

Additional Science A

General Certificate of Secondary Education

Unit **A216/01**: Modules B5, C5, P5 (Foundation Tier)

Mark Scheme for June 2011

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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.

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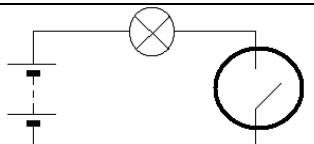
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Question		Answer					Mark	Guidance																																									
1	a	Pbs	PBs	PbS	PbSO ₄	1																																											
	b	<p>idea of more impurities (in modern ores) ORA ;</p> <p>idea of the good / Roman / high grade ores have been used up ORA ;</p>					2	<p>ignore references to the amount of lead, the answer must be in terms of amount of impurities</p> <p>if refers to modern ores accept have less lead sulfide not have less lead</p> <p>gives a reason for the lack of high grade ore suggests what the other impurities might be</p>																																									
	c	lead oxide + lead sulfide → lead + sulfur dioxide					1	<p>reactants in either order</p> <p>products in either order</p>																																									
	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	<p>7 ticks correct = 4</p> <p>6 or 5 ticks correct = 3</p> <p>4 or 3 ticks correct = 2</p> <p>2 ticks correct = 1</p> <p>1 tick = 0</p>
description	silicon dioxide only	sulfur dioxide only	both	neither																																													
high melting point	✓																																																
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simple molecular compound		✓																																															
weak forces between		✓																																															

Question		Answer	Mark	Guidance
e		<p style="text-align: center;">use property</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 150px;">line water troughs</div> <div style="border: 1px solid black; padding: 5px; width: 150px;">lead has a low melting point</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; width: 150px;">heavy weights</div> <div style="border: 1px solid black; padding: 5px; width: 150px;">lead is dense</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; width: 150px;">filling gaps in stones</div> <div style="border: 1px solid black; padding: 5px; width: 150px;">lead is malleable</div> </div>	2	all three lines correct = 2 2 or 1 lines correct = 1
f	i	2.125% 47% 50% 53%	1	
	ii	<p>any three from:</p> <p>bubbles / fizzes / red-brown / smell;</p> <p>ties bromine OR lead formation to electrodes;</p> <p>to the correct electrode;</p> <p>lead collects at the bottom;</p>	3	<p>accept bromine formed at anode / positive electrode = 2 OR accept lead formed at cathode / negative electrode = 2</p>
Total			[14]	

Question		Answer	Mark	Guidance									
2	a		1										
	b	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">lamp</td> <td style="width: 10%;"></td> <td style="width: 60%; padding: 5px;">pushes charge...</td> </tr> <tr> <td style="padding: 5px;">switch</td> <td></td> <td style="padding: 5px;">heats up</td> </tr> <tr> <td style="padding: 5px;">battery</td> <td></td> <td style="padding: 5px;">changes resistance</td> </tr> </table>	lamp		pushes charge...	switch		heats up	battery		changes resistance	2	all three lines correct = 2 2 or 1 lines correct = 1
lamp		pushes charge...											
switch		heats up											
battery		changes resistance											
	c	<p>any two from: (closed switch) allows charge to move AW; (the charge moves) around the circuit AW; delivering energy (from the battery to the lamp);</p>	2	<p>accept electrons instead of charge not electricity instead of charge</p> <p>this may be implied</p> <p>accept AW for delivering e.g. taking / giving</p>									
Total			[5]										
3	a	<p style="text-align: center;"> <input type="checkbox"/> All three resistors have the same ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> </p>	1										
	b	voltage (1)	1										
	c	i 6 (V) (1)	1										
		ii 18 (W) (1)	1										
	d	power (1)	1										
Total			[5]										

Question		Answer	Mark	Guidance
4	a	voltage (1) current (1)	2	
	b	<div style="text-align: center;"> <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>	2	
Total			[4]	
5	a	two (1) four (1)	2	
	b	i	1	accept mitochondria / chromosomes / genes
		ii	1	accept ribosome
Total			[4]	

Question		Answer	Mark	Guidance
6	a	B (1)	1	if no answer given, check the table
	b	<p>any three from:</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>accept mis-spelling of meiosis [ie but not if a 'T' is present!]</p> <p>accept 'reduction division' instead of meiosis</p> <p>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>ignore 'cells / chromosomes split in half'</p> <p>allow 'half the <u>genetic</u> information'</p> <p>'gametes fuse and double the number of chromosomes' = 1</p> <p>ignore 'gametes double the number of chromosomes'</p> <p>ignore '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>
Total			[4]	

Question		Answer	Mark	Guidance								
7	a	(plant) hormone (1) to help roots to form/grow (1)	2	accept auxins allow 'rooting powder' as a 1 mark answer								
	b	<table border="0"> <tr> <td style="text-align: center;">tissue</td> <td style="text-align: center;">property</td> </tr> <tr> <td style="text-align: center;">phloem</td> <td style="text-align: center;">can develop into different types of cells</td> </tr> <tr> <td style="text-align: center;">meristem</td> <td style="text-align: center;">cannot develop into different types of cells</td> </tr> <tr> <td style="text-align: center;">xylem</td> <td></td> </tr> </table>	tissue	property	phloem	can develop into different types of cells	meristem	cannot develop into different types of cells	xylem		2	3 correct lines = 2 marks 1 or 2 correct lines = 1 mark
tissue	property											
phloem	can develop into different types of cells											
meristem	cannot develop into different types of cells											
xylem												
	c	<p>... some cells... mitosis</p> <p style="text-align: right;"> <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/> </p>	1									
	d	<p>Chromosomes separate</p> <p style="text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/> </p>	1									
Total			[6]									
Paper Total			[42]									

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