AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.1.1

Communities

Past-paper questions

Tier	**Higher**
Question groups	**10**
Available paper years	**2008–2025**

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.

4.7.1.1 Communities

Question 01

March 2008 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Read the passage:

> Mount Rainier in America is home to some very rare plants. Many of them grow there even though the weather is so cold that trees cannot grow. As global warming continues, the mountain will become warmer. For every one degree Celsius rise in temperature, the trees can grow 75 metres higher up the mountain.

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

A competition

B environmental change

C survival

D extinction

1	allows trees to grow higher up the mountain
2	a possible consequence of global warming for the rare plants
3	a possible consequence of global warming for both the trees and the rare plants
4	a possible consequence of protecting the rare plants

4.7.1.1 Communities

Question 02

June 2008 | BLY1H | Original Q5 | Legacy

5 The photograph shows a Crossbill.



A Crossbill feeds by using its bill (beak) to force apart the scales on conifer cones. It then uses its tongue to extract the seeds. If the bill is clipped it grows back again.

Scientists were interested in the evolution of the bill of the Crossbill.

In an investigation, they clipped the bills of several Crossbills so that their bills no longer crossed.

They observed that Crossbills with clipped bills took much longer to get seeds.

Use information from the investigation to suggest an explanation for the evolution of the bill in the Crossbill.

In your explanation, use the ideas of *selection, competition* and *mutation*.

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(4 marks)

4

4.7.1.1 Communities

Question 03

June 2009 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

There are several theories of how new species of plants and animals have developed.

The statements below outline four of these theories.

- Creationism: Each organism is made independently. Evolution does not occur. Gaps in the fossil record support this idea.
- Intelligent Design: Living things work in too complex a way for them to have evolved by chance. A higher being has designed all living things.
- Lamarckism: Changes occur during the lifetime of an individual. These changes can be passed on to offspring.
- Darwinism: Variation exists between members of a population. Only the organisms best suited to a habitat survive. Survivors pass on their advantages to their offspring.

Use the above information and your own knowledge and understanding to answer this question.

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

A Creationism

B Intelligent Design

C Lamarckism

D Darwinism

The idea that Manx cats, which have no tails, are the offspring of a cat which originally lost its tail in an accident could be used to support . . . **1** . . . .

Unsuccessful competitors die and so do not reproduce, is part of the theory of . . . **2** . . . .

The complicated way in which cells work can be used to support . . . **3** . . . .

The observation that fossils of all the different kinds of animals appear suddenly in the rocks, with no evidence of ancestors, supports . . . **4** . . . .

4.7.1.1 Communities

Question 04

June 2009 | BLY1H | Original Q1 | Legacy

1 Swallows and swifts migrate between Britain and South Africa every year.

1 (a) **Photograph 1** shows a swallow.

Photograph 1



Swallows can fly very quickly.

Use information from the photograph to give **one** way in which the swallow is adapted for flying very quickly.

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(1 mark)

1 (b) **Photograph 2** shows swifts.

Photograph 2



Swallows and swifts both feed on flying insects.
They both spend the summer in Britain and then migrate to South Africa in the autumn.

Suggest **one** reason why swallows and swifts do not stay in Britain in the winter.

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(1 mark)

4.7.1.1 Communities

Question 04 · continued

for mark

1 (c) The table gives data about swallows and swifts.

	Swallows	Swifts
Arrival date in Britain	April	Early May
Leaving date from Britain	October	Early August
Food	Flying insects	Flying insects
Height at which the birds feed	Near ground level	Up to 350 m above ground level
Times at which birds feed	Mainly when it is light	Almost 24 hours per day

1 (c) (i) There is very little competition between swallows and swifts for food.

Use information from the table to suggest **two** reasons for this.

1 .....

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2 .....

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(2 marks)

(Extra space) .....

1 (c) (ii) Swallows and swifts do compete for some factors.

Suggest **one** of these factors.

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(1 mark)

5

4.7.1.1 Communities

Question 05

March 2010 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Bristlecone pines are some of the oldest known trees.



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

A The trees' leaves live for about 30 years.

B The trees can grow new bark.

C The trees have needle-shaped leaves.

D The trees grow far apart.

1	The tree trunks can survive being struck by lightning.
2	There is little competition for minerals between the trees.
3	The trees can survive long periods of drought.
4	The trees need few minerals each year for growth.

4.7.1.1 Communities

Question 06

March 2010 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Read the passage about the introduction of invasive species.

Birds are important members of forest communities.

Guam, a Pacific island, lost most of its native birds after a predator, the brown tree snake, was introduced by accident. The snake population density is now quite high – estimated at more than 4000 per square kilometre.

Before the introduction of the brown tree snake, Guam had 12 species of native forest birds. Today, 10 of those are extinct on Guam, and the other two species each have fewer than 200 individuals.

9A The main reason for the rapid increase in the population of brown snakes on Guam was probably that . . .

1 the climate on Guam suited them.

2 there was an abundant supply of tree seeds for food for the snakes.

3 the bird population on Guam had decreased rapidly.

4 there were no predators of brown snakes on Guam.

9B The bird populations on Guam fell rapidly after the introduction of the brown snake.

One possible reason for this was that . . .

1 the number of trees on Guam declined rapidly.

2 the birds on Guam did not recognise the brown snake as a predator.

3 there was competition between the snake and the birds for food.

4 the number of insects on Guam declined rapidly.

A scientist investigated seed dispersal in forests on Pacific islands. She set seed traps beneath and near trees on Guam and on the nearby island of Saipan. Saipan does not have brown tree snakes.

On Saipan, the scientist found seeds in nearly every trap at each location. But on Guam, the seeds appeared only in traps directly under the trees.

Use all the information in this question to answer the following two questions.

9C The scientist's results suggest that . . .

1 seeds on Guam are mainly dispersed by birds.

2 seeds on Guam are mainly dispersed by wind.

3 the distance that seeds on Guam are dispersed depends mainly on their mass.

4 fewer seeds are produced by the trees on Guam than on Saipan.

9D Overall, the most serious long-term effect of the introduction of brown snakes into Guam is likely to be . . .

1 a reduction in the number of birds.

2 a reduction in the number of trees.

3 a reduction in biodiversity.

4 a reduction in sustainable development.

END OF TEST

4.7.1.1 Communities

Question 07

June 2014 | BL1HP | Original Q2 | Legacy

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

Animals and plants have features (adaptations) that allow them to survive in the conditions in which they normally live.

Describe how animals and plants are adapted to survive in dry conditions such as deserts.

For each adaptation that you give, describe how the adaptation helps the animal or plant to survive in dry conditions.

To obtain full marks you should refer to **both** animals and plants.

[6 marks]

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Extra space .....

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6

4.7.1.1 Communities

Question 08

June 2023 | 8461/1H | Original Q4

0 4 This question is about exercise.

0 4 . 1 During vigorous exercise, anaerobic respiration occurs in a person's body.

Explain **two** effects of anaerobic respiration on the person's body.

[4 marks]

1

2

4.7.1.1 Communities

Question 08 · continued

0 4 . 2 Design an investigation to show the effect of different types of exercise on the heart rate of athletes.

[6 marks]

Question 4 continues on the next page

Anabolic steroids are drugs.

Anabolic steroids:

- increase muscle mass in humans
- are banned in most competitive sports.

Some athletes take anabolic steroids to improve their performance in sport.

0 4 . 3 Explain how taking anabolic steroids could improve an athlete's performance.

[2 marks]

Scientists use monoclonal antibodies to test for the presence of anabolic steroids in an athlete's urine.

To produce monoclonal antibodies, a mouse lymphocyte is combined with a tumour cell.

0 4 . 4 What type of cell is created when a mouse lymphocyte and a tumour cell combine?

[1 mark]

Tick (✓) **one** box.

- Embryo ☐
- Hybridoma ☐
- Phagocyte ☐
- Stem cell ☐

4.7.1.1 Communities

Question 08 · continued

0 4 . 5 Describe how scientists make monoclonal antibodies using the cell created when a mouse lymphocyte and a tumour cell combine.

[3 marks]

0 4 . 6 What property makes a monoclonal antibody useful in detecting the presence of an anabolic steroid in urine?

[1 mark]

Tick (✓) **one** box.

A monoclonal antibody is quick and easy to produce. ☐

A monoclonal antibody is specific to only one person's urine. ☐

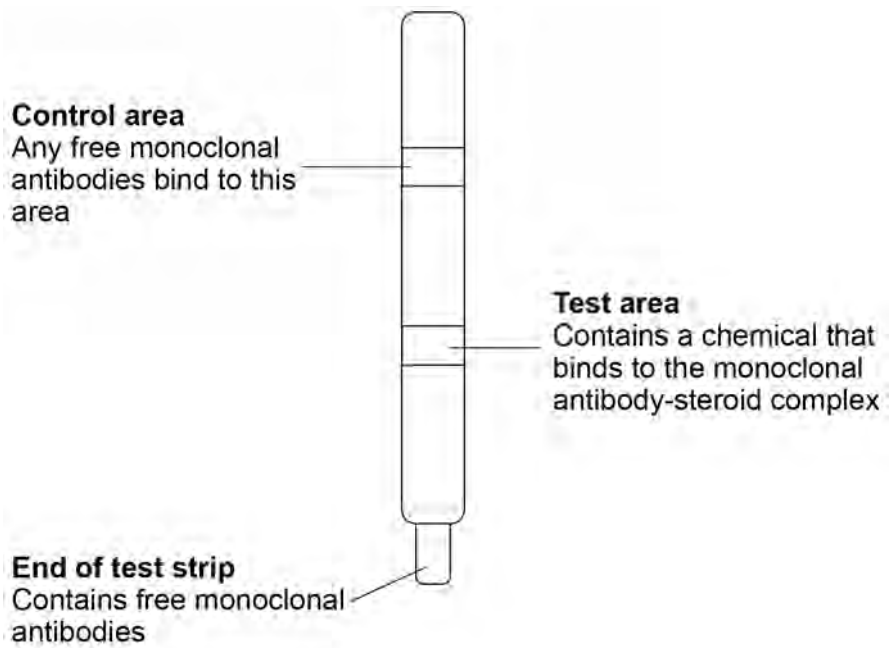
A monoclonal antibody only binds to the anabolic steroid. ☐

A monoclonal antibody can identify many different drugs at the same time. ☐

Question 4 continues on the next page

Figure 5 shows a test strip that can detect the presence of an anabolic steroid in an athlete's urine.

Figure 5



The end of the test strip is dipped in urine.

The urine moves up through the test strip.

The test area and the control area contain a dye.
The dye turns blue when monoclonal antibodies bind to it.

0 4 . 7 Suggest the purpose of the control area in the test strip.

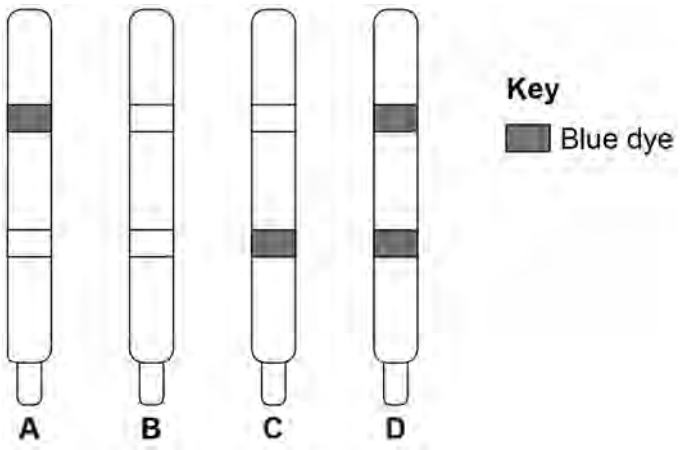
[1 mark]

4.7.1.1 Communities

Question 08 · continued

Figure 6 shows the urine test results of four athletes.

Figure 6



0 4 . 8 Describe the evidence in **Figure 6** that shows the test for athlete **B** has **not** worked.

Suggest **one** reason why the test did **not** work.

[2 marks]

Evidence _____

_____

Reason _____

_____

0 4 . 9 Which athlete has tested positive for anabolic steroids in their urine?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

21

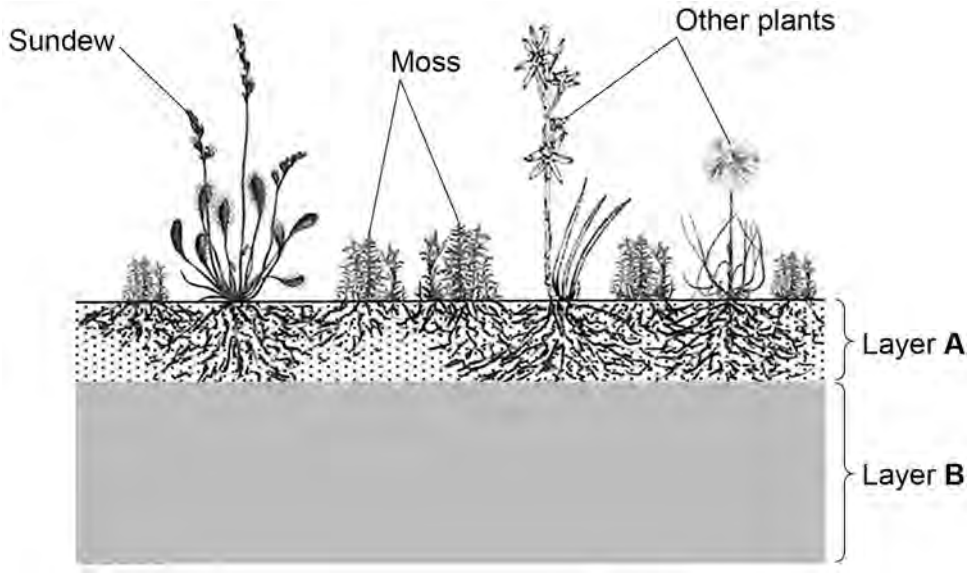
4.7.1.1 Communities

Question 09

0 2 Peat bogs are estimated to contain twice as much carbon as all the world's forests.

Figure 2 shows a section through part of a peat bog.

Figure 2



Layer **A** contains a lot of air.

Layer **B**:

- contains the dead remains of plants
- has a low pH
- contains very little oxygen
- contains carbon dioxide and methane.

4.7.1.1 Communities

Question 09 · continued

0 2 . 1 Explain why most of the dead remains of plants in layer **B** do **not** decay.

[3 marks]

0 2 . 2 The peat bog in **Figure 2** is a stable community.

The moss produces biomass at a rate of 340 g/m^2/year.

What is the approximate biomass of the moss that becomes biomass in primary consumers?

[1 mark]

Tick (✓) **one** box.

- 0.34 g/m^2/year ☐
- 3.4 g/m^2/year ☐
- 34 g/m^2/year ☐
- 340 g/m^2/year ☐

Question 2 continues on the next page

4.7.1.1 Communities

The sundew plant shown in **Figure 2** on page 4 has leaves with sticky hairs that trap and digest insects.

Digestion of the insects releases phosphates and simple compounds of nitrogen that are used by the sundew plant.

0 2 . 3 What substance can the sundew plant make using the **phosphates**?

[1 mark]

Tick (✓) **one** box.

- Cellulose ☐
- DNA ☐
- Glycerol ☐
- Starch ☐

0 2 . 4 What substance can the sundew plant make using the **nitrogen**?

[1 mark]

Tick (✓) **one** box.

- Fatty acid ☐
- Glucose ☐
- Lactic acid ☐
- Protein ☐

0 2 . 5 Humans have destroyed large areas of peat bog to collect peat.

The peat provides fuel and provides compost for gardeners to use.

The peat comes from layer **B** in **Figure 2** on page 4.

Layer **B**:

- contains the dead remains of plants
- has a low pH
- contains very little oxygen
- contains carbon dioxide and methane.

Figure 3 shows the removal of peat from a peat bog.

Figure 3



Explain how the destruction of peat bogs and the use of peat affects the temperature of the Earth's atmosphere.

[4 marks]

10

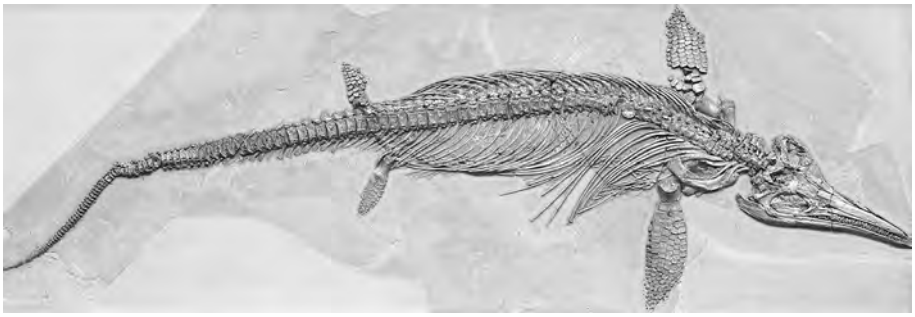
4.7.1.1 Communities

Question 10

0 1 Ichthyosaurs are reptiles that lived in the sea millions of years ago.

Figure 1 shows the fossilised remains of an ichthyosaur.

Figure 1



0 1 . 1 Suggest how the fossil in **Figure 1** was formed after the ichthyosaur died.

[2 marks]

0 1 . 2 The length of the image of the ichthyosaur in **Figure 1** is 120 mm.

The real length of the ichthyosaur was 17 times longer than the image in **Figure 1**.

Calculate the real length of the ichthyosaur.

Give your answer in metres.

[3 marks]

Real length of ichthyosaur = _____ metres

4.7.1.1 Communities

Question 10 · continued

0 1 . 3 **Table 1** gives the classification of the ichthyosaur in **Figure 1**.

Table 1

Classification group	Name
Kingdom	Animalia
	Chordata
Class	Reptilia
Order	Ichthyosauria
	Ichthyosauridae
Genus	Ichthyosaurus
Species	intermedius

Complete **Table 1**.

[2 marks]

Choose answers from the box.

Community	Family	Mammal	Phylum	Population

0 1 . 4 Ichthyosaurs were predators.

Ichthyosaurs are now extinct.

Scientists think that extinction of the ichthyosaurs was caused by increased competition with other predators for food.

Suggest **two other** possible causes of extinction of the ichthyosaurs.

[2 marks]

1 _____

_____

2 _____

_____

9