



# **General Certificate of Secondary Education**

## **Science B 4462 / Biology 4411**

**BLY1H      Unit 1 Biology**

## **Mark Scheme**

*2008 examination – January 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.

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## MARK SCHEME

### 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. 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.

### 3.8 Unexpected Correct Answers not in the Mark Scheme

The Examiner should use professional judgement to award credit where a candidate has given an unexpected correct answer which is not covered by the mark scheme. The Examiner should consult with the Team Leader to confirm the judgement. The Team Leader should pass this answer on to the Principal Examiner with a view to informing all examiners.

**BLY1H****Question 1**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)(i)	using drugs for pleasure / to make you feel good / to reduce stress	allow not for medical use	1
(a)(ii)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• drug contains addictive chemical / names</li> <li>• drugs alter body chemistry</li> <li>• cause withdrawal symptoms</li> <li>• uses drug frequently</li> </ul> <b>or</b> uses a lot of the drug <b>or</b> needs more drugs	ignore craving	2
(b)(i)	(no) only leads to cocaine use <b>or</b> only leads to 1 class A	allow (yes) leads to cocaine ignore reference to uptake of class B drugs	1
(b)(ii)	(using) class B drugs / named class B (each / named type B drug) can lead to use of 2 class A drugs / 2 named class A drugs <b>or</b> most +s for class A drugs opposite class B drugs	mark the two answers independently	1 1
total			6

**BLY1H****Question 2**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	any <b>two</b> from: eg <ul style="list-style-type: none"> <li>• same volume of solution</li> <li>• left for same length of time</li> <li>• same temperature</li> <li>• same oxygen</li> <li>• same pH</li> <li>• same number of invertebrates / animals</li> <li>• same age / stage of invertebrates / animals</li> </ul>	do <b>not</b> allow same size of container      do <b>not</b> allow same number of species	2
(b)	line of best fit / curve / point to point drawn going through 240-260 and 25		1
	correct interpolation to X axis	if no work on graph allow 250	1
(c)(i)	(C)  50% killed at lowest / low copper concentration	ignore least survivors	1
(c)(ii)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• involves counting</li> <li>• easy to do</li> <li>• invertebrates more sensitive</li> <li>• needs less / no apparatus</li> </ul>	easy to count gains <b>2</b> marks   ignore more reliable / accurate	2
total			7

**BLY1H****Question 3**

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

**Question 4**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	stays cool	ignore shade	1
	less sweat		1
(b)	any <b>two</b> from: <ul style="list-style-type: none"> <li>breathing rate less</li> <li>less water lost via breath</li> <li>less water <u>from</u> respiration</li> </ul>	less can be implied	2
total			4

**BLY1H****Question 5**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	<p>any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>vaccine is inactive / dead form of (pathogen)</li> <li>stimulates antibody production</li> <li>stimulates antitoxin production</li> <li>by white cells</li> <li>antibodies kill (pathogen)</li> <li>antitoxins neutralise poisons</li> <li>antibodies quickly produced on reinfection</li> <li>reference to ingestion by white cells</li> </ul>	<p>allow antigens</p> <p>ignore antibodies remain in blood</p>	3
(b)(i)	<p>(no)</p> <p>any <b>two</b> from</p> <ul style="list-style-type: none"> <li>sample size small / only 12</li> <li>conclusion based on hearsay from parents</li> <li>only 8 parents linked autism to MMR</li> <li>no control used</li> </ul>		2
(b)(ii)	<p>(yes)</p> <p>being paid by parents / lawyers</p>		1
total			6



**BLY1H****Question 6**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	3.2	award <b>both</b> marks for correct answer irrespective of working  if answer incorrect $(55 + 55 + 1.2 + 5) - (110 + 3)$ <b>or</b> $116.2 - 113$ <b>or</b> $(55 + 55 + 1.2 + 5 + 90) - (110 + 93)$ gains <b>1</b> mark	2
(b)	any <b>one</b> from: <ul style="list-style-type: none"> <li>less carbon dioxide taken in by trees</li> <li>less photosynthesis</li> <li>burning trees releases carbon dioxide</li> <li>decay releases carbon dioxide</li> </ul>	ignore carbon dioxide released by trees <b>or</b> trees store carbon dioxide	1
(c)	heat / infra red / radiation / energy  radiated by Earth  carbon dioxide absorbs / traps / radiates	must be in correct context ignore light  do <b>not</b> accept reflection  allow reflects  ignore absorbs radiation / heat / light <u>from Sun</u>  ignore ozone	1  1  1
total			6

**BLY1H****Question 7**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	<p>any <b>four</b> from:</p> <ul style="list-style-type: none"> <li>• mutation / variation</li> <li>• produces smaller wings / fatter body</li> <li>• wings no longer an advantage since no predators</li> <li>• wings no longer an advantage since food on ground</li> <li>• fatter body can store more energy when fruit scarce</li> <li>• successful birds breed / pass on genes</li> </ul>	<p>must be linked to mutation / variation</p> <p>allow wings / flight not needed as no predators</p> <p>allow wings / flight not needed as food on ground</p>	4
(b)	<p>any <b>one</b> from:</p> <ul style="list-style-type: none"> <li>• evidence has all gone</li> <li>• no scientists on island at time to record evidence</li> <li>• no records (from sailors)</li> </ul>		1
total			5

**BLY1H****Question 8**

	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)(i)	chromosomes	allow DNA  ignore nucleus	1
(a)(ii)	enzymes		1
(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
(c)	can spray crop with herbicide – <u>only</u> <u>weeds</u> killed	crop survives herbicide insufficient	1
(d)	any <b>one</b> from: <ul style="list-style-type: none"> <li>fears / lack of knowledge about effects of GM food on health</li> <li>crop plants may pass on gene to wild plants</li> <li>encourages use of herbicides</li> </ul>	allow ‘think that GM food is bad for health’  ignore not natural <b>or</b> against religion	1
total			6