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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F 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)	**A** nucleus **B** (cell) membrane **C** cytoplasm		1 1 1
1(b)(i)	it is thin		1
1(b)(ii)	diffusion		1
Total			**5**

question	answers	extra information	mark
2(a)	photosynthesis		1
2(b)	oxygen		1
2(c)	chlorophyll		1
2(d)	starch		1
Total			**4**

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question	answers	extra information	mark
3(a)	microorganisms / bacteria / fungi / microbes	allow named example **or** mould ignore decomposers unqualified / germs / maggots / worms	1
3(b)	it is warm(er) / hot / increased heat / increased temperature	ignore 'sun is hot' unqualified	1
3(c)	oxygen		1
Total			**3**

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question	answers	extra information	mark
4(a)(i)	1400	award **2** marks for correct answer if no working shown 2400 – (300 + 600 + 100) or equivalent for **1** mark	2
4(a)(ii)	$\frac{1}{3}$		1
4(b)	**A**: chemical reactions **B**: food **C**: drinking	all **three** required for **1** mark	1
4(c)	cools / reduces temperature	allow 'maintaining body temperature' owtte do **not** allow regulate unqualified ignore reference to urea numerical references to temperature should be correct	1
4(d)	more sweat produced less urine produced		1 1
Total			**7**

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question	answers	extra information	mark
5(a)(i)	0		1
5(a)(ii)	osmosis		1
5(b)	0.5 no change in mass / weight **or** no (net) osmosis / same amount of water in <u>and</u> out	 allow 'chip / it stays the same'	1 1
5(c)	repeat / use more chips in each solution	allow use of other people's results do **not** allow 'get more results' unqualified do **not** allow leave longer / use more concentrations / better instrumentation	1
Total			**5**

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question	answers	extra information	mark
6(a)	30	award **both** marks for correct answer, irrespective of working 100 – (33 + 27 + 10) or equivalent for **1** mark	2
6(b)	2 **or** 1.98	award **both** marks for correct answer, irrespective of working (33 / 100) × 6 or equivalent for **1** mark	2
6(c)	respiration		1
6(d)(i)	less / no heat loss / movement	do **not** accept 'energy' / warmth unqualified	1
6(d)(ii)	any reference to cruelty eg stress to calf / cramped conditions	ignore references to disease / hygiene	1
Total			**7**

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question	answers	extra information	mark
7(a)	lipase	allow phonetic spelling allow lipidase	1
7(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) if no other marks gained, 'falls to an optimum' gains **1** mark	1
7(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 7 continued on next page...

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Question 7 continued...

question	answers	extra information	mark
7(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
8(a)	cell membranes		1
8(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
8(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
8(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 8 continued on next page…

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Question 8 continued…

question	answers	extra information	mark
8(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**