



General Certificate of Secondary Education

Biology 4411

BLY3H Unit 3 Biology

Mark Scheme

2008 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.

3.8 Unexpected Correct Answers not in the Mark Scheme

The Examiner should use professional judgement to award credit where a candidate has given an unexpected correct answer which is not covered by the mark scheme. The Examiner should consult with the Team Leader to confirm the judgement. The Team Leader should pass this answer on to the Principal Examiner with a view to informing all examiners.

BLY3H**Question 1**

question	answers	extra information	mark
(a)	0.62 to 0.64	ignore working or lack of working correct figures from graph 8.4 and 2.2 but no answer / wrong answer gains 1 mark or wrong figures from graph subtracted and divided by 10 gains 1 mark or answer 0.61 gains 1 mark	2
(b)	(oxygen for) <u>aerobic</u> respiration <u>more</u> energy available owtte or no / less harmful products or no ethanol / alcohol	allow more energy produced / created / made allow converse ignore more efficient	1 1
total			4

BLY3H**Question 2**

question	answers	extra information	mark
(a)	to kill (micro)organisms / bacteria / named organism or to sterilise	allow germs ignore remove / get rid of	1
(a)(ii)	(room temperature is) suitable / best for growth / reproduction of microorganisms or suitable / best for enzymes	accept converse allow germs allow grow / culture (at room temperature) ignore not killed / live	1
(a)(iii)	to prevent entry of microorganisms owtte	apply list principle allow germs ignore dust / dirt	1
(b)	yes (no mark) microorganisms / bacteria could (only) enter B or microorganisms / bacteria etc cannot enter flask A living organisms / bacteria / etc only develop from pre-existing organisms / bacteria owtte eg 'life from life' or reference to reproduction	can be implied allow do not spontaneously generate eg they can only grow if they can get in gains 2 marks	1 1
total			5

BLY3H**Question 3**

question	answers	extra information	mark
(a)(i)	methane	apply list principle allow symbols	1
(a)(ii)	<u>anaerobic</u> respiration / (anaerobic) fermentation	ignore decay / decomposition etc	1
(b)(i)	any two from: <ul style="list-style-type: none"> • manure disposed of • gains fertiliser (for crops) • gets (free) fuel or cheap supply of energy or (free) cooking / heating / lighting • can sell crops at higher price 	allow converse allow not using wood / trees	2
(b)(ii)	<u>in the UK</u>	allow converse arguments for Sri Lanka	1
	lower temperature or not enough heat	ignore other factor(s)	1
	process is slower or enzymes action slower	ignore references to efficiency / 'bacteria working'	
total			6

BLY3H**Question 4**

question	answers	extra information	mark
(a)	any three from: <ul style="list-style-type: none"> • rose <u>rapidly</u> (during exercise) / use of approximate figures • then more slowly (during exercise) • to max 126 / at 5 minutes / end of exercise • <u>rapid</u> fall (during recovery) or use of approximate numbers • then less rapid fall / use of approximate numbers • returned to resting rate (60 bpm) by 11 minutes 	accept rate (of increase) slows down	3
(b)	arteries dilate / widen	accept muscle in wall relaxes	1
(c)	any four from: <ul style="list-style-type: none"> • muscles using more energy or more energy released • muscles <u>respire</u> faster • supply more oxygen • supply more glucose / sugar • remove more CO₂ • remove lactic acid • remove heat / to cool 	do not accept energy produced } allow for aerobic respiration or to prevent anaerobic respiration } 'more' needed ONCE only for full marks	4
total		8	

BLY3H**Question 5**

question	answers	extra information	mark
(a)	any three from: <ul style="list-style-type: none"> • glucose enters blood from gut / liver / glycogen • glucose is <u>filtered out</u> of the blood • glucose is (a) small (molecule) • taken / etc back into the blood / reabsorbed • by active transport 	ignore 'diffusion' allow absorbed into the blood but not absorbed unqualified ignore diffusion	3
(b)(i)	<u>in a healthy person</u> protein not present because proteins are large (molecules) or because cannot pass through (filter) <u>in person with disease</u> lets protein through (filter) owtte		1 1

continued...

Question 5 continued...

question	answers	extra information	mark
(b)(ii)	<p><u>advantages:</u> up to any three from:</p> <ul style="list-style-type: none"> • no build-up of toxins / keeps blood conc. \pm constant • prevent high blood pressure • don't need restricted diet / restricted fluid intake or time wasted on dialysis • blood clots may result from dialysis • infection may result from dialysis • with dialysis, blood may not clot properly due to anti-clotting drugs • cost issues (ie transplant cheaper) <p><u>disadvantages: at least one from:</u></p> <ul style="list-style-type: none"> • rejection / problem finding tissue match • use of immuno-suppressant drugs \rightarrow other infections • dangers during operation / example described 	<p>ignore 'kidney works all the time'</p> <p>must have <u>at least one</u> advantage and <u>at least one</u> disadvantage for full marks</p>	<p>3</p> <p>1</p>
total			9

BLY3H**Question 6**

question	answers	extra information	mark
(a)	any two from: <ul style="list-style-type: none"> • transport up / against concentration gradient / low to high concentration • uses energy • use of protein / carrier 		2
(b)	microvilli – large(r) surface area	accept have carriers	1
	mitochondria – release energy or make ATP	do not accept ‘makes energy’	1
total			4

BLY3H**Question 7**

question	answers	extra information	mark
(a)(i)	ref. access of <u>fungus</u> to reactants / food / oxygen or maintain even temperature throughout or prevents sedimentation of fungus		1
(a)(ii)	any two from: <ul style="list-style-type: none"> • maintain constant / suitable / optimum temperature • prevent denaturation of enzymes / prevent death of microorganisms • microorganisms release / produce heat / energy or respiration releases / produces heat / energy 	ignore 'to cool' – needs qualification re. <u>reason</u> for cooling do not allow death of enzymes or denaturation of microorganisms	2
(b)(i)	66 – 72		1
(b)(ii)	glucose concentration falls first	allow falls faster	1

continued...

BLY3H**Question 7 continued...**

question	answers	extra information	mark
(b)(iii)	<u>description:</u> glucose concentration falls as biomass / fungus / Cephalosporium increases		1
	Cephalosporin C increases <u>after</u> biomass increase	must imply after	1
	<u>explanation:</u> glucose used in respiration / as source of energy for Cephalosporium or glucose used as material to make cells / to make hyphae	not just ‘used for growth’	1
	Cephalosporin C is a product from Cephalosporium (so Cephalosporium must be present to produce it) or Cephalosporium not produced until growth has ceased		1
total			9