AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.1

Biodiversity

Past-paper questions

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

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.7.3.1 Biodiversity

Question 01

7 Deforestation affects the environment in many ways.

(a) Deforestation increases the amount of carbon dioxide in the atmosphere.

Give **two** reasons why.

1 .....

.....

2 .....

.....

(2 marks)

(b) Deforestation also results in a loss of *biodiversity*.

(i) What is meant by *biodiversity*?

.....

.....

(1 mark)

(ii) Give **one** reason why it is important to prevent organisms from becoming extinct.

.....

.....

(1 mark)

4

4.7.3.1 Biodiversity

Question 02

June 2007 | BLY1B | Original Q2 | Legacy

QUESTION TWO

The burning of forests to create more land for growing rice is affecting the environment.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A biodiversity

B carbon dioxide

C energy

D methane

Forests remove . . . **1** . . . from the atmosphere.

Cutting down forests reduces the amount of . . . **2** . . . .

Growing more rice is increasing the amount of . . . **3** . . . in the atmosphere.

The greenhouse effect is caused by the re-radiation of . . . **4** . . . back to the Earth.

4.7.3.1 Biodiversity

Question 03

June 2007 | BLY1B | Original Q4 | Legacy

QUESTION FOUR

Human activities affect the environment.

Match words, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A burning fuels that release sulfur dioxide

B digging a new quarry

C sewage disposal

D using pesticides on crops

	Effect on the environment
1	pollutes hedges that surround fields
2	pollutes river water directly
3	produces acid rain
4	reduces the land available for wild plants

4.7.3.1 Biodiversity

Question 04

March 2010 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

The drawing shows trees being cleared to make more land for farming.



Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A biodiversity

B pollution

C global warming

D deforestation

The removal of vast areas of trees is called . . . **1** . . . .

This can reduce . . . **2** . . . .

The trees no longer remove carbon dioxide from the atmosphere. This results in increased . . . **3** . . . .

The lorries used to move the trees cause air . . . **4** . . . .

4.7.3.1 Biodiversity

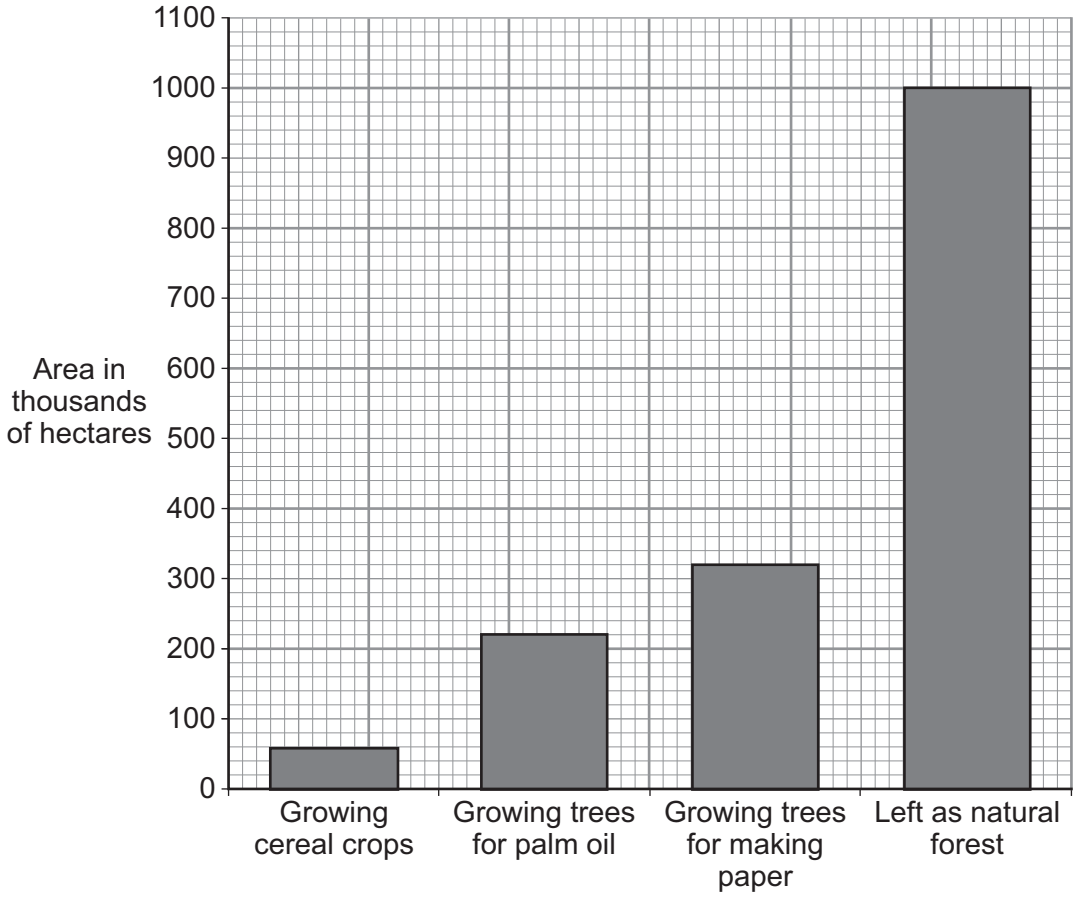
Question 05

June 2010 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

Tropical forests are being cut down and the cleared land used for other purposes.

The bar chart shows how tropical forest areas are now being used in one Asian country.



Match areas, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A 60 000 hectares

B 320 000 hectares

C 540 000 hectares

D 1 000 000 hectares

1	area of forest cleared for growing cereals
2	total area planted with trees for palm oil and making paper
3	area with the largest biodiversity
4	area which could be reduced by recycling

4.7.3.1 Biodiversity

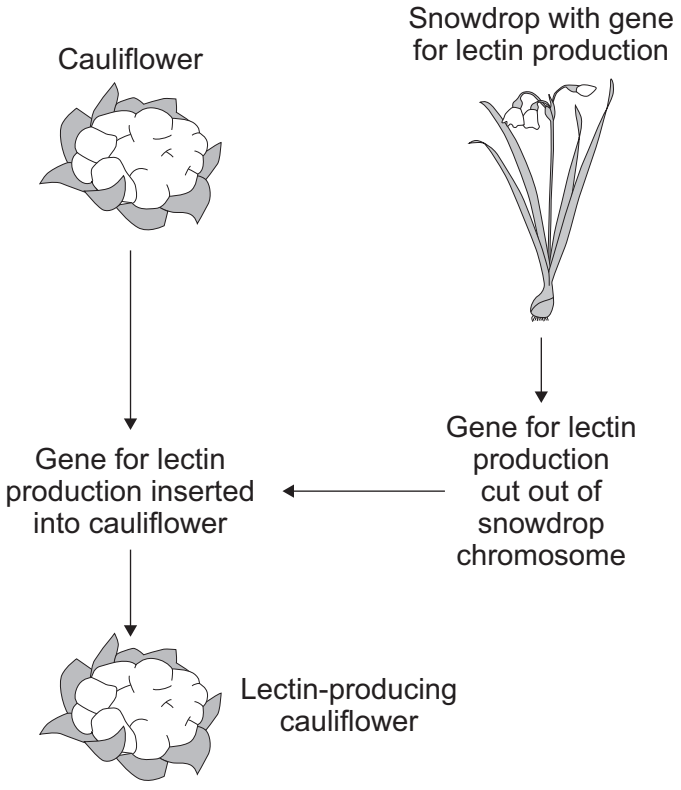
Question 06

June 2010 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Up to 40 % of cauliflower crops may be eaten by insects.
Snowdrops can survive attacks by insects because they produce a substance called lectin.
Lectin interferes with the insect's digestive system.

The diagram shows one method of introducing the gene for lectin production into cauliflowers.



9A The gene for lectin production is cut from the snowdrop chromosome using . . .

1 lectin.

2 a herbicide.

3 an enzyme.

4 an electric shock.

9B The technique used to transfer the gene from the snowdrop to the cauliflower is called . . .

1 biodiversity.

2 embryo transplant.

3 cloning.

4 genetic engineering.

4.7.3.1 Biodiversity

Question 06 · continued

9C What is the main benefit to the environment of farmers growing lectin-producing cauliflowers?

1 More snowdrops will survive.

2 Less pesticide will be used.

3 Insects will eat something else.

4 Less fertiliser will be needed.

9D An ethical concern about this technique is that . . .

1 it will make farmers richer.

2 it will increase biodiversity.

3 it is interfering with nature.

4 it is sustainable.

END OF TEST

4.7.3.1 Biodiversity

Question 07

November 2010 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

Living things have evolved on Earth over billions of years.

Match words, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A extinction

B mutation

C natural selection

D variation

1	a sudden change in a gene or chromosome
2	the range of differences in the characteristics of a species
3	the survival of organisms best suited to the environment
4	the death of all organisms of a species

4.7.3.1 Biodiversity

Question 08

January 2011 | BLY1F | Original Q6 | Legacy

6 The photograph shows water buffalo.
The water buffalo are being used to get a field ready for growing rice.



Draw a ring around the correct answer to complete each sentence.

6 (a) Rice crops add to global warming because rice produces

methane.
oxygen.
sulfur dioxide.

(1 mark)

6 (b) Waste from the buffalo is spread on the rice fields.

This means that the farmer needs to use less

fertiliser.
herbicide.
pesticide.

(1 mark)

6 (c) Using buffalo instead of a tractor helps to save

biodiversity.
fuel.
trees.

(1 mark)

6 (d) Global warming is caused by

acid rain.
the greenhouse effect.
toxic chemicals.

(1 mark)

4

4.7.3.1 Biodiversity

Question 09

March 2011 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

The picture shows part of a forest burning in Mexico.



8A The main reason for burning forests like this is to . . .

1 reduce the need for fertilisers.

2 use the land for agriculture.

3 use the land for roads.

4 reduce the 'greenhouse effect'.

8B Many scientists believe that large-scale deforestation has led to an increase in the carbon dioxide concentration in the atmosphere.

Which row in the table shows the effects of deforestation?

	Amount of carbon dioxide locked up in wood	Amount of carbon dioxide released by burning	Amount of carbon dioxide released by microorganisms
1	increases	decreases	increases
2	decreases	increases	increases
3	increases	increases	increases
4	decreases	decreases	decreases

4.7.3.1 Biodiversity

Question 09 · continued

8C Deforestation affects biodiversity.

What does the biodiversity of a habitat measure?

1 the total number of all living things in the habitat

2 the number of animal and plant species that have become extinct in the habitat

3 the number of different species in the habitat

4 the total number of animals of the most common species in the habitat

8D Sometimes cattle may be kept on areas that have been deforested.

Which gas in the atmosphere is produced in large amounts by cattle but not by humans?

1 carbon dioxide

2 methane

3 oxygen

4 sulfur dioxide

4.7.3.1 Biodiversity

Question 10

June 2011 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Human activities affect the environment.

Match activities, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A burning fuels that release carbon dioxide

B building new houses

C spraying crops with pesticides

D using weedkillers on crops

	Effect on the environment
1	may damage hedges that surround fields
2	may kill useful insects such as bees
3	may cause global warming
4	may reduce the land available for wild plants

4.7.3.1 Biodiversity

Question 11

June 2011 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

There are only a few unmapped and unexplored places on Earth. Scientists looking at satellite images on the internet have discovered a new giant forest area in Mozambique.

The scientists have made the first expedition to this giant forest area in Mozambique.

The scientists discovered several new species.

8A Only in the past 20 years have scientists been able to investigate the distribution of animals and plants by . . .

1 looking for fossil evidence.

2 going on an expedition.

3 searching the internet.

4 doing laboratory experiments.

8B The scientists say that the newly discovered giant forest has 'a very large biodiversity'.

Biodiversity is . . .

1 the total number of plant and animal species in an area.

2 the number of undiscovered plants and animals in the giant forest.

3 the number of plants and animals already known to scientists.

4 the number of plants and animals known to local villagers.

8C Why is it important to maintain a high level of biodiversity?

1 so that the forest is not cut down

2 so that many plant and animal specimens can be collected and stored

3 so that scientists may discover new plants to use as drugs and to use in different ways in the future

4 so that the locations of plants and animals can be recorded

4.7.3.1 Biodiversity

8D Some people think that it was not ethical for scientists to go on the expedition to the giant forest because . . .

1 scientists may discover new species.

2 scientists may help to map the area.

3 scientists may put information about the area's food chains on the internet.

4 scientists may carry new diseases to the people in the area.

Turn over for the next question

4.7.3.1 Biodiversity

Question 12

June 2011 | BLY1F | Original Q1 | Legacy

1 The photographs show some ways in which humans affect the environment.

1 (a) Coal-burning power stations give off smoke. The smoke contains many different gases.



Draw a ring around the correct answer to complete each sentence.

1 (a) (i) The gas which causes global warming is

carbon dioxide.
oxygen.
sulfur dioxide.

(1 mark)

1 (a) (ii) The gas which causes acid rain is

methane.
oxygen.
sulfur dioxide.

(1 mark)

1 (b) The photograph shows a quarry.



4.7.3.1 Biodiversity

Question 12 · continued

June 2011 | BLY1F | Original Q1 | Legacy

Draw a ring around the correct answer to complete each sentence.

1 (b) (i) Quarrying

- releases methane into the atmosphere.
- increases biodiversity.
- reduces land available for animals and plants.

(1 mark)

1 (b) (ii) Quarrying can be reduced by recycling

- metals.
- paper.
- plastic

(1 mark)

1 (c) The photograph shows a farmer spraying fruit trees.



Chemicals in the spray kill insects on the trees.

Draw a ring around the correct answer to complete each sentence.

1 (c) (i) The spray contains

- fertiliser.
- herbicide.
- pesticide.

(1 mark)

1 (c) (ii) The chemical in the spray might also

- kill other animals.
- kill plants.
- increase biodiversity.

(1 mark)

6

4.7.3.1 Biodiversity

Question 13

November 2011 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Human activities affect the environment.

Match activities, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A deforestation

B recycling waste

C less cattle farming

D treating sewage

	Effect on the environment
1	reduces river pollution
2	reduces the need for landfill sites
3	reduces biodiversity
4	reduces the production of methane

4.7.3.1 Biodiversity

Question 14

June 2013 | BL3FP | Original Q1 | Legacy

1 Human activities affect the environment.

1 (a) **List A** gives four human activities.

List B gives the effect of the activities on the environment.

Draw **one** line from each human activity in **List A** to its effect on the environment in **List B**.

List A **Human activity**	**List B** **Effect on the environment**
	Adds methane to the atmosphere
Digging a new quarry	
	Pollutes hedges around fields
Spraying pesticides on crops	
	Reduces the land available for wild animals
Growing rice	
	Produces lots of litter
Driving cars that release sulfur dioxide	
	Produces acid rain

(4 marks)

4.7.3.1 Biodiversity

Question 14 · continued

1 (b) Human activities are increasing *global warming*.

Give **two** effects of *global warming* on the environment.

1 .....

.....

2 .....

.....

(2 marks)

6

Turn over for the next question

4.7.3.1 Biodiversity

Question 15

June 2014 | BL3FP | Original Q7 | Legacy

7 **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Deforestation affects the environment.

Deforestation is causing a change in the amounts of different gases in the atmosphere. This change causes global warming and climate change.

Figure 11 shows an area of deforestation.

Figure 11



Give the reasons why deforestation is taking place.

Describe how deforestation is causing the change in the amounts of different gases in the atmosphere.

[6 marks]

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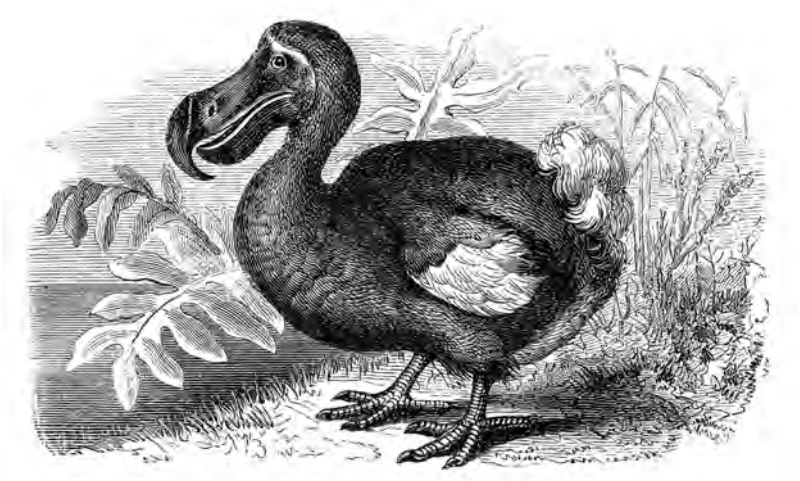
4.7.3.1 Biodiversity

Question 16

June 2019 | 8461/2F | Original Q5

0 5 **Figure 10** shows a flightless bird called the dodo (*Raphus cucullatus*).

Figure 10



The dodo:

- was 1 m tall
- had a mass of 20 kg
- lived in rainforests on a tropical island
- ate fruits
- made its nest on the ground.

A female dodo laid only one egg each year.

Humans arrived on the island in the year 1507. By 1681 the dodo was extinct.

0 5 . 1 What is the genus of the dodo?

[1 mark]

Tick (✓) **one** box.

Animal ☐

Bird ☐

Raphus ☐

4.7.3.1 Biodiversity

Question 16 · continued

0 5 . 2 Before the arrival of humans, there were no other large animals living on the island.

Suggest **two** reasons why the dodo became extinct soon after the arrival of humans.

[2 marks]

1 _____

_____

2 _____

_____

Today, humans are cutting down large areas of tropical rainforests.

0 5 . 3 Suggest **one** use of the land after the trees have been removed.

[1 mark]

_____

_____

0 5 . 4 Why does the removal of trees cause an increase in carbon dioxide in the atmosphere?

[2 marks]

Tick (✓) **two** boxes.

- There are fewer animals. ☐
- There is less photosynthesis. ☐
- There is less respiration. ☐
- The soil dries out. ☐
- The trees are burned. ☐

Question 16 · continued

0 5 . 5 What effect would an increase in carbon dioxide in the atmosphere have on global air temperature?

[1 mark]

Tick (✓) **one** box.

Decrease ☐

Increase ☐

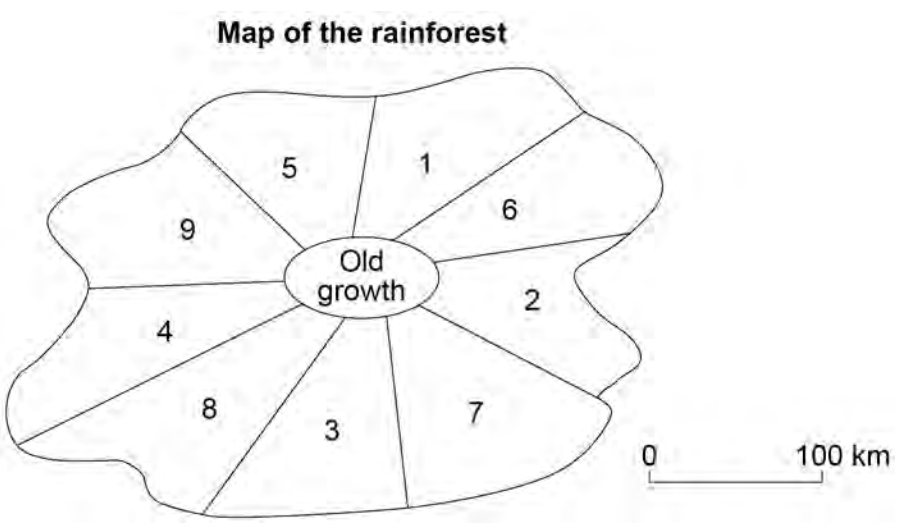
Stay the same ☐

'Sustainable forestry' reduces the harmful effects of cutting down trees on the environment.

Figure 11 shows a method of 'sustainable forestry'.

Numbers 1–9 show different parts of a rainforest.

Figure 11



The trees are cut down in the sequence 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

- The trees are cut down in only one area at any one time.
- It takes 30 years to cut down the trees in each area.
- The trees in the 'Old growth' area are never cut down.

4.7.3.1 Biodiversity

Question 16 · continued

0 5 . 6 How many years would it take to cut down the trees in all of the numbered areas in **Figure 11**?

[2 marks]

Number of years = _____

0 5 . 7 The rainforest contains:

- 750 species of trees
- 400 species of birds
- 150 species of butterflies
- many other species of plants and animals.

Explain how the pattern of cutting down trees shown in **Figure 11** stops the biodiversity of the rainforest being reduced.

[4 marks]

13

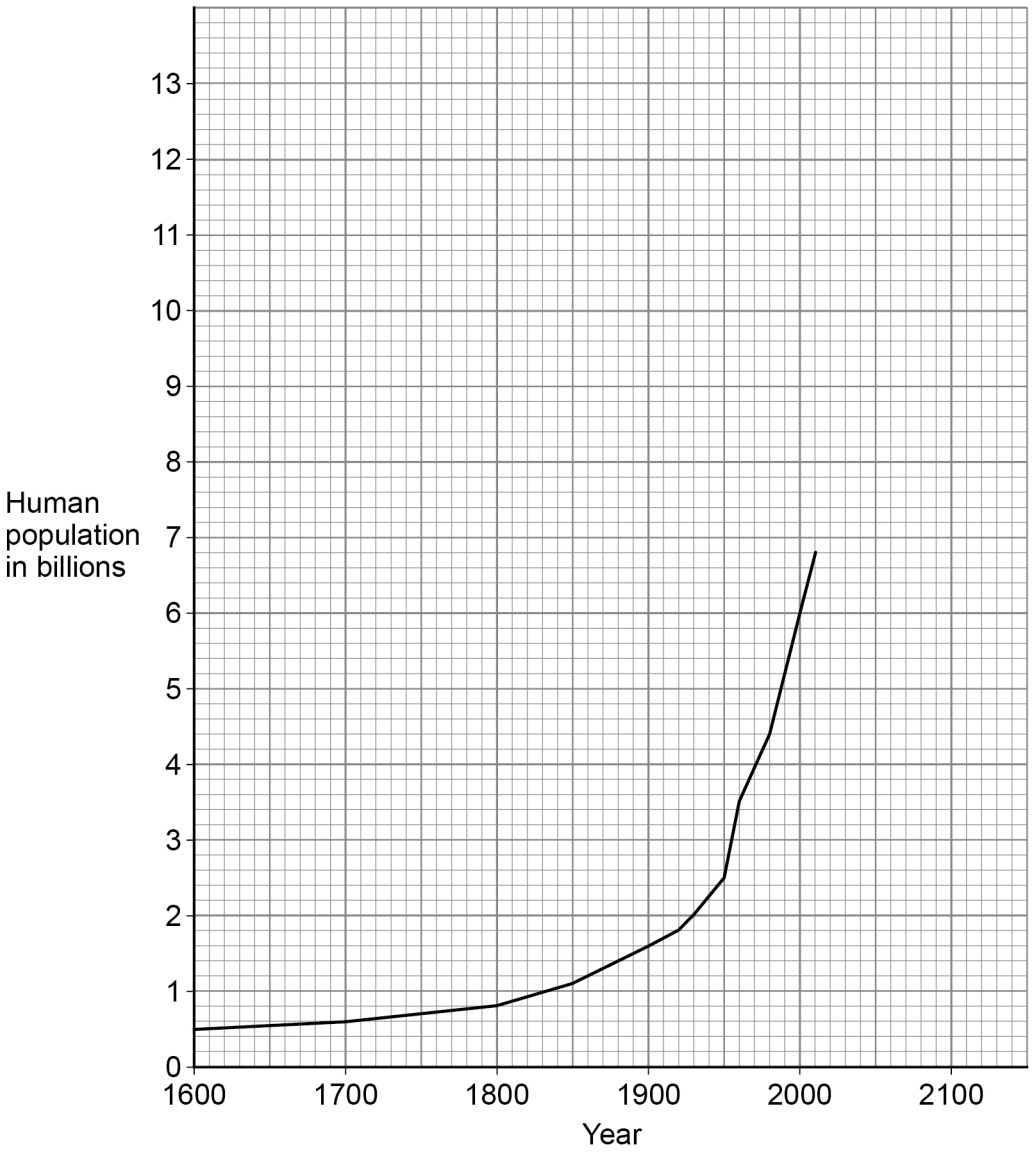
4.7.3.1 Biodiversity

Question 17

November 2020 | 8461/2F | Original Q9

0 9 **Figure 12** shows the human population from 1600 to 2010.

Figure 12



In 1900 the human population was 1.6 billion.

0 9 . 1 Calculate how many times greater the human population was in the year 2000 compared with the year 1900.

[2 marks]

Number of times greater = _____

4.7.3.1 Biodiversity

Question 17 · continued

0 9 . 2 In 1950 the human population was 2.5 billion.

Calculate the mean annual increase in the human population between 1900 and 1950.

[2 marks]

Mean annual increase = _____ billion per year

0 9 . 3 Predict the human population in 2050 if the current rate of population increase continues.

You should draw an extrapolation line on **Figure 12**.

[2 marks]

Predicted human population = _____

0 9 . 4 The increasing human population has caused a decline in fish stocks.

Describe how fishing quotas can help to return fish stocks to a sustainable level.

[2 marks]

Question 9 continues on the next page

4.7.3.1 Biodiversity

Question 17 · continued

0 9 . 5 Farming techniques have changed in recent years.

Describe:

- why more land is being used for farming
- how increased farming has decreased biodiversity.

[6 marks]

4.7.3.1 Biodiversity

Question 17 · continued

November 2020 | 8461/2F | Original Q9

0 9 . 6 Genetic modification of crop plants can help meet the demands of the increasing human population.

Golden rice is a genetically modified (GM) crop.

What is the advantage of golden rice compared with non-GM rice?

[1 mark]

Tick (✓) **one** box.

Golden rice contains protein-rich mycoprotein ☐

Golden rice has improved nutritional value ☐

Golden rice produces human insulin ☐

0 9 . 7 Suggest **one** reason why some people are concerned about the use of golden rice.

[1 mark]

_____

_____

16

4.7.3.1 Biodiversity

Question 18

November 2021 | 8461/2F | Original Q5

0 5 Potato blight is a disease of potato plants.

Potato blight is caused by the fungus *Phytophthora infestans.*

0 5 . 1 What is the genus of the fungus that causes potato blight?

[1 mark]

Tick (✓) **one** box.

infestans ☐

Phytophthora ☐

Phytophthora infestans ☐

0 5 . 2 The fungus grows near the surface of the potato.

How does growing near the surface help the fungus to respire?

[1 mark]

Tick (✓) **one** box.

The fungus can get nitrogen from the soil. ☐

The fungus can get oxygen from the air. ☐

The fungus can get water from the potato. ☐

Question 5 continues on the next page

Question 18 · continued

A farmer sprays his potato plants with a pesticide.

The pesticide kills the fungus that causes potato blight.

Spraying the crop with a pesticide could decrease biodiversity in a river flowing through his farm.

0 5 . 3 What does 'biodiversity in a river' mean?

[1 mark]

Tick (✓) **one** box.

- The variety of species of animals in the river. ☐
- The variety of species of organisms in the river. ☐
- The variety of species of plants in the river. ☐

0 5 . 4 The farmer sprayed pesticide on his potato plants. The next day it rained heavily.

Explain why the biodiversity in the river decreased.

[2 marks]

Another method of preventing potato blight is to breed potatoes that are resistant to blight.

Resistance to potato blight is controlled by two alleles:

R = a dominant allele for having resistance to blight.

r = a recessive allele for **not** having resistance to blight.

A scientist crosses two potato plants. Each plant has the genotype **Rr**.

Question 18 · continued

0 5 . 5 Complete **Figure 9** to show the possible genotypes of the offspring produced.

[2 marks]

Figure 9

		Male gametes: R	Male gametes: r
Female gametes	R	RR	
Female gametes	r		

0 5 . 6 Draw a ring around **one** of the homozygous genotypes in **Figure 9**.

[1 mark]

0 5 . 7 What percentage of the offspring in **Figure 9** will be resistant to potato blight?

[1 mark]

Tick (✓) **one** box.

25% ☐ 50% ☐ 75% ☐ 100% ☐

0 5 . 8 Potatoes can also reproduce asexually.

Potatoes from one plant can be planted in the ground to produce new potato plants.

All the new plants from a parent plant that is resistant to blight will also be resistant to blight.

Explain why.

[2 marks]

11