

## **Additional Science A**

General Certificate of Secondary Education

Unit **A216/02**: Modules B5, C5, P5 (Higher Tier)

## **Mark Scheme for June 2011**

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A216/02

## Mark Scheme

June 2011

Question		Answer	Mark	Guidance																																								
1	a	3, 2, 2	2	all correct = 2 2 correct = 1																																								
	b	answer = 62.1 [tonnes] (1)	2	if not correct, <b>accept</b> any reference to 239 for 1 mark																																								
	c	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div> <p>higher quality ores</p> <p>There are no ores left</p> </div> <div> <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)  <input type="checkbox"/>  <input type="checkbox"/> </div> </div>	1																																									
	d	<table border="1"> <thead> <tr> <th>description</th><th>silicon dioxide only</th><th>sulfur dioxide only</th><th>both</th><th>neither</th></tr> </thead> <tbody> <tr> <td>high melting point</td><td>✓</td><td></td><td></td><td></td></tr> <tr> <td>low melting point</td><td></td><td>✓</td><td></td><td></td></tr> <tr> <td>covalent bonds</td><td></td><td></td><td>✓</td><td></td></tr> <tr> <td>ionic bonds</td><td></td><td></td><td></td><td>✓</td></tr> <tr> <td>giant structure</td><td>✓</td><td></td><td></td><td></td></tr> <tr> <td>simple molecular compound</td><td></td><td>✓</td><td></td><td></td></tr> <tr> <td>weak forces between</td><td></td><td>✓</td><td></td><td></td></tr> </tbody> </table>	description	silicon dioxide only	sulfur dioxide only	both	neither	high melting point	✓				low melting point		✓			covalent bonds			✓		ionic bonds				✓	giant structure	✓				simple molecular compound		✓			weak forces between		✓			4	7 ticks correct = 4 6 or 5 ticks correct = 3 4 or 3 ticks correct = 2 2 ticks correct = 1 1 tick correct = 0
description	silicon dioxide only	sulfur dioxide only	both	neither																																								
high melting point	✓																																											
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ionic bonds				✓																																								
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weak forces between		✓																																										

A216/02

Mark Scheme

June 2011

Question			Answer	Mark	Guidance
	<b>e</b>		recycling [if the material is named, it must be lead containing] (1)  of car batteries (1)	<b>2</b>	
	<b>f</b>		<b>A</b> (1)	<b>1</b>	
	<b>g</b>	<b>i</b>	<b>Br<sup>-</sup></b> (1)	<b>1</b>	<b>accept</b> Br <sup>-1</sup> must be capital 'B' and lower case 'r'
		<b>ii</b>	line from the lead ion pointing towards the negative electrode. The line must stay within the liquid, and must not end below the bottom of the electrode.  line from bromide ion pointing towards the positive electrode. The line must stay within the liquid, and must not end below the bottom of the electrode.	<b>1</b>	lines must have direction indication, e.g. arrowheads  lines go anticlockwise
			<b>Total</b>	<b>[14]</b>	

<b>2</b>	<b>a</b>		voltage (1) current (1)	<b>2</b>	
	<b>b</b>		<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  Move the magnet more quickly into ... <input checked="" type="checkbox"/> (1)  Increase the number of turns ... <input checked="" type="checkbox"/> (1)  <input type="checkbox"/> </div>	<b>2</b>	correct pattern = 2  one mistake = 1  a mistake is <ul style="list-style-type: none"> <li>• a tick in the wrong place</li> <li>• a missing tick</li> <li>• an extra tick</li> </ul>
			<b>Total</b>	<b>[4]</b>	

A216/02

Mark Scheme

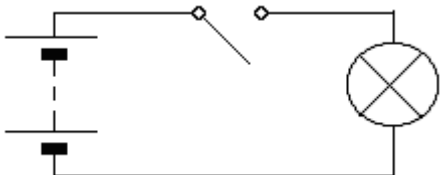
June 2011

Question			Answer	Mark	Guidance
3	a		<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)         </div> All three resistors have the same ...	1	
	b		electrons move [atoms don't]  [electrons] collide with atoms [in the resistor]  energy transferred FROM [electrons to atoms] / MAKES atoms [only] vibrate OWTTE	3	<b>ignore</b> reference to current  <b>ignore</b> 'electrons and atoms collide'
	c		24 W (1)	1	
			<b>Total</b>	<b>[5]</b>	

A216/02

Mark Scheme

June 2011

Question			Answer	Mark	Guidance
4	a			1	look for complete loop and correct symbol for switch and lamp anywhere in series with other components <b>accept</b> curved lines for wires <b>accept</b> switch without the circles <b>accept</b> either symbol for the lamp / LED correct direction
	b		resistance (1) battery (1) current (1)	3	
	c		<div style="display: flex; align-items: center;"> <div style="flex: 1;">Charge is not able to flow through ...</div> <div style="display: flex; flex-direction: column; align-items: center;"> <input type="checkbox"/>  <input checked="" type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> </div> <div style="margin-left: 10px;">(1)</div> </div>	1	
			<b>Total</b>	<b>[5]</b>	

A216/02

Mark Scheme

June 2011

Question		Answer	Mark	Guidance
5	a	B (1)	1	
	b	<p><b>any three from:</b></p> <p>meiosis (1)</p> <p>idea that [gametes have] 39 chromosomes / haploid / half the chromosomes (1)</p> <p>links [gamete fusion] to zygote / embryo (1)</p> <p>[gametes fuse] to give full number / diploid / double the number of chromosomes (1)</p>	3	<p>NB 'Gametes fuse' is in the stem</p> <p><b>accept</b> mis-spelling of meiosis [ie but not if a 'T' is present!]</p> <p><b>accept</b> 'reduction division' instead of meiosis unless stated otherwise, assume that the candidate is referring to gametes as the product of cell division</p> <p>this mark not available if candidate implies chromosomes come from both parents</p> <p><b>ignore</b> 'cells/ chromosomes split in half'</p> <p><b>allow</b> 'half the <u>genetic</u> information'</p> <p>'gametes fuse and double the number of chromosomes' = 1</p> <p><b>ignore</b> 'gametes double the number of chromosomes'</p> <p><b>ignore</b> 'half the chromosomes from each parent' in the context of this marking point</p> <p>references to fusing and to halving must be in the correct context</p>
		<b>Total</b>	<b>[4]</b>	
6	a	nucleus cytoplasm two four	2	4 correct = 2 3 or 2 correct = 1
	b	<p>link different genes to [different] protein / colours (1)</p> <p>genes are switched on/off [at different times of the year] (1)</p>	2	<b>accept</b> 'activated' / made active
	c	27 % (1)	1	
		<b>Total</b>	<b>[5]</b>	

A216/02

Mark Scheme

June 2011

Question			Answer	Mark	Guidance
7	a		C (1)	1	
	b		<div><div><div><div><div></div></div></div><div>auxin diffused</div><div><div><div>✓</div></div>(1)</div></div><div><div><div></div></div><div>most auxin grew more</div><div><div><div>✓</div></div>(1)</div></div><div><div><div></div></div></div><div><div><div></div></div></div><div><div><div></div></div></div></div> <td>2</td> <td></td>	2	
	c		photosynthesis (1)	1	
	d		Wendy (1)	1	
			Total	[5]	
			Paper Total	[42]	



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