

Additional Science A

General Certificate of Secondary Education **A215/02**

Unit 1: Modules B4, C4, P4

Mark Scheme for June 2010

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Question		Expected Answers	Marks	Additional Guidance
1	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"> • a ring in the wrong place • an extra ring a missing ring
	c	Molecules ... <input type="checkbox"/> Chemical reactions ... <input type="checkbox"/> Enzymes ... <input checked="" type="checkbox"/> (1) Cells change shape ... <input type="checkbox"/>	[1]	more than one box ticked = 0 marks
Total			[4]	

Question		Expected Answers	Marks	Additional Guidance
2	a	diffusion is movement (of particles) from high concentration to lower concentration/down concentration gradient (1) active transport moves (particles) from low to high concentration/against concentration gradient (1) active transport needs energy / diffusion does not need energy (1)	[3]	accept 'passive' for idea that diffusion does not require energy
	b	i	[1]	pituitary (1)
		ii	[3]	four lines correct = 3 marks three lines correct = 2 marks two lines correct = 1 mark zero or one line correct = 0 marks
<pre> graph LR A[alcohol] --> B[increased ...] E[Ecstasy] --> C[decreased ...] B --> D[greater volume and less dilute] B --> E[greater volume and more dilute] C --> F[smaller volume and less dilute] C --> G[smaller volume and more dilute] </pre>			[7]	
Total				

Question		Expected Answers	Marks	Additional Guidance
3	a	hypothalamus (1)	[1]	accept brain ignore CNS/ central nervous system
	b	any two from: increases blood flow through surface capillaries; allowing (more) heat loss; by radiation;	[2]	accept more blood flow at surface of skin/near her skin do not accept capillaries move accept (more) energy loss ignore references to sweat and sweating
		Total	[3]	
4	a	Brenda (1)	[1]	
	b	i one (1)	[1]	
		ii any three from: pick up/ lose electrons at the electrode; (the compound is) ionic/made of ions; ions are charged; ions move;	[3]	do not accept spread for move
	c	i some movement; it gets smaller; it produces bubbles;	[2]	three columns correct = 2 marks two columns correct = 1 mark zero or one column correct = 0 marks
		ii lithium + water → lithium hydroxide + hydrogen (1)	[1]	accept reactants in either order accept products in either order accept symbol equation only if perfect
		Total	[8]	

Question			Expected Answers	Marks	Additional Guidance																
5	a	i	g, aq, l	[2]	all three correct for 2 marks any two correct for 1 mark must be correct symbols, not words not AQ or Aq or aQ accept L or G																
		ii	OCI ⁻ (1)	[1]																	
	b	i	2Na + Cl ₂ → 2NaCl	[2]	all formulae correct = 1 mark correct balancing = 1 mark (allow correct multiples) e.g. 2Na + Cl ₂ → 2C/Na scores 1 mark for balancing accept = for →																
		ii	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>highly reactive</td><td style="text-align: center;">✓</td><td style="width: 20px;"></td><td style="width: 20px;"></td></tr> <tr><td>reactive</td><td></td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>less reactive</td><td></td><td></td><td style="text-align: center;">✓</td></tr> <tr><td>unreactive</td><td></td><td></td><td></td></tr> </table>	highly reactive	✓			reactive		✓		less reactive			✓	unreactive				[1]	all three correct for 1 mark the pattern must not end on the bottom row of the table
highly reactive	✓																				
reactive		✓																			
less reactive			✓																		
unreactive																					
Total				[6]																	
6	a		120 000 J / 120 kJ (2)	[2]	accept 300 000 J for 1 mark accept 420 000 J for 1 mark accept 180 000 J for 1 mark accept 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]	accept counter/opposing force ignore sound (energy) accept becomes heat																
Total				[4]																	

Question		Expected Answers	Marks	Additional Guidance
7	a	friction (1) reaction (1)	[2]	one mark for each correct word
	b	40N (1)	[1]	
	c	i	[1]	
		ii	[1]	
		The momentum constant. <input type="checkbox"/>		
		The reaction slows ... <input type="checkbox"/>		
		There must be a force ... <input type="checkbox"/>		
		The average speed less ... <input checked="" type="checkbox"/> (1)		
Total			[5]	
8	a	the same as in the opposite direction to	[1]	both must be correct for the mark
	b	The velocity increases ... <input type="checkbox"/>	[2]	one mark for each correct answer
		The reaction slows ... <input type="checkbox"/>		
		The weight momentum. <input checked="" type="checkbox"/> (1)		
		The total energy same ... <input checked="" type="checkbox"/> (1)		
		The counter force ... <input type="checkbox"/>		
	c	20m (1)	[1]	
	d	A (1)	[1]	
Total			[5]	

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