General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H   **Unit Biology 1**

Mark Scheme

2010 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.

Marking Guidance for Examiners

GCSE Science Papers

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.

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Question 1

question	answers	extra information	mark
1(a)	any **two** from: • *s*treamlined / smooth • flippers • flattened / long / large / powerful tail	 allow description eg long and thin ignore slimy / oily skin unless qualified allow fins **or** webbed feet tail must be qualified to gain credit	2
1(b)	**1** mark for each adaptation and **1** mark for its correct <u>linked</u> advantage *eg* fat / blubber (1) insulates (1) **or** large mass to area ratio **or** small area to mass ratio (1) heat loss reduced (1)	correct advantage mark can be awarded if adaptation is attempted but not awarded the mark ignore skin / fur allow keeps warm ignore large body unqualified allow volume for mass ignore keeps warm	*2*
Total			**4**

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Question 2

question	answers	extra information	mark
2(a)(i)	quadrat / grid	allow suitable description in a(i) or a(ii) allow quadrant	1
2(a)(ii)	any **two** from: • use a transect / description • sample every metre • count plants (in quadrat)	allow measure distance of the test or sample site from road ignore random placing of quadrat	2
2(a)(iii)	the nearer to the road, the more (plantain) plants	accept the more dead nettles the less plantains	1

Question 2 continues on the next page

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Question 2 continued

question	answers		extra information	mark
2(b)(i)	any **two** factors from: eg			2
	• grow better / survive away from road			
	• sensitive to pollutant / named pollutant / dust / fumes		ignore carbon dioxide as pollutant	
	• (roadside) weedkillers			
	• trampling /damage / turbulence			
	• grass cutting			
	• competition			
	• aspect eg hillier			
	or			
	give **one** mark for a factor and **one** mark for its effect eg			
	dust (from road)	(1)		
	reduces photosynthesis	(1)		
	or			
	'loses' in competition	(1)		
	for light / water / nutrients / minerals / ions / space / soil	(1)	ignore food for plants	

Question 2 continues on the next page

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Question 2 continued

question	answers	extra information	mark
2(b)(ii)	any **two** factors eg • can withstand pollution • competition • aspect eg flat **or** give **one** mark for a factor and **one** mark for its effect eg use carbon dioxide (from traffic) (1) enhances photosynthesis (1) **or** 'wins' in competition (1) for light / water / nutrients / minerals / ions / space (1)	ignore distribution allow grows better in polluted air ignore 'prefer' pollution ignore food for plants	2
Total			**8**

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Question 3

question	answers	extra information	mark
3(a)	worldwide **or** several countries (outbreak)	ignore affects large numbers of people	1
3(b)	any **three** from • new strain of flu / virus changes / virus different • vaccination not effective **or** new vaccine not yet developed • antiviral drugs not effective / not yet developed • *people* not immune to it • virus not recognised by white blood cells / antibodies **or** antibodies / antitoxins not effective • people / animals travel between countries / abroad spreading infection	 ignore mutation allow resistant / immune to vaccine allow drugs / treatment not effective do **not** allow antibiotics not effective allow people not resistant accept no antibodies / antitoxins ignore white blood cells / antibodies fighting off	*3*
Total			**4**

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Question 4

question	answers	extra information	mark
4(a)	any **two** from: • arthritis • diabetes • high blood pressure • strokes • allow breathing difficulties	allow damaged joints accept high blood sugar allow blocked blood vessels / thrombosis ignore cancer ignore high cholesterol	2
4(b)(i)	any **two** from: • lower number of women deaths up to age of 75-80 • higher number of women deaths after 80 • men's peak higher • men's peak at an earlier age • men's death start earlier than women • more men than women die of heart disease	to gain marks there must be a comparison ignore comparison at single age ignore women die older **or** men die younger	2

Question 4 continues on the next page

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Question 4 continued

question	answers	extra information	mark
4(b)(ii)	any **two** from: • men smoke more (cigarettes) • more men smoke • men under more stress • men less active • more men overweight / eat more / less diet conscious **or** different fat distribution • genetic factors • men might have lower metabolic rate • men less likely to visit doctor even though they have symptoms	ignore alcohol ignore reference to body size ignore references to hormones	2
4(c)	 laboratory tests / tests on tissues **or** tests on animals **or** tests for toxicity tests for <u>side effects</u> on volunteers / healthy people / small numbers widespread testing **or** testing for optimum dose *or* test on patients / sick people *or* test to see if it is effective	points can be in any order ignore computer simulations accept use of placebo	1 1 1
Total			**9**

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Question 5

question	answers	extra information	mark
5	only 24 students tested **or** only one test **or** reference to lack of controls eg gender / age		1
	students could drink as much water as they wanted		1
	or		
	some students drank more water than others		
	or		
	some students drank water and beer		1
	differences only slight		
		ignore effects of beer or promotion of beer drinking	
Total			**3**

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Question 6

question	answers	extra information	mark
6(a)	genetically identical / same DNA / same chromosomes	**gains 2 marks** accept identical without reference to genetic material for **1** mark	2
6(b)	remove nucleus from egg	allow use empty egg cell	1
	insert genetic material / nucleus / DNA / chromosomes from frozen mouse	do **not** allow if reference to sperm	1
	electric shock **or** allow to divide **or** insert into womb / uterus		1
6(c)	ethical / religious / emotional reasons **or** not known if it is safe / long term effects not known	ignore playing God / unnatural / immoral	1
Total			**6**

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Question 7

question	answers	extra information	mark
7(a)	variation / range of leg sizes / mutation	do **not** allow <u>intention</u> to mutate	1
	ones with longer legs could feed in deeper water / get more food **or** long legged ones less likely to get feathers wet **or** long-legged ones could escape from leopards	allow reverse argument	1
	survive / <u>breed</u> / pass on genes	allow characteristics passed onto next generation	1
7(b)	flamingos stretched their legs (to be able to feed in deeper water/ keep feathers dry / escape from leopards)	It must be clear that the characteristic develops during the organisms lifetime ie it is not inherited from parents accept long legs are an acquired characteristic	1
	longer legs / acquired characteristic inherited by offspring	accept (acquired) genes for long legs passed on	1
Total			**5**

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Question 8

question	answers	extra information	mark
8(a)	FSH / follicle stimulating (hormone)	either order	1
	LH / luteinising (hormone)		1
8(b)	any **three** from: advantages of Invocell eg • low(er) cost • quick(er) • laboratory / incubator / equipment not <u>needed</u> • more convenient disadvantages of Invocell eg • low(er) success rate • embryo development cannot be monitored • can not be used where male is infertile • only tested on 800 women • (risk of) infection / pain in vagina argued conclusion	max **2** if only advantages **or** only disadvantages discussed allow reverse arguments ignore can be done in doctors surgery ignore sedation must include reference to **both** advantages and disadvantages and must be at end of answer	3 1
Total			**6**