



**General Certificate of Secondary
Education**

**Additional Science 4463 /
Biology 4411**

BLY2F

Unit Biology 2

Mark Scheme

2011 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.

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Question 1

question	answers	extra information	mark
<p>1(a)</p>		<p>1 mark for each correct line</p> <p>mark each line from left hand box</p> <p>two lines from left hand box cancels mark for that box</p>	<p>3</p>
<p>1(b)</p>	<p>energy</p>		<p>1</p>
<p>Total</p>			<p>4</p>

BLY2F**Question 2**

question	answers	extra information	mark
2(a)(i)	lung		1
2(a)(ii)	kidney		1
2(a)(iii)	bladder		1
2(b)(i)	more the same less	} allow synonyms	1 1 1
2(b)(ii)	cools / reduces temperature or prevent overheating	ignore reference to sweat	1
Total			7

BLY2F**Question 3**

question	answers	extra information	mark
3(a)(i)	70	award 2 marks for correct answer irrespective of working allow 1 mark for $30 + 10 + 24 + 6$ (with wrong answer or no answer), do not award this sum if other figure(s) are included in the addition	2
3(a)(ii)	6	award 2 marks for correct answer irrespective of working award 2 marks for correct answer to (a)(i) – 64 (ecf) award 1 mark either for $70 - 64$ or answer to (a)(i) – 64 with no answer or incorrect answer	2
3(b)	photosynthesis		1
Total			5

BLY2F**Question 4**

question	answers	extra information	mark
4(a)(i)	any one from: <ul style="list-style-type: none"> • A • C 		1
4(a)(ii)	any one from: <ul style="list-style-type: none"> • B • D 		1
4(b)(i)	pig A		1
4(b)(ii)	a gamete		1
4(c)	XY or YX	in this order only	1
	X Y		1
	XY or YX		1
Total			7

BLY2F**Question 5**

question	answers	extra information	mark
5(a)(i)	any two from: <ul style="list-style-type: none"> • fibres not damaged • machines last longer / machines not damaged by stones • shorter<u>er</u> time or quicker • lower<u>er</u> temperature 	} allow cheaper / uses less energy as an alternative to shorter time / lower temperature, if these not given	2
5(a)(ii)	any two from: <ul style="list-style-type: none"> • different enzymes (for different dyes) • enzymes expensive • enzymes have to be removed (from denim material) (after washing / treatment) 	no mark for expensive alone	2
5(b)	protease		1
Total			5

BLY2F**Question 6**

question	answers	extra information	mark
6(a)(i)	diffusion		1
6(a)(ii)	A		1
6(b)(i)	osmosis		1
6(b)(ii)	R		1
Total			4

BLY2F**Question 7**

question	answers	extra information	mark
7(a)(i)	colour of light / bulb / lamp	allow wavelength for colour allow bulb alone do not accept light / colour unqualified	1
7(a)(ii)	any one from eg <ul style="list-style-type: none"> • temperature • light intensity or distance between lamp and plant / tube • carbon dioxide • other light in room • mass / size / amount / age / type of pondweed • volume / amount of water 	allow heat allow amount / brightness of light ignore light unqualified allow symbols allow use a dark room allow same piece of pondweed ignore pondweed unqualified ignore reference to time	1
7(a)(iii)	improved reliability or can spot anomalies / changes	allow for reliability or less likely to lose count allow reference to calculating a mean / average ignore reference to accuracy / precision / fair	1
7(b)(i)	green		1

Question 7 continues on the next page

BLY2F**Question 7 continued**

question	answers	extra information	mark
7(b)(ii)	any two from: <ul style="list-style-type: none"> • least / less bubbles / gas / oxygen / mean • least / less photosynthesis • least / less glucose / sugar / carbohydrate / food made 	ignore references to colour reference to least / less needed only once, in context, for 2 marks only penalise no once, ie no bubbles = 0 mark no bubbles so no photosynthesis = 1 mark allow most / more green light reflected (by chloroplasts)	2
Total			6

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Question 8

question	answers	extra information	mark
8(a)(i)	6000	award 2 marks for correct answer irrespective of working allow 1 mark for 20 x 300 with incorrect or no answer allow answer in table if answer line blank	2
8(a)(ii)	bar width 6000 or to match answer to (a)(i)	anywhere on scale ignore depth / height of bar	1
	drawn below slugs	label not required	1
8(b)	any three from: <ul style="list-style-type: none"> • respiration (by hedgehog) • (results in) loss of CO₂ • faeces (of hedgehog) or not digested • excreted / urine / urea (by hedgehog) • not all slug(s) are eaten (by hedgehogs) or some slugs eaten by other things 	ignore reference to size / mass / number of organisms assume reference is to / of hedgehog unless stated otherwise do not accept idea that respiration uses / produces energy accept waste for 1 mark if neither faeces nor excretion point made ignore sweat alone ignore some slugs die ignore reference to movement / heat / growth allow references to energy losses by these methods, rather than biomass losses	3
Total			7