



**GCSE**

## **Additional Science A**

General Certificate of Secondary Education **A215/01**

Unit 1: Modules B4, C4, P4

## **Mark Scheme for June 2010**

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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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Question		Expected Answers	Marks	Additional Guidance
1	a	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <b>part</b>  <div style="border: 1px solid black; padding: 5px; margin: 5px;">effector</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">receptor</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">processing centre</div> </div> <div style="text-align: center;"> <b>function</b>  <div style="border: 1px solid black; padding: 5px; margin: 5px;">detects stimuli</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">produces the response</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">receives information ...</div> </div> </div>	[2]	<p>correct pattern for 2 marks one or two mistakes for 1 mark</p> <p>a mistake is:</p> <ul style="list-style-type: none"> <li>• a missing line</li> <li>• an extra line</li> <li>• a line in the wrong place</li> </ul>
	b	<p><b>EITHER</b></p> <p><b>any two from:</b>  receptors send signal to brain;  receptors in skin or brain;  brain sends signal to effectors;  effectors are sweat glands;  which produce sweat;  sweat evaporates;</p> <p><b>OR</b></p> <p><b>any two from:</b>  effectors dilate blood vessels in skin;  allowing blood to surface (of skin);  so heat (radiation) can escape;</p>	[2]	<p><b>ignore</b> references to moving away from heat source</p> <p><b>accept</b> processor for brain</p> <p><b>accept</b> arteries/capillaries/veins for blood vessels  <b>not</b> blood vessels move to surface</p>
		<b>Total</b>	[4]	

Question		Expected Answers	Marks	Additional Guidance
2	a	diffusion (1)	[1]	
	b	more oxygen than; less oxygen than; carbon dioxide;	[2]	correct pattern of rings for 2 marks one mistake for 1 mark a mistake is: <ul style="list-style-type: none"> <li>• a ring in the wrong place</li> <li>• an extra ring</li> <li>• a missing ring</li> </ul>
	c	Molecules ... <input type="checkbox"/> Chemical reactions ... <input type="checkbox"/> Enzymes ... <input checked="" type="checkbox"/> (1) Cells change shape ... <input type="checkbox"/>	[1]	correct pattern of ticks for 1 mark
		<b>Total</b>	<b>[4]</b>	

3	a	becomes more concentrated (1)	[1]	
	b	sugar – all is reabsorbed (1) urea – none is reabsorbed (1) salt – some is reabsorbed (1)	[3]	one mark for each chemical correctly matched <b>accept</b> almost all/most/a lot of sugar <b>accept</b> some urea is reabsorbed <b>accept</b> as much as is needed for salt  <b>accept</b> sugar and salt reabsorbed for 1 mark
	c	greater, more (1) smaller, less (1)	[2]	one mark for each correct sentence
		<b>Total</b>	<b>[6]</b>	

Question			Expected Answers	Marks	Additional Guidance																								
4	a	i	(group) 1 (1)	[1]																									
		ii	<table><tr><td>relative atomic mass</td><td>7</td></tr><tr><td>number of electrons</td><td>3</td></tr><tr><td>number of protons</td><td>3</td></tr></table>	relative atomic mass	7	number of electrons	3	number of protons	3	[2]	all three correct for 2 marks any two correct for 1 mark																		
relative atomic mass	7																												
number of electrons	3																												
number of protons	3																												
		iii	Brenda (1)	[1]	<b>accept</b> any unambiguous correct response																								
	b		one (1)	[1]	<b>ignore</b> signs before or after the number																								
	c		<table><tr><td><b>first product</b></td><td></td><td><b>second product</b></td><td></td></tr><tr><td>lithium oxide</td><td><input type="checkbox"/></td><td>oxygen</td><td><input type="checkbox"/></td></tr><tr><td><b>or</b></td><td></td><td><b>or</b></td><td></td></tr><tr><td>lithium chloride</td><td><input type="checkbox"/></td><td>hydrogen</td><td><input checked="" type="checkbox"/></td></tr><tr><td><b>or</b></td><td></td><td><b>or</b></td><td></td></tr><tr><td>lithium hydroxide</td><td><input checked="" type="checkbox"/></td><td>carbon dioxide</td><td><input type="checkbox"/></td></tr></table>	<b>first product</b>		<b>second product</b>		lithium oxide	<input type="checkbox"/>	oxygen	<input type="checkbox"/>	<b>or</b>		<b>or</b>		lithium chloride	<input type="checkbox"/>	hydrogen	<input checked="" type="checkbox"/>	<b>or</b>		<b>or</b>		lithium hydroxide	<input checked="" type="checkbox"/>	carbon dioxide	<input type="checkbox"/>	[2]	correct tick in first column for 1 mark correct tick in second column for 1 mark
<b>first product</b>		<b>second product</b>																											
lithium oxide	<input type="checkbox"/>	oxygen	<input type="checkbox"/>																										
<b>or</b>		<b>or</b>																											
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<b>or</b>		<b>or</b>																											
lithium hydroxide	<input checked="" type="checkbox"/>	carbon dioxide	<input type="checkbox"/>																										
	d		some movement; it gets smaller; it produces bubbles;	[2]	three columns correct for 2 marks any two columns correct for 1 mark																								
			<b>Total</b>	[9]																									


Question		Expected Answers	Marks	Additional Guidance
5	a	kills bacteria/microbes/germs/microorganisms (1)	[1]	<b>accept</b> bugs / disease <b>ignore</b> dirt/impurities/chemicals <b>accept</b> 'disinfects/sterilises[the water]'
	b	any sensible answer which avoids the danger of inhalation (1)	[1]	e.g. ventilation/gas mask/oxygen supply/use a fume cupboard <b>ignore</b> clothing, goggles, gloves ... unqualified mask for 0 marks
	c	g, aq, l	[2]	all three correct for 2 marks any two correct for 1 mark must be correct symbols, not words <b>not</b> AQ or Aq or aQ <b>accept</b> L or G
	d	chlorine + sodium → sodium chloride	[1]	<b>accept</b> reactants in either order <b>accept</b> = instead of → watch out for chloride and chlorine in the correct places <b>not</b> symbol equations
		<b>Total</b>	<b>[5]</b>	

6	a	120 000 J / 120 kJ	[2]	<b>accept</b> 300 000 J for 1 mark <b>accept</b> 420 000 J for 1 mark <b>accept</b> 180 000 J for 1 mark <b>accept</b> 200×600 or 600×200 for 1 mark
	b	friction/air resistance (1) transfers kinetic energy to heat energy / some of the work energy is converted to heat (1)	[2]	<b>accept</b> counter/opposing force <b>ignore</b> sound (energy) <b>accept</b> becomes heat
		<b>Total</b>	<b>[4]</b>	

Question			Expected Answers	Marks	Additional Guidance
7	a		friction (1) reaction (1)	[2]	one mark for each correct response
	b		40 x 0.5	[1]	
	c	i	<div>The weight ... <input type="checkbox"/></div> <div>The balls momentum ... <input type="checkbox"/></div> <div>The ball travels a distance of ... <input checked="" type="checkbox"/> (1)</div> <div>The velocity ... <input type="checkbox"/></div>	[1]	correct pattern of ticks for 1 mark
		ii	C (1)	[1]	any unambiguous correct response
			<b>Total</b>	<b>[5]</b>	

8	a			[1]	if no response, look at the picture above
	b		the same as (1) in the opposite direction to (1)	[2]	one mark for each correct response must be in correct order
	c		gravitational (potential) (1) kinetic (1)	[2]	one mark for each correct response must be in correct order
			<b>Total</b>	<b>[5]</b>	

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