

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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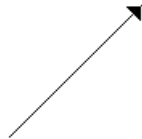
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Question		Expected Answers	Marks	Additional Guidance												
1	a	<table border="0" style="width: 100%; text-align: center;"> <tr> <td style="border: none;">part</td> <td style="border: none;"></td> <td style="border: none;">function</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">effector</td> <td style="border: none;">\</td> <td style="border: 1px solid black; padding: 5px;">detects stimuli</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">receptor</td> <td style="border: none;">/</td> <td style="border: 1px solid black; padding: 5px;">produces the response</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">processing centre</td> <td style="border: none;">—</td> <td style="border: 1px solid black; padding: 5px;">receives information ...</td> </tr> </table>	part		function	effector	\	detects stimuli	receptor	/	produces the response	processing centre	—	receives information ...	[2]	correct pattern for 2 marks one or two mistakes for 1 mark a mistake is: <ul style="list-style-type: none"> • a missing line • an extra line • a line in the wrong place
part		function														
effector	\	detects stimuli														
receptor	/	produces the response														
processing centre	—	receives information ...														
	b	EITHER any two from: receptors send signal to brain; receptors in skin or brain; brain sends signal to effectors; effectors are sweat glands; which produce sweat; sweat evaporates; OR any two from: effectors dilate blood vessels in skin; allowing blood to surface (of skin); so heat (radiation) can escape;	[2]	ignore references to moving away from heat source accept processor for brain accept arteries/capillaries/veins for blood vessels not blood vessels move to surface												
		Total	[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"> • 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]	correct pattern of ticks for 1 mark
Total			[4]	
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 accept almost all/most/a lot of sugar accept some urea is reabsorbed accept as much as is needed for salt accept sugar and salt reabsorbed for 1 mark
	c	greater, more (1) smaller, less (1)	[2]	one mark for each correct sentence
Total			[6]	

Question			Expected Answers	Marks	Additional Guidance																		
4	a	i	(group) 1 (1)	[1]																			
		ii	<table border="1" style="width: 100%;"> <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]	accept any unambiguous correct response																		
	b		one (1)	[1]	ignore signs before or after the number																		
	c		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">first product</td> <td></td> <td style="text-align: center;">second product</td> </tr> <tr> <td>lithium oxide <input type="checkbox"/></td> <td></td> <td>oxygen <input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">or</td> <td></td> <td style="text-align: center;">or</td> </tr> <tr> <td>lithium chloride <input type="checkbox"/></td> <td style="text-align: center;">+</td> <td>hydrogen <input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">or</td> <td></td> <td style="text-align: center;">or</td> </tr> <tr> <td>lithium hydroxide <input checked="" type="checkbox"/></td> <td></td> <td>carbon dioxide <input type="checkbox"/></td> </tr> </table>	first product		second product	lithium oxide <input type="checkbox"/>		oxygen <input type="checkbox"/>	or		or	lithium chloride <input type="checkbox"/>	+	hydrogen <input checked="" type="checkbox"/>	or		or	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
first product		second product																					
lithium oxide <input type="checkbox"/>		oxygen <input type="checkbox"/>																					
or		or																					
lithium chloride <input type="checkbox"/>	+	hydrogen <input checked="" type="checkbox"/>																					
or		or																					
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																		
			Total	[9]																			

Question		Expected Answers	Marks	Additional Guidance
5	a	kills bacteria/microbes/germs/microorganisms (1)	[1]	accept bugs / disease ignore dirt/impurities/chemicals accept '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 ignore 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 not AQ or Aq or aQ accept L or G
	d	chlorine + sodium → sodium chloride	[1]	accept reactants in either order accept = instead of → watch out for chloride and chlorine in the correct places not symbol equations
		Total	[5]	
6	a	120 000 J / 120 kJ	[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 response
	b	40 x 0.5	[1]	
	c	i	[1]	correct pattern of ticks for 1 mark
		The weight ... <input type="checkbox"/>		
		The balls momentum ... <input type="checkbox"/>		
		The ball travels a distance of ... <input checked="" type="checkbox"/> (1)		
		The velocity ... <input type="checkbox"/>		
		ii C (1)	[1]	any unambiguous correct response
		Total	[5]	
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
		Total	[5]	

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