

## **Additional Science A**

General Certificate of Secondary Education

Unit **A215/02**: Modules B4, C4, P4

### **Mark Scheme for June 2011**

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Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Mark Scheme

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Question			Answer	Mark	Guidance
1	a		<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> </div> ... proteins that speed up chemical ... (1)	1	
	b		B (1)	1	
	c		decrease denatured shape	2	3 correct = 2 marks 2 correct = 1 mark 1 or 0 correct = 0 marks
			Total	[4]	

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Question			Answer	Mark	Guidance
2			<b>any three from:</b> water enters cells ; across cell membrane ; cells swell ; this is osmosis ;	3 max	<b>credit</b> correct explanation of concentration <b>credit</b> “partially permeable membrane”  <b>accept</b> “burst” for swell
			<b>Total</b>	<b>[3]</b>	

3			<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)         </div> ... less than outside the cell	1	
			<b>Total</b>	<b>[1]</b>	

4	a		<b>hypothalamus</b> <b>hypothalamus</b> <b>vasoconstriction</b>	1	all three needed for the mark
	b		<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)  <input type="checkbox"/> </div> It allows a more sensitive response.	1	
			<b>Total</b>	<b>[2]</b>	

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Question			Answer	Mark	Guidance
5	a		ADH (1)	1	<b>accept</b> aldosterone or antidiuretic hormone
	b		<b>pituitary</b> (1)	1	
	c		alcohol suppresses ADH production (1) produces greater volume / more dilute urine (1)	2	
			<b>Total</b>	<b>[4]</b>	

6	a		$2\text{Fe} + 3\text{Cl}_2 \rightarrow 2\text{FeCl}_3$ (1)				1	
	b			halogen	colour	state	1	all 3 boxes correct = 1 mark  <b>accept</b> red or brown for bromine colour
				chlorine		gas		
				bromine	orange			
				iodine		solid		
	c		NaCl (1)				1	<b>ignore</b> equations but give mark where NaCl is given as product
			<b>Total</b>				<b>[3]</b>	

Question			Answer	Mark	Guidance
7	a		<p><b>symbol</b>                      <b>electronic structure</b></p>	2	3 lines correct = 2 marks 2 or 1 lines correct = 1 mark
	b		<p><b>start                      middle                      end</b></p>	2	left hand box correct = 1 mark right hand box correct = 1 mark <b>ignore</b> centre boxes

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Question			Answer	Mark	Guidance
	<b>c</b>		circles all approximately the same size they should be grouped together positive circles may only touch negative, and vice versa	<b>1</b>	There must be at least four circles; any extra circles must be correct <b>credit</b> any <u>correct</u> pattern of four circles, including chains <b>ignore</b> small gaps between circles <b>accept</b> variation in circle size so long as it doesn't look intentional
	<b>d</b>		conductivity measurement (1) of melt / solution [in water] (1)	<b>2</b>	<b>credit</b> any implication of conductivity a diagram is acceptable
			<b>Total</b>	<b>[7]</b>	

<b>8</b>			F <sup>-</sup> Na <sup>+</sup> P	<b>2</b>	3 correct = 2 marks 2 or 1 correct = 1 mark a correct response must give the correct symbol <u>and</u> charge
			<b>Total</b>	<b>[2]</b>	

<b>9</b>			<b>any two:</b> contains sodium ; plus other material ; extra lines are present ;	<b>2 max</b>	<b>accept</b> chlorine or chloride for "other material"
			<b>Total</b>	<b>[2]</b>	

<b>10</b>	<b>a</b>		$\frac{1}{2} \times 50 \times 8^2$ (1)	<b>1</b>	
	<b>b</b>		<b>any three from:</b> GPE decreases ; <b>because</b> height (above ground) decreases ; KE increases ; as GPE is converted to KE / energy is conserved ;	<b>3 max</b>	<b>credit</b> "change in GPE not equal to increase in KE because some energy is transferred as heat"
			<b>Total</b>	<b>[4]</b>	

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Question			Answer	Mark	Guidance
11	a	i	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 2px;">A</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 2px;">C</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">D</div>	1	all three correct for the mark
		ii	5 N (1)	1	
	b		0.5 s (1)	1	
	c		Work done on the moving ball ... <input checked="" type="checkbox"/> (1) <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px 0;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px 0;"></div> ... friction on the ball from the ground ... <input checked="" type="checkbox"/> (1) <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px 0;"></div>	2	correct pattern for 2 marks one mistake for 1 mark  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>[5]</b>	



Question			Guidance	Mark	Guidance
12	a		300 (kg m/s) (1)	1	
	b			2	<b>straight</b> line through 0,0 for one mark <b>straight</b> line passing through 50 m at 10 s for one mark
	c		<div> <div>Pete's kinetic energy ...</div> <div>... remains constant.</div> </div> <div> <div>A force on Pete from the ground...</div> <div>... heats up the air as he moves.</div> </div> <div> <div>Pete's gravitational P.E ...</div> <div>... increases steadily with time.</div> </div> <div> <div></div> <div>... pushes him in the direction ...</div> </div>	2	correct pattern of lines for 2 marks one or two mistakes for 1 mark  a mistake is <ul style="list-style-type: none"> <li>• a line in the wrong place</li> <li>• a missing line</li> <li>• an extra line</li> </ul>
			<b>Total</b>	<b>[5]</b>	
			<b>Paper Total</b>	<b>[42]</b>	

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