AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.1

Biodiversity

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**18**
Available paper years	**2007–2021**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.7.3.1 Biodiversity

Answer 01 · Mark scheme January 2007 | BLY1F | Original Q7 | Legacy

Question 7

	answers	extra information	mark
(a)	any **two** from: • burning • activity of microbes / microbial respiration • less photosynthesis **or** trees take in CO_2 **or** less CO_2 locked up in wood • CO_2 given off by clearing machinery	ignore CO_2 release unqualified do **not** accept CO_2 taken in for respiration	2
(b)(i)	range of different species	accept idea of variety of organisms or plants or animals	1
(ii)	any **one** from: • organisms may produce substances useful to humans • duty to preserve for future generations • effect on other organisms e.g. food chain effects • loss of environmental indicators	do **not** accept if food is only example ignore effect on human food supply	1
total			4

4.7.3.1 Biodiversity

Answer 02 · Mark scheme June 2007 | BLY1B | Original Q2 | Legacy

Two	**A**	biodiversity	**2**
	B	carbon dioxide	**1**
	C	energy	**4**
	D	methane	**3**

Answer 03 · Mark scheme June 2007 | BLY1B | Original Q4 | Legacy

Four	**A**	burning fuels that release sulfur dioxide	**3**
	B	digging a new quarry	**4**
	C	sewage disposal	**2**
	D	using pesticides on crops	**1**

Answer 04 · Mark scheme March 2010 | BLY1BP | Original Q2 | Legacy

Two	**A**	biodiversity	**2**
	B	pollution	**4**
	C	global warming	**3**
	D	deforestation	**1**

Answer 05 · Mark scheme June 2010 | BLY1BP | Original Q4 | Legacy

No matching mark scheme was available in the supplied archive for this question.

Answer 06 · Mark scheme June 2010 | BLY1BP | Original Q9 | Legacy

No matching mark scheme was available in the supplied archive for this question.

4.7.3.1 Biodiversity

Answer 07 · Mark scheme November 2010 | BLY1BP | Original Q3 | Legacy

Three	**A**	extinction	**4**
	B	mutation	**1**
	C	natural selection	**3**
	D	variation	**2**

Answer 08 · Mark scheme January 2011 | BLY1F | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6(a)	methane		1
6(b)	fertiliser		1
6(c)	fuel		1
6(d)	the greenhouse effect		1
Total			**4**

Answer 08 · Mark scheme January 2011 | BLY1F | Original Q6 | Legacy

BLY1F

Answer 09 · Mark scheme March 2011 | BLY1BP | Original Q8 | Legacy

Eight	**2**	**2**	**3**	**2**

Answer 10 · Mark scheme June 2011 | BLY1BP | Original Q2 | Legacy

Two	**A**	burning fuels that release carbon dioxide	3
	B	building new houses	4
	C	spraying crops with pesticides	2
	D	using weedkillers on crops	1

Answer 11 · Mark scheme June 2011 | BLY1BP | Original Q8 | Legacy

Eight	**3**	**1**	**3**	**4**

4.7.3.1 Biodiversity

Answer 12 · Mark scheme

June 2011 | BLY1F | Original Q1 | Legacy

Question 1

question	answers	extra information	mark
1(a)(i)	carbon dioxide		1
1(a)(ii)	sulfur dioxide		1
1(b)(i)	reduces land available for animals and plants		1
1(b)(ii)	metals		1
1(c)(i)	pesticide		1
1(c)(ii)	kill other animals		1
Total			6

4.7.3.1 Biodiversity

Answer 12 · Mark scheme June 2011 | BLY1F | Original Q1 | Legacy

BLY1F

Answer 13 · Mark scheme November 2011 | BLY1BP | Original Q2 | Legacy

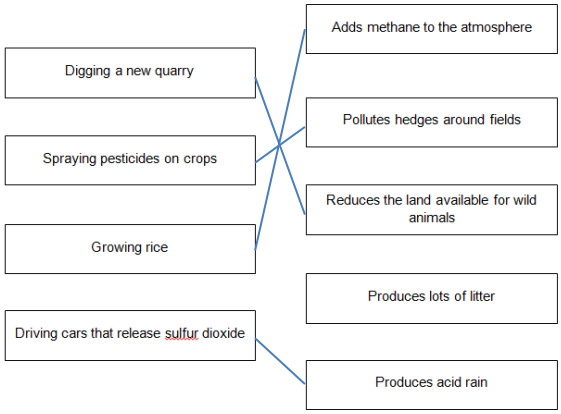
Two	**A**	deforestation	**3**
	B	recycling waste	**2**
	C	less cattle farming	**4**
	D	treating sewage	**1**

4.7.3.1 Biodiversity

Answer 14 · Mark scheme

June 2013 | BL3FP | Original Q1 | Legacy

Question 1

question	answers	extra information	mark
1(a)		**1** mark for each correct line extra line from box in left hand column cancels mark	4
1(b)	any **two** from: • climate change • more extreme weather / changes to weather (patterns) / described • rise in sea level • melting of ice caps • reduced biodiversity • changes to migration patterns • changes in distribution of species	ignore 'Earth warmer' accept faster plant growth / tropical species can be grown in UK accept tropical diseases / example spread to temperate regions	2
Total			**6**

4.7.3.1 Biodiversity

Answer 15 · Mark scheme

7			6	AO1 3.3.1

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.

0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content	There is at least one reason for deforestation **or** an attempt at a description of at least one way deforestation is affecting the atmosphere.	There is at least one reason for deforestation **and** a description of the way deforestation is affecting one gas in the atmosphere **or** the process that causes an effect.	There are reasons for deforestation **and** a clear description of the way deforestation is affecting one gas in the atmosphere **and** the process that causes this.

examples of the points made in the response	extra information
Reasons for deforestation • timber for construction / furniture / boat building / paper production • growing plants for biofuels for motor fuel / aviation / lawnmowers • use of wood as a fuel • land for building or agriculture to provide food, such as rice fields and cattle ranching	

Effects of deforestation
• increase in carbon dioxide in atmosphere
  ○ due to burning
  ○ due to activities of microbes
  ○ less carbon dioxide taken in / locked up (by trees)
  ○ less photosynthesis
• increase in methane in atmosphere
  ○ due to rice production / cattle
	ignore references to oxygen
	
	accept explanations of the effect of water (vapour)

4.7.3.1 Biodiversity

Answer 16 · Mark scheme

June 2019 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	Raphus		1	AO2 4.6.4
05.2	any **two** from: • humans hunted / killed / ate the dodo **or** dodo easy to catch • humans ate / collected eggs • humans ate the dodo's food • animals brought by humans ate dodo / eggs • diseases introduced by humans **or** by imported animals • humans destroyed dodo's habitat / nests	allow examples – eg cats / dogs / pigs / rats allow deforestation	2	AO2 4.6.3.6
05.3	any **one** from: • growing crops / biofuels • grazing animals • building houses • quarrying / mining • dumping waste	allow farming / agriculture allow other correct examples – eg building roads	1	AO1 4.7.3.3 4.7.3.4
05.4	there is less photosynthesis the trees are burned		1 1	AO2 4.4.1.1 4.4.1.2 4.7.3.4 4.7.3.5
05.5	increase		1	AO1 4.7.3.5
05.6	9 × 30 270	an answer of 270 scores **2** marks	1 1	AO2 4.7.3.4 4.7.3.6

4.7.3.1 Biodiversity

Answer 16 · Mark scheme

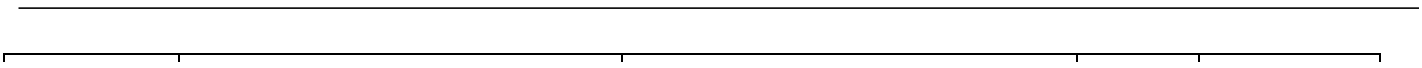
June 2019 | 8461/2F | Original Q5

Question	Answers	Mark	AO / Spec. Ref.
05.7	**Level 2:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	3–4	AO3
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	
	No relevant content	0	
	Indicative content • displaced animals can move to adjacent areas • where suitable habitat is found **or** where the trees have not been cut down • seeds return to deforested area • from other (forested) areas • plants / trees begin to grow back • so provide food / shelter / nest sites / suitable habitat for animals • animals return to re-growing area • from other (forested) areas • sufficient time for regeneration • old growth area is a source of recolonising organisms		4.7.3.1 4.7.3.4 4.7.3.6
Total			**13**

4.7.3.1 Biodiversity

Answer 16 · Mark scheme

June 2019 | 8461/2F | Original Q5



4.7.3.1 Biodiversity

Answer 17 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	$\frac{6.0}{1.6}$ 3.75	allow a range of 5.9 to 6.1 for 6.0 do **not** accept if a unit is given if no other marks awarded, allow a correct answer using a value of 5.8 or 6.2 for **1** mark	1 1	AO2 4.7.3.2
09.2	$\frac{2.5 - 1.6}{50}$ 0.018 (billion per year)	allow $\frac{0.9}{50}$	1 1	AO2 4.7.3.2
09.3 view with Figure 12	suitable extrapolation line on Figure **2** reading taken at 2050 from student's line	allow straight extrapolation allow a tolerance of ± ½ small square allow **1** mark for 10 billion if no extrapolation drawn	1 1	AO2 4.7.3.2
09.4	fewer fish caught **or** limit the number of fish caught (remaining fish) can reproduce	allow a method of doing this, eg increase mesh size **or** do not catch young fish allow more fish (survive to) reproduce	1 1	AO1 4.7.5.1 4.7.5.3

4.7.3.1 Biodiversity

Answer 17 · Mark scheme

November 2020 | 8461/2F | Original Q9

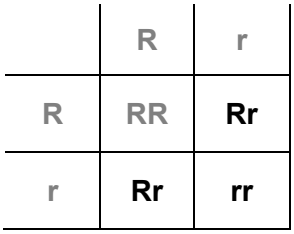
Question	Answers	Mark	AO / Spec. Ref.
09.5	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4-6	AO1 4.7.3.1 4.7.3.2 4.7.3.3 4.7.3.4 4.7.3.6 4.7.3.5 4.7.5.1 4.7.5.2
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1–3	
	No relevant content	0	
	Indicative content **human land use** • increasing population requires more food • crops / livestock for food • farming crops for biofuels • peat use as compost • peat use as fuel • increased use of pesticide / insecticide / herbicide / fertilisers • use of free-range / organic methods increases land use (for same yield) **link to biodiversity** • deforestation • monocultures • loss of hedgerows to make fields larger • loss of habitat • consequence of loss of habitat eg (change in) migration • fertiliser run off polluting water • use of pesticide / insecticide / herbicide reduces insects / plants which damages food chains • more soil erosion **link to atmospheric pollution** • more carbon dioxide (from farm animals / machinery) • more methane (from cows) • climate change **or** global warming • example of impact on biodiversity • acid rain • desertification Answers referring to only land use or only biodiversity are level 1		

09.6	golden rice has improved nutritional value		1	AO1 4.7.5.4
09.7	any **one** from: • gene may contaminate / enter other breeds / species • reduction / extinction of population of wild / traditional rice • reduction / extinction of population of flowers / insects • high cost of seeds • may have too much vitamin A (in diet)	ignore references to religious beliefs allow decrease in biodiversity allow decrease in gene pool allow may harm (human) health allow may cause side effects (on humans) ignore may harm humans unqualified	1	AO3 4.6.2.4
Total			**16**	

4.7.3.1 Biodiversity

Answer 18 · Mark scheme

November 2021 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	*Phytophthora*		1	AO2 4.6.4 4.7.5.1
05.2	the fungus can get oxygen from the air		1	AO2 4.4.2.1 4.7.5.1
05.3	the variety of species of organisms in the river		1	AO1 4.7.3.1
05.4	pesticide washed into river pesticide kills (some) organisms / plants / animals in river	allow spray drift allow reference to run-off allow carried by rainfall	1 1	AO2 4.7.3.1 4.7.3.2 4.7.3.6 4.7.5.1
05.5		all 3 correct = **2** marks 2 correct = **1** mark 0 or 1 correct = **0** marks	2	AO2 4.6.1.6 4.7.5.1
05.6	ring drawn around **RR** / **rr** in **Figure 9**	allow around both **RR** and **rr**	1	AO2 4.6.1.6 4.7.5.1
05.7	75%	percentage must match student's answer in **Figure 9** allow 75% if no answer to question **05.5**	1	AO3 4.6.1.6 4.7.5.1

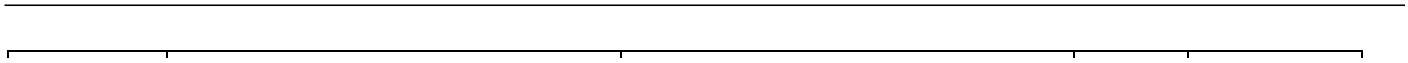
4.7.3.1 Biodiversity

Answer 18 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.8	no fusion of gametes **or** (asexual reproduction involves) mitosis	allow no fertilisation	1	AO2 4.6.1.1 4.6.1.3 4.7.5.1
	(so) offspring are genetically identical (to parent plant)	allow offspring are a clone allow offspring have same DNA allow no mixing of genes / DNA allow no mixing of genetic material allow all offspring inherit **R**	1	
Total			**11**	

4.7.3.1 Biodiversity

Answer 18 · Mark scheme November 2021 | 8461/2F | Original Q5



Answer 17 · Examiner comments November 2020 | 8461/2F | Original Q9

Question 9 (standard demand)

The question was about human population increase and the problem of provision of sufficient food. For the calculation in **09.2**, both of the values required were given in the information, so it was not necessary to determine figures from the graph. Despite this, many students did attempt to, often incorrectly. For those who did show the correct numbers in their calculations, a large proportion used them incorrectly, often adding them and very few did the necessary calculation of dividing the difference by 50. Some just left the value at '0.9' and a significant number divided this by 5, rather than by 50. Others calculated the mean of the two given values rather than the mean annual increase.

In **09.3** most students attempted to draw some sort of extrapolation on the graph; however, this was often not linked to the trend shown by the line, rising a little, then plateauing or even taking a downturn. Students could still gain the second mark for reading the correct value from their own line. Often this was not done accurately, particularly by students who continued their extrapolation beyond 2050 and read off the final population value. It was clear that students who simply read the scale, and gave answers such as '10' had not considered the implication that their answer of a human population of only 10, rather than 10 billion, is unlikely.

Of the more successful students in **09.4** these showed some understanding of the term 'quota' and described limiting fishing in one way or another. However, this was as far as some got as they omitted the idea that the remaining fish would be able to reproduce, in order to maintain stocks. Lower-attaining students often suggested that a quota referred to the amount of fish that people could buy or eat. In **09.5** many students did not link the need for more farmland to an increasing population needing more food. References to the use of chemicals to enhance growth were only given very occasionally. In terms of reduced biodiversity, hardly any students went beyond 'cutting down trees' and habitat loss. Few students referred to methane production but these rarely went any further. Whilst many students filled up the available space, most of these simply repeated the same vague points in order to do so.

Concluding Remarks

Particular problems which occurred quite frequently included:

- confusion of certain terms, eg mitosis / meiosis, reabsorption / filtration / excretion
- paying insufficient attention to information provided in the stem of a question in order to guide a reasoned response, avoid misconceptions and the inclusion of irrelevant information
- repeating, rather than using, information given in the question, for which no marks are available
- careless reading of the question resulting in an inappropriate answer, or not following instructions in multiple-choice items, such as to tick the correct number of boxes
- careless reading of data from a graph
- omitting numbers when a question asks for the use of data
- missing a question when no answer lines were provided and the answer needed to be in a table or a Punnett square
- poor handwriting, for example with numerals – especially the distinction between the numbers 1 and 2
- not checking whether the answer to a calculation is sensible – for example, in converting units over an appropriate order of magnitude, such as the conversion of nanometres to metres.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.