Version: 17/08/2010

General Certificate of Secondary Education

Science B 4462 / Chemistry 4421

CHY1F Unit Chemistry 1

Mark Scheme

2010 Examination – June Series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334).
Registered address: AQA, Devas Street, Manchester M15 6EX

Marking Guidance for Examiners

GCSE Science Papers

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example:

where consequential marking needs to be considered in a calculation;

or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following lines is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution? (1 mark)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct

substitution / working and this is shown in the 'extra information' column;

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

CHY1F

Question 1

question	answers	extra information	mark
1(a)	building		1
1(b)	provides jobs		1
1(c)	any **two** from: • noise • dust / visual pollution • air / atmospheric • exhaust gases • (more) traffic	ignore references to water allow sound pollution accept global dimming ignore smoke accept acid rain / global warming / named gaseous pollutants accept more lorries	2
1(d)	O 3 / three	ignore any numbers	1 1
1(e)	calcium oxide	accept quicklime do **not** accept calcium dioxide	1
Total			**7**

CHY1F

Question 2

question	answers	extra information	mark
2(a)	alloys		1
2(b)	bar drawn correctly up to 4%	ignore width of bar	1
2(c)	(contains) more carbon	ignore contains 4% carbon accept higher level responses related to structure / arrangement of atoms	1
2(d)(i)	73.8		1
2(d)(ii)	mild (steel)		1
2(d)(iii)	corrosion		1
Total			**6**

CHY1F

Question 3

question	answers	extra information	mark
3(a)	acid rain → sulfur dioxide global warming → carbon dioxide global dimming → carbon particles		1 1 1
3(b)(i)	oxygen		1
3(b)(ii)	carbon monoxide		1
3(c)(i)	decreasing	accept running out / none left	1
3(c)(ii)	any **two** from: • world needs (more) energy • plentiful supply • (many) countries have coal • easy to find / extract • oil / gas is running out • cheap **or** cheaper than oil	it = coal accept population is increasing allow (greater) demand for coal / fuels / energy accept readily available allow coal will 'last longer' accept need to use less oil / gas accept need to use it to replace oil / gas	2
Total			**8**

CHY1F

Question 4

question	answers	extra information	mark
4(a)(i)	2 / two		1
4(a)(ii)	E104 spots are at the same level / match	 independent mark	1 1
4(b)(i)	to improve / enhance the colour / change the colour	ignore sell more drinks allow to improve appearance do **not** accept preservative / emulsifier / improve taste / make it fizzy	1
4(b)(ii)	any **one** from: • (artificial) flavourings • carbon dioxide • preservatives • plastic (bottle / cap)	 accept sugar / saccharine / glucose / sweetener / caffeine ignore other additives / tartrazine / quinoline yellow / sunset yellow	1
4(c)(i)	monomers polymers	 	1 1

Question 4 Continues on the next page

CHY1F

Question 4 continued

question	answers	extra information	mark
4(c)(ii)	any **two** from: • not enough space • not biodegradable • waste of resource / crude oil • could be recycled • can burn as a fuel to provide energy	ignore litter / global warming / animals / habitats accept not enough landfills **or** landfills are full / filling up allow crude oil is running out ignore reuse	2
Total			**9**

CHY1F

Question 5

question	answers	extra information	mark
5(a)(i)	A **and** 3 anomalous result	accept A **and** 39 independent mark accept not close to other two volumes **or** correct comparison using the results ignore does not fit the pattern	1 1
5(a)(ii)	any **one** from: • volume of water (used) • time (for water to run through) • temperature • mass / surface area of pad • same filter funnel	 allow amount of water (used) accept rate / speed (at which water runs through) accept amount / size / volume / thickness of pad ignore other equipment	1
5(a)(iii)	any **one** from: • incorrect / volume / amount of water added • reading / volume / amount of water collected • some water does not go through the pad • not enough time allowed for water to drain through • pads (from one company) not identical / faulty	ignore human error unqualified allow spillage / poorly placed pad accept rate / speed at which water is added	1

Question5 Continues on the next page

CHY1F

Question 5 continued

question	answers	extra information	mark
5(b)(i)	any **two** from: • it was not the best (at absorbing the water) • (needed) to absorb more (water) • to improve their image / sales	accept correct descriptions of *'*not the best' / third best **or** only better than B allow not absorbing enough (water) accept *(*needs) to absorb more (water) than A and C for **2** marks	2
5(b)(ii)	any **one** from: • cost (more) • use (more) resources • use (more) energy	must relate to the company	1
Total			**7**

CHY1F

Question 6

question	answers	extra information	mark
6(a)(i)	condensed	it = water vapour accept temperature went below 100°C / boiling point of water allow cooled to form liquid / water / rain do **not** accept evaporated	1
	formed the oceans / seas	ignore rain accept (water vapour) cooled and formed the ocean / sea for **2** marks	1
6(a)(ii)	any **two** from: • used by (green) plants / *algae* • changed into oxygen • dissolved in oceans / seas • *(*locked up) in carbonates / sedimentary rocks • *(*locked up) in fossil fuels / named fossil fuel	ignore oxygen / nitrogen increased ignore reference to volcanoes / respiration accept photosynthesis / plants give out oxygen accept (locked up) in shells / skeletons (of animals)	2
6(b)(i)	cannot get to / reach / drill to / see the core	accept the core is (too) far down (into the Earth) / do not know what happens under the crust / Earth's surface accept it is (too) hot / radioactive ignore lack of evidence unqualified	1
6(b)(ii)	any **three** from: • heat / *energy* released • from radioactive decay / processes • (causing) convection currents • in the mantle	accept radioactivity / nuclear reactions	3
Total			**8**