



General Certificate of Secondary Education

Biology 4411

BLY3F

Unit Biology 3

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.

BLY3F**Question 1**

question	answers	extra information	mark
1(a)(i)	capillary		1
1(a)(ii)	diffusion		1
1(a)(iii)	Carbon dioxide	low(er) high(er)	1 mark for each correct row 1
	Oxygen	high(er) low(er)	
1(b)(i)	red blood cells		1
1(b)(ii)	haemoglobin		1
Total			6

BLY3F**Question 2**

question	answers	extra information	mark
2(a)(i)	respiration		1
2(a)(ii)	kill the <i>Penicillium</i>		1
2(a)(iii)	mix the <i>Penicillium</i> with the nutrients		1
2(b)(i)	5	accept in range 4.9 to 5.1	1
2(b)(ii)	between 40 and 70 hours		1
Total			5

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Question 3

question	answers	extra information	mark
<p>3(a)</p>	<p>The diagram consists of four boxes on the left and three on the right. Lines connect the boxes as follows: 'He heated the inoculating...' connects to 'To stop bacteria from the air...'; 'He secured the lid of the Petri dish...' connects to 'To stop oxygen getting in'; 'He put the Petri dish in an incubator' connects to 'To reduce the growth of pathogens'; 'To stop bacteria from the air...' connects to 'To kill bacteria'; and 'To stop oxygen getting in' connects to 'To kill bacteria'.</p>	<p>each correct line gains 1 mark extra line from a statement cancels the mark</p>	<p>3</p>
<p>3(b)(i)</p>	<p>Y</p>		<p>1</p>
<p>3(b)(ii)</p>	<p>separate (colony) or all from one bacterium</p>		<p>1</p>
<p>3(c)(i)</p>	<p>carbohydrate</p>		<p>1</p>
<p>3(c)(ii)</p>	<p>lactose more acidic</p>		<p>1 1</p>
<p>Total</p>			<p>8</p>

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Question 4

question	answers	extra information	mark
4(a)(i)	(too) big		1
	cannot fit / pass through filter / through (pores) in membrane / cannot be filtered	too big to be filtered = 2 marks	1
4(a)(ii)	water		1
4(a)(iii)	partially permeable		1
4(b)	<p>any two from:</p> <ul style="list-style-type: none"> • hazards of operation / named eg • may be rejected or need to use immunosuppressant drugs / long term drug use or transplant may need to be replaced • susceptible to other infections • shortage of donors • high <u>initial</u> cost 		2
Total			6

BLY3F**Question 5**

question	answers	extra information	mark
5(a)	transpiration		1
5(b)(i)	200	correct answer with or without working if answer incorrect: allow 1 mark for 8×25 or allow 1 mark for answer from candidate's count $\times 25$	2
5(b)(ii)	R	allow P or Q if candidate's answer to (b)(i) nearer to value for one of those do not allow R if the answer to 5bi would give an answer of P or Q allow R if 5bi is blank	1
5(b)(iii)	few stomata	allow no stomata on upper surface / all stomata on lower surface	1
	little / less transpiration or little / less water (vapour) loss / enable water to be retained	allow no water loss from upper surface	1
Total			6

BLY3F**Question 6**

question	answers	extra information	mark
6(a)(i)	carbon dioxide	accept CO ₂ / CO2 do not accept CO ²	1
6(a)(ii)	fermentation / respiration	ignore aerobic / anaerobic	1
6(b)	most / more gas (produced) or liquid level lowest	do not allow 'a lot' allow alternative descriptions ignore name of gas	1
6(c)(i)	repeat or compare with results of others	ignore reference to average or mean	1
6(c)(ii)	if reliable – get same / similar results or small range	allow same pattern but not pattern alone allow no anomalies ignore anomalies unqualified	1
6(d)	use smaller intervals around 30°C or between 25°C and 35°C	can be implied do not allow for temperatures below 25°C above 35°C ignore references to sensitivity or precision (of thermometer) NB do at 28°C, 30°C and 32°C = 2 marks	1 1
Total			7

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Question 7

question	answers	extra information	mark
7(a)	<p><u>person with muscle disease:</u></p> <p>any three from:</p> <ul style="list-style-type: none"> • higher resting rate or higher at start • when exercise starts / then increases more / more rapidly • peaks (then falls) • levels off <u>later</u> than healthy person • higher rate during exercise • greater range 	<p>allow reverse argument for healthy person</p> <p>NB all points are comparative except peak (point 3)</p> <p>allow use of two approximate figures as a comparison</p> <p>accept description eg rise fall</p> <p>if no other marks awarded allow 1 mark for 'it's higher'</p>	3
7(b)(i)	oxygen	<p>accept adrenaline</p> <p>accept O₂</p> <p>do not accept O, O2 or O²</p>	1
7(b)(ii)	<p>cannot release sugar / glucose (from glycogen)</p> <p>or</p> <p>cannot store glucose / sugar (as glycogen)</p> <p>need to receive glucose / sugar (from elsewhere)</p> <p>for energy / respiration / cannot store energy</p>	<p>ignore oxygen</p> <p>ignore aerobic / anaerobic</p>	<p>1</p> <p>1</p> <p>1</p>
Total			7

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