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General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H Unit Biology 1

Mark Scheme

2011 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.

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Question 1

question	answers	extra information	mark
1(a)	any **two** from: • food / feeding • mates / mating • territory / space / land / shelter / nesting sites • status (within group)	 ignore water ignore homes / place to live / habitat / resources	2
1(b)(i)	rises to 1480 to 1500 **or** rises by 880 to 900 **or** rises until 1993 falls to 400 to 440 **or** falls by 1040 to 1100	 ignore incorrect figures if 1993 given if neither mark gained then allow **1** mark for rise followed by fall **or** fell by 160 to 200	1 1
1(b)(ii)	rises because: - less competition from mule deer **or** mule deer population falling **or** fewer mule deer falls because: - more competition from mule deer **or** mule deer population rising **or** more mule deer	ignore reference to food / breeding ignore reference to predation / disease ignore more / less suited to environment if neither mark gained then correct reference to competition gains **1** mark	1 1
Total			**6**

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Question 2

question	answers	extra information	mark
2(a)	any **two** from: • (high) CRP / protein • (no) heart condition • (not high) LDL • over 50 / age • number of tablets (each day)	allow health ignore time ignore placebo / rosuvastatin ignore number of people	2
2(b)	any **one** from: • tablet with no drug • tablet that has no effect • tablet without chemicals • tablet that people thought contained statin **or** reference to psychological effect	allow fake (pill) / dummy (pill) / sugar / chalk (pill) allow drug that has no effect ignore vitamin / mineral pill ignore control / different statin	1
2(c)	17802 / large number of people **or** enough people	ignore control group / fair test / control variables ignore time / repeats	1

Question 2 continues on the next page

Question 2 continued . . .

question	answers	extra information	mark
2(d)	any **one** from: • placebo group at risk of heart attack **or** to allow statin to be given to everyone • statin group 54% less likely to get heart attack **or** showed that statin worked **or** showed trial (very) successful • sufficient information gained / results conclusive • unethical / unfair to carry on trial	ignore cost ignore reliable ignore got results early	1
2(e)	to avoid bias **or** show impartiality **or** show results independent	allow manufacturers could cheat ignore reliability ignore could be sued / blamed if trial went wrong ignore manufacturer would know which group got statin / placebo	1
2(f)	any **two** from: • reduction in LDL • reduction in (saturated) fats • reduces deposition of fat / cholesterol / LDL in walls of blood vessels **or** blood vessels less likely to be blocked with fat / cholesterol / LDL	allow improves LDL:HDL balance **or** LDL and HDL concentrations equal ignore less cholesterol ignore more HDL do **not** accept less HDL	2
Total			**8**

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Question 3

question	answers	extra information	mark
3	(wbc) ingest / digest pathogens / bacteria / viruses	allow eat germs ignore swallow germs ignore ingest the disease ignore attack / kill the disease	1
	(wbc) produce antibodies		1
	(wbc) produce antitoxins		1
	any **one** from:		1
	• (antibodies) destroy or kill pathogens / bacteria / viruses / germs	ignore destroy / kill disease ignore attack / fight pathogens	
	• (antitoxins) counteract / destroy /neutralise toxins / poisons	ignore attack / killing toxins	
	• reasonable reference to memory cells **or** rapid production of antibodies upon re-infection		
Total			**4**

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Question 4

question	answers	extra information	mark
4(a)	improving quality of life **or** meeting (current) needs		1
	without compromising future **or** without harming environment	allow preserving natural resources ignore reference to using renewables / planting trees and other examples	1
4(b)	any **three** from eg:	ignore litter / pollution / rubbish	3
	• using public transport / walk / cycle / car share		
	• recycling	award only one mark for recycling	
	• using energy efficient appliances		
	• switching off appliances when not in use		
	• insulating home **or** reducing household temperatures	allow references to using less energy / electricity **only if** there is reference to specific example of how reduction can be achieved	
	• using less water by eg showering instead of bath		
	• using renewable energy **or** reducing use of fossil fuels	ignore planting trees	
	• using local resources **or** growing own food		
Total			**5**

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Question 5

question	answers	extra information	mark
5(a)	alters chemical reaction in the body **or** changes brain / body functioning **or** brain / body does not function correctly without drug	ignore references to dependence	1
	withdrawal symptoms	allow crave / craving	1
5(b)(i)	(rises to a) maximum at 25–29 / 30–34 / 25–34		1
	(falls to) minimum at 55–59		1
		if neither mark gained allow **1** mark for indicating high usage anywhere in the 20–44 range	
5(b)(ii)	any **two** from reference to eg: • (peer) pressure / fashionable • experiment / try new things • ease of obtaining drugs	ignore references to maturity / disposable income / stress	2
5(b)(iii)	some people will be dishonest / afraid to admit use	ignore sample not accurate	1
	(because) class A drugs illegal **or** because they will get into trouble		1
Total			**8**

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Question 6

question	answers	extra information	mark
6	mutation **or** variation **or** range of sizes	do **not** accept deliberate mutation **or** factor caused mutation	1
	warm(er) / dry(er) now	allow global warming	1
	if warmer more smaller lambs / sheep survive winter **or** if warmer sheep do not need fat / wool / fur to keep warm	award 'survival' point only if linked to warmer / dryer conditions	1
	or if warmer smaller sheep can lose heat more readily / do not overheat / keep cool (so survive)	do **not** accept smaller sheep retain more heat	
	or if warmer smaller sheep have larger SA / V ratio (so survive)	do **not** accept smaller sheep have smaller SA / V ratio	
	or if dryer smaller lambs / sheep need less grass (to survive)	ignore small sheep feed easier on grass	
	small sheep breed / pass genes / mutations / characteristics to next generation	do **not** accept if Lamarckian ignore competition / predation / human influence	1
Total			**4**

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Question 7

question	answers	extra information	mark
7(a)	any **two** from: • no fusion in asexual **or** sexual involves fusion **or** no mixing of genetic information in asexual **or** mixing of genetic information in sexual **or** asexual involves splitting (of one individual) • no gametes in asexual **or** sexual involves gametes • only one parent in asexual **or** sexual involves two parents • no variation in asexual **or** asexual produces clones **or** sexual leads to variations	assume it refers to asexual accept no fertilisation in asexual **or** fertilisation in sexual accept genes / alleles / chromosomes / genetics for genetic information accept named gametes allow offspring of sexual have characteristics of both parents for this point ignore sexual intercourse ignore external / internal ignore plants / animals ignore mitosis / meiosis	2
7(b)	nucleus of egg removed **or** involves empty egg cell so only one nucleus **or** one set of genetic information / genes / chromosomes **or** so genetic information / genes / chromosomes from one parent only		1 1
Total			**4**

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Question 8

question	answers	extra information	mark
8(a)	inhibit FSH production	ignore LH production ignore wrong hormone	1
	so egg does not mature	ignore egg production / egg release / egg development	1
8(b)	any **three** comparisons: eg • ease of insertion compared ie ring easily inserted by woman whereas implant needs professional **or** no damage to skin with ring	comparisons must be made ie two separate lists will gain no marks unless the lists are linked by eg whereas / however / on the other hand **and** the points are made in the same order in both lists	3
	• length of delivery compared eg 3 weeks for ring whereas 3 years for implant **or** delivery longer for implant **or** woman has to remember to insert ring whereas does not have to remember to insert implant	ignore cost	
	• effectiveness compared eg 0.3% failure with ring whereas nil for implant **or** implant more effective		
	• number giving up compared eg 4% for ring whereas 2% for implant **or** fewer women give up using implant **or** ring might cause vaginal discomfort whereas implant may cause irregular menstrual bleeding		
	reasoned conclusion (normally at the end)	ie must state 'better because....'	1
Total			**6**

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