



**General Certificate of Secondary  
Education**

**Science B 4462 / Biology 4411**

**BLY1F            Unit Biology 1**

**Mark Scheme**

*2012 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 students' 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 students' 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 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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## 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 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	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)

Student	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, 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, 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.

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**BLY 1F****Question 1**

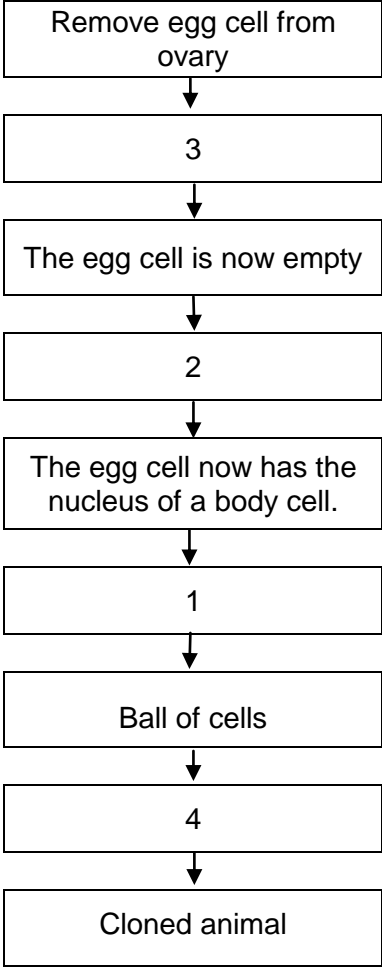
<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>1(a)</b>	brown (colour)		<b>1</b>
<b>1(b)</b>	(long) ears		<b>1</b>
<b>1(c)</b>	(long) horns		<b>1</b>
<b>1(d)</b>	(white) ring		<b>1</b>
<b>Total</b>			<b>4</b>

**BLY1F****Question 2**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>2(a)</b>	any <b>two</b> from: <ul style="list-style-type: none"> <li>• light / sunlight</li> <li>• water</li> <li>• nutrients / ions / salts / minerals</li> <li>• space</li> </ul>	ignore Sun  ignore food	2
<b>2(b)(i)</b>	herbicides		1
<b>2(b)(ii)</b>	pesticides		1
<b>2(c)</b>	any <b>two</b> from: <ul style="list-style-type: none"> <li>• habitat destroyed</li> <li>• numbers / species / biodiversity reduced</li> <li>• less food / fewer breeding sites</li> </ul>	mark as a whole  allow animals die / move away  allow fewer homes / nowhere to live  ignore would keep animals out	2
<b>Total</b>			<b>6</b>

**BLY1F**

**Question 3**

question	answers	extra information	mark
<b>3(a)</b>	sexual characteristic mutation chromosome	this order only	1 1 1 1
<b>3(b)</b>	 <pre>                     graph TD                         A[Remove egg cell from ovary] --&gt; B[3]                         B --&gt; C[The egg cell is now empty]                         C --&gt; D[2]                         D --&gt; E[The egg cell now has the nucleus of a body cell.]                         E --&gt; F[1]                         F --&gt; G[Ball of cells]                         G --&gt; H[4]                         H --&gt; I[Cloned animal]                     </pre>	four correct gains <b>3</b> marks two or three correct gains <b>2</b> marks one correct gains <b>1</b> mark accept correct connection between statement and box	<b>3</b>
<b>Total</b>			<b>7</b>

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**Question 4**

question	answers	extra information	mark
<p><b>4(a)</b></p>		<p><b>1</b> mark for each correct line                  mark each line from left hand box                  two lines from left hand box                  cancels mark for that box</p>	<p><b>3</b></p>
<p><b>4(b)</b></p>	<p>reference to diet / less food /                  healthier food / balanced diet</p> <p>reference to exercise / activity</p>		<p><b>1</b></p> <p><b>1</b></p>
<p><b>4(c)(i)</b></p>	<p>27.77 / 27.78 / 27.8 / 27.7*</p>	<p>correct BMI gains <b>3</b> marks</p> <p>accept 2 or more 7s after decimal                  point for <b>3</b> marks</p> <p>27.7 gains <b>2</b> marks</p> <p>if answer incorrect:</p> <p>allow <b>1</b> mark for 3.24</p> <p>allow <b>1</b> mark for correct answer                  based on incorrect (height)<sup>2</sup></p>	<p><b>3</b></p>
<p><b>4(c)(ii)</b></p>	<p>overweight</p>	<p>allow ecf from (c)(i)</p> <p>if no attempt at (c)(i) no mark can                  be awarded for (c)(ii)</p>	<p><b>1</b></p>
<p><b>Total</b></p>			<p><b>9</b></p>



**BLY1F****Question 5**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>5(a)(i)</b>	6		1
<b>5(a)(ii)</b>	1/5 <b>or</b> 10/50 <b>or</b> one fifth <b>or</b> 20% <b>or</b> 1 in 5 <b>or</b> 0.2 <b>or</b> 1:4 <b>or</b> 1 to 4	do <b>not</b> allow 1:5 <b>or</b> 1 to 5	1
<b>5(b)</b>	heroin	apply list principle	1
<b>5(c)</b>	people not honest in answers	allow small sample / people from same area  do <b>not</b> accept unequal numbers of men and women	1
<b>5(d)</b>	might lead to mental illness / named  <b>or</b> might lead to more addictive / hard drugs / named hard drugs	ignore cancer / lung disease / tar / damages brain cells  accept gateway drug  ignore addictive / slows reactions	1
<b>Total</b>			<b>5</b>

**BLY1F****Question 6**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>6(a)</b>	(soft) body parts / other parts / named parts	accept flesh	1
	decayed / decomposed / rotted / eaten <b>or</b> bones do not decay / decompose / rot / get eaten	ignore disintegrated / dissolved ignore microorganisms	1
<b>6(b)</b>	any <b>one</b> aquatic feature from: eg <ul style="list-style-type: none"> <li>• streamlined body shape</li> <li>• long tail</li> <li>• eyes on top of head</li> <li>• scales</li> <li>• fins / paddles / flippers / webbed feet</li> </ul>	ignore gills	1
	any <b>one</b> terrestrial feature from: <ul style="list-style-type: none"> <li>• (front) legs / limbs / hands</li> <li>• could lift front end upwards</li> </ul>	ignore feet  accept for <b>2</b> marks eg fin / flipper can be used for walking <b>or</b> fins like legs	1
<b>Total</b>			<b>4</b>

## BLY1F

## Question 7

question	answers	extra information	mark
7(a)	hearsay		1
7(b)	(volunteers with feet in) <u>empty</u> bowls	accept bowl with no (iced) water do <b>not</b> accept mention of bowl with iced water	1
7(c)	any <b>three</b> from: <ul style="list-style-type: none"> <li>• only some of those whose feet were in cold water caught colds</li> <li>• some controls caught colds</li> <li>• only feet were cold in experimental group</li> <li>• only kept feet in cold water for 20 minutes</li> <li>• insufficient evidence for ‘proof’ / only showed increased risk</li> <li>• don’t know activities of individuals before / after the investigation (eg exposure to cold virus) / reference to immune system</li> </ul>	ignore control variables, eg age, gender  allow (control) not wrapped up warm  allow small sample size  allow investigation done in ‘cold season’	3
<b>Total</b>			<b>5</b>

**BLY1F****Question 8**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>8(a)</b>	Y – spinal cord / central nervous system / CNS	do <b>not</b> accept spine  ignore nerve / nervous system / coordinator  ignore grey / white matter	1
	W – receptor / nerve ending	ignore sensory / neurone / stimulus	1
	X – effector / muscle	allow gland	1
<b>8(b)</b>	any <b>two</b> from: eg <ul style="list-style-type: none"> <li>• reflex action quicker</li> <li>• effect of reflex action over shorter period</li> <li>• hormone involves blood system <u>and</u> reflex involves neurones / nerve cells</li> <li>• reflex involves impulses <u>and</u> hormone involves chemicals</li> <li>• reflex action affects only one part of the body</li> </ul>	accept reverse argument for each marking point  ignore nervous system / nerves  ignore involves brain  ignore outside / inside stimuli	2
<b>Total</b>			<b>5</b>

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