

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.

✗
✗

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.

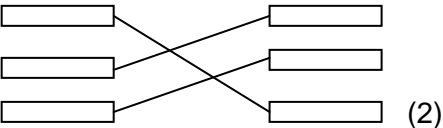
Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

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 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	Mark	Guidance															
1	(a)	(i)		2	3 lines correct = 2 marks 1 or 2 lines correct = 1 mark															
		(ii)	<table border="1" data-bbox="450 443 981 560"> <tr> <td>Plastic is a renewable resource</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Most plastics melt when heated</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Plastic chairs are not as heavy</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	Plastic is a renewable resource	<input type="checkbox"/>	Most plastics melt when heated	<input type="checkbox"/>	Plastic chairs are not as heavy	<input checked="" type="checkbox"/>	1	one correct tick = 1 mark more than one tick = 0 marks									
Plastic is a renewable resource	<input type="checkbox"/>																			
Most plastics melt when heated	<input type="checkbox"/>																			
Plastic chairs are not as heavy	<input checked="" type="checkbox"/>																			
	(b)		<table border="1" data-bbox="376 616 1055 895"> <tr> <td>Wooden chairs rot faster than plastic ones</td> <td><input checked="" type="checkbox"/></td> <td>(1)</td> </tr> <tr> <td>Chairs made from wood look better than those made from plastic</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Plastic chairs bend more than wooden ones</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Wood comes from trees and plastic from crude oil</td> <td><input checked="" type="checkbox"/></td> <td>(1)</td> </tr> <tr> <td>Wooden chairs are more expensive than plastic ones</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Wooden chairs rot faster than plastic ones	<input checked="" type="checkbox"/>	(1)	Chairs made from wood look better than those made from plastic	<input type="checkbox"/>		Plastic chairs bend more than wooden ones	<input type="checkbox"/>		Wood comes from trees and plastic from crude oil	<input checked="" type="checkbox"/>	(1)	Wooden chairs are more expensive than plastic ones	<input type="checkbox"/>		2	two correct ticks = 2 marks one correct tick plus one incorrect = 1 mark three ticks = max 1 mark four or more ticks = 0 marks
Wooden chairs rot faster than plastic ones	<input checked="" type="checkbox"/>	(1)																		
Chairs made from wood look better than those made from plastic	<input type="checkbox"/>																			
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Wood comes from trees and plastic from crude oil	<input checked="" type="checkbox"/>	(1)																		
Wooden chairs are more expensive than plastic ones	<input type="checkbox"/>																			
	(c)	(i)	<i>similarity:</i> contain (only) C and H atoms / hydrocarbons (1) <i>difference:</i> are different sizes / different lengths / some branched / different molecular structures (1)	2																
		(ii)	(small molecules/monomers) joined together (1) to make polymer / long molecules / chains (1)	2	polymerisation with no explanation = 1 mark															
Total				9																

Question		Answer	Mark	Guidance		
2	(a)		3	all 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks		
		When the chain length is 100 the strength is 21 MPa.				✓
		The maximum strength is 21 Mpa.			✓	
		As the chain length increases from 130 to 150 the tensile strength increases.				✓
		The steepest part of the graph is between a chain length of 70 and 90.	✓			
			(3)			
	(b)	bigger than (1) more difficult (1)	2			
			Total	5		

Question		Answer	Mark	Guidance
3	(a)	<p>Amy <input checked="" type="checkbox"/> (1)</p> <p>Betty <input type="checkbox"/></p> <p>Clive <input checked="" type="checkbox"/> (1)</p> <p>David <input type="checkbox"/></p> <p>Erica <input type="checkbox"/></p>	2	<p>two correct ticks = 2 marks</p> <p>one correct tick plus one incorrect = 1 mark</p> <p>three ticks = max 1 mark</p> <p>four or more ticks = 0 marks</p>
	(b)	<p>Amy <input type="checkbox"/></p> <p>Betty <input checked="" type="checkbox"/> (1)</p> <p>Clive <input type="checkbox"/></p> <p>David <input type="checkbox"/></p> <p>Erica <input type="checkbox"/></p>	1	<p>one correct tick = 1 mark</p> <p>more than one tick = 0 marks</p>
	(c)	<p>Amy <input type="checkbox"/></p> <p>Betty <input type="checkbox"/></p> <p>Clive <input type="checkbox"/></p> <p>David <input checked="" type="checkbox"/> (1)</p> <p>Erica <input type="checkbox"/></p>	1	<p>one correct tick = 1 mark</p> <p>more than one tick = 0 marks</p>
Total			4	

Question		Answer	Mark	Guidance
4		burning fossil fuels/any correct example, e.g. driving cars (1) releases CO ₂ (into atmosphere) (1) OR deforestation/cutting down trees (1) stops CO ₂ being taken in by trees (1)	2	allow idea of burning rubbish/waste
Total			2	

Question		Answer	Mark	Guidance
5		photons (1) high energy (1) absorbs (1)	3	
Total			3	

Question		Answer	Mark	Guidance
6		any three from: plants take in CO ₂ (to make food); by photosynthesis; animals (and plants) release CO ₂ ; from respiration (1)	3	ignore refs to oxygen
Total			3	

Question		Answer	Mark	Guidance
7		microwaves (1) light (1)	2	must be in correct order
Total			2	

Question	Answer	Mark	Guidance									
8 (a)	<table border="1" style="width: 100%;"> <tr> <td style="width: 80%;">It was carried out in the Netherlands</td> <td style="width: 20%;"></td> <td rowspan="4" style="vertical-align: middle; padding-left: 10px;">(1)</td> </tr> <tr> <td>The scientists they used a control group totest</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>The scientists studied drinking tea and</td> <td></td> </tr> <tr> <td>40 000 people were studied</td> <td style="text-align: center;">✓</td> </tr> </table>	It was carried out in the Netherlands		(1)	The scientists they used a control group totest	✓	The scientists studied drinking tea and		40 000 people were studied	✓	2	two correct ticks = 2 marks one correct tick plus one incorrect = 1 mark three or more ticks = 0 marks
It was carried out in the Netherlands		(1)										
The scientists they used a control group totest	✓											
The scientists studied drinking tea and												
40 000 people were studied	✓											
(b)	any two from: study checked/repeated; ref. to other scientists (checking/repeating etc.); to make sure study is valid/reliable (2)	2	allow specific ref to method/results/conclusion being checked do not allow proof-read/review									
(c)	<table border="1" style="width: 100%;"> <tr> <td style="width: 80%;">...a vein carrying blood to the heart</td> <td style="width: 20%;"></td> <td rowspan="4" style="vertical-align: middle; padding-left: 10px;">(1)</td> </tr> <tr> <td>...an artery carrying blood to the heart</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>...a vein carrying blood away from the heart</td> <td></td> </tr> <tr> <td>...an artery carrying blood away from the heart</td> <td></td> </tr> </table>	...a vein carrying blood to the heart		(1)	...an artery carrying blood to the heart	✓	...a vein carrying blood away from the heart		...an artery carrying blood away from the heart		1	one correct tick = 1 mark more than one tick = 0 marks
...a vein carrying blood to the heart		(1)										
...an artery carrying blood to the heart	✓											
...a vein carrying blood away from the heart												
...an artery carrying blood away from the heart												
(d)	B (1)	1										
(e)	any three from: high fat diet; high salt diet; obesity/overweight; lack of exercise; stress; drinking (alcohol) (1)	1	any three = 1 mark allow eating fatty food/eating too much fat ignore junk food/bad diet/unhealthy diet/unbalanced diet do not allow exercise unqualified ignore smoking ignore ref to drugs do not allow genetics/inherited									
Total	7											

Question	Answer	Mark	Guidance										
9 (a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>...can reproduce asexually</td> <td><input type="checkbox"/></td> </tr> <tr> <td>...contain antibodies</td> <td><input type="checkbox"/></td> </tr> <tr> <td>...produce poisons</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>...are very small</td> <td><input type="checkbox"/></td> </tr> <tr> <td>...can damage cells</td> <td><input checked="" type="checkbox"/></td> </tr> </table> <p style="text-align: right;">(1)</p>	...can reproduce asexually	<input type="checkbox"/>	...contain antibodies	<input type="checkbox"/>	...produce poisons	<input checked="" type="checkbox"/>	...are very small	<input type="checkbox"/>	...can damage cells	<input checked="" type="checkbox"/>	1	two correct ticks = 1 mark one correct tick plus one incorrect = 0 marks three or more ticks = 0 marks
...can reproduce asexually	<input type="checkbox"/>												
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...produce poisons	<input checked="" type="checkbox"/>												
...are very small	<input type="checkbox"/>												
...can damage cells	<input checked="" type="checkbox"/>												
(b)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Antibiotics do not kill viruses.</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Using antibiotics unnecessarily...</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Using antibiotics will make the...</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Antibiotics encourage bacterial...</td> <td><input type="checkbox"/></td> </tr> </table> <p style="text-align: right;">(1)</p>	Antibiotics do not kill viruses.	<input checked="" type="checkbox"/>	Using antibiotics unnecessarily...	<input checked="" type="checkbox"/>	Using antibiotics will make the...	<input type="checkbox"/>	Antibiotics encourage bacterial...	<input type="checkbox"/>	1	two correct ticks = 1 mark one correct tick plus one incorrect = 0 marks three or more ticks = 0 marks		
Antibiotics do not kill viruses.	<input checked="" type="checkbox"/>												
Using antibiotics unnecessarily...	<input checked="" type="checkbox"/>												
Using antibiotics will make the...	<input type="checkbox"/>												
Antibiotics encourage bacterial...	<input type="checkbox"/>												
(c)	<p>any three from: (vaccination) prevents daughter getting measles; reduces risk of infection spreading (to others) / fewer people suffer from measles / makes an epidemic less likely; side effects (of vaccination) milder than getting measles / idea that the benefit of having the vaccination outweighs the risk; (vaccinating child) encourages/promotes others to do the same (1)</p>	3	allow reverse argument throughout										

Question		Answer		Mark	Guidance	
9	(d)	... causes white blood cells to make...		2	two correct ticks = 2 marks one correct tick plus one incorrect = 1 mark three ticks = max 1 mark four or more ticks = 0 marks	
		... contains white blood cells.				
		... contains antibodies.				
		... causes white blood cells to make...	✓			(1)
		... contains a safe form of the...	✓			(1)
		... acts as a barrier stopping the...				
Total				7		

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