

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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Question		Answer	Mark	Guidance
1	a	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ... proteins that speed up chemical ... <input checked="" type="checkbox"/> (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]	

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

3			<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> (1)	1	
		... less than outside the cell			
		Total	[1]		

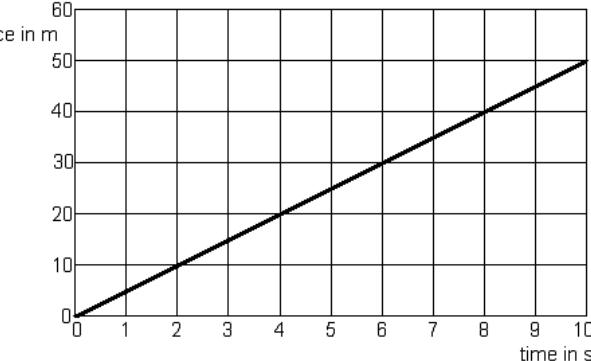
4	a		hypothalamus hypothalamus vasoconstriction	1	all three needed for the mark
	b		<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	1	
		It allows a more sensitive response.			
		Total	[2]		

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

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

Question			Answer	Mark	Guidance
	c		circles all approximately the same size they should be grouped together positive circles may only touch negative, and vice versa	1	There must be at least four circles; any extra circles must be correct credit any <u>correct</u> pattern of four circles, including chains ignore small gaps between circles accept variation in circle size so long as it doesn't look intentional
	d		conductivity measurement (1) of melt / solution [in water] (1)	2	credit any implication of conductivity a diagram is acceptable
Total			[7]		
8			F ⁻ Na ⁺ P	2	3 correct = 2 marks 2 or 1 correct = 1 mark a correct response must give the correct symbol <u>and</u> charge
Total			[2]		
9			any two: contains sodium ; plus other material ; extra lines are present ;	2 max	accept chlorine or chloride for "other material"
Total			[2]		
10	a		$\frac{1}{2} \times 50 \times 8^2$ (1)	1	
	b		any three from: GPE decreases ; because height (above ground) decreases ; KE increases ; as GPE is converted to KE / energy is conserved ;	3 max	credit "change in GPE not equal to increase in KE because some energy is transferred as heat"
Total			[4]		

Question			Answer	Mark	Guidance
11	a	i	<div style="text-align: center;"> <input type="checkbox"/> A <input type="checkbox"/> C <input type="checkbox"/> 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) <input type="checkbox"/> <input type="checkbox"/> ... friction on the ball from the ground ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	2	correct pattern for 2 marks one mistake for 1 mark A mistake is <ul style="list-style-type: none"> • a tick in the wrong place • a missing tick • an extra tick
			Total		[5]

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

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