability/accuracy of the best estimate															
		ii 0.168 (2)	[2]	2 marks for correct answer allow 1 mark for addition of values to 0.84															
	b	<table> <tbody> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[2]								
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
		Total	[6]																

Question		Expected Answers	Marks	Additional Guidance						
3	a	i 135 (1)	[1]							
		ii 134 to 137 (1)	[1]	allow 137 to 134 but do not allow 3 or 4						
		iii B higher than A <input type="checkbox"/> ... same value as the mean. <input type="checkbox"/> The mean near to the middle ... <input type="checkbox"/> ... narrow range. <input checked="" type="checkbox"/> (1)	[1]							
		iv ... many errors ... <input type="checkbox"/> ... small variations in structure. <input checked="" type="checkbox"/> (1) ... different melting points. <input type="checkbox"/>	[1]							
	b	i it has a lower melting point (1) and any one from: which will allow easier moulding; reduces energy needed/cost of heating; idea of increased productivity/time saving;	[2]	first mark requires comparison						
		ii <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>strength</td><td>... do not bend too easily</td></tr><tr><td>durability</td><td>... last a long time</td></tr><tr><td>stiffness</td><td>... not easy to break</td></tr></table> 	strength	... do not bend too easily	durability	... last a long time	stiffness	... not easy to break	[2]	all three correct = 2 marks two correct = 1 mark two lines to or from one box negates that box from score
strength	... do not bend too easily									
durability	... last a long time									
stiffness	... not easy to break									
		Total	[8]							

Question		Expected Answers	Marks	Additional Guidance
4	a	valid choice of article (no marks) material this article used to be made from (1) material this article is now made from (1) valid advantage of new material (1)	[3]	if article choice is not valid = 0 marks reject any mention of shoes advantage mark can only be scored if two different old and new materials valid for the article named are given
	b	... renewable ... <input checked="" type="checkbox"/> ... more attractive appearance ... <input type="checkbox"/> ... more expensive ... <input type="checkbox"/> ... will rot ... <input checked="" type="checkbox"/> ... uses more energy ... <input checked="" type="checkbox"/> ... used for longer ... <input type="checkbox"/>	[2]	three correct answers = 2 marks two correct answers = 1 mark
	c	... chemicals from crude oil. <input type="checkbox"/> ... animal skins. <input type="checkbox"/> ... obtained without spoiling ... <input checked="" type="checkbox"/> (1) ... hard wearing ... <input type="checkbox"/>	[1]	
		Total	[6]	

Question		Expected Answers			Marks	Additional Guidance												
5	a	<table border="1"> <thead> <tr> <th>statement</th> <th>type 1 diabetes</th> <th>type 2 diabetes</th> </tr> </thead> <tbody> <tr> <td>...diet and exercise</td> <td>✓</td> <td></td> </tr> <tr> <td>...young people</td> <td></td> <td>✓</td> </tr> <tr> <td>...its own insulin</td> <td></td> <td>✓</td> </tr> </tbody> </table>			statement	type 1 diabetes	type 2 diabetes	...diet and exercise	✓		...young people		✓	...its own insulin		✓	[2]	three ticks in boxes as shown all three correct = 2 marks two correct = 1 mark
statement	type 1 diabetes	type 2 diabetes																
...diet and exercise	✓																	
...young people		✓																
...its own insulin		✓																
	b	i	<p>... contains a lot of sugar. <input checked="" type="checkbox"/> (1)</p> <p>... contains a lot of fat. <input type="checkbox"/></p> <p>Fat digested into sugar. <input type="checkbox"/></p> <p>Sugar is quickly absorbed... <input checked="" type="checkbox"/> (1)</p>			[2]												
		ii	<p>any two from: (they believe) it is cheaper to eat a poor diet; they do not have enough knowledge about food to make a more sensible choice; they do not realise that they have a higher risk; comfort eating / better taste / habit;</p>			[2] accept arguments based around 'no choice'												
			Total		[6]													

Question		Expected Answers	Marks	Additional Guidance
6	a	amino acids (1) proteins (1)	[2]	
	b	plant legumes/beans/peas/clover / crop rotation (1) because bacteria in their roots fix nitrogen / because one crop puts back the nitrogen taken out by others (1)	[2]	do not allow idea of adding compost /dead plants/ dead animals/sewage to soil do not allow small scale ideas that apply to gardening but not farming
	c	i any three (including at least one 'pests' answer and at least one 'weeds' answer) from: 'pests' idea of using natural predators of insect pests; pick off insects by hand; grow insect repelling plants amongst crops; use protective measures eg scarecrows, netting or bird scares; 'weeds' pull out weeds by hand; plant crops with little space between to deter weeds; use mulch on surface of soil to deter weeds;	[3]	at least one pests answer at least one weeds answer other answer can be either all pests answer /all weeds answer = max 2 marks
		ii idea of not using harmful chemicals (1)		
		Total	[8]	

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