



General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY 1F Unit Biology 1

Mark Scheme

2010 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.

BLY 1F**Question 1**

| question | answers | extra information | mark |
|-----------------|--|--|-------------|
| 1(a)(i) | eye | ignore sight | 1 |
| 1(a)(ii) | nose / nostril | ignore smell | 1 |
| 1(a)(iii) | tongue | allow mouth / taste buds ignore taste | 1 |
| 1(b)(i) | stores more sugar / food / energy or sugar converted to fat | allow sugar builds up (in body) do not allow contains fat ignore more sugar in sugary cola ignore drank more sugar ignore sugar fattening | 1 |
| 1(b)(ii) | arthritis / diabetes / (high) blood pressure / heart disease | ignore cancer allow colon cancer | 1 |
| 1(c)(i) | 0.5 / half | allow 0.45 – 0.55 | 1 |
| 1(c)(ii) | 0.1 | for correct answer with or without working if incorrect / no answer then evidence of correct method 0.9 + 0.8 + 1.4 – 3 gains 1 mark or evidence of 3.1 – wrong column from graph ie 0.5 / 2 / 5/ 6 gains 1 mark | 2 |

Question 1 continues on the next page

BLY1F**Question 1 continued**

| question | answers | extra information | mark |
|-----------------|-----------------------|--|-------------|
| 1(c)(iii) | (high) blood pressure | allow heart disease / hypertension do not allow blocked arteries / cholesterol / diabetes / obesity | 1 |
| Total | | | 9 |

BLY1F**Question 2**

| question | answers | extra information | mark |
|-----------------|---|---|-------------|
| 2(a) | camouflage / less visible | ignore insulation | 1 |
| 2(b) | insulates / keeps warm | allow keeps out cold ignore camouflage | 1 |
| 2(c) | prey can't hear it / help catch prey / cannot hear it so isn't scared away | ignore predation on owl | 1 |
| 2(d) | catching / eating / killing prey / perching / defence | | 1 |
| Total | | | 4 |

BLY1F**Question 3**

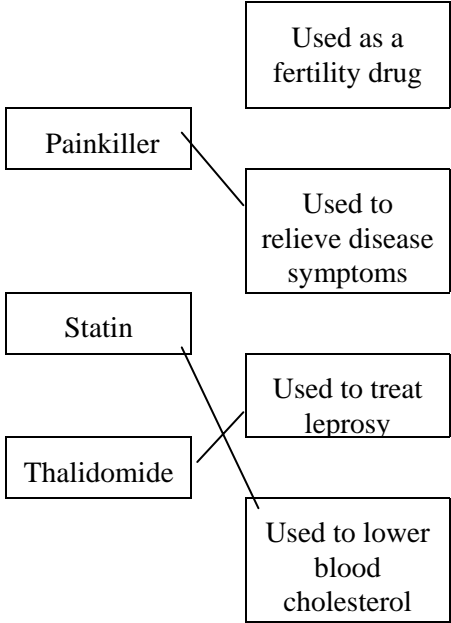
| question | answers | extra information | mark |
|-----------------|---|--------------------------|-------------|
| 3(a) | measles | | 1 |
| | mumps | | 1 |
| | rubella | | 1 |
| 3(b) | antibodies | | 1 |
| 3(c)(i) | any two from: <ul style="list-style-type: none"> • fell • then rose • any reasonable amplification eg until 2004 / to 80% • flattens off (between 1999–2000) | | 2 |
| 3(c)(ii) | eg fear of side effects or cost of vaccine or lack of vaccine or complacency / disease less common | | 1 |
| Total | | | 7 |

BLY1F**Question 4**

| question | answers | extra information | mark |
|-----------------|--|---|-------------|
| 4(a) | sexual | | 1 |
| 4(b) | chromosome | | 1 |
| 4(c)(i) | any two from: <ul style="list-style-type: none"> • genetic-engineering can produce fast-growing food animals • genetic engineering can be used to clone animals in danger of extinction • using GM animals can reduce the number of animals used in medical research | ignore answers that do not relate to list | 2 |
| 4(c)(ii) | GM animals might escape and breed with wild animals animals have the right to be free from genetic modification | ignore answers that do not relate to list | 1 1 |
| Total | | | 6 |

BLY1F

Question5

| question | answers | extra information | mark |
|--------------|---|---|----------|
| 5(a) |  <p>Used as a fertility drug</p> <p>Painkiller</p> <p>Used to relieve disease symptoms</p> <p>Statin</p> <p>Used to treat leprosy</p> <p>Thalidomide</p> <p>Used to lower blood cholesterol</p> | all three correct = 3 marks two correct = 2 marks one correct = 1 mark extra line from a statement cancels the mark | 3 |
| 5(b)(i) | 8 | | 1 |
| 5(b)(ii) | 3210 | | 1 |
| 5(c)(i) | if it is toxic | | 1 |
| 5(c)(ii) | if it has side effects | | 1 |
| Total | | | 7 |

BLY1F**Question 6**

| question | answers | extra information | mark |
|-----------------|--|---|-------------|
| 6(a) | any two from <ul style="list-style-type: none"> • survival of fittest • amplification of fittest ie has adaptations to survive • go on to breed or genes / characteristics passed on to next generation | allow examples allow examples NB best adapted organisms survive gains 2 marks | 2 |
| 6(b) | any two from eg: <ul style="list-style-type: none"> • increased height • increased erectness • shorter arms • legs straighter • larger skull • larger pelvis or changing shape described • humans walk on two legs / feet | ignore unqualified change eg ‘the skull changes shape’ allow description of modern human characteristic eg ‘modern humans stand up straight’ allow description of ape-like characteristics eg ape-like ancestor walked on four legs | 2 |
| 6(c) | any two from: <ul style="list-style-type: none"> • religious objections • insufficient evidence • mechanism of heredity not known did not know about genes / chromosomes / DNA / mutations • did not like the thought of being descended from apes | ignore no evidence accept could not prove | 2 |

Question 6 continues on next page

BLY1F**Question 6 continued**

| question | answers | extra information | mark |
|-----------------|--|---|-------------|
| 6(d) | Darwin's theory depends on differences in genes at birth / inborn variation / mutation | allow Darwin's theory depends on genetics ignore reference to time | 1 |
| Total | | | 7 |

BLY1F**Question 7**

| question | answers | extra information | mark |
|-----------------|---|--|-------------|
| 7(a) | any one from eg: <ul style="list-style-type: none"> • shorter distance between samples • sample to greater height • specify the size of each site | ignore repeat investigation / measurements ignore longer transect | 1 |
| 7(b)(i) | Parmelia | | 1 |
| 7(b)(ii) | Evernia | | 1 |
| 7(c) | any two from: <ul style="list-style-type: none"> • Lecanora does not extend over whole range of transect / does not grow everywhere / does not grow in town centre / does not grow in countryside • Lecanora grows in a range of <u>sulfur dioxide</u> concentrations or Lecanora only grows in limited range of <u>sulfur dioxide</u> concentrations or Lecanora lives over large range of <u>sulfur dioxide</u> concentrations • other factors eg different pollutant might also influence growth of Lecanora • sulfur dioxide / pollutant concentration was not measured • amount of Lecanora not measured | ignore Lecanora does not give accurate measure of sulfur dioxide concentration | 2 |
| Total | | | 5 |