

Version 1.0



**General Certificate of Secondary Education
January 2013**

Science B / Biology

BLY1H

(Specification 4462 / 4411)

Unit: Biology 1

Final

Mark Scheme

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 events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised 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 students' 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.

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Information to Examiners

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. Boldening

- 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 bullet points 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 students 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)

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

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

Student	Response	Marks awarded
1	Neptune, Mars, Moon	1
2	Neptune, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a student 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, 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 or by each stage of a longer calculation.

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.

3.8 Ignore / Insufficient / Do **not** allow

Ignore or insufficient is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

Do **not** allow means that this is a wrong answer which, even if the correct answer is given, will still mean that the mark is not awarded.

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Question 1

question	answers	extra information	mark
1(a)	any two from: <ul style="list-style-type: none"> • burning • activity of microbes / microbial respiration • less photosynthesis or trees take in CO ₂ or <u>less</u> CO ₂ locked up in wood <ul style="list-style-type: none"> • CO₂ given off by clearing machinery 	ignore CO ₂ release unqualified do not accept CO ₂ taken in for respiration	2
1(b)(i)	range of different species	accept idea of variety of organisms or plants or animals	1
1(b)(ii)	any two from: <ul style="list-style-type: none"> • organisms may produce substances useful to humans • duty to preserve for future generations • effect on other organisms, eg food chain effects • loss of environmental indicators 	do not accept if food is only example ignore effect on human food supply	2
Total			5

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Question 2

question	answers	extra information	mark
2(a)	any two from: <ul style="list-style-type: none"> • age • gender • mass • number in group • time 		2
2(b)	highest (mean) mass loss on Rosemary Conley or Rosemary Conley most effective least (mean) mass loss in control group or <u>mean</u> the lowest		1 1
2(c)	(Atkins) costs least mass loss very similar to other diets or second highest mass loss or as effective as other diet	accept book lasts forever	1 1
2(d)	any two from: <ul style="list-style-type: none"> • (exercise) increases metabolic rate / respiration or (exercise) needs / uses energy / calories • (this) energy comes from food / fat • less food / energy/ calories converted to fat 	ignore sweating allow burns fat / calories do not accept energy <u>for</u> respiration do not accept respiration uses energy	2
Total			8

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Question 3

question	answers	extra information	mark
3(a)	<p>1 mark for each adaptation and 1 mark for its correct linked advantage</p> <ul style="list-style-type: none"> • long / thick hair / fur (1) for insulation (1) • small ears (1) for reduced heat loss (1) • small feet (1) for reduced heat loss (1) • white fur / coat (1) for camouflage / poor emitter (1) • small SA/V ratio (1) reduces heat loss (1) • thick layer of fat (1) insulates / keeps warm (1) 	<p>allow keeps warm</p> <p>ignore wide feet ignore prevent sinking</p>	Max 4
3(b)	<p>1 mark for an adaptation and 1 mark for its correct linked advantage</p> <ul style="list-style-type: none"> • horns (1) for defence (1) • long legs (1) for speed / escape / vision (1) • light colour (1) for camouflage (1) • eyes on side of head (1) for wider field of vision (1) • hooves (1) for speed / escape (1) • large ears (1) to hear predators better (1) 	<p>allow pattern</p>	Max 2
Total			6

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Question 4

question	answers	extra information	mark
4(a)(i)	heroin / cocaine / nicotine	accept tobacco ignore alcohol / cigarettes / cannabis / caffeine / coffee	1
4(a)(ii)	alters body chemistry / processes	ignore withdrawal symptoms / craving ignore non-chemical effects on nervous system	1
4(b)	any two from: <ul style="list-style-type: none"> • increase in cannabis smoking increases (%) depression • greater effect in women • depression linked with / not directly caused by cannabis • not all cannabis smokers get depression 	ignore women become more depressed / men less depressed ignore cannabis causes depression	2
Total			4

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Question 5

question	answers	extra information	mark
5(a)	A sensory (neurone)	ignore nerve	1
	B motor (neurone)	ignore nerve	1
	C spinal cord / central nervous system / white matter	accept grey matter	1
5(b)	by chemical / substance	allow transmitter	1
5(c)	muscle	allow extensor ignore muscle names	1
Total			5

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Question 6

question	answers	extra information	mark
6(a)(i)	viruses live inside cells		1
	viruses inaccessible to antibiotic	allow drug / antibiotic (if used) would (have to) kill cell	1
6(a)(ii)	any two from eg <ul style="list-style-type: none"> • non-resistant strains killed (by antibiotics) • so less competition • overuse of antibiotics / antibiotics prescribed for mild infections 	if no marks gained allow one mark for 'people do not finish course of antibiotics'	2
6(b)	(stimulate) antibody production	ignore antitoxin	1
	(by) white cells		1
	<u>rapidly</u> produce antibody on re-infection	ignore antibodies remain in blood	1
Total			7

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Question 7

question	answers	extra information	mark
7(a)	wing pattern similar to <i>Amauris</i>	allow looks similar to <i>Amauris</i>	1
	birds assume it will have an unpleasant taste		1
7(b)	mutation / variation produced wing pattern similar to <i>Amauris</i>	<i>do not accept breeds with Amauris</i>	1
	these butterflies not eaten (by birds)	<i>do not accept idea of intentional adaptation</i>	1
	these butterflies breed or their genes are passed to the next generation		1
Total			5

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Question 8

question	answers	extra information	mark
8(a)	(use of) enzymes		1
8(b)	asexual reproduction / no gametes / no fusion / only one parent	ignore clones	1
	cells all contain same genetic information / same genes (as parent) / same DNA		1
8(c)	can spray crop with herbicide – <u>only weeds</u> killed	crop survives herbicide insufficient	1
8(d)	any one from: <ul style="list-style-type: none"> • fears / lack of knowledge about effects of GM food on health • crop plants may pass on gene to wild plants • encourages use of herbicides 	allow 'think that GM food is bad for health' ignore not natural or against religion	1
Total			5

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