



General Certificate of Secondary Education

Science B 4462/ Biology 4411

BLY1H Unit Biology 1

Mark Scheme

2009 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.

COMPONENT NUMBER: BLY1H**COMPONENT NAME: Science B / Biology****STATUS: Final****DATE: January 2009**

question	answers	extra information	mark
1(a)	brewed (coffee)	cancel if other coffees given	1
1(b)	less fat or less saturated fat or the amount of fat or fat levels or 0 / no fat or 0 / no saturated fat	it = latte with skimmed milk ignore less energy cancel if other nutrients given allow converse for latte with whole milk clearly identified eg 10.6 / 6.6	1
1(c)(i)	white chocolate mocha	apply list principle	1
1(c)(ii)	any two from: <ul style="list-style-type: none"> • high / most fat • high / most saturated fat • high / most energy • high / most sodium / salt • high / most sugar • leads to obesity / heart disease / high cholesterol / diabetes / arthritis / high blood pressure 	allow 'too much' for high	2
Total			5

COMPONENT NUMBER: BLY1H**COMPONENT NAME: Science B / Biology****STATUS: Final****DATE: January 2009**

question	answers	extra information	mark
2(a)	antibodies	allow antitoxins / memory cells do not allow antigens	1
	immune	ignore protection allow resistant	1
2(b)(i)	fell		1
	numerical qualification to zero / nothing / by 100%	allow stopped in 1995	1
2(b)(ii)	(no) % vaccination fell or when no vaccination	ignore circle	1
	but autism numbers did not fall / stayed high / increased or '(yes) might support it if time lag between vaccination and autism symptoms' / 'time lag for diagnosis' (1) 6 year time lag quantified (1)		1
Total			6

COMPONENT NUMBER: BLY1H**COMPONENT NAME: Science B / Biology****STATUS: Final****DATE: January 2009**

question	answers	extra information	mark
3(a)(i)	does not contain drug / chemical	allow eg fake / sugar pill / dummy drug ignore control	1
3(a)(ii)	as control or to see if the effects are psychological or allows blind testing	allow 'to compare (with NRT)' ignore fair test	1
3(b)(i)	gum	allow gum placebo allow placebo	1
3(b)(ii)	high / highest number of participants / people or correct number given ie gum 16706, gum placebo 9319, placebo 16458		1
3(c)(i)	nasal spray		1
3(c)(ii)	highest <u>percentage</u> of people stopped / 24% stopped biggest difference between treatment and placebo	 allow 'highest by 4%' for 2 marks	1 1
Total			7

COMPONENT NUMBER: BLY1H**COMPONENT NAME: Science B / Biology****STATUS: Final****DATE: January 2009**

question	answers	extra information	mark
4(a)(i)	receptor	allow named receptor eg light receptor ignore sensory neurone allow sense organ / named sensory organ eg skin / eye	1
4(a)(ii)	sensory (neurone)	allow afferent	1
4(a)(iii)	motor (neurone)	allow efferent	1
4(a)(iv)	effector / muscle / gland / named		1
4(b)	any two from: <ul style="list-style-type: none"> impulse / information passes from one neurone to another or impulse / information passes across gap chemical / transmitter involved diffusion (across gap) 		2
4(c)	brain / person not aware of pain / stimulus / can't feel	allow brain/ person doesn't know / realise / unable to coordinate ignore reflex ignore information	1
	possibility of (permanent / serious) damage / eg burning	ignore danger	1
Total			8

COMPONENT NUMBER: BLY1H**COMPONENT NAME: Science B / Biology****STATUS: Final****DATE: January 2009**

question	answers	extra information	mark
5(a)	any five from: <ul style="list-style-type: none"> • methane produced • <u>by</u> cattle • <u>by</u> rice • (more) greenhouse gas • CO₂ from tractors / machinery / food transport / fertiliser <u>production</u> • deforestation releases CO₂ • via decomposition / burning / less photosynthesis / reduced carbon sink • absorbs / reflects energy radiated from earth • energy / heat re-radiated back to earth 	} must be linked to methane ignore CO ₂ from animals ignore heat trapped	5
5(b)	variation / mutation individuals with characteristics most suited to environment survive genes passed to next generation or these individuals reproduce	allow survival of the fittest	1 1 1

Question 5 continued on next page...

COMPONENT NUMBER: BLY1H

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Question 5 continued...

question	answers	extra information	mark
5(c)	any two from: <ul style="list-style-type: none">• similar in size to Emperor penguin or bigger than all penguins• large size is adaptation to cold climate• since less heat loss per unit of body volume or smaller surface area / volume ratio		2
Total			10

COMPONENT NUMBER: BLY1H

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STATUS: Final

DATE: January 2009

question	answers	extra information	mark
6(a)	any four from: <ul style="list-style-type: none"> • nucleus / DNA / chromosomes / genetic material removed (from egg) • from (unfertilised) egg / ovum • nucleus from body cell of champion (cow) • inserted into egg / ovum • electric shock • to make cell divide or develop into embryo • (embryo) inserted into womb / host / another cow 	linked to second point allow 'empty egg cell' for first two marks do not allow fertilised egg allow egg from champion cow allow this point if wrong method eg embryo splitting	4

Question 6 continued on next page...

