GCSE

Biology

BL3FP

Mark scheme

4401

June 2015

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

Further copies of this Mark Scheme are available from aqa.org.uk

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 Assessment Objectives and specification content that each question is intended to cover.

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 and underlining

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 bullet points 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.

2.4 Any wording that is underlined is essential for the marking point to be awarded.

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students 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)

Student	Response	Marks awarded
1	green, 5	0
2	red*, 5	1
3	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Student	Response	Marks awarded
1	Neptune, Mars, Moon	1
2	Neptune, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a student 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, 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 or by each stage of a longer calculation.

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 is 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.

3.8 Ignore / Insufficient / Do <u>not</u> allow

Ignore or insufficient are used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

Do **not** allow means that this is a wrong answer which, even if the correct answer is given, will still mean that the mark is not awarded.

Quality of Written Communication and levels marking

In Question 8(c) students are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Students will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

Question	Answers	Extra information	Mark	AO / Spec. Ref.
1(a)(i)	alveoli / alveolus	allow air sacs allow phonetic spelling	1	AO1 312a
1(a)(ii)	any **one** from: • protection (of lungs / heart) • help you breathe / inflate lungs		1	AO1 312a
1(b)(i)	diffusion		1	AO1 312b
1(b)(ii)	capillaries		1	AO1 311h/i/k
1(b)(iii)	any **two** from: • (have many) alveoli • large surface / area • thin (exchange) surface **or** short diffusion pathway • good blood supply / many capillaries	allow air sacs accept only one / two cell(s) thick allow (kept) ventilated or maintained concentration gradient	2	AO1 321g
Total			**6**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
2(a)	any **one** from: • increased pollution • dumping waste	 allow described consequence eg vermin accept (increased) landfill accept (increased) fly tipping	1	AO1 341a
2(b)(i)	(mass of SO_2) decreases and then levels off / plateaus		1 1	AO2 341b
2(b)(ii)	2008	clear evidence of calculating 700 (000) = 1 mark	2	AO2 341
2(b)(iii)	any **one** from: • acid rain • erosion of statues / buildings • destruction of habitats • reduction in biodiversity • damage to lichen • breathing problems	ignore reference to ozone layer allow damage to plants	1	AO1 341b
2(c)	Carbon dioxide being absorbed in oceans and lakes Photosynthesis by trees		1 1	AO1 343b,342a
Total			**8**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3(a)	Lung		1	AO1 331a
3(b)	Filtering the blood		1	AO1 331c
3(c)	They will take in water and burst		1	AO2 311f,331b
3(d)(i)	6		1	AO2 331c/d/e
3(d)(ii)	less than 28		1	AO2 331c/d/e
3(d)(iii)	urea not reabsorbed **or** dialysis (fluid) has removed urea		1	AO2 331c/d/e
3(e)(i)	antibodies		1	AO1 331g/h
3(e)(ii)	Tissue typing the donor kidney		1	AO1 311i
Total			**8**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)	methane / CH_4	allow CH_4 do **not** allow CH^4 **or** ch4 or CH4	1	AO1 343c
4(b)	any **two** from: • didn't carry out repeats • only tested four types of manure • don't know the mass of manure was the same each time • inaccuracies in measuring (diameter of) balloon • bottles might have been different sizes • temperature of the room may have been different		2	AO3 343c
4(c)	The potato contains a lot of carbohydrate		1	AO1 343c
Total			**4**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)(i)	water / H_2O	accept oxygen allow H_2O do **not** allow H^2O or H2O	1	AO1 313a
5(a)(ii)	the mineral ions are absorbed by active transport the absorption of mineral ions needs energy		1 1	AO1 / AO2 311a/g, 313a
5(a)(iii)	have (many root) <u>hairs</u> (which) give a large surface area (for absorption)		1 1	AO2 313b
5(b)	carbon dioxide in **or** oxygen out **or** control water loss	accept gas exchange ignore gases in and out ignore gain / lose water	1	AO1 313c
5(c)(i)	guard cells		1	AO1 313e
5(c)(ii)	(stomata are) closed	allow there is no gap / space	1	AO2 313d/e
5(c)(iii)	plant will wilt / droop	ignore die	1	AO3 313d/e
Total			**9**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6(a)(i)	**B**		1	AO2 333a
6(a)(ii)	**D**		1	AO2 333a
6(a)(iii)	**C**		1	AO2 333a
6(b)(i)	insulin		1	AO1 333a
6(b)(ii)	pancreas		1	AO1 333a
Total			**5**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)(i)	fungus		1	AO1 344d
7(a)(ii)	oxygen / O_2	accept air accept O_2 do **not** allow O^2/ O / O2	1	AO2 344d
7(a)(iii)	glucose (syrup)	allow carbohydrate / sugar ignore food / starch allow oxygen if oxygen / air not given in (a)(ii)	1	AO1 344d
7(b)	any **two** from: • quicker • suitable for vegetarians • cheaper • more efficient **or** less land / methane	ignore high in protein ignore sustainability unqualified ignore less pollution unqualified allow less animals harmed / killed allow food chain is shorter **or** has less trophic levels allow less energy lost (from the food chain) do **not** allow no energy lost allow low(er) in calories (than some meat) allow low(er) in fat / healthier (than some meat) allow source of fibre / prevent constipation	2	AO3 344a/d
Total			**5**	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
8(a)	any **two** from: • carbon dioxide / CO_2 • urea • protein • water / H_2O • hormones / insulin	ignore food / waste / alcohol / drugs / enzymes ignore glucose and oxygen allow **two** correct hormones for 2 marks allow **two** correct food components for 2 marks allow antibodies allow antitoxins	2	AO1 321a,322b /c,331a
8(b)(i)	plasma platelets		1 1	AO1 322a
8(b)(ii)	(cardiac) muscle	allow muscular	1	AO1 321b

<table>
<tr><th>Question</th><th>Answers</th><th>Extra Information</th><th>Mark</th><th>AO / Spec. Ref</th></tr>
<tr><td>8(c)</td><td></td><td></td><td>6</td><td>AO3
32, 321f</td></tr>
<tr><td colspan="4">Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a ‘best-fit’ approach to the marking.</td></tr>
<tr><td>0 marks</td><td>Level 1 (1–2 marks)</td><td>Level 2 (3–4 marks)</td><td>Level 3 (5–6 marks)</td></tr>
<tr><td>No relevant content</td><td>There is a description of at least one advantage of the cow tissue valve
or
a description of at least one disadvantage of the cow tissue valve.</td><td>There is a description of at least one advantage of the cow tissue valve
and
at least one disadvantage of the cow tissue valve.</td><td>There is a description of the advantages and disadvantages of the cow tissue valve
or
a description of several advantages of the cow tissue valve and at least one disadvantage.</td></tr>
<tr><td colspan="2">examples of the points made in the response
Advantages of cow tissue valve:
• abundant supply of cows
• so shorter waiting time
• no need for tissue typing
• quicker operation
• less invasive or shorter recovery time
• cheaper operation costs
• less operation / anaesthetic risks

Disadvantages of cow tissue valve:
• made from cow so possible objections on religious grounds
• new procedure so could be unknown risks
• risks of using a stent eg. blood clots, stent breaking or valve tearing
• not proven as a long term treatment
• may be rejected</td><td colspan="2">extra information
ignore information copied directly from the table without value added

ignore can take many years to find a suitable human donor

ignore ethical arguments

allow possible transfer of disease from cow</td></tr>
</table>

Total			**11**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
9(a)	any **two** from: • (volume of) peat compost has been steady and then declined **or** volume of peat compost has declined since 2005 • (volume of) peat-free compost has increased (since 1999) • (volume of) peat is higher than peat-free until 2005, then peat-free compost is higher (than peat) • total volume of peat and peat-free compost has increased	allow 2007 instead of 2005 allow 2007	2	AO2 342d
9(b)	increases carbon dioxide (in the atmosphere)	ignore methane	1	AO1 342
9(c)	any **one** from: • reduces biodiversity • destruction of habitats • disruption of food chains		1	AO1 342b
Total			**4**	