GCSE

Chemistry A

General Certificate of Secondary Education

Unit **A321/01**: Modules C1, C2, C3 (Foundation Tier)

Mark Scheme for January 2012

Oxford Cambridge and RSA Examinations

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2012

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

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
BOD	benefit of doubt
CON	contradiction
✖	incorrect response
ECF	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
NBOD	no benefit of doubt
R	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.	Put ticks (✔) in the two correct boxes.	Put ticks (✔) in the two correct boxes.
☐	☐	☒
☐	☐	☒
☒	✔	✔
☒	☒	✔
☐	☐	☐
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, 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 <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)	(i)	It is well outside the range of the other measurements. ✔ (1)	1	
		(ii)	It would make the best estimate less accurate. ✔ (1) It is likely to have resulted from an error in measurement. ✔ (1)	2	
	(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)		measurements for town **B** are higher (than town **A)** (1)	3	town **B** has more carbon/particulates
			town **B** has cars (in centre) but Town **A** does not (1)		**allow** town **B** has more cars
			statement linking the two e.g. correlation / causal link (1)		if no mention of town **A** or **B** max 1
					allow reverse argument
					ignore references to pollution that do not mention carbon/particulates
			Total	9	
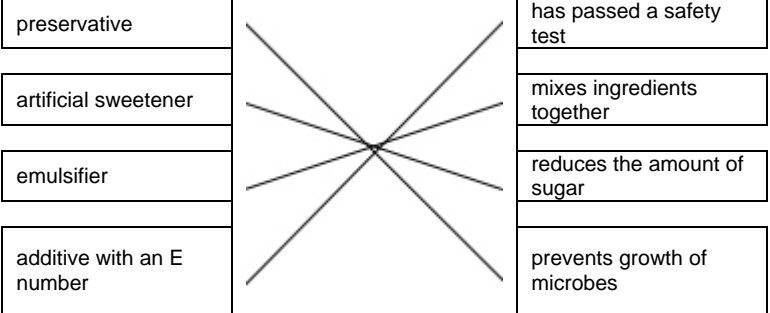
Question			Answer	Marks	Guidance
2	(a)		**5** (1) **4** (1)	2	one mark for each correct number
	(b)		**3 8 10** (1)	1	all three required
	(c)		carbon (1) and carbon monoxide (1)	2	either order **allow** carbon particulates but do not allow particulates
			Total	**5**	

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)	preservative / artificial sweetener / emulsifier / additive with an E number — has passed a safety test / mixes ingredients together / reduces the amount of sugar / prevents growth of microbes	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)		Trees can be grown to get more wood. ✔ (1) uPVC is made from chemicas in crude oil… ✔ (1)	2	

8

Question			Answer			Marks	Guidance
6	(c)					1	
			The forces of attraction between polymer chains…	✓	(1)		
					Total	**5**	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance
programme your call may be recorded or monitored