

**Science A**

General Certificate of Secondary Education **A211/01**

Unit 1: Modules B1, C1, P1

**Mark Scheme for June 2010**

---

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils 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 2010

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](mailto:publications@ocr.org.uk)

Question		Expected Answers	Marks	Additional Guidance
1	a	<p>... a nucleus. <input type="checkbox"/></p> <p>... DNA. <input type="checkbox"/></p> <p>... a protein. <input checked="" type="checkbox"/> (1)</p> <p>... a fat. <input type="checkbox"/></p>	[1]	more than 1 tick = 0 marks
	b	<p>... accurate and reliable? <input checked="" type="checkbox"/></p> <p>... all the genes ... ..been identified? <input checked="" type="checkbox"/></p> <p>... to have the results ... <input type="checkbox"/></p> <p>... Government pay ... <input type="checkbox"/></p>	[1]	two correct ticks and two blanks for 1 mark one correct tick = 0 marks
	c	<p><b>any two from:</b>            Colin knows his children may get this;            Colin knows he may get this;            Colin can change his lifestyle;            Colin can take preventative medicine eg aspirin;            Colin might worry/panic;            cost of test;            false positive/test (result) might be wrong/inaccurate;            insurance issue/employment issue;</p>	[2]	<p><b>allow</b> 'pass on to his children' but <b>not</b> 'pass on' alone  <b>not</b> Colin has heart disease or Colin has it  <b>ignore</b> 'make decisions for future'  <b>not</b> his heart disease can be treated or it can be treated/medicated.  <b>accept</b> 'be relieved if test is negative' as alternative to worry (if positive)  <b>not</b> it's wrong to do the test/immoral/unnatural</p>
<b>Total</b>			<b>[4]</b>	

Question		Expected Answers	Marks	Additional Guidance
2	a	breathlessness <b>and</b> digestion problems (1)	[1]	<b>both</b> needed <b>accept</b> any indication of correct answers
	b	<p>... dominant allele for CF. <input type="checkbox"/></p> <p>... recessive allele for CF. <input checked="" type="checkbox"/> (1)</p> <p>... no symptoms ... <input checked="" type="checkbox"/> (1)</p> <p>... can develop symptoms ... <input type="checkbox"/></p> <p>... 50% chance of passing on ... <input checked="" type="checkbox"/> (1)</p> <p>... can not pass on ... <input type="checkbox"/></p>	[3]	one mark for each tick in the correct box if four ticks given deduct 1 mark if five ticks given deduct 2 marks six ticks = 0 marks
	c	<p><b>any three from:</b>  could produce cure;  benefits/helps people;  immoral / it's wrong/unnatural/ religious reasons / embryo  is human;  kills (human) embryo;</p>	[3]	<p><b>ignore</b> 'treat' and answers which imply the embryo is cured e.g.  the child will not be born with cystic fibrosis  <b>allow</b> examples of benefits eg saves lives/allows normal life  <b>ignore</b> answers referring to cloning people/embryos or the  consequences of this</p>
<b>Total</b>			[7]	

Question		Expected Answers	Marks	Additional Guidance												
3	a	One egg ... .. one sperm. <input type="checkbox"/> Two eggs ... .. one sperm. <input type="checkbox"/> One egg ... .. two different sperm. <input type="checkbox"/> Two eggs ... ..two different sperms. <input checked="" type="checkbox"/> (1)	[1]	more than 1 tick = 0 marks												
	b	<table style="width: 100%; border: none;"> <tr> <td></td> <td style="text-align: center;">similar</td> <td style="text-align: center;">different</td> </tr> <tr> <td>... same parents.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>... unique combination ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>... different alleles ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>		similar	different	... same parents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	... unique combination ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	... different alleles ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	[1]	all three rows correct for 1 mark any additional ticks = 0 marks
	similar	different														
... same parents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>														
... unique combination ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>														
... different alleles ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>														
	c	Y (1)	[1]													
<b>Total</b>			<b>[3]</b>													

Question		Expected Answers	Marks	Additional Guidance
4	a	1% argon 21% oxygen 78% nitrogen	[2]	all three correct = 2 marks two correct = 1 mark one or zero correct = 0 marks
	b	i hydrocarbons (1)	[1]	<b>Accept</b> any indication of correct answer
		ii <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; justify-content: space-between; width: 100%;"> <div style="border: 1px solid black; padding: 2px; width: 20%;">particulate carbon</div> <div style="border: 1px solid black; padding: 2px; width: 20%;"></div> <div style="border: 1px solid black; padding: 2px; width: 20%;">complete ...</div> </div> <div style="display: flex; justify-content: space-between; width: 100%; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; width: 20%;">carbon dioxide</div> <div style="border: 1px solid black; padding: 2px; width: 20%;"></div> <div style="border: 1px solid black; padding: 2px; width: 20%;">incomplete ...</div> </div> <div style="display: flex; justify-content: space-between; width: 100%; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; width: 20%;">carbon monoxide</div> <div style="border: 1px solid black; padding: 2px; width: 20%;"></div> <div style="border: 1px solid black; padding: 2px; width: 20%;">incomplete ...</div> </div> <div style="display: flex; justify-content: space-between; width: 100%; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; width: 20%;">nitrogen oxides</div> <div style="border: 1px solid black; padding: 2px; width: 20%;"></div> <div style="border: 1px solid black; padding: 2px; width: 20%;">reaction ...</div> </div> </div>	[2]	all four lines correct = 2 marks three or two lines correct = 1 mark one correct line = 0 marks any left-hand box with more than one line coming from it is incorrect for that box
		iii sulfur in/from the fuel/coal (1)  reacts with/burns in oxygen (1)	[2]	the mark is for the idea that the sulfur is from the coal not from the burning process <b>allow</b> 'from burning coal' <b>not</b> 'from burning the coal' or 'from the coal-burning'  <b>not</b> 'mixes with oxygen' <b>allow</b> 'combines with oxygen'
		<b>Total</b>	[7]	

Question			Expected Answers	Marks	Additional Guidance																				
5	a	i	No cars ... <input type="checkbox"/> No electricity ... <input type="checkbox"/> Some factories ... <input checked="" type="checkbox"/> (1) People drove ... <input type="checkbox"/>	[1]	More than 1 tick = 0 marks																				
		ii	... not harmed ... <input type="checkbox"/> ... use data ... <input checked="" type="checkbox"/> (1) ... detects change ... <input checked="" type="checkbox"/> (1) ... ride bicycles. <input type="checkbox"/> ... only by traffic. <input type="checkbox"/>	[2]	one mark for each tick in the correct box if three ticks deduct 1 mark four or five ticks = 0 marks																				
		iii	pollution dissolves/reacts with rain (water) (1)  (reacts with)/(washed into) rivers/ground/sea/ buildings (1)	[2]	<b>accept</b> combines/absorbed/mixes <b>accept</b> 'forms acid rain' <b>not</b> is diluted by the rain (water) <b>not</b> washed away alone																				
	b		<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"></td> <td style="width: 10%; text-align: center;">true</td> <td style="width: 10%; text-align: center;">false</td> <td style="width: 50%;"></td> </tr> <tr> <td>... WHO limit ...</td> <td style="text-align: center;">...150 <math>\mu\text{g}/\text{m}^3</math>.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>... always lower ...</td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>... greater than 250 <math>\mu\text{g}/\text{m}^3</math> ...</td> <td></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>... lowest level ...</td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>		true	false		... WHO limit ...	...150 $\mu\text{g}/\text{m}^3$ .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	... always lower ...		<input type="checkbox"/>	<input checked="" type="checkbox"/>	... greater than 250 $\mu\text{g}/\text{m}^3$ ...		<input checked="" type="checkbox"/>	<input type="checkbox"/>	... lowest level ...		<input type="checkbox"/>	<input checked="" type="checkbox"/>	[2]	all four correct = 2 marks two or three correct = 1 mark
	true	false																							
... WHO limit ...	...150 $\mu\text{g}/\text{m}^3$ .	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
... always lower ...		<input type="checkbox"/>	<input checked="" type="checkbox"/>																						
... greater than 250 $\mu\text{g}/\text{m}^3$ ...		<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
... lowest level ...		<input type="checkbox"/>	<input checked="" type="checkbox"/>																						
<b>Total</b>				[7]																					

Question		Expected Answers	Marks	Additional Guidance
6	a	<p>... crashed in to the ground. <input type="checkbox"/></p> <p>... exploded high in the air. <input checked="" type="checkbox"/> (1)</p> <p>... passed near the Earth. <input type="checkbox"/></p> <p>... hit the moon. <input type="checkbox"/></p>	[1]	more than 1 tick = 0 marks
	b	<p>... orbit the Earth, <input type="checkbox"/></p> <p>... orbit the sun. <input checked="" type="checkbox"/> (1)</p> <p>... smaller than a planet. <input checked="" type="checkbox"/> (1)</p> <p>... come from other planets. <input type="checkbox"/></p> <p>... come from the moon. <input type="checkbox"/></p>	[2]	one mark for each tick in the correct box if three ticks deduct 1 mark four or five ticks = 0 marks
	c	<p><b>i</b> <b>any two from:</b> dust thrown into air; travels around world; blocks sunlight; climate cooling; idea of mass extinction; tsunami/massive flooding;</p>	[2]	must have global effects <b>not</b> just local to strike <b>not</b> earthquakes/movement of plates/shock waves/new orbit
		<p><b>ii</b> probability of asteroid hitting the earth is very small (1)</p>	[1]	
<b>Total</b>			[6]	



Question			Expected Answers	Marks	Additional Guidance
7	a	i	the Sun (1)	[1]	
		ii	the Earth (1)	[1]	
	b		<p>... had always worked well. <input checked="" type="checkbox"/> (1)</p> <p>... too old-fashioned. <input type="checkbox"/></p> <p>... friends of Ptolemy. <input type="checkbox"/></p> <p>... good at persuading ... <input type="checkbox"/></p>	[1]	more than one tick = 0 marks
			<b>Total</b>	<b>[3]</b>	

Question		Expected Answers	Marks	Additional Guidance
8	a	<p>... a poor country. <input type="checkbox"/></p> <p>... a small country. <input type="checkbox"/></p> <p>... edge of a tectonic plate. <input checked="" type="checkbox"/> (1)</p> <p>Hurricanes are very common ... <input type="checkbox"/></p>	[1]	more than one tick = 0 marks
	b	<p>cities <input type="checkbox"/></p> <p>deserts <input type="checkbox"/></p> <p>forests <input type="checkbox"/></p> <p>mountains <input checked="" type="checkbox"/> (1)</p> <p>volcanoes <input checked="" type="checkbox"/> (1)</p>	[2]	one mark for each tick in the correct box if three ticks deduct 1 mark four or five ticks = 0 marks
	c	<p>Build taller buildings. <input type="checkbox"/></p> <p>Educate people ... <input checked="" type="checkbox"/> (1)</p> <p>Move everyone ... <input type="checkbox"/></p> <p>Prepare emergency plans ... <input checked="" type="checkbox"/> (1)</p> <p>Build wider roads. <input type="checkbox"/></p>	[2]	one mark for each tick in the correct box if three ticks deduct 1 mark four or five ticks = 0 marks
<b>Total</b>			<b>[5]</b>	

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

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

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

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

© OCR 2010