AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.4

Deforestation

Past-paper questions

Tier	**Higher**
Question groups	**17**
Available paper years	**2007–2023**

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.

4.7.3.4 Deforestation

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

4.7.3.4 Deforestation

Question 02

June 2007 | BLY1B | Original Q7 | Legacy

QUESTION SEVEN

This question is about global warming.

7A How does an increase in greenhouse gases in the atmosphere lead to an increase in global warming?

1 More of the radiation from the Sun passes into the atmosphere.

2 The atmosphere radiates more energy back to Earth.

3 The Earth radiates more energy back into the atmosphere.

4 The sea absorbs more energy from the Sun.

7B Forests are often cut down to clear land for growing crops.

Keeping forests rather than cutting them down for growing crops helps to reduce global warming because . . .

1 carbon dioxide can be ‘locked-up’ in wood for many years.

2 growing crop plants increases the number of microorganisms in the soil.

3 forests release large amounts of carbon dioxide.

4 some crop plants remove sulfur dioxide from the atmosphere.

4.7.3.4 Deforestation

Question 02 · continued

7C Scientists use computer models to predict increases in global temperature.

The table shows the predictions for global temperature increases from 2000 to 2100 produced by different models.

	Predicted temperature increase 2000 to 2100 in °C		
Model	**Total**	**Land**	**Ocean**
P	4.7	7.0	3.8
Q	4.0	5.0	3.6
R	3.9	4.8	3.4
S	3.7	5.5	3.0
T	3.3	4.2	3.0
U	3.0	4.6	2.4
V	2.3	3.1	2.0
W	2.2	2.8	2.0

Which two predictions are in closest agreement?

1 **R** and **S**

2 **S** and **T**

3 **T** and **U**

4 **V** and **W**

7D The predictions made by using the different models vary because . . .

1 the instruments that scientists use are not sensitive enough.

2 scientists do not have sufficient data on how different factors affect global temperatures.

3 some of the scientists do not have appropriate computer programming skills.

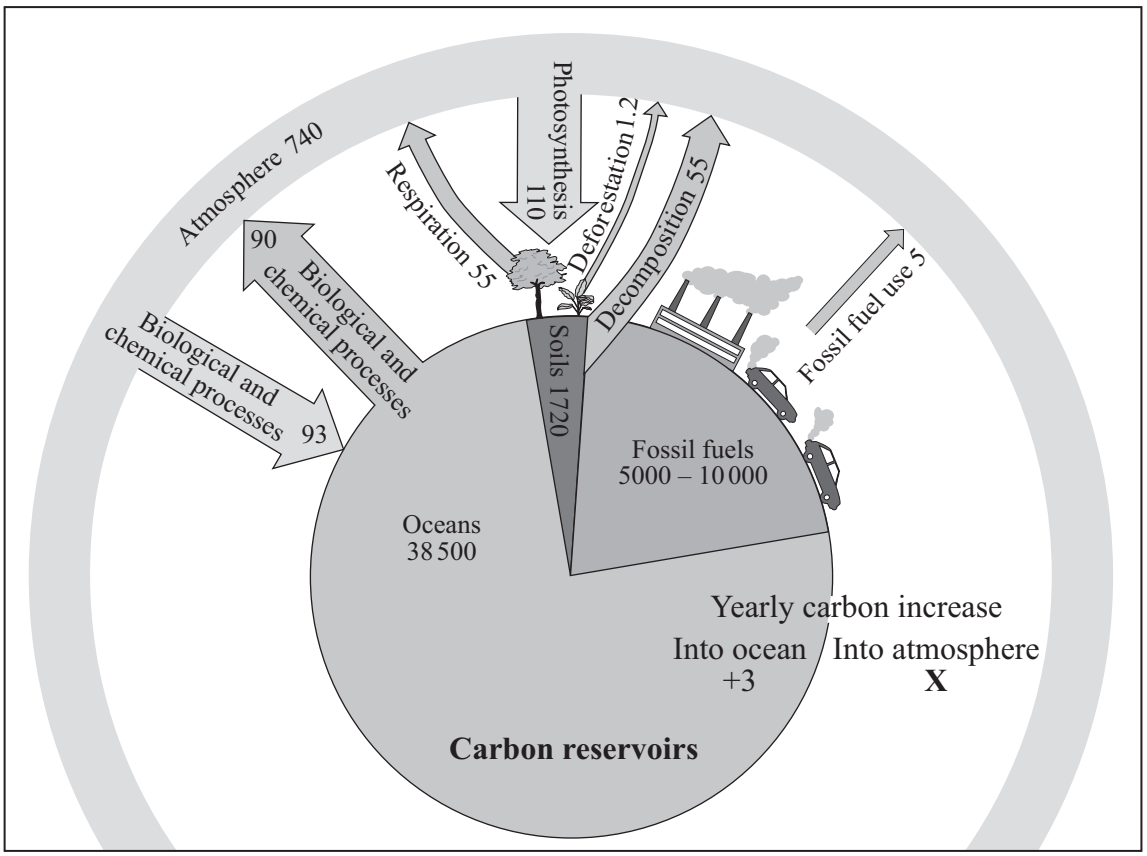
4 it is impossible to do experiments connected with global warming.

4.7.3.4 Deforestation

Question 03

January 2008 | BLY1H | Original Q6 | Legacy

6 The diagram shows the mass of carbon exchanged between carbon reservoirs and the atmosphere. The pie chart in the diagram shows the mass of carbon in three reservoirs: oceans, soils and fossil fuels. The figures are in billions of tonnes of carbon per year.



(a) Calculate **X** (the yearly carbon increase into the atmosphere).

Show all your working.

.....

.....

.....

.....

X = ... billion tonnes of carbon
(2 marks)

4.7.3.4 Deforestation

Question 03 · continued

BLANK

(b) Give **one** reason why deforestation increases the carbon dioxide concentration of the atmosphere.

.....

.....

(1 mark)

(c) Explain, as fully as you can, why the increasing concentration of carbon dioxide in the atmosphere is causing global warming.

.....

.....

.....

.....

.....

.....

(3 marks)

6

4.7.3.4 Deforestation

Question 04

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.

4.7.3.4 Deforestation

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

4.7.3.4 Deforestation

Question 05

March 2009 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

Biofuels can be produced from crops such as sugar cane. After harvesting, the sugar is converted into alcohol by microorganisms. Alcohol can be used in vehicles either on its own or mixed with petrol. This reduces the need to use crude oil as an energy source.

6A Some people have linked global shortages of food to the increase in biofuel production.

This could be because . . .

1 rainforests provide large amounts of food.

2 land previously used for food crops is being used to grow sugar cane for conversion to alcohol.

3 factories making biofuel are often built on farmland.

4 drilling for crude oil damages large areas of farmland.

6B Supporters of the use of biofuel claim that it is more 'environmentally friendly' than using petrol.

This could be because . . .

1 sugar cane plants take in carbon dioxide from the atmosphere.

2 trees 'lock up' large amounts of carbon, for many years, in wood.

3 fields of sugar cane increase the number of different species of animals in an area.

4 burning alcohol releases about the same amount of carbon dioxide as the plants took in when they were growing.

6C Large areas of rainforest might be cut down to provide land to grow sugar cane.

This may be harmful because . . .

1 biodiversity is reduced.

2 less oxygen will be released into the atmosphere.

3 extra methane is released which causes global warming.

4 more carbon dioxide will be released into the atmosphere.

4.7.3.4 Deforestation

Question 05 · continued March 2009 | BLY1BP | Original Q6 | Legacy

6D The land made available by cutting down trees can only be used to grow sugar cane for about three years. After this, the land can be used to raise cattle.

Increased cattle farming leads to increasing atmospheric temperatures on Earth.

This is mainly because cattle release . . .

1 methane which allows more of the Sun's heat to reach Earth.

2 carbon dioxide which absorbs heat and retains it.

3 methane which absorbs heat and radiates it back to Earth.

4 carbon dioxide which allows more of the Sun's heat to reach Earth.

Turn over for the next question

4.7.3.4 Deforestation

Question 06

June 2009 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

Read the extract from a newspaper.

Huge chunks of polar ice shelf breaking up

A chunk of ice the size of the Isle of Man has started to break away from Antarctica in what scientists say is further evidence of a warming climate.

6A The British Antarctic Survey (BAS) monitors the Antarctic ice shelves.

In 1993, a scientist predicted that this area of the ice shelf would be lost within 30 years if global temperatures continued to rise. He now says that it is happening more quickly than he expected.

What is the most likely reason for his inaccurate prediction?

1 He was biased.

2 He did not have enough evidence.

3 He made many errors when recording his data.

4 He did not want to alarm the public.

6B Which row in the table correctly indicates the human activities that contribute to global warming?

	Burning fossil fuels	Deforestation	Increasing the number of cattle reared for food	Increased recycling of paper
1	✓		✓	✓
2	✓	✓	✓	
3		✓	✓	✓
4	✓	✓		✓

4.7.3.4 Deforestation

Question 06 · continued

6C What is the cause of global warming?

1 The Sun is getting hotter.

2 The hole in the ozone layer is letting more heat in.

3 Gases in the atmosphere absorb heat and radiate it back to Earth.

4 More heat is being released from power stations.

6D An increase in the Earth's temperature by only a few degrees will cause . . .

1 more volcanic eruptions.

2 more earthquakes.

3 more acid rain.

4 widespread flooding.

Turn over for the next question

4.7.3.4 Deforestation

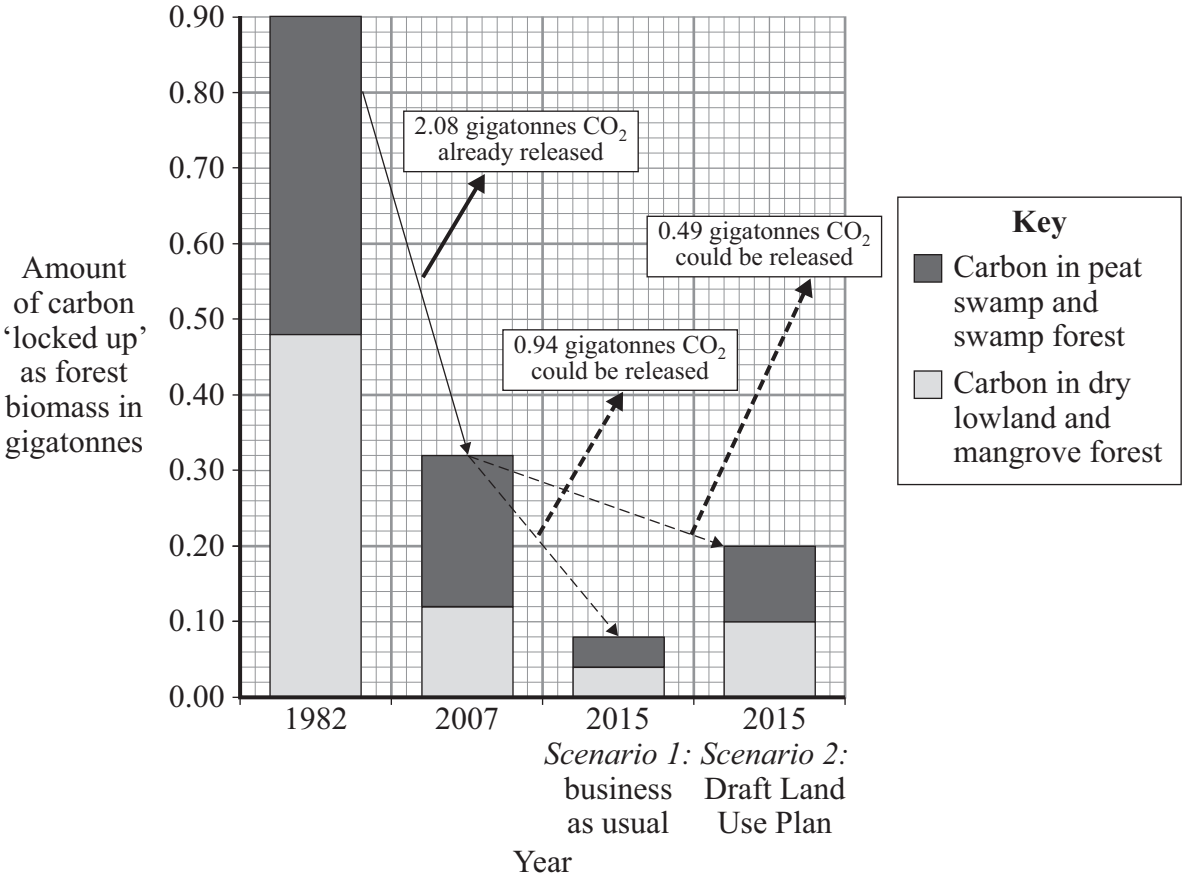
Question 07

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

4.7.3.4 Deforestation

Question 07 · continued November 2009 | BLY1BP | Original Q7 | Legacy

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.

4.7.3.4 Deforestation

Question 08

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.

4.7.3.4 Deforestation

Question 08 · continued

March 2010 | BLY1BP | Original Q8 | Legacy

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.

4.7.3.4 Deforestation

Question 09

June 2010 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

Many scientists are concerned about global warming.

One way to reduce global warming is to replace fossil fuels with biofuels, such as ethanol.
Forests are being cut down to grow crops that are used to produce ethanol.

8A When biofuels are burned, . . .

1 the volume of carbon dioxide they give off is about equal to the volume of carbon dioxide the plants take in.

2 the volume of carbon dioxide they give off is larger than the volume of carbon dioxide the plants take in.

3 the volume of methane they give off is equal to the volume of carbon dioxide the plants take in.

4 the volume of carbon dioxide they give off is equal to the volume of methane the plants take in.

8B One effect of cutting down forests is that . . .

1 more paper is recycled.

2 less renewable energy is used.

3 there may be a reduction in biodiversity.

4 less land is available for food production.

4.7.3.4 Deforestation

Question 09 · continued

The table shows the yield of ethanol from four biofuel crops.

Plant material	Volume of ethanol produced in litres per kg of plant material	Volume of ethanol produced in litres per m^2 of land
Cassava	0.18	0.4
Maize	0.36	0.2
Sugar cane	0.07	1.2
Sweet potato	0.12	0.5

8C Which of the plant materials would result in the least amount of deforestation to produce 1000 litres of fuel?

1 Cassava

2 Maize

3 Sugar cane

4 Sweet potato

8D Global warming means that the average temperature of the Earth's atmosphere is gradually increasing.

What causes this increase in temperature?

1 more energy from the Sun entering the Earth's atmosphere

2 more energy being produced by human activity

3 more energy being radiated by the Earth

4 more energy being re-radiated back to Earth

4.7.3.4 Deforestation

Question 10

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'.

4.7.3.4 Deforestation

Question 10 · continued

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

4.7.3.4 Deforestation

Question 11

March 2011 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Read the information about rice growing.

- Rice growing can contribute to global warming.
- Most rice is grown in wetland areas, where other crops cannot grow.
- Methane is produced by bacteria which live in soil water that has very little oxygen in it.
- Rice can be grown on drier land, but yields are reduced.
- Other crops are more profitable in these drier areas.
- Allowing the soil to dry out for a short time increases the amount of oxygen in the soil and increases rice yields.

9A In wetland areas, rice is a very important crop for people's diet and for the economy of these areas.

For people who live in these wetland areas, the best way of reducing methane in the atmosphere is . . .

1 to invest money in new drainage systems.

2 to stop producing rice in wetland areas.

3 to grow more rice in drier areas.

4 to grow other crops in wetland areas.

9B Over its growing period, a rice crop will . . .

1 reduce the amount of carbon dioxide in the atmosphere.

2 reduce the amount of oxygen in the atmosphere.

3 reduce the amount of methane in the atmosphere.

4 have no effect on the composition of the atmosphere.

9C Some varieties of rice plant cause 30 % less methane to be released into the atmosphere. However, these rice plants produce less rice.

Which of the following might produce a high yielding rice plant **and** release less methane?

1 cloning

2 embryo transplantation

3 sexual reproduction

4 tissue culture

4.7.3.4 Deforestation

Question 11 · continued

March 2011 | BLY1BP | Original Q9 | Legacy

9D A new strain of rice has been genetically modified to produce extra vitamins.

The final decision whether to allow this strain of rice to be grown on a large scale should be taken by . . .

1 farmers.

2 industrialists.

3 politicians.

4 scientists.

END OF TEST

4.7.3.4 Deforestation

Question 12

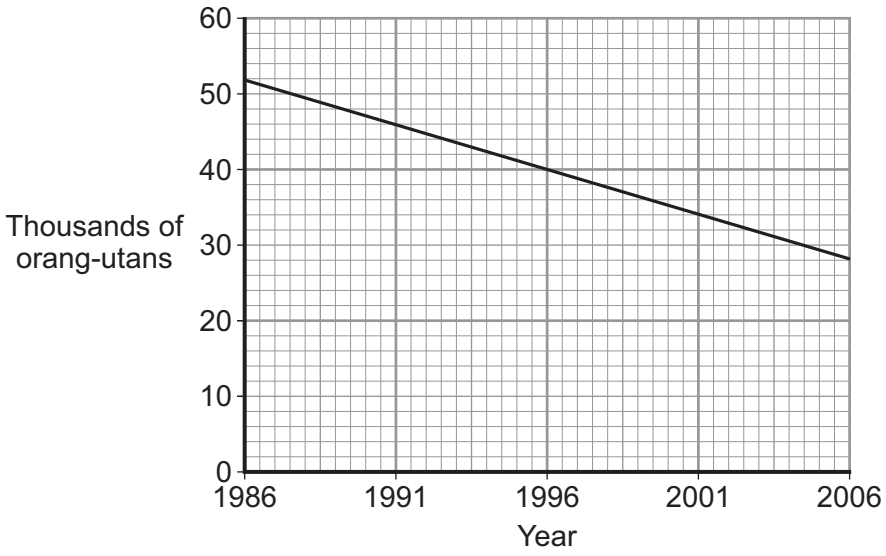
November 2011 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

The decrease in the total area of tropical rainforest on Earth is reducing biodiversity and affecting the climate.

Scientists surveyed the numbers of orang-utans in Borneo.

Their results are shown in the graph.



8A What was the annual rate of decrease in orang-utan numbers between 1986 and 2006?

1 1200 per year

2 2400 per year

3 2800 per year

4 5200 per year

8B Biodiversity is . . .

1 the number of different species living in a habitat.

2 the number of individuals living in a habitat.

3 the maintenance of tropical rainforests.

4 the number of endangered species in a habitat.

4.7.3.4 Deforestation

Question 12 · continued

8C Forests in Borneo are being cut down to clear land for growing crops.

Keeping forests rather than cutting them down for growing crops helps to reduce global warming because . . .

1 carbon dioxide can be 'locked-up' in wood for many years.

2 growing crop plants increases the number of microorganisms in the soil.

3 forests release large amounts of carbon dioxide.

4 some crop plants remove sulfur dioxide from the atmosphere.

8D How does an increase in the amount of greenhouse gases in the atmosphere lead to an increase in global warming?

1 More of the radiation from the Sun passes into the atmosphere.

2 The atmosphere radiates more energy back to Earth.

3 The Earth radiates more energy back into the atmosphere.

4 The sea absorbs more energy from the Sun.

4.7.3.4 Deforestation

Question 13

June 2014 | BL3HP | Original Q2 | Legacy

2 **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 2 shows an area of deforestation.

Figure 2



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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4.7.3.4 Deforestation

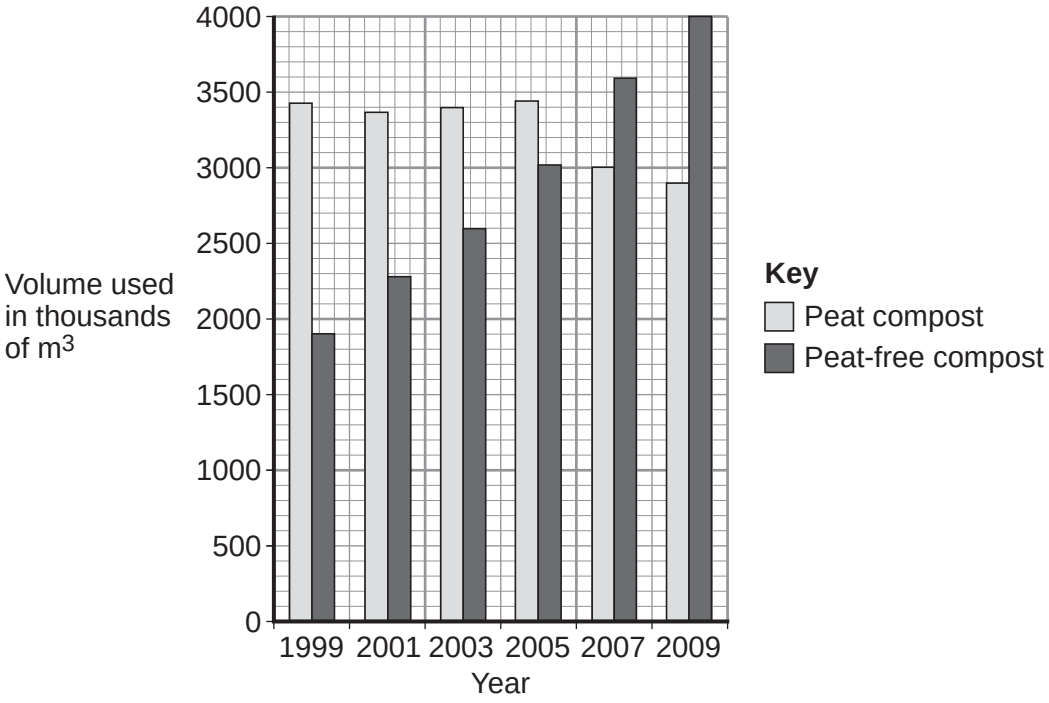
Question 14

June 2015 | BL3HP | Original Q3 | Legacy

3 Human activities have many effects on our ecosystem.

Figure 3 shows the volume of peat compost and peat-free compost used in gardening from 1999 to 2009.

Figure 3



3 (a) Describe the trends shown in **Figure 3**.

[2 marks]

.....

.....

.....

.....

.....

4.7.3.4 Deforestation

Question 14 · continued

3 (b) What effect does the destruction of peat bogs have on the gases in the atmosphere?

[1 mark]

.....

.....

3 (c) Deforestation is also damaging ecosystems.

Describe **one** effect of deforestation on ecosystems.

[1 mark]

.....

.....

4

Turn over for the next question

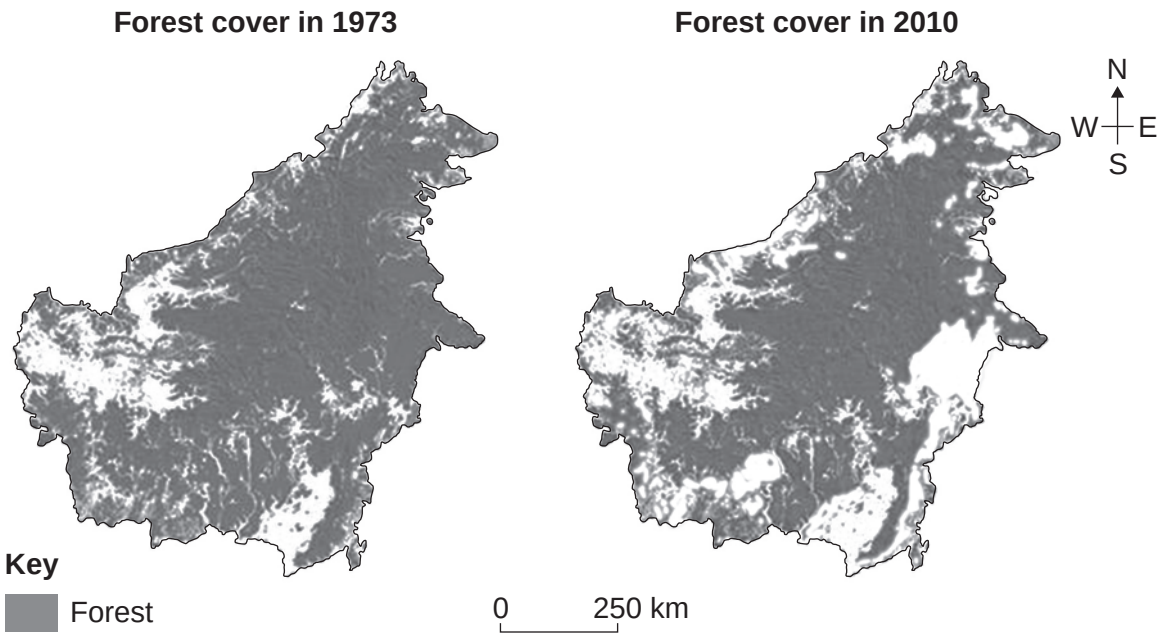
4.7.3.4 Deforestation

Question 15

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

4.7.3.4 Deforestation

Question 15 · 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

4.7.3.4 Deforestation

Question 16

June 2017 | BL3HP | Original Q1 | Legacy

1 Large areas of forest are cut down each year. This is called deforestation.

1 (a) Apart from decay, describe how the removal of trees from forests can lead to global warming.

[1 mark]

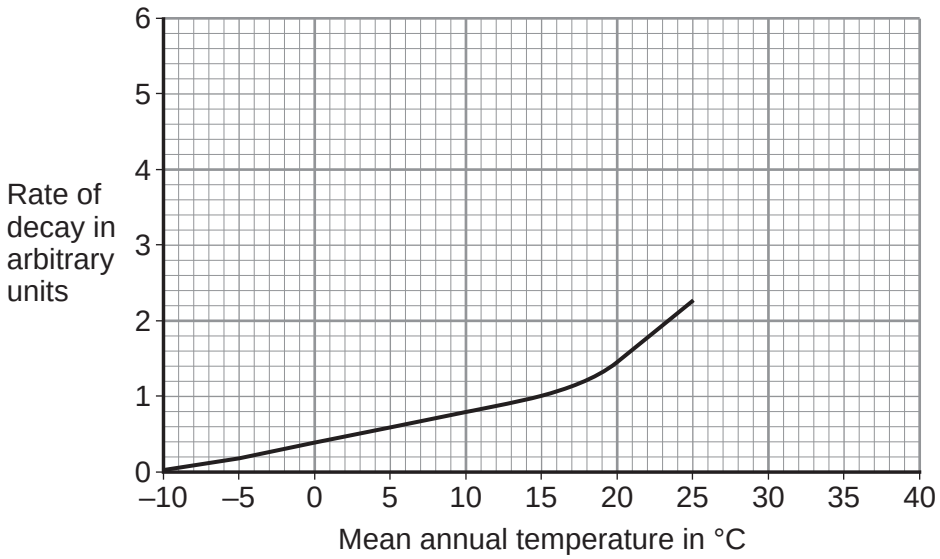
_____

_____

1 (b) After trees have been cut down, branches and leaves are left on the ground to decay.

Figure 1 shows how the rate of decay changes with the mean annual temperature in different environments.

Figure 1



1 (b) (i) The mean annual temperature in forest **A** is 10 °C.

What is the rate of decay in forest **A**?

[1 mark]

Rate of decay = _____ arbitrary units

1 (b) (ii) Forest **B** has a mean annual temperature of 30 °C.

Use information from **Figure 1** to predict the rate of decay in forest **B**.

[1 mark]

Rate of decay = _____ arbitrary units

4.7.3.4 Deforestation

Question 16 · continued

1 (c) Describe how decay in forests contributes to global warming.

[2 marks]

5

Turn over for the next question

4.7.3.4 Deforestation

Question 17

June 2023 | 8461/2H | Original Q6

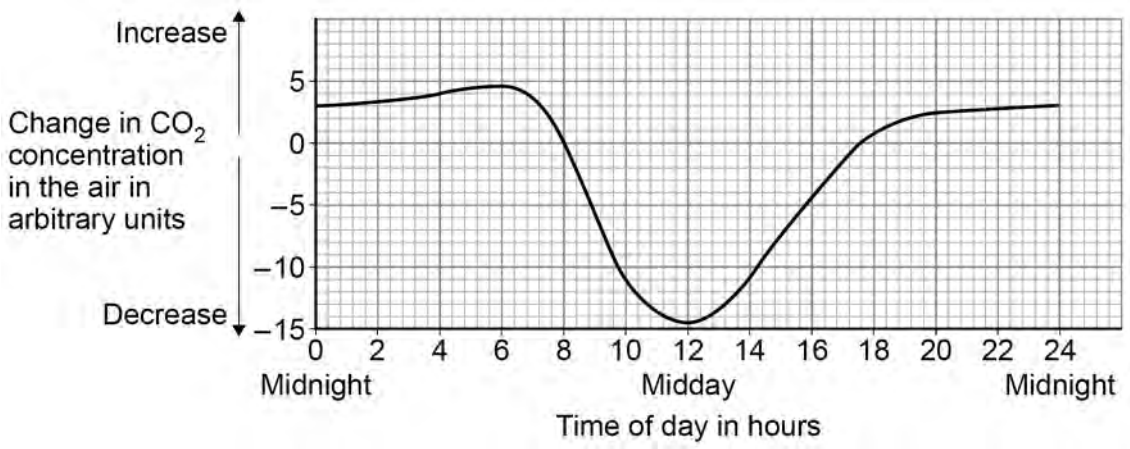
0 6 This question is about the effects of deforestation and agriculture.

The processes of photosynthesis and respiration affect the carbon dioxide concentration in the air.

Figure 9 shows the changes in the carbon dioxide concentration in the air in a tropical rainforest during one day.

The data are mean daily values over a whole year.

Figure 9



0 6 . 1 Explain what causes the changes in the carbon dioxide concentration in the air:

- from 0 to 6 hours
- from 8 to 12 hours.

Use information from **Figure 9**.

[4 marks]

0 to 6 hours _____

_____

_____

_____

8 to 12 hours _____

_____

_____

_____

4.7.3.4 Deforestation

Question 17 · continued

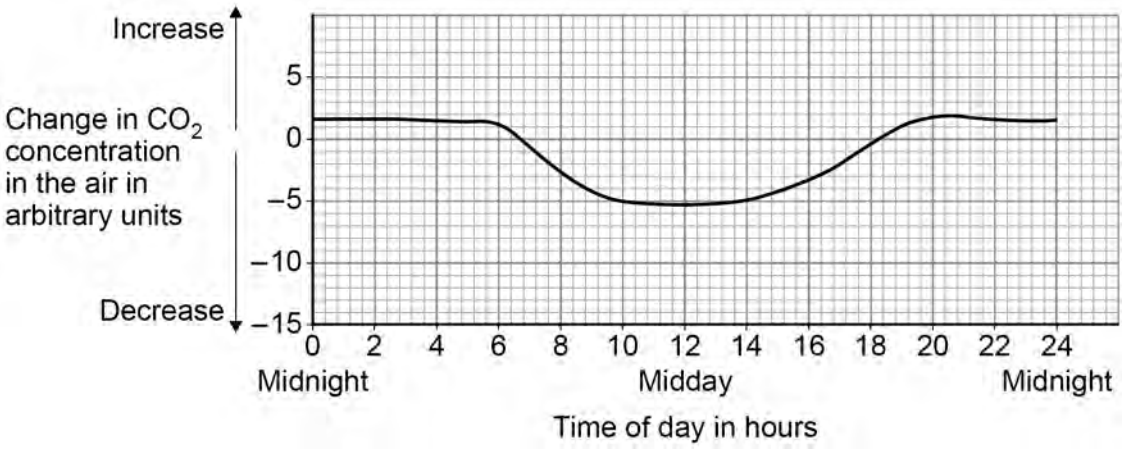
0 6 . 2 An area of rainforest is cut down and replaced with a field of maize plants.

Only one crop of maize is grown each year.

Figure 10 shows the changes in the carbon dioxide concentration in the air in the field of maize during one day.

The data are mean daily values over the 6-month growing period.

Figure 10



The maize grows for only 6 months of the year.

Explain why replacing rainforest with maize will increase the carbon dioxide concentration in the air after one year.

Use information from **Figure 9** and **Figure 10**.

[2 marks]

Question 6 continues on the next page

4.7.3.4 Deforestation

Question 17 · continued

A tropical rainforest can contain over 1000 different tree species.

Large areas of tropical rainforest have been cut down during the last 100 years so crops can be grown.

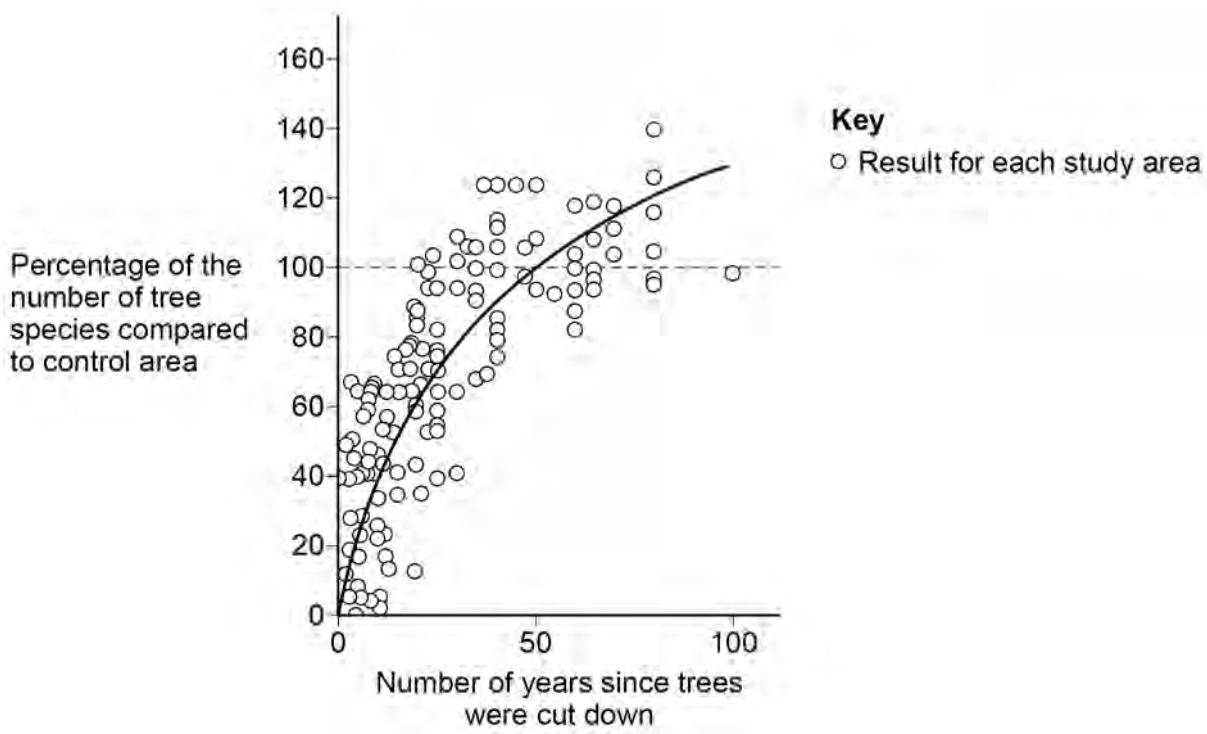
Scientists studied the regeneration of different areas of tropical rainforest.

The scientists:

- investigated areas of rainforest that had been cut down at different times during the previous 100 years
- recorded the number of tree species that re-grew in each area
- compared each area with a control area next to it. The control areas were undisturbed rainforest which had never been cut down.

Figure 11 shows the scientists' results.

Figure 11



4.7.3.4 Deforestation

Question 17 · continued

0 6 . 3 The values plotted in **Figure 11** are percentages of the results for the control areas.

Explain why the scientists presented their results as **percentages**.

[2 marks]

During the 100 years, the biodiversity of trees in the regenerating rainforest increases.

0 6 . 4 Give **one** other conclusion you can make from **Figure 11**.

[1 mark]

0 6 . 5 Give **two** reasons why an increase in the diversity of trees in the rainforest leads to an increase in animal diversity.

[2 marks]

1

2

11