AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.2.1

Variation

Past-paper questions

Tier	**Foundation**
Question groups	**12**
Available paper years	**2008–2019**

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.

4.6.2.1 Variation

Question 01

June 2008 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

This question is about evolution.

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

A extinction

B natural selection

C mutation

D variation

1	a theory put forward by Darwin
2	differences shown by individuals in the same species
3	a change in a gene
4	may be caused by new predators

4.6.2.1 Variation

Question 02

November 2008 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

This question is about Darwin's and Lamarck's theories of evolution.

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

A observed that all species change over time

B had sufficient evidence to prove evolution

C thought that natural selection operated on variations present at birth

D thought that the changes that happen during an organism's lifetime are inherited by their offspring

1	only Darwin
2	only Lamarck
3	Darwin and Lamarck
4	neither Darwin nor Lamarck

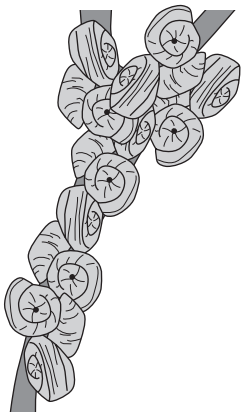
4.6.2.1 Variation

Question 03

June 2009 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

Banded snails live in woodland and grassland.



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

A evolution

B mutation

C selection

D variation

Banded snails have a wide range of different colours on their shells.

This wide range of colours is an example of . . . **1** . . . .

A change in a gene that gives a different colour is caused by . . . **2** . . . .

Birds only eat certain coloured snails. This is an example of . . . **3** . . . .

Over a long period of time, new species of snails develop. This is an example of . . . **4** . . . .

4.6.2.1 Variation

Question 04

November 2009 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

This question is about reproduction in animals and plants.

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

A clones

B cuttings

C gametes

D variations

Sexual reproduction involves the joining of . . . **1** . . . .

The offspring from sexual reproduction are a mixture of genetic information from two parents.

This leads to . . . **2** . . . .

Asexual reproduction involves genetic information from only one parent.

The offspring are genetically identical to the parent and are known as . . . **3** . . . .

An asexual method of producing plants is by taking . . . **4** . . . .

4.6.2.1 Variation

Question 05

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

4.6.2.1 Variation

Question 06

June 2011 | BLY1AP | Original Q7 | Legacy

QUESTION SEVEN

Several factors affect the risk of heart disease.

The table shows how different occupations and the risk factors for heart disease are linked.

Risk factor	Percentage of occupational group at risk of heart disease				
	Professional	Semi-professional	Self-employed	Semi-skilled	Unskilled
Smoking	18	22	26	28	35
Less than 30 minutes of exercise per week	28	30	28	30	35
Drinking over 4 units of alcohol per day	34	37	34	36	34
Drinking over 8 units of alcohol on at least one day per week	18	19	18	20	18
High blood pressure	25	27	25	29	28
High total cholesterol	66	65	67	65	60
Being overweight	43	43	38	39	39
Obesity	21	20	27	24	23

7A Which occupational group take least exercise on average?

1 professional

2 semi-professional

3 semi-skilled

4 unskilled

7B Which risk factor affects all occupational groups the most?

1 smoking

2 drinking over 4 units of alcohol per day

3 high total cholesterol

4 obesity

4.6.2.1 Variation

Question 06 · continued

7C For which risk factor is there the least variation between the different occupational groups?

1 smoking

2 drinking over 8 units of alcohol on at least one day per week

3 high blood pressure

4 being overweight

7D To which occupational group would it be best to target an anti-smoking campaign?

1 professional

2 semi-professional

3 self-employed

4 unskilled

Turn over for the next question

4.6.2.1 Variation

Question 07

June 2011 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

The modern theory of evolution is based mainly on Charles Darwin's work.

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

A extinction

B mutation

C reproduction

D variation

The range of characteristics we can see in a species is known as . . . **1** . . . .

This range of characteristics has been brought about by . . . **2** . . . .

Characteristics that give advantages are passed on during . . . **3** . . . .

Characteristics that are disadvantages may result in . . . **4** . . . .

4.6.2.1 Variation

Question 08

June 2011 | BLY1F | Original Q7 | Legacy

7 Soay sheep live wild on an island off the north coast of Scotland. No people live on the island.



Over the last 25 years, the average height and mass of the wild Soay sheep have decreased.

The scientists think that climate change might have affected the size of the sheep.

7 (a) More Soay sheep are now able to survive winter than 25 years ago.

What change in the climate may have helped more Soay sheep to survive winters?

.....

.....

(1 mark)

7 (b) Complete the sentences.

7 (b) (i) Soay sheep show variation in size because of differences in their

..... .

(1 mark)

7 (b) (ii) The change in the size of the Soay sheep over 25 years can be explained by Darwin's theory of ..... .

(1 mark)

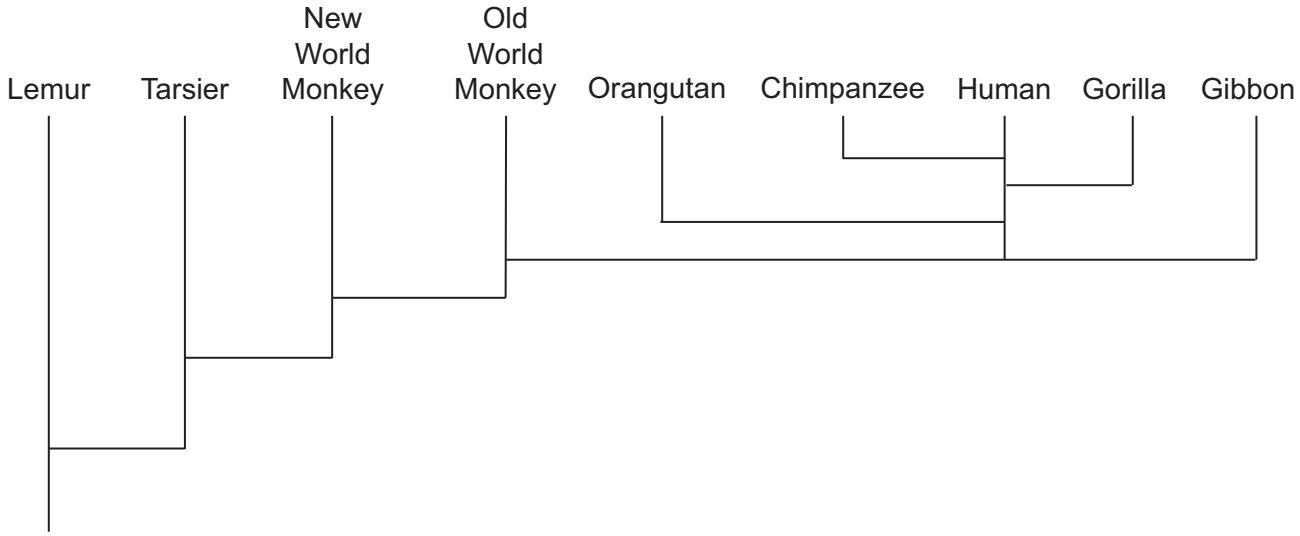
3

4.6.2.1 Variation

Question 09

January 2012 | BL1FP | Original Q3 | Legacy

3 The diagram shows the evolution of a group called the primates.



3 (a) Which primate evolved first?

.....

(1 mark)

3 (b) Name **two** primates that developed most recently from the same common ancestor as humans.

1 .....

2 .....

(2 marks)

3 (c) (i) The theory of evolution by natural selection was suggested in the 1800s.

Which scientist suggested this theory?

.....

(1 mark)

4.6.2.1 Variation

Question 09 · continued

3 (c) (ii) Use words from the box to complete the passage about natural selection.

evolution	**environment**	**generation**
mutate	**survive**	**variation**

Individual organisms of a species may show a wide range of ..... because of differences in their genes. Individuals with characteristics most suited to the ..... are more likely to ..... and breed successfully. The genes that have helped these individuals to survive are then passed on to the next ..... .

(4 marks)

8

4.6.2.1 Variation

Question 10

June 2016 | BL1FP | Original Q6 | Legacy

6 Darwin's theory of natural selection states that all living things have evolved from simple life forms.

6 (a) Use the correct answer from the box to complete the sentence.

[1 mark]

three billion	three million	three thousand

Darwin's theory states that life began on Earth _____ years ago.

6 (b) Life evolved due to changes in genes. Changes in genes cause variation.

Complete the sentences.

[2 marks]

Changes in genes are called _____ .

Individuals with characteristics most suited to the environment are more likely to survive and _____ .

3

4.6.2.1 Variation

Question 11

June 2018 | 8461/2F | Original Q3

0 3 Fossils give evidence about organisms that lived a long time ago.

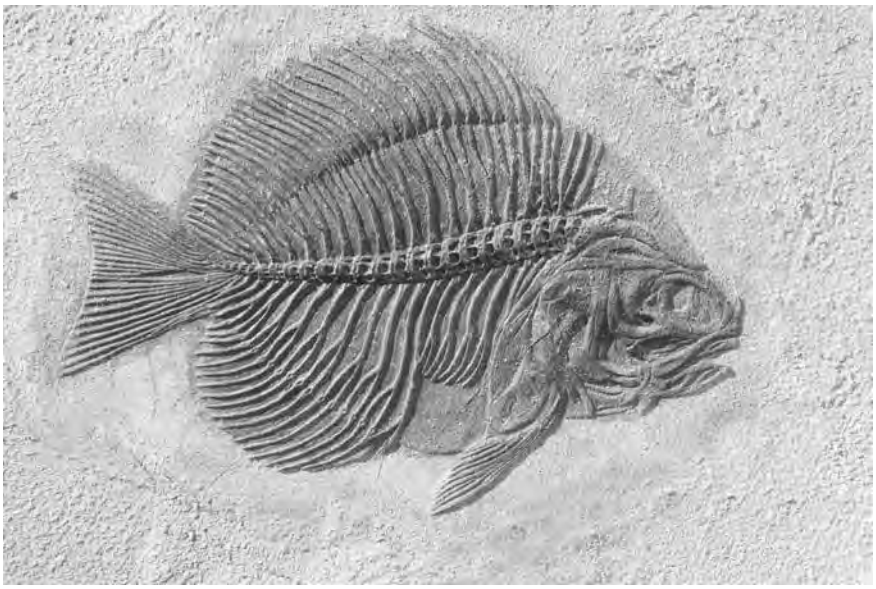
0 3 . 1 Scientists have found very few fossils of the earliest life forms.

Give **one** reason why.

[1 mark]

Figure 3 is a photograph of a fossilised fish.

Figure 3



0 3 . 2 Suggest how the fossil in **Figure 3** was formed.

[2 marks]

4.6.2.1 Variation

Question 11 · continued

0 3 . 3 The species of fish shown in **Figure 3** is now extinct.

Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

Modern fish species have evolved from fish that lived a long time ago.

Evolution is caused by mutation and natural selection.

0 3 . 4 What is a mutation?

[1 mark]

Tick **one** box.

A change in a gene ☐

Accidental damage to an organism ☐

An organism with a new characteristic ☐

The loss of a species ☐

0 3 . 5 Describe the process of natural selection.

[3 marks]

_____

_____

_____

_____

_____

_____

9

4.6.2.1 Variation

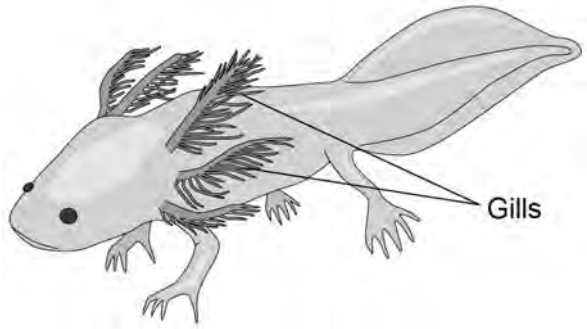
Question 12

June 2019 | 8461/1F | Original Q2

0 2 An animal called an axolotl lives in water.

Figure 3 shows an axolotl.

Figure 3



Oxygen enters the axolotl's bloodstream through the gills by diffusion.

0 2 . 1 What is diffusion?

[1 mark]

Tick (✓) **one** box.

The movement of particles from a high concentration to a low concentration ☐

The movement of particles from a low concentration to a high concentration ☐

The movement of water from a concentrated solution to a more dilute solution ☐

0 2 . 2 Describe how **one** feature of the axolotl's gills increases the rate of diffusion of oxygen.

Use information from **Figure 3**.

[2 marks]

Feature _____

Description _____

_____

_____

4.6.2.1 Variation

Question 12 · continued

If a gill of an axolotl is removed, stem cells in the damaged area will divide and a new gill will grow.

0 2 . 3 Complete the sentence.

[1 mark]

Choose the answer from the box.

adaptation	**differentiation**	**evolution**	**variation**

When stem cells specialise to produce gill cells, this process is

known as _____.

0 2 . 4 Complete the sentence.

[1 mark]

Choose the answer from the box.

binary fission	**mitosis**	**mutation**

To grow a new gill the stem cells divide by _____.

0 2 . 5 Which **one** of the following does **not** contain stem cells?

[1 mark]

Tick (✓) **one** box.

- Bone marrow ☐
- Embryos ☐
- Hair ☐
- Meristem tissue ☐

4.6.2.1 Variation

Question 12 · continued

0 2 . 6 Axolotls are small animals. Axolotls are used in stem cell research.

What are **two** advantages of using axolotls in stem cell research?

[2 marks]

Tick (✓) **two** boxes.

- Axolotls are cheap to feed. ☐
- Axolotls are easy to breed. ☐
- Axolotls are endangered. ☐
- Axolotls live in water. ☐
- Axolotl research is cruel. ☐

4.6.2.1 Variation

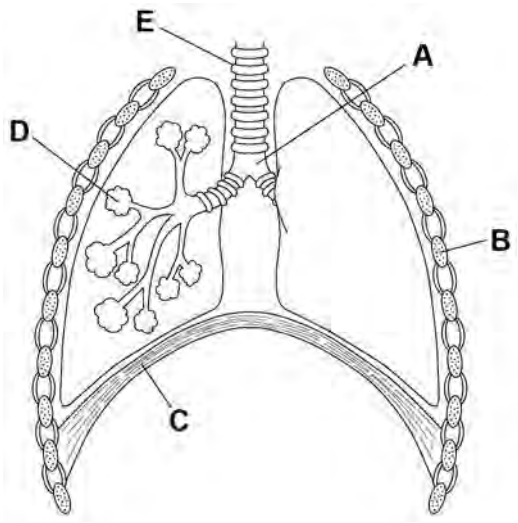
Question 12 · continued

June 2019 | 8461/1F | Original Q2

Oxygen uptake in humans takes place in the lungs.

Figure 4 shows the human breathing system.

Figure 4



0 2 . 7 Where does oxygen enter the bloodstream?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 2 . 8 Name part **E** on **Figure 4**.

[1 mark]

0 2 . 9 Which blood vessel carries blood to the lungs?

[1 mark]

Tick (✓) **one** box.

Aorta ☐

Pulmonary artery ☐

Vena cava ☐

11