



General Certificate of Secondary Education

Biology 4411

BLY3F Unit 3 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.

BLY3F**Question 1**

question	answers	extra information	mark
1(a)	A = alveolus	allow air sac / alveoli	1
	B = diaphragm	ignore labelling of C and D	1
1(b)	A		1
1(c)(i)	red blood cells		1
1(c)(ii)	plasma		1
Total			5

BLY3F**Question 2**

question	answers	extra information	mark
2(a)	mineral ions	each extra box ticked cancels 1 mark	1
	water		1
2(b)(i)	blood plasma		1
2(b)(ii)	dialysis fluid		1
2(b)(iii)	diffusion		1
2(b)(iv)	partially permeable		1
2(b)(v)	small		1
2(c)	drug treatment is needed to suppress the immune system		1
Total			8

BLY3F

Question 3

question	answers	extra information	mark		
<p>3(a)</p>	<table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;"> <p>List A – Action</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">The agar jelly is heated at 120°C for 20 minutes</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Make sure the temperature for growing the microorganisms is 25°C</div> <div style="border: 1px solid black; padding: 5px;">The lid of the Petri dish is held on with tape</div> </td> <td style="vertical-align: top;"> <p>List B – Effect</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To reduce the growth of pathogens</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To kill unwanted microorganisms</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To prevent microorganisms from the air getting into the dish</div> <div style="border: 1px solid black; padding: 5px;">To prevent oxygen entering</div> </td> </tr> </table>	<p>List A – Action</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">The agar jelly is heated at 120°C for 20 minutes</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Make sure the temperature for growing the microorganisms is 25°C</div> <div style="border: 1px solid black; padding: 5px;">The lid of the Petri dish is held on with tape</div>	<p>List B – Effect</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To reduce the growth of pathogens</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To kill unwanted microorganisms</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To prevent microorganisms from the air getting into the dish</div> <div style="border: 1px solid black; padding: 5px;">To prevent oxygen entering</div>	<p>1 mark per correct line each extra line cancels 1 mark</p>	<p>3</p>
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<p>3(b)(i)</p>	<p>dish 2 has (colonies of) microorganisms / bacteria / (but there are none in dish 1)</p>	<p>allow fungi / pathogens / microbes / germs allow more microorganisms in dish 2</p>	<p>1</p>		
<p>3(b)(ii)</p>	<p>untreated milk contains <u>living</u> microorganisms or microorganisms killed by UHT or no <u>living</u> microorganisms in UHT milk</p>	<p>ignore microorganisms enter from the air</p>	<p>1</p>		

Question 3 continues on the next page...

BLY3F**Question 3 Continued**

question	answers	extra information	mark
3(b)(iii)	dish 3 was not opened or it was sterilised or nothing / no milk was added	do not allow no growth of microorganisms because of lack of air / oxygen ignore microorganisms cannot enter from the air	1
Total			6

BLY3F**Question 4**

question	answers	extra information	mark
4(a)	root hair		1
4(b)(i)	85	if incorrect unit added = 0	1
4(b)(ii)	0.85	ignore working or lack of working accept correct answer from candidate's (i) for 2 marks $\frac{85}{100}$ with no answer or wrong answer gains 1 mark accept ecf	2
4(b)(iii)	absorb <u>more</u> water / ions or <u>large</u> surface area to absorb water / ions (2)	allow 'get / collect / take in / take up / soak up / suck up' for absorb allow 'lots' for more allow 'moisture' for water allow 'minerals / salts / nutrients' for ions do not allow food or named foods absorb water / ions gains 1 mark large surface area linked to incorrect function = 1 ignore small so short diffusion pathway	2
Total			6

BLY3F**Question 5**

question	answers	extra information	mark
5(a)(i)	bacteria		1
5(a)(ii)	8		1
5(a)(iii)	4 tonnes		1
5(b)(i)	mycoprotein contains less fat or less circulatory problems	it = mycoprotein fat must be comparative	1
	mycoprotein contains (more) fibre or reduces colon cancer		1
5(b)(ii)	beef contains <u>more</u> protein or <u>better</u> for growth / making cells / enzymes / antibodies	it = beef must be comparative	1
Total			6

BLY3F**Question 6**

question	answers	extra information	mark
6(a)	A high(er) pressure in A pulse / described in A	no mark – can be specified in reason part if B given = no marks throughout if unspecified plus two good reasons = 1 mark allow opposite for B do not accept ‘zero pressure’ for B accept fluctuates / ‘changes’ allow reference to beats / beating ignore reference to artery pumping	1 1
6(b)(i)	17		1
6(b)(ii)	68	accept correct answer from candidate’s (b)(i) x 4	1
6(c)(i)	oxygen / oxygenated blood glucose / sugar	allow adrenaline ignore air extra wrong answer cancels eg sucrose / starch / glycogen / glucagon / water allow fructose as an alternative to glucose ignore energy ignore food	1 1

Question 6 continues on the next page...

BLY3F**Question 6 Continued**

6(c)(ii)	carbon dioxide / CO ₂ / lactic acid	allow CO ₂ / CO ² ignore water	1
Total			7