



General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F

Unit Biology 2

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.

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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. 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 boldened. 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.

BLY2F**Question 1**

question	answers	extra information	mark
1(a)(i)	C and D		1
1(a)(ii)	cell wall		1
1(b)(i)	A		1
1(b)(ii)	D		1
1(c)	respiration		1
Total			5

BLY2F**Question 2**

question	answers	extra information	mark
2(a)	microorganisms		1
2(b)	moist		1
2(c)	respiration		1
2(d)	roots		1
Total			4

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Question 3

question	answers	extra information	mark
3(a)(i)	<p style="text-align: center;">Large food molecule</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>starch</p> <p>fat</p> <p>protein</p> </div> <div style="text-align: center;"> <p>Enzyme</p> <p>amylase</p> <p>protease</p> <p>lipase</p> <p>isomerase</p> </div> </div>	<p>all three correct = 3 marks</p> <p>two correct = 2 marks</p> <p>one correct = 1 mark</p> <p>extra line from a large food molecule cancels the mark</p>	3
3(a)(ii)	<p>sugars</p> <p>fatty acids and glycerol</p> <p>amino acids</p>	<p>must be in this order</p>	1 1 1
3(b)	liver		1
Total			7

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Question 4

question	answers	extra information	mark
4(a)(i)	circle	mark independently	1
	unshaded	could be in body of script	1
4(a)(ii)	(Harriet) dd	in first box	1
	DD	if another letter is chosen it must be used throughout and upper or lower case must be clear	1
	Dd		1
4(b)(i)	to check for the D allele.		1
4(b)(ii)	any one from: <ul style="list-style-type: none"> • may harm / kill foetus / embryo / baby / mother • immoral / unethical / religion 	allow could affect the baby ignore playing God ignore references to unnatural ignore wrong unqualified ignore expense / prejudice unqualified ignore lack of permission ignore results are unreliable	1
Total			7

BLY2F**Question 5**

question	answers	extra information	mark
5(a)	pancreas		1
5(b)	any one from <ul style="list-style-type: none"> • (controlling / changing) diet • exercise • pancreas transplant 	accept descriptions as to how diet could be changed eg eat less sugar(y foods) ignore reference to fat / protein accept example eg go for a run accept named drug eg metformin	1
5(c)(i)	increase then fall relevant data quote (for male)	ignore reference to women max at ages 65 – 74 eg starts at 10 (per thousand) or max at 130 (per thousand) or ends at 120 (per thousand) accept a difference between any pairs of numbers in data set quoting of scale or per thousand but not 'thousands' accuracy ± 2	1 1 1

Question 5 continues on the next page

BLY2F**Question 5 continued**

question	answers	extra information	mark
5(c)(ii)	(between 0 and 64) more females (than males) / less males	ignore numbers allow eg females more diabetic than males	1
	(over 65) more males (than females) / less females		1
Total			7

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Question 6

question	answers	extra information	mark
6(a)	the starch is stored for later use.		1
6(b)(i)	any two from: <ul style="list-style-type: none"> • carbon dioxide (concentration) • light intensity • light colour / wavelength • pH • size / amount plant • same / species / type plant • amount of water <u>in the tube</u> 	do not accept temperature – apply list principle ignore reference to time allow one mark for light if neither intensity or colour are awarded allow 'the plant' ignore amount of water alone	2
6(b)(ii)	number / amount of bubbles or amount of gas / oxygen (relevant reference to) time / named time interval	allow volume of bubbles (together) ignore 'the bubbles' unqualified allow how long it bubbles for do not accept time bubbles start / stop ignore speed / rate bubbles ignore instruments do not accept other factors eg temperature accept how many bubbles per minute for 2 marks	1 1
6(c)(i)	temperature	allow heat / °C / cold	1
6(c)(ii)	carbon dioxide / CO ₂	allow CO ₂ / CO ² / Co ₂ / Co ² / co ₂ / co ² do not accept CO / 2CO	1
Total			7

BLY2F**Question 7**

question	answers	extra information	mark
7(a)(i)	20		1
7(a)(ii)	one tenth / 0.1 / 10% / 1:9 / 1 in 10 / 1 out of 10 / $\frac{1}{10}$	for correct answer irrespective of working 2 marks ignore any units accept equivalent fractions eg $\frac{4}{40}$ / $\frac{2}{20}$ do not allow eg 1:10 / 1 to 10 if answer is incorrect clear selection of 2 and 20, or equivalent or 1:4:5 / 1:5:4 gains 1 mark	2
7(b)	any two from: <ul style="list-style-type: none"> • (body) heat / maintaining body temperature • movement (max 2) • growth / cell division / repair / reproduction / building molecules • accept active transport 	do not accept sweating / cooling / excretion allow keep warm allow 2 different examples of movement, internally and / or externally eg breathing / exercise / eating / circulation allow muscle contraction if no other muscle action is credited movement + breathing = 1 mark allow examples eg making proteins (from amino acids) ignore 'chemical reactions' / digestion	2

Question 7 continues on the next page

BLY2F**Question 7 continued**

question	answers	extra information	mark
7(c)	more movement / have to hunt / catch food	allow converse if stated for herbivore eg herbivores food is all around ignore reference to size or predator unqualified	1
7(d)	any two from <ul style="list-style-type: none"> • less movement • less heat loss • less respiration 	ignore reference to food allow no movement allow less space to move ignore less space unqualified allow no heat loss or they are kept warm	2
Total			8