

Science A

General Certificate of Secondary Education **A211/02**

Unit 1: Modules B1, C1, P1

Mark Scheme for June 2010

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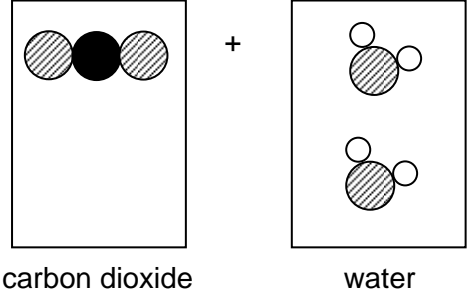








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

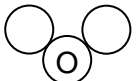
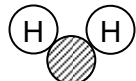
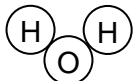
Question		Expected Answers	Marks	Additional Guidance
1	a	<p>... a nucleus. <input type="checkbox"/></p> <p>... DNA. <input type="checkbox"/></p> <p>... a protein. <input checked="" type="checkbox"/> (1)</p> <p>... a fat. <input type="checkbox"/></p>	[1]	more than one tick = 0 marks
	b	<p>... accurate 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>insurance company (1) may refuse to insure him or charge more for premium (1)</p> <p>or</p> <p>employer (1) may not employ him as risk too high/may not promote him (1)</p> <p>or</p> <p>family (1) cause worry to other members of his family (1)</p>	[2]	one mark for identifying the person/agency who might get the information and one for the consequences accept unhappiness for worry.
Total			[4]	

Question		Expected Answers	Marks	Additional Guidance															
2	a	<table border="1"> <thead> <tr> <th>symptom</th> <th>Huntington's disorder</th> <th>cystic fibrosis</th> </tr> </thead> <tbody> <tr> <td>breathlessness</td> <td></td> <td>✓</td> </tr> <tr> <td>digestive problems</td> <td></td> <td>✓</td> </tr> <tr> <td>forgetfulness</td> <td>✓</td> <td></td> </tr> <tr> <td>twitching muscles</td> <td>✓</td> <td></td> </tr> </tbody> </table>	symptom	Huntington's disorder	cystic fibrosis	breathlessness		✓	digestive problems		✓	forgetfulness	✓		twitching muscles	✓		[1]	all correct for 1 mark any additional ticks = 0 marks
symptom	Huntington's disorder	cystic fibrosis																	
breathlessness		✓																	
digestive problems		✓																	
forgetfulness	✓																		
twitching muscles	✓																		
	b	<p>any three from: CF caused by a recessive allele; need two recessive alleles to show symptoms; one recessive inherited from each parent; both parents must be carriers; 25% chance of two carriers having a CF child;</p>	[3]	can also refer to the effect of the dominant allele allow recessive gene rather than allele															
	c	i	50% / 0.5 / 1 in 2/ a half/ 2/4/even chance (1)	[1]															
		ii	Jen Tt / tT Mykel tt	[1]	both must be correct														
			Total	[6]															

Question		Expected Answers	Marks	Additional Guidance																				
3	a	<table style="width: 100%; border: none;"> <tr> <td></td> <td style="text-align: center;">similar</td> <td style="text-align: center;">different</td> <td></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> <td></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> <td></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> <td></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																						
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... different alleles ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>																						
	b	<table style="width: 100%; border: none;"> <tr> <td></td> <td style="text-align: center;">true</td> <td style="text-align: center;">false</td> <td></td> </tr> <tr> <td>Clones can be produced ..</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>... to their parents.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>... to each other.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>... caused by the environment.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>		true	false		Clones can be produced ..	<input checked="" type="checkbox"/>	<input type="checkbox"/>		... to their parents.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		... to each other.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		... caused by the environment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		[1]	all four rows correct for 1 mark any additional ticks = 0 marks
	true	false																						
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... to their parents.	<input type="checkbox"/>	<input checked="" type="checkbox"/>																						
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... caused by the environment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
	c	i	unspecialised (1)	[1] accept totipotent/pleuripotent																				
		ii	<table style="width: 100%; border: none;"> <tr> <td>... fertilised ...</td> <td>... adult cell.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>... fertilised ...</td> <td>... embryonic cell.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>... unfertilised ...</td> <td>... adult cell.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>(1)</td> </tr> <tr> <td>... unfertilised ...</td> <td>... embryonic cell.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>	... fertilised adult cell.	<input type="checkbox"/>		... fertilised embryonic cell.	<input type="checkbox"/>		... unfertilised adult cell.	<input checked="" type="checkbox"/>	(1)	... unfertilised embryonic cell.	<input type="checkbox"/>		[1]	any additional ticks = 0 marks			
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... unfertilised adult cell.	<input checked="" type="checkbox"/>	(1)																					
... unfertilised embryonic cell.	<input type="checkbox"/>																						
			Total	[4]																				

Question		Expected Answers	Marks	Additional Guidance
4	a	1% argon/Ar 21% oxygen/O/O ₂ 78% nitrogen/N/N ₂	[2]	all three correct = 2 marks two correct = 1 mark one or zero correct = 0 marks
	b	i hydrocarbons (1)	[1]	
		ii <div style="display: flex; flex-direction: column; align-items: flex-start; margin-top: 10px;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-right: 10px;">particulate carbon</div> <div style="margin-left: 20px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-bottom: 10px;">complete ...</div> <div style="border: 1px solid black; padding: 2px 10px;">incomplete ...</div> </div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-right: 10px;">carbon dioxide</div> <div style="margin-left: 20px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-bottom: 10px;">complete ...</div> <div style="border: 1px solid black; padding: 2px 10px;">incomplete ...</div> </div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-right: 10px;">carbon monoxide</div> <div style="margin-left: 20px;"> <div style="border: 1px solid black; padding: 2px 10px; margin-bottom: 10px;">complete ...</div> <div style="border: 1px solid black; padding: 2px 10px;">incomplete ...</div> </div> </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px; margin-right: 10px;">nitrogen oxides</div> <div style="margin-left: 20px;"> <div style="border: 1px solid black; padding: 2px 10px;">reaction ...</div> </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

Question	Expected Answers	Marks	Additional Guidance
4 c	 <p>carbon dioxide</p> <p>water</p>	[3]	<p>1 mark for correct carbon dioxide molecule 1 mark for correct water molecule 1 mark for one carbon dioxide molecule and two water molecules</p> <p>ignore size of circles ignore whether circles are joined in line or at an angle circles must be joined in correct order eg OOC is wrong for carbon dioxide and HHO is wrong for water accept alternative representations of molecules:</p> <p>for carbon dioxide, molecule must include one carbon atom and two oxygen atoms</p> <p>accept for carbon:</p> <p> or </p> <p>accept for oxygen:</p> <p> or </p> <p>eg for carbon dioxide this could be any of:</p> <p> </p> <p> </p>

Question		Expected Answers	Marks	Additional Guidance
4	c			<p>continued:</p> <p>for water, molecule must include one oxygen atom and two hydrogen atoms</p> <p>accept for oxygen:</p> <p> or </p> <p>accept for hydrogen:</p> <p> or  or </p> <p>ignore size of circles</p> <p>eg for water this could be any of:</p> <p> </p> <p> </p> <p> </p>
Total			[8]	

Question		Expected Answers	Marks	Additional Guidance																				
5	a	<p>... not harmed ... <input type="checkbox"/></p> <p>... use data ... <input checked="" type="checkbox"/> (1)</p> <p>... detects change ... <input checked="" type="checkbox"/> (1)</p> <p>... ride bicycles. <input type="checkbox"/></p> <p>... only by traffic. <input type="checkbox"/></p>	[2]	1 mark for each tick in the correct box if three ticks deduct 1 mark four or five ticks = 0 marks																				
	b	rain dissolves/washes away pollutants / windy conditions blow pollutants away (1)	[1]	condition and effect (1)																				
	c	<table border="0"> <tr> <td></td> <td>i</td> <td></td> <td>true</td> <td>false</td> </tr> <tr> <td></td> <td></td> <td>... go down steadily ...</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td>... exceeded toe WHO limit ...</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td>... over twice the WHO limit ...</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>		i		true	false			... go down steadily ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>			... exceeded toe WHO limit ...	<input checked="" type="checkbox"/>	<input type="checkbox"/>			... over twice the WHO limit ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	[1]	all three rows correct = 1 mark two or one rows correct = 0 marks more than one tick per row no credit for that row
	i		true	false																				
		... go down steadily ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>																				
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		... over twice the WHO limit ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>																				
		<p>ii any two from: dust thrown into air; travels around world; blocks sunlight; climate cooling; idea of mass extinction; tsunami/massive flooding;</p>	[2]	must have global effects not just local to strike not earthquakes/movement of plates/shock waves/new orbit																				
		Total	[6]																					

Question		Expected Answers	Marks	Additional Guidance
6	a	uses 'structure' and/or 'hardness' to explain lack of impact crater for a comet (1) uses 'made of' column to argue that comet fragments are ephemeral whilst those of asteroids are persistent (1)	[2]	accept reverse arguments
	b	i any two from: dust thrown into air; travels around world; blocks sunlight; effect on plants and animal life/temperature;	[2]	must have effects not local to strike allow marks for strike on sea: ie any two from: tsunami caused; drowning and direct devastation of tsunami; flooding of affected land;
		ii probability is very small (1)	[1]	
Total			[5]	

Question			Expected Answers	Marks	Additional Guidance
7	a	i	Earth, Sun, Mars (1)	[1]	correct order
		ii	Sun, Earth, Mars (1)	[1]	correct order
	b	i	<p>... had worked well ... <input checked="" type="checkbox"/></p> <p>... made better predictions. <input type="checkbox"/></p> <p>... good at persuading ... <input type="checkbox"/></p> <p>... new and different. <input checked="" type="checkbox"/></p>	[1]	both needed for the mark two correct ticks and two blanks for 1 mark one correct tick = 0 marks more than two ticks = 0 marks
		ii	<p>The moon goes around ... <input checked="" type="checkbox"/></p> <p>Most planets have moons ... <input type="checkbox"/></p> <p>... Venus ... <input checked="" type="checkbox"/></p> <p>Spaceflight calculation ... <input type="checkbox"/></p>	[2]	one mark for each correct tick two correct ticks and two blanks for = 2 marks one correct tick and at least two blanks = 1 mark
			Total	[5]	

Question		Expected Answers	Marks	Additional Guidance																				
8	a	<p>...active volcanoes. <input checked="" type="checkbox"/> (1)</p> <p>A mountain chain... <input checked="" type="checkbox"/> (1)</p> <p>Hurricanes are very common ... <input type="checkbox"/></p> <p>... near the equator. <input type="checkbox"/></p> <p>... where South and North...join. <input type="checkbox"/></p>	[2]	<p>two correct ticks and three blanks for = 2 marks</p> <p>one correct tick and at least three blanks = 1 mark</p>																				
	b	<table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">damage</td> <td style="text-align: center;">deaths</td> <td style="text-align: center;">both</td> </tr> <tr> <td>... building regulations.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Educate ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Prepare plans ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Improve predictions ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		damage	deaths	both	... building regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Educate ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Prepare plans ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Improve predictions ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	[2]	<p>all four rows correct = 2 marks</p> <p>two or three correct = 1 mark</p> <p>accept as correct all three boxes in first row ticked, but not if only two boxes ticked</p>
	damage	deaths	both																					
... building regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
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Total			[4]																					

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