



General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F Unit 2 Biology

Mark Scheme

2009 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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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.

BLY2F**Question 1**

question	answers	extra information	mark
1(a)	it has many chloroplasts.		1
1(b)	(has) cell wall	assume plant cell throughout accept converse for animal cell	1
	(has) vacuole or large / permanent vacuole	do not allow chloroplasts	1
Total			3

BLY2F**Question 2**

question	answers	extra information	mark
2(a)	A		1
2(b)(i)	diffusion		1
2(b)(ii)	respiration		1
2(b)(iii)	mitochondria		1
2(b)(iv)	photosynthesis		1
Total			5

BLY2F**Question 3**

question	answers	extra information	mark
3(a)	$\frac{1}{5}$ / 20% / 1 in 5 / 1 : 4 / 0.2 / $\frac{600}{3000}$ / 600 : 2400 / 600 in 3000	any correct proportion ignore working do not allow 1 : 5 award 1 mark for selection of 3000 and 600	2
3(b)(i)	sweat / sweating / perspiring	allow cooling / for cooling / to lose heat / to cool	1
3(b)(ii)	the volume of water in the urine decreases. the volume of water taken as food or drink increases.		1 1
3(c)(i)	liver	apply list principle	1
3(c)(ii)	kidney	apply list principle	1
3(c)(iii)	bladder	apply list principle	1
Total			8

BLY2F

Question 4

question	answers	extra information	mark
4(a)(i)	tick in box of FIRST pyramid		1
4(a)(ii)	any one from: <ul style="list-style-type: none"> • less energy / biomass lost / wasted • greatest biomass / energy for humans • shortest food chain or less stages or least number of different organisms or only one predator or only 2 boxes tall or least boxes 	ignore human box is bigger ignore 'food' for humans allow only one stage	1
4(b)(i)	any two from: <ul style="list-style-type: none"> • quicker / more growth or grow fatter • less urine or less faeces • less heat (lost) • less movement 	assume for pigs indoors allow converse if clear for pigs outdoors } do not allow no for less ignore less space	2
4(b)(ii)	any one from: <ul style="list-style-type: none"> • less cruelty or more ethical or better animal welfare • better flavour / quality (of meat) • less pollution / etc / less fossil fuel used for heating 	assume for pigs outdoors allow converse if clear for pigs indoors ignore more natural ignore ideas referring to against God's will ignore pig health or free range / organic ignore quality of life	1
Total			5

BLY2F**Question 5**

question	answers	extra information	mark
5(a)	chromosomes		1
5(b)	diagram showing four separate chromosomes two long and two short (as in diagram 1)	allow each chromosome shown as two joined chromatids do not allow if chromosomes touching each other	1
5(c)(i)	any two from: <ul style="list-style-type: none"> • can grow into any type of tissue / named tissue • used in medical research • used to treat human diseases • large numbers can be grown 		2
5(c)(ii)	any two from: <ul style="list-style-type: none"> • expensive • grow out of control / ref cancers • may be rejected • need for drugs (for rest of life) 		2
Total			6

BLY2F**Question 6**

question	answers	extra information	mark
6(a)(i)	50	award 2 marks for correct answer irrespective of working award 1 mark for selection of 60 and 10	2
6(a)(ii)	any two from: <ul style="list-style-type: none"> • increases • (then) decreases • highest at 65 – 74 (years old) or maximum 112 (per thousand) 	ignore comparisons with men allow peaks at 65 - 74	2
6(b)(i)	stomach		1
6(b)(ii)	any sensible reference to diet or carbohydrate intake or pancreas / stem cell transplant	eg eat less / no sugary food or eat more fibre or go on a diet or watch what you eat ignore eat more protein do not accept reduce salt	1
Total			6

BLY2F**Question 7**

question	answers	extra information	mark
7(a)(i)	water / H ₂ O oxygen / O ₂ / O	answers must be in this order	1
		allow hydrogen oxide	1
		allow upper and lower case symbols and superscripts	
7(a)(ii)	respiration in the plant	allow clear indication of correct response	1
7(b)	light (: no light) / light intensity chlorophyll (: no chlorophyll) / chloroplast	ignore references to the card / covered / uncovered	1
		allow leaf colour or both green and white given	1
7(c)(i)	no light (received) or it's dark	allow no photosynthesis do not allow little light / photosynthesis ignore sun apply list principle for other factors	1
7(c)(ii)	no chlorophyll / chloroplasts (present)	allow no / little photosynthesis allow white or not green or little chlorophyll / few chloroplasts apply list principle for other factors	1
Total			7

BLY2F**Question 8**

question	answers	extra information	mark
8(a)(i)	increase / higher / faster / quicker numerical comparison eg from 30 to 60 / by 30 or it is 30 at 15°C and 60 at 25°C	award 2 marks for doubles / goes twice as fast or 30 units <u>more</u>	1 1
8(a)(ii)	any two from: <ul style="list-style-type: none"> • oxygen / air (in) • for microorganisms / bacteria / microbes / fungi / decomposers • (for aerobic) respiration • let heat out • heat kills microorganisms 	do not accept lets oxygen / air out ignore reference to other substances / light passing in or out ignore microorganisms passing in ignore worms / germs / bugs ignore heat in	2
8(b)	compost contains minerals / nutrients / elements / ions / named	allow improve moisture / drainage allow nitrogen ignore CO ₂ / food / goodness / fertilisers do not accept vitamins / glucose etc	1
Total			5