AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.6

Maintaining biodiversity

Past-paper questions

Tier	**Higher**
Question groups	**14**
Available paper years	**2007–2025**

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.

4.7.3.6 Maintaining biodiversity

Question 01

January 2007 | BLY1H | Original Q2 | Legacy

2 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

4.7.3.6 Maintaining biodiversity

Question 02

November 2008 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

The table gives information about the number of species of organisms in the world today.

	Total number of known species
plants	400 000
animals	1 400 000
species which live in tropical rainforests	720 000

5A The rate of extinction of species in tropical rainforests is currently 0.5% per year. This rate is predicted to increase to 5% per year.

How many species will become extinct next year if the predicted rate takes place?

1 3600

2 20 000

3 36 000

4 70 000

5B What is the main cause of the extinction of rainforest species?

1 pollution

2 loss of habitat

3 overcrowding

4 increase in sustainable development

5C Deforestation also damages the environment because . . .

1 less oxygen is released into the atmosphere.

2 less carbon dioxide is released into the atmosphere.

3 less carbon is ‘locked-up’ in timber.

4 more methane is released into the atmosphere.

4.7.3.6 Maintaining biodiversity

5D One reason often given for clearing forests is that it provides an income for the local population.

Which of the following is **not** an economic reason for deforestation?

1 The forest could be developed for tourism.

2 Some plants in the forest may be sources of useful drugs.

3 The local people can conserve the forest for future generations.

4 Some trees in the forest may be valuable.

Turn over for the next question

4.7.3.6 Maintaining biodiversity

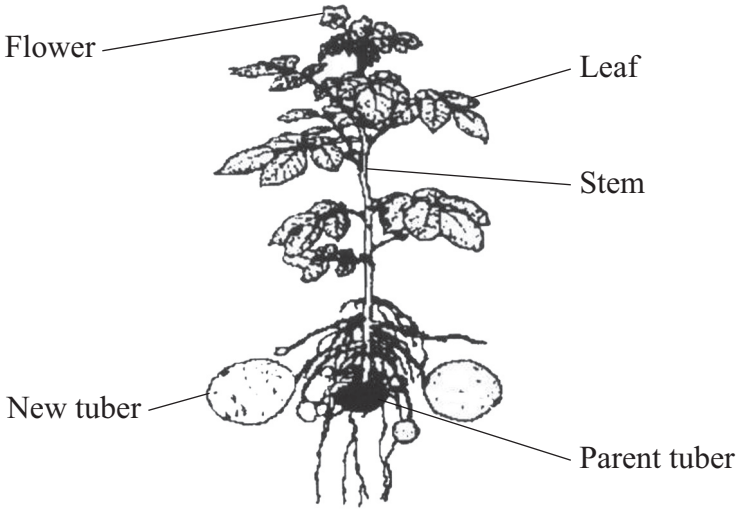
Question 03

March 2009 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

There are many varieties of potato plant, producing tubers with different qualities.

Potato plants can reproduce both sexually and asexually.



7A How could new varieties of potato be produced?

1 taking small groups of cells from a new tuber and growing them

2 taking cuttings from the leaf or stem of the plant and growing them

3 allowing gametes from different potato plants to fuse together

4 allowing new tubers to stay in the ground and to grow next year

7B Scientists wish to create a variety of potato which will tolerate drought conditions.
They have identified the gene which gives a cactus species the ability to survive with very little water.

What would be the best way of producing drought-resistant potatoes?

1 breed ordinary potato plants with cactus plants

2 use enzymes to cut out the gene from the cactus and transfer it to potato cells

3 selectively breed cactus plants which, over many generations, are more like potatoes

4 grow potato plants in low water conditions over many generations

4.7.3.6 Maintaining biodiversity

Question 03 · continued

7C Some people believe that using genetic engineering to develop potatoes that are tolerant to drought conditions should **not** be allowed.

One reason for this is because . . .

1 the new variety of potato may be susceptible to the same diseases as cactus plants.

2 the cost of the technology required outweighs the possible profits.

3 the native potato may compete with the new variety.

4 there are ethical concerns about interfering with natural processes.

7D Herbicide-resistant potatoes have also been produced.

The advantage of this is that . . .

1 old potato plants can easily be killed to make way for new crops.

2 it is easy to kill insects which might feed on the crop.

3 the growth of wild flowers is encouraged, maintaining biodiversity.

4 competition from other plants can be reduced.

4.7.3.6 Maintaining biodiversity

Question 04

June 2009 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Organic foods have become popular in recent years. They are grown without the use of pesticides and artificial fertilisers. But a government report in 2007 showed that the production of some organic foods is more damaging to the environment than their non-organic equivalents. However, supporters of organic farming claim that it is better than non-organic farming in conserving biodiversity and is better for the soil.

9A Biodiversity is . . .

1 the ability of plants and animals to adapt to a wide variety of different environments.

2 the ability of two plants or animals to live alongside each other for their mutual benefit.

3 the existence of a wide variety of plants and animals.

4 the existence of two different environmental adaptations of the same species of plant.

The table compares some of the effects of non-organic and organic food production on the environment.

Environmental effect and units	Amount in kg of production on farm					
	Sheep meat		Chicken		Milk	
	Non-organic	Organic	Non-organic	Organic	Non-organic	Organic
Energy used in MJ	23	18	12	16	2.5	1.6
Global warming potential in grams of CO_2 equivalent	17 400	10 100	4750	6680	1060	1230
Freshwater pollution by fertiliser potential in grams of phosphate equivalent	200	584	49	86	6.3	10.3
Acidification potential in grams of sulfur dioxide equivalent	380	1510	173	264	16.2	26.4
Land use in hectares	0.0014	0.003	0.64	1.4	0.001	0.002

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9B The information in the table indicates that . . .

1 all organic food production uses more energy than non-organic farming methods.

2 changing completely to organic methods will at least double the amount of land used for food production.

3 organic food production improves the environment.

4 organic farming reduces the amount of pollution resulting from sulfur dioxide.

4.7.3.6 Maintaining biodiversity

Question 04 · continued

9C A change from non-organic farming methods to the organic production of chicken and milk may . . .

1 contribute to an increase in acid rain.

2 help to reduce pollution of freshwater.

3 help to reduce global warming.

4 reduce the amount of energy consumed in the production of the food.

9D Which of the foods in the table is responsible for the greatest increase in environmental pollution when it is produced organically rather than non-organically?

1 sheep meat

2 chicken

3 milk

4 it is impossible to tell from this data

END OF TEST

4.7.3.6 Maintaining biodiversity

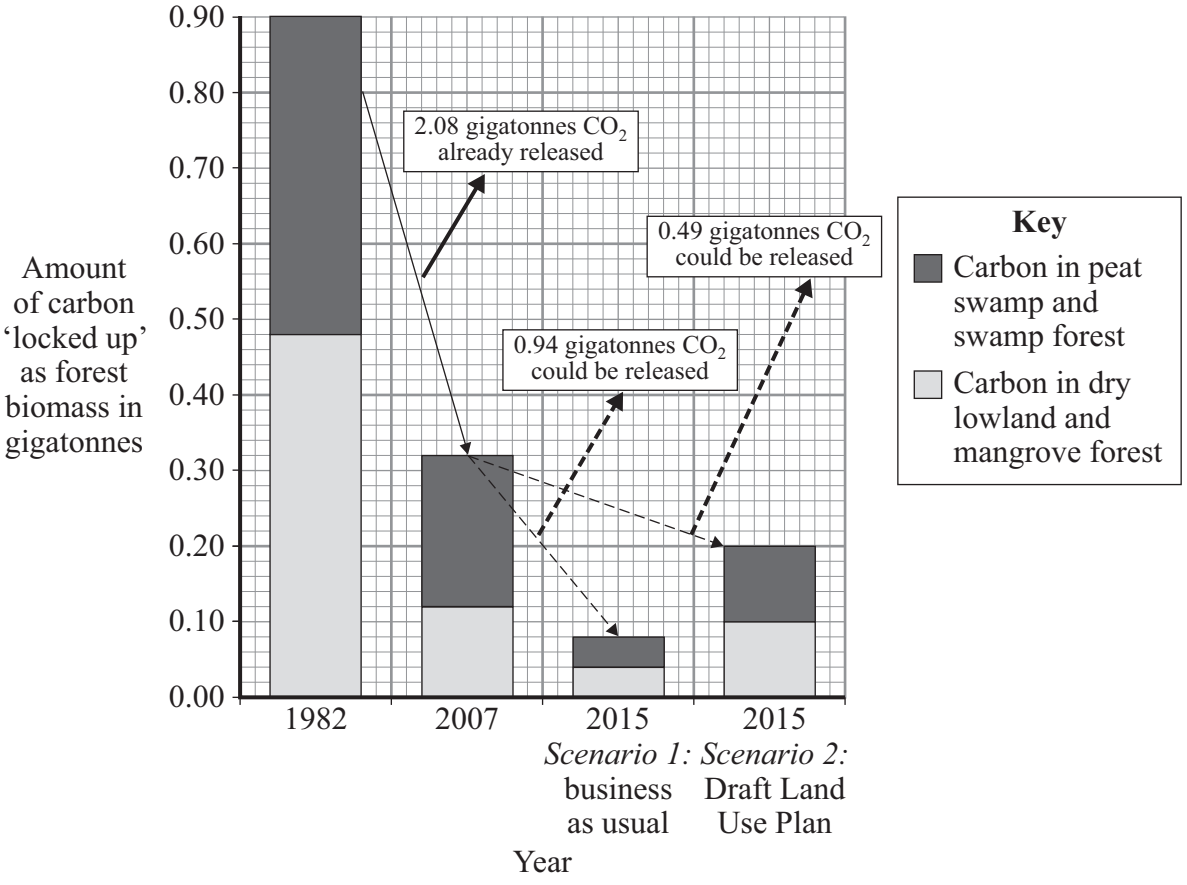
Question 05

November 2009 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

Deforestation affects the environment.

The graph shows some possible effects of deforestation in part of Indonesia.



7A By how much did the total amount of carbon 'locked up' in peat swamp and swamp forest decline between 1982 and 2007?

1 0.16 gigatonnes

2 0.22 gigatonnes

3 0.36 gigatonnes

4 0.58 gigatonnes

4.7.3.6 Maintaining biodiversity

Question 05 · continued

7B What mass of carbon dioxide will be released between 1982 and 2015 if *Scenario 2* is adopted?

1 0.49 gigatonnes

2 1.43 gigatonnes

3 2.57 gigatonnes

4 3.02 gigatonnes

7C The graph refers to a *Draft Land Use Plan* for 2015.

How could this plan reduce the amount of carbon dioxide in the atmosphere by 2015?

1 by building more roads

2 by building more houses

3 by replanting forests

4 by giving protected status to more animal species

7D The *Draft Land Use Plan* is an example of . . .

1 biodiversity.

2 increasing the human population.

3 recycling.

4 sustainable development.

4.7.3.6 Maintaining biodiversity

Question 06

March 2010 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

The Lua tribe of the Philippines rely on 'slash and burn' agriculture. They cut down and burn an area of forest big enough to grow their crops. After about two years they move on to use another area of the forest. The Lua tribe has survived in the same region for many years. Their agriculture has to be managed very carefully.

8A The population of the tribe increased, so they burned a bigger area of the forest in which they lived.

What would be the most likely effect on the species that normally live in the region?

1 The animals would live at a higher population density in the remaining forest.

2 The animals would move away from the farmed area but die in the remaining forest because there would be too much competition.

3 There would be more types of native species because new areas of forest had been cleared.

4 There would be no effect on the native species.

The agricultural methods used by the Lua tribe had little effect on the carbon dioxide concentration in the air.

8B The most likely reason for this is that . . .

1 their population was not growing fast enough.

2 when the Lua tribe burns the forest, oxygen is taken in and carbon dioxide is released.

3 the Lua tribe did not plant rice on the cleared land.

4 the amount of carbon dioxide released by burning was the same as the amount of carbon dioxide reabsorbed by the crops.

4.7.3.6 Maintaining biodiversity

Question 06 · continued

8C A forestry company was given the right to harvest the mature trees in the area, but also burned other areas.

Why was the company accused of increasing the chance of climate change?

1 Cutting down trees causes an increase in the temperature of the atmosphere.

2 Burning trees releases the 'locked up' carbon as carbon dioxide into the atmosphere, which then traps heat.

3 Using the trees for timber releases carbon dioxide into the atmosphere more quickly than photosynthesis can absorb it.

4 Fewer trees in the area allows more space for microorganisms to respire and release carbon dioxide.

8D Deforestation by the forestry company led to a reduction in biodiversity.

Why should society be concerned about this decrease?

1 A greater biodiversity reduces the chance of climate change.

2 The forest food chains would be shorter.

3 Some of the organisms that were lost may have been of future use.

4 There may be an increased use of herbicides in the area.

4.7.3.6 Maintaining biodiversity

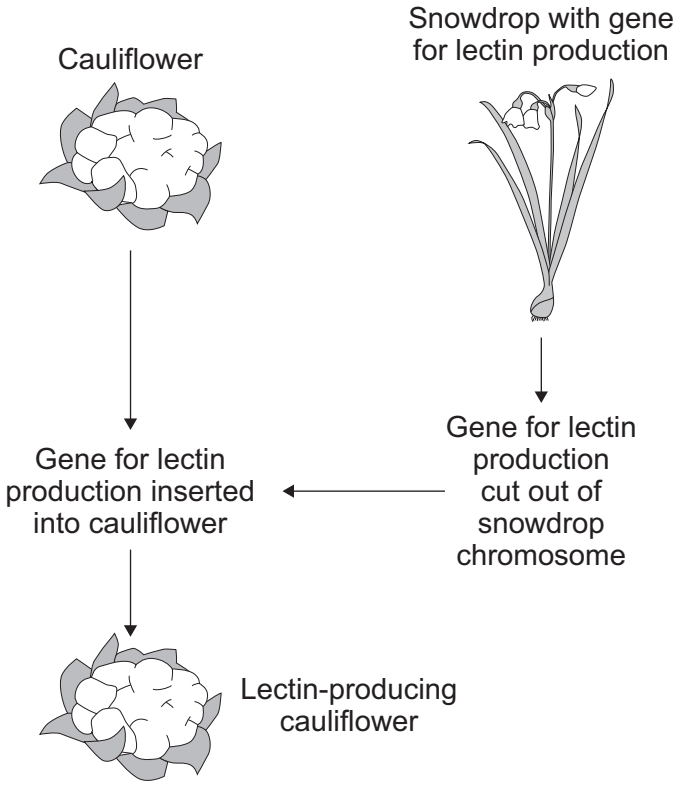
Question 07

June 2010 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

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.



4A The gene for lectin production is cut from the snowdrop chromosome using . . .

1 lectin.

2 a herbicide.

3 an enzyme.

4 an electric shock.

4B 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.

4.7.3.6 Maintaining biodiversity

Question 07 · continued

4C 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.

4D 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.

Turn over for the next question

4.7.3.6 Maintaining biodiversity

Question 08

March 2011 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

The picture shows part of a forest burning in Mexico.



3A 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'.

4.7.3.6 Maintaining biodiversity

3B 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

3C 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

3D 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

4.7.3.6 Maintaining biodiversity

Question 09

June 2011 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

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.

3A 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.

3B 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.

3C 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

4.7.3.6 Maintaining biodiversity

3D 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

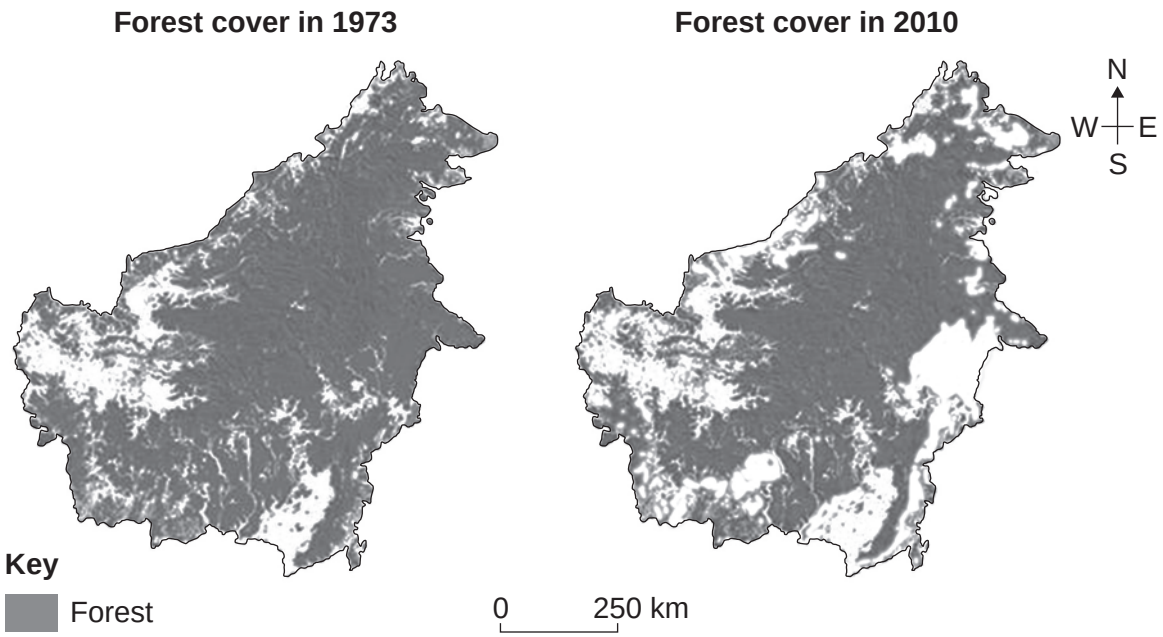
4.7.3.6 Maintaining biodiversity

Question 10

June 2016 | BL3HP | Original Q4 | Legacy

4 **Figure 4** shows the amount of forest cover on an island in Asia, in 1973 and in 2010.

Figure 4



4 (a) (i) Deforestation has decreased the amount of forest cover on the island.

Describe the change in the pattern of forest cover on the island.

[2 marks]

4 (a) (ii) Give **two** possible reasons why the amount of forest has decreased between 1973 and 2010.

[2 marks]

1

2

4.7.3.6 Maintaining biodiversity

Question 10 · continued

4 (b) Scientists are concerned about the effects of a decrease in forest cover on ecosystems.

Give **two** possible negative effects of the decrease in forest cover on ecosystems.

[2 marks]

1 _____

_____

2 _____

_____

6

Turn over for the next question

4.7.3.6 Maintaining biodiversity

Question 11

June 2019 | 8461/2H | Original Q6

0 6 Water conservation is important to the human body.

0 6 . 1 Which gland releases the hormone that controls water loss from the body?

[1 mark]

Tick (✓) **one** box.

- Adrenal ☐
- Pancreas ☐
- Pituitary ☐
- Thyroid ☐

0 6 . 2 Which hormone helps the kidneys to control water loss from the body?

[1 mark]

Tick (✓) **one** box.

- ADH ☐
- Adrenaline ☐
- LH ☐
- Thyroxine ☐

4.7.3.6 Maintaining biodiversity

Question 11 · continued

0 6 . 3 A man is walking across a desert.

The man has used up his supply of drinking water.

Explain how the gland you named in Question **06.1** and the kidneys reduce water loss.

[3 marks]

Question 6 continues on the next page

4.7.3.6 Maintaining biodiversity

Question 11 · continued

0 6 . 4 Some people have kidney failure.

Doctors may treat patients with kidney failure by either:

- dialysis
- a kidney transplant.

Explain **two** biological reasons why most doctors think that a kidney transplant is a better method of treatment than dialysis.

Do **not** refer to cost or convenience.

[4 marks]

Reason 1 _____

_____

_____

_____

Reason 2 _____

_____

_____

_____

9

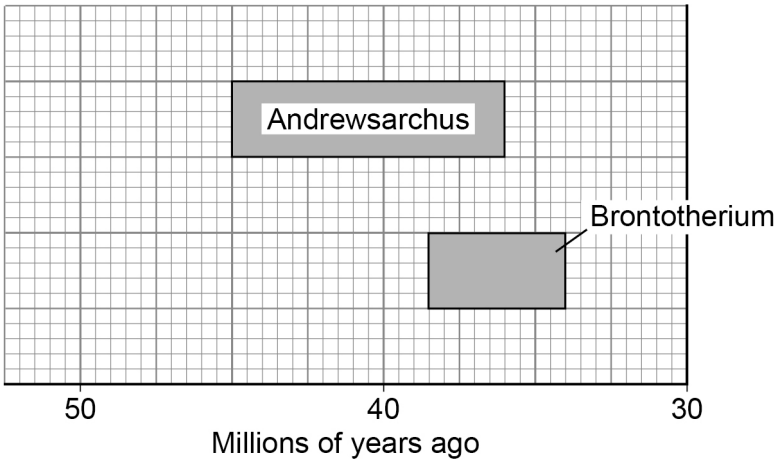
4.7.3.6 Maintaining biodiversity

Question 12

November 2020 | 8461/2H | Original Q8

0 8 **Figure 8** shows when two mammals existed in Asia.

Figure 8



0 8 . 1 Determine the number of years both Andrewsarchus and Brontotherium existed together.

[2 marks]

Time = _____ years

Question 12 · continued

0 8 . 2 The oldest fossils of human ancestors found in this area are 700 000 years old.

Andrewsarchus was a carnivore and Brontotherium was a herbivore.

Suggest how the extinction of Andrewsarchus could have resulted in the extinction of Brontotherium.

[3 marks]

0 8 . 3 Information about extinct animals is often **not** clear because the fossil record is incomplete.

Give **three** reasons why the fossil record is **not** clear for older species.

[3 marks]

1

2

3

Question 8 continues on the next page

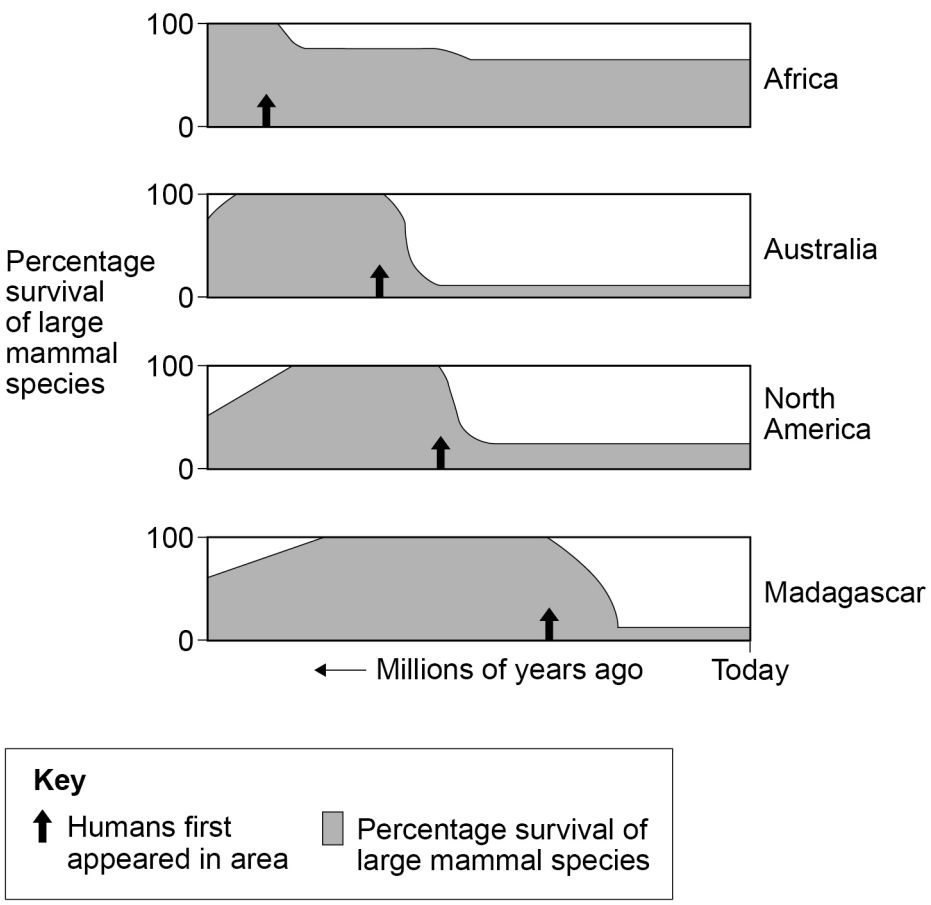
4.7.3.6 Maintaining biodiversity

Question 12 · continued

Figure 9 shows the percentage (%) survival of large mammal species in four areas of the world.

The time at which humans first appeared in each of the four areas is also shown.

Figure 9



4.7.3.6 Maintaining biodiversity

Question 12 · continued

A mass extinction is a rapid decrease in biodiversity on Earth.

0 8 . 4 A student stated:

'The data in **Figure 9** shows that humans caused mass extinctions.'

Evaluate the student's statement.

[6 marks]

Question 8 continues on the next page

4.7.3.6 Maintaining biodiversity

Question 12 · continued

November 2020 | 8461/2H | Original Q8

0 8 . 5 Give **one** disadvantage and **one** advantage of mass extinction events.

Answer in terms of evolution.

[2 marks]

Disadvantage _____

_____

Advantage _____

_____

16

4.7.3.6 Maintaining biodiversity

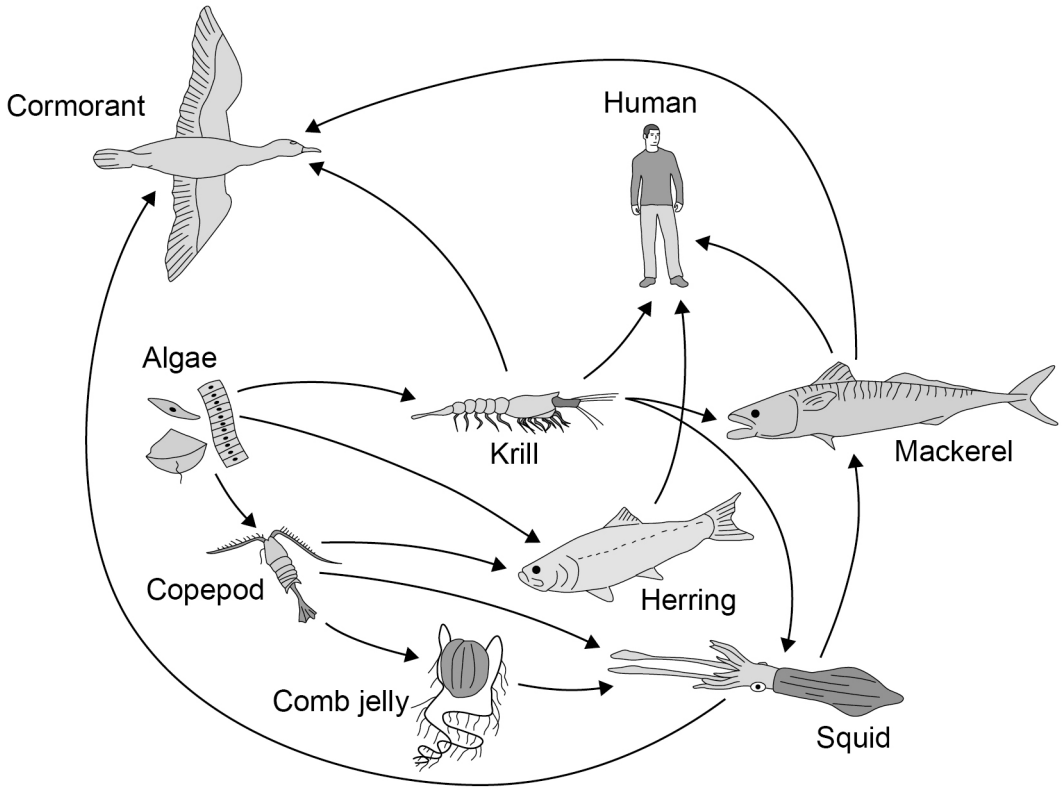
Question 13

November 2021 | 8461/2H | Original Q7

0 7 A food web contains several food chains.

Figure 9 shows a food web.

Figure 9



Not to scale

0 7 . 1 The animals in **Figure 9** get their energy by eating other organisms.

Describe how the algae get energy.

[2 marks]

0 7 . 2 Name **one** primary consumer in **Figure 9**.

[1 mark]

4.7.3.6 Maintaining biodiversity

Question 13 · continued

0 7 . 3 Name **one** producer in **Figure 9**.

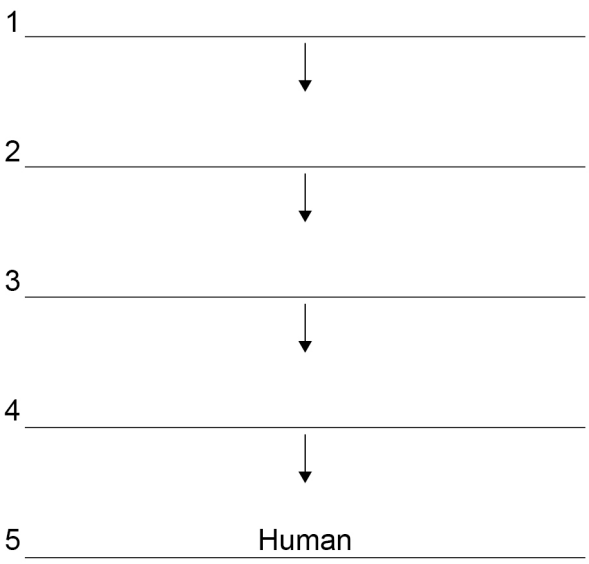
[1 mark]

0 7 . 4 The different food chains in **Figure 9** have different numbers of organisms.

Complete **Figure 10** to show a food chain in **Figure 9** with **five** organisms, including the human.

[1 mark]

Figure 10



0 7 . 5 **Figure 9** shows that mackerel eat krill and squid.

The biomass of mackerel is much less than the combined biomass of krill and squid.

One reason for this is that the mackerel cannot digest all parts of the krill and squid.

Give **two** other reasons.

[2 marks]

1

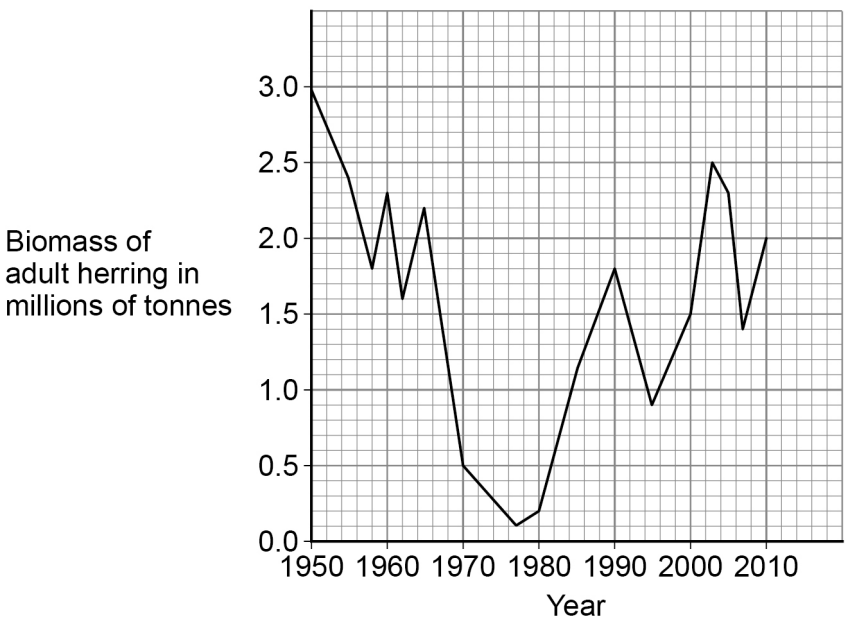
2

4.7.3.6 Maintaining biodiversity

Question 13 · continued

Figure 11 shows how the biomass of adult herring in the North Sea has changed between 1950 and 2010.

Figure 11



0 7 . 6 Calculate the percentage decrease in the biomass of herring between 1960 and 1977.

Give your answer to the nearest whole number.

[4 marks]

Percentage decrease = _____ %

Question 13 · continued

0 7 . 7 Too many herring were caught by fishermen between 1960 and 1977.

Herring can live for up to 12 years and begin to reproduce when 3 to 4 years old.

Laws have been introduced to help conserve herring:

- 1977 to 1981 – herring fishing was banned in the North Sea
- 1984 to present day – control of mesh size of fishing nets
- 1997 to present day – fishing quotas were introduced
- 1998 to present day – herring fishing was banned in breeding grounds during the breeding season.

Figure 12 shows how a minimum mesh size helps to conserve herring.

Figure 12

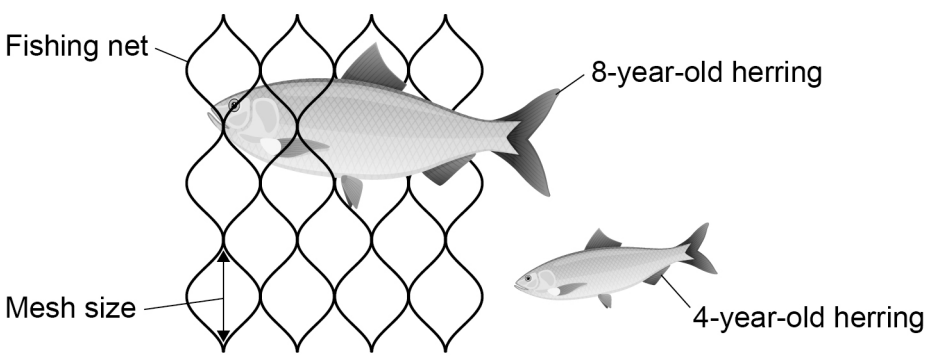
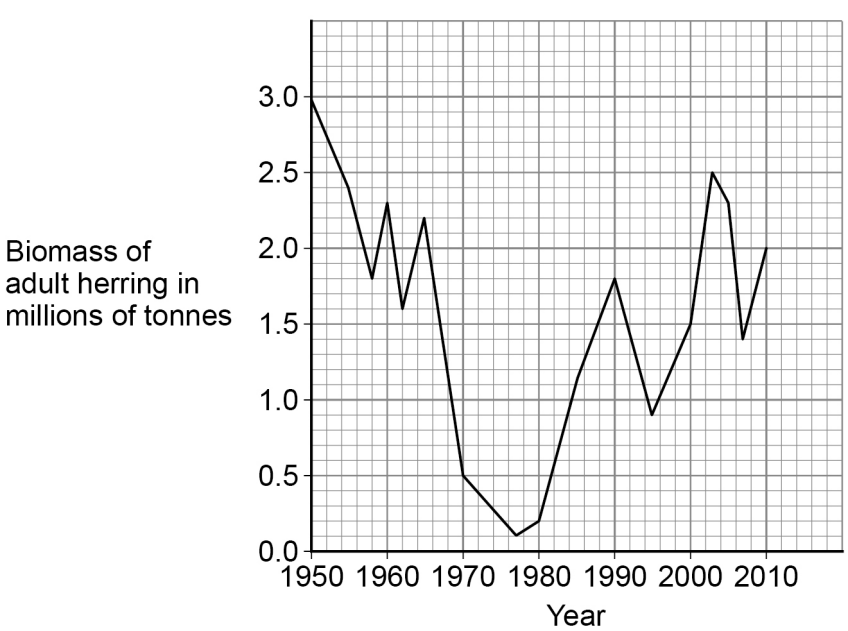


Figure 11 is repeated below.

Figure 11



4.7.3.6 Maintaining biodiversity

Question 13 · continued

Evaluate the effect of these laws on the conservation of herring stocks.

Use data from **Figure 11** and information from **Figure 12** in your answer.

[6 marks]

17

4.7.3.6 Maintaining biodiversity

Question 14

June 2025 | 8461/2H | Original Q5

0 5 Peat bog is a specialised habitat for some living organisms.

0 5 . 1 Peat has been removed from peat bogs so that the land can be used for farming or forestry.

Give **two** uses of the peat removed from peat bogs.

[2 marks]

1 _____

_____

2 _____

_____

The destruction of peat bogs can affect biodiversity.

0 5 . 2 What is meant by 'biodiversity'?

[1 mark]

_____

_____

4.7.3.6 Maintaining biodiversity

Question 14 · continued

0 5 . 3 Explain how the destruction of peat bogs can affect biodiversity:

- in the local area
- globally.

[6 marks]

Extra space

9