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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2H Unit 2 Biology

Mark Scheme

2008 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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COMPONENT NAME: Additional Science / Biology

STATUS: Final

DATE: June 2008

question	answers	extra information	mark
1(a)	lipase	allow phonetic spelling allow lipidase	1
1(b)(i)	fall **then** rise owtte eg down **then** up	allow faster **then** slower ignore explanations	1
	minimum / least / fastest / best / optimum at 39–41(^{o}C)	allow it falls to 40(^{o}C)	1
		if no other marks gained, 'falls to an optimum' gains **1** mark	
1(b)(ii)	(yes)	there is no mark for circling 'yes' maximum **1** mark if No is circled	
	any **two** from: • less heat / energy / electricity / power required / used / wasted • conserves fuel supplies **or** less fuel used • less pollution from power stations owtte	ignore lower temperature accept less global warming **or** less CO_2 / carbon emissions / greenhouse gases **or** less SO_2 / acid rain **NB** only direct effects less pollution only is not enough	2

Question 1 continued on next page...

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Question 1 continued...

question	answers	extra information	mark
1(c)	any **two** from: • enzyme / lipase • destroyed / denatured • reference to (specific) shape changed	max **1** mark for reference to cell accept any named enzyme allow damaged / broken down **not** 'killed' ignore detergent / it	2
Total			**7**

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question	answers	extra information	mark
2(a)	cell membranes		1
2(b)(i)	two recessive / cystic fibrosis / faulty / diseased / the allele(s) / genes from Bob **and** Carol / both parents / the parents	two can be implied by second marking point ignore chromosomes if no other marks awarded 'Carol is a carrier' gains **1** mark	1 1
2(b)(ii)	(inherited) dominant / normal allele / gene from Carol / mother	ignore references to recessive allele / gene from father / Bob if no other marks awarded he has <u>just</u> / <u>only</u> one recessive allele gains **1** mark	1 1
2(c)(i)	reduce number of people with cystic fibrosis (in population) **or** reduce health-care costs **or** expensive to have baby with cystic fibrosis	accept to allow decision / emotional argument qualified eg allows abortion **or** allows people to make choices about termination **or** help to prepare financially / emotionally etc	1

Question 2 continued on next page…

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Question 2 continued…

question	answers	extra information	mark
2(c)(ii)	any **one** from: • possible damage / risk to embryo / fetus / baby • screening / it is expensive • (may) have to make ethical / moral / religious decisions • right to life	 allow possible harm / risk to mother ignore not natural / playing God / unethical / immoral / religious unqualified	1
Total			**7**

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question	answers	extra information	mark
3(a)	8.3 **or** 8.3 recurring **or** 8	award **both** marks for correct answer, irrespective of working 7 / 84 × 100 or equivalent for **1** mark	2
3(b)	any **three** from: • heat • respiration • movement **or** example of movement eg exercise / kinetic • faeces / waste / urine / excretion / urea	 allow keeping warm **not** <u>for</u> respiration ignore eggs / sound	3
3(c)	any **one** from: • less / no movement • less / no heat loss • reference to selective breeding • reference to controlled / better / more feeding	 allow examples of movement	1
3(d)	any **two** from: • less steps in food chain • less losses of biomass / energy / examples of losses • cheaper to feed herbivores	 allow dangerous to keep carnivores herbivores contain more energy is insufficient	2
Total			**8**

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question	answers	extra information	mark
4(a)	any **two** from: • to combine / use amino acids • in specific / particular / correct / right order • to manufacture protein / enzymes / hormones	do **not** allow to make amino acids allow examples of proteins / enzymes / hormones	2
4(b)(i)	(man) B any **three** from: • child gets DNA / bars / lines from mother and father / parents • (child has) mother's 25 / 28 / 30 / 31 **or** child gets 17 / 19 / 22 / 24 from mother • (child has) man B's 10 / 12 / 13 / 14 **or** child gets 18 / 20 / 21 / 23 from B • no bars / DNA / lines from man A correspond to child	no mark for this **but** max **2** marks if A given ignore genes / chromosomes Man B Child Mother 17 ——— 25 10 ——— 18 19 ——— 28 12 ——— 20 13 ——— 21 22 ——— 30 14 ——— 23 24 ——— 31 contradictions disqualify 2nd and / or 3rd marking points ignore genes / chromosomes	3
4(b)(ii)	any **two** from: • gametes / eggs / sperm • contain only half of (mother's / father's) DNA / chromosomes / genes / genetic information • due to meiosis		2
Total			**7**

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question	answers	extra information	mark
5(a)	pancreas		1
5(b)	protease	allow proteinase	1
5(c)(i)	(same) enzymes / named enzymes produced in other parts / named parts of digestive system	if named, enzymes and part must be correct	1
5(c)(ii)	diet / activity varies / amount of glucose in blood varies	accept too much insulin leads to coma / hypo / low blood sugar accept too little insulin leads to coma / hyper / high blood sugar	1
5(d)	any **two** from: pros • less / no experimentation on humans • dogs (more) similar to humans (than lower / named organisms) • it allows us to find a treatment **or** improves medical understanding cons • harmful / cruel to dogs • dogs may not be (metabolically) like humans conclusion justified by argument	 accept allows us to find a cure accept kills dogs 	2 1
Total			**7**

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question	answers	extra information	mark
6(a)	any **three** from: • ((mean) mass) increases up to 7 / 8 units (of light) then levels off • light limiting factor up to 7 / 8 units • for photosynthesis • other factor / temperature limiting above 7 / 8 units	must be in correct context	3
6(b)	any **two** from: • cost of providing conditions / heat / light / CO_2 • effect of treatment on profit • relevant use of data from graph eg limiting factors • named other factors eg fertiliser / pest control / weeds / density of planting	allow too much of factor is wasteful allow taste / appearance	2
6(c)	**nitrate function** produce amino acids / proteins / enzymes **nitrate deficiency** stunted growth **magnesium function** produce chlorophyll **magnesium deficiency** yellow leaves / plant	ignore DNA do **not** allow chlorophyll allow description ignore plant dies ignore chloroplasts ignore plant dies	1 1 1 1
Total			**9**