

Additional Applied Science A

General Certificate of Secondary Education

Unit **A335/01**: Harnessing Chemicals (Foundation Tier)

Mark Scheme for June 2011

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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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1 Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
not	= answers which are not worthy of credit
reject	= answers which are not worthy of credit
ignore	= statements which are irrelevant
allow	= answers that can be accepted
()	= words which are not essential to gain credit
<u> </u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

Question			Expected Answer	Mark	Rationale/Additional Guidance							
1	a	i	B / measuring cylinder	1								
	a	ii	D / balance	1								
	b		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 40px; height: 15px;"></td> <td style="width: 10px; text-align: center;">+</td> <td style="width: 100px; height: 15px;">magnesium</td> <td style="width: 15px; text-align: center;">→</td> <td style="width: 40px; height: 15px;"></td> <td style="width: 10px; text-align: center;">+</td> <td style="width: 100px; height: 15px;">hydrogen</td> </tr> </table>		+	magnesium	→		+	hydrogen	2	allow correct formulae (Mg or H ₂) / magnesium ribbon
	+	magnesium	→		+	hydrogen						
	c		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 100px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> </tr> <tr> <td style="width: 100px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> </tr> <tr> <td style="width: 100px; height: 15px;">do not heat</td> <td style="width: 20px; height: 15px; text-align: center;">✓</td> </tr> </table>					do not heat	✓	1		
do not heat	✓											
	d		filtration	1	allow any clear indication of the correct answer							
	e	i	(3.0/5.0) x 100; 60 (%)	2	correct answer of 60% = 2 marks							
	e	ii	value will be larger / higher / goes up / not accurate	1	ignore references to the mass or weight of the crystals							
Total				[9]								

Question			Expected Answer	Mark	Rationale/Additional Guidance						
2	a	i	ammonia / sulfuric acid / sodium hydroxide / phosphoric acid / hydrochloric acid / nitric acid / alcohol(s) / ethanoic acid	1	allow correct formula allow any chemical made on a large scale and found in a school lab						
	a	ii	bulk	1	allow any clear indication of the correct answer						
	b	i	sugar cane regrows easily / is a renewable resource (supplies of) crude oil limited / running out / non renewable	2	one mark for each method. ignore comments about sustainability as in stem						
	b	ii	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 100px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> </tr> <tr> <td style="width: 100px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> </tr> <tr> <td style="width: 100px; height: 15px;">goes faster</td> <td style="width: 20px; height: 15px; text-align: center;">✓</td> </tr> </table>					goes faster	✓	1	
goes faster	✓										
Total				[5]							

Question		Expected Answer	Mark	Rationale/Additional Guidance	
3	a		1		
		irritant			✓
	b	HCl	1	allow any clear indication of the correct answer	
	c	carbon dioxide	1	allow correct formula	
	d	idea that 1 litre = 1000 ml / 5x10; 50 (g/l)	2	correct answer 50 (g/l) = 2 marks	
	e	i	fine	1	allow any clear indication of the correct answer
	e	ii	(an) alcohol ; (a) carboxylic acid	2	either order and need to be these words
Total			[8]		

Question		Expected Answer	Mark	Rationale/Additional Guidance				
4	a	idea of two (or more) different liquids; one liquid (finely) dispersed in the other	2	need to use the words each needs explanation to score a mark				
		any correct example for food or cosmetics			1	e.g. milk / salad cream / oil & water / foundation / butter / margarine / ice cream / mayonnaise / body lotion / ketchup		
		any two from: quality assurance; consumer protection / safety; meet standards					2	OWTTE for each point up to 2 max.
		idea that they are the same wherever they are done / universal nature of tests / comparability of results						
Total			[6]					

Question			Expected Answer	Mark	Rationale/Additional Guidance
5	a		Health & Safety Executive/HSE	1	
	b	i	butane (name only from the list)	1	allow correct formula
	b	ii	(names only from the list) ammonia; potassium hydroxide	2	allow correct formulae either order
	b	iii	potassium sulfate ; (names only from the list) water	2	allow correct formula either order
	b	iv	butane (name only from the list)	1	allow correct formula / not propanoic acid
	b	v	ammonia (name only from the list)	1	allow correct formula
			Total	[8]	
			Paper Total	[36]	

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