AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.3.6

Extinction

Past-paper questions

Tier	**Foundation**
Question groups	**37**
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.

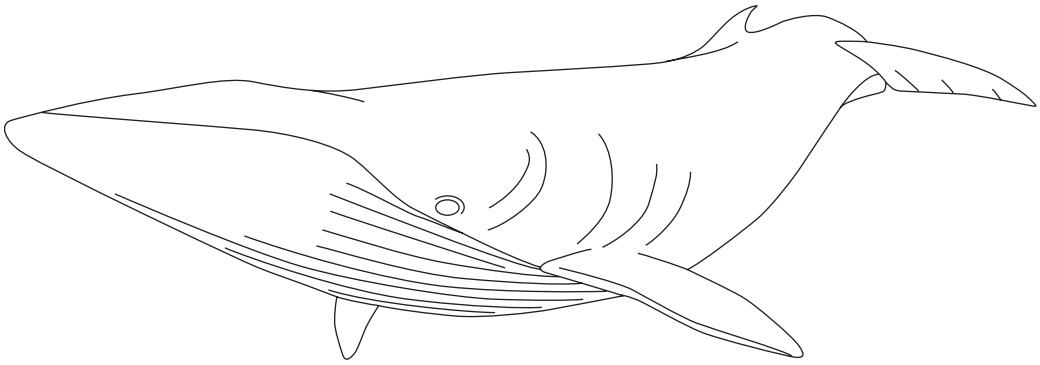
4.6.3.6 Extinction

Question 01

January 2007 | BLY1F | Original Q1 | Legacy

1 (a) **Figure 1** shows a minke whale. Whales live in the sea.

Figure 1



Write down **two** ways in which the body of the whale is adapted for swimming.

1 .....

.....

2 .....

.....

(2 marks)

(b) **Figure 2** shows the skeleton of a minke whale.

Figure 2

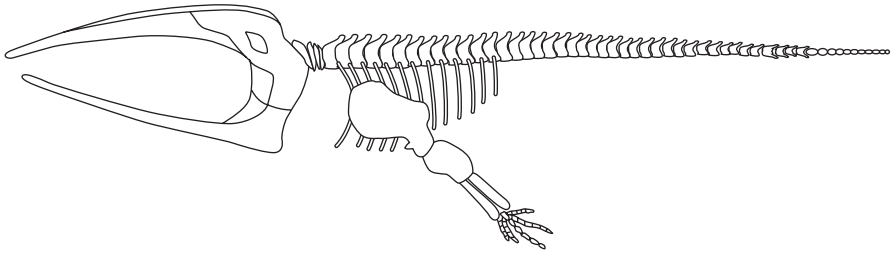
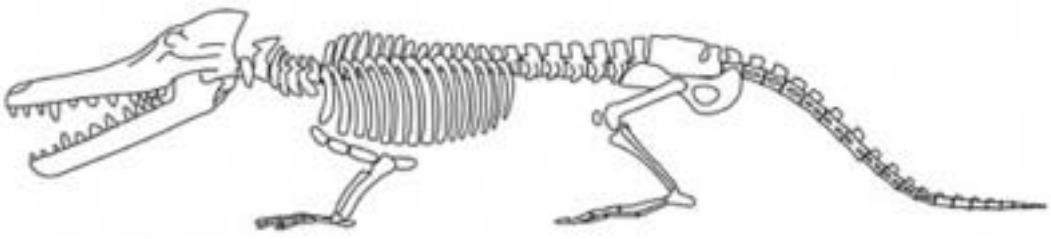


Figure 3 shows the fossil skeleton of an extinct whale.

Figure 3



4.6.3.6 Extinction

Question 01 · continued

BLANK

(i) Apart from size, give **two** differences between the skeleton of the minke whale and the fossil skeleton of the extinct whale.

1 .....

.....

2 .....

.....

(2 marks)

(ii) In each of the sentences below, draw a ring around the correct answer.

Life on Earth first developed more than three [billion / million / thousand] years ago.

Fossils [disprove / give evidence for / prove] the theory of evolution.

(2 marks)

6

4.6.3.6 Extinction

Question 02

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

4.6.3.6 Extinction

Question 03

June 2007 | BLY1B | Original Q8 | Legacy

QUESTION EIGHT

One theory of evolution states that all different species of living organisms alive today have evolved from much simpler life forms. These simpler life forms first appeared more than three billion years ago.

The remains of extinct animals and plants may form fossils that can be found in rocks.

Fossils are studied to find out how present-day species have changed from earlier species.

8A The presence of fossils supports the theory of evolution because . . .

1 fossil organisms are found in different layers of rocks.

2 fossil organisms have features in common with present-day organisms.

3 present-day organisms have evolved from fossil organisms.

4 adaptation to the environment by fossil organisms caused the development of new species.

8B Which of the following is **not** a cause of extinction?

1 changes in the environment

2 mutation

3 new diseases

4 new predators

8C Darwin's theory of evolution via natural selection was only gradually accepted because . . .

1 books were expensive.

2 Darwin was not a scientist.

3 Lamark had a better theory.

4 the causes of variation were not known at that time.

4.6.3.6 Extinction

8D Scientists are uncertain about the origin of life on Earth because . . .

1 fossils last for only a few million years.

2 humans evolved later than most other organisms.

3 new competitors caused the extinction of the earliest organisms.

4 the earliest organisms had soft bodies.

Turn over for the next question

4.6.3.6 Extinction

Question 04

November 2007 | BLY1B | Original Q6 | Legacy

QUESTION SIX

The drawing shows a museum specimen of an ivory-billed woodpecker which is now thought to be extinct.

Some birdwatchers claim to have heard its distinct call.

Other birdwatchers have heard knocking on the trunk of a tree.

Some people on websites claim to have seen it but nobody has a photograph.



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

A a recent photograph of an ivory-billed woodpecker

B people claiming to have seen the ivory-billed woodpecker

C the distinct bird calls

D the knocking on the trunk of a tree

The most reliable evidence, **so far**, that the ivory-billed woodpecker is **not** extinct is . . . **1** . . . .

After that, the next most reliable evidence would be . . . **2** . . . .

The most valid evidence that the ivory-billed woodpecker is **not** extinct would be . . . **3** . . . .

The evidence that must be considered carefully for any bias must be . . . **4** . . . .

4.6.3.6 Extinction

Question 05

November 2007 | BLY1B | Original Q8 | Legacy

QUESTION EIGHT

Rabbits and hares are closely related species.

They are thought to have descended from a common ancestor that is now extinct.

8A Extinction may be caused by . . .

1 an increase in variation.

2 a lack of new competitors.

3 fossilisation.

4 changes in the environment.

8B The evidence that rabbits and hares have evolved from a common ancestor would be shown by . . .

1 comparing modern rabbits and hares with other related species.

2 studying the fossil record of rabbits and hares.

3 studying the fossils of predators of rabbits and hares.

4 comparing the behaviour of rabbits and hares.

8C Rabbits and hares both feed on plants and have teeth adapted for this.

Which one of the following is **not** a possible factor for the development of the specialised teeth of rabbits and hares?

1 adaptation to the environment

2 changes in the environment

3 evolution of predators

4 natural selection

8D What is a mutation?

1 a change in the physical appearance of an organism

2 a change in a gene

3 a form of natural selection

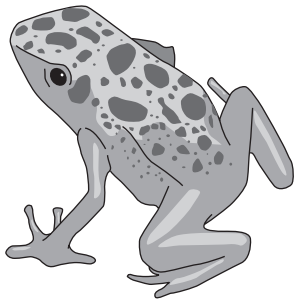
4 a change in the environment

4.6.3.6 Extinction

Question 06

January 2008 | BLY1F | Original Q2 | Legacy

2 The drawing shows a poison-dart frog.



(a) The poison-dart frog moves mainly by jumping.

Use information from the drawing to suggest **one** way in which this frog is adapted for jumping.

.....

.....

(1 mark)

(b) Use the information below to suggest how the poison-dart frog is adapted for survival.

- This poison-dart frog is bright blue in colour.
- Animals that eat poison-dart frogs become very sick.

.....

.....

(1 mark)

4.6.3.6 Extinction

Question 06 · continued

BLANK

(c) There are over five thousand species of frogs in the world. One third of these species are threatened with extinction.

(i) Suggest **two** reasons why many species of frogs are now threatened with extinction.

1 .....

.....

2 .....

.....

(2 marks)

(ii) It is important that we do not allow species of frogs to become extinct.

Suggest **one** reason why.

.....

.....

(1 mark)

5

4.6.3.6 Extinction

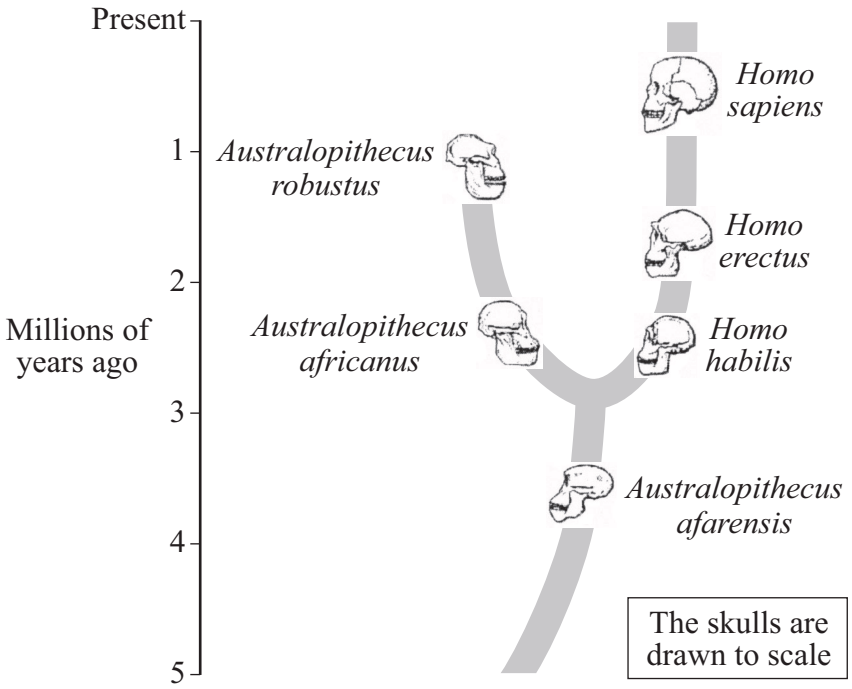
Question 07

June 2008 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

The diagram shows a possible evolutionary tree for humans (*Homo sapiens*).

All the organisms except *Homo sapiens* are extinct.



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

A *Homo sapiens*

B *Australopithecus robustus*

C *Australopithecus afarensis*

D *Homo habilis*

1	the first organism to evolve
2	the direct ancestor of modern humans that evolved $2\frac{1}{2}$ million years ago
3	the organism with the largest brain
4	the organism that became extinct most recently

4.6.3.6 Extinction

Question 08

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

4.6.3.6 Extinction

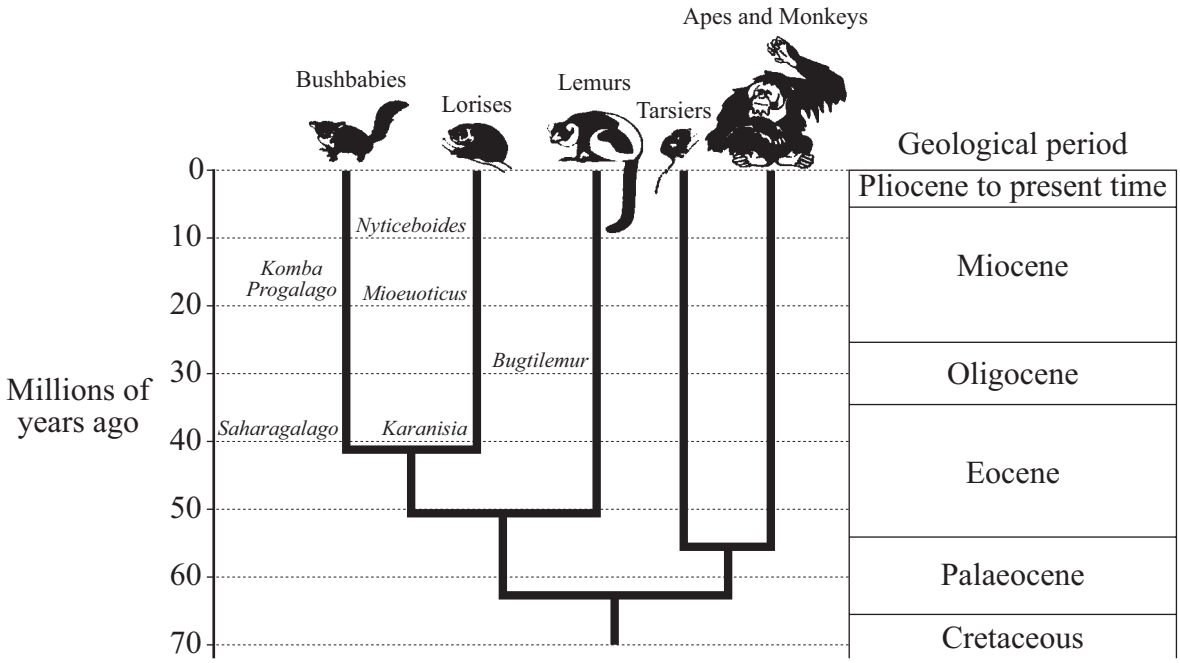
Question 09

June 2008 | BLY1F | Original Q4 | Legacy

4 The diagram shows an evolutionary tree for a group of animals called primates.

The names of extinct animals are printed in italics e.g. *Nycticeboides*.

The drawings show animals that are alive today.



4 (a) (i) How many million years ago did *Karanisia* first appear?

..... millions of years ago.

(1 mark)

4 (a) (ii) During which geological period did the Apes and Monkeys begin to evolve?

.....

(1 mark)

4 (a) (iii) Which group of primates alive today are the closest relatives of the Lorises?

.....

(1 mark)

4.6.3.6 Extinction

Question 09 · continued

for mark

4 (b) Darwin was the first scientist to state that humans and other primates had common ancestors.

Many people were against Darwin's ideas at that time.

Give **two** reasons why they were against his ideas.

1 .....

.....

2 .....

.....

(2 marks)

5

Turn over for the next question

4.6.3.6 Extinction

Question 10

January 2009 | BLY1F | Original Q2 | Legacy

2 The photograph shows an area where a tropical forest is being cleared.



© Kazuyoshi Nomachi/Corbis

2 (a) Complete the sentences.

People could use timber from the forest for ..... .

The cleared land can be used for ..... .

Clearing forests increases the concentration of ..... in the atmosphere.

This increase causes global ..... .

(4 marks)

2 (b) Clearing forests causes some species to become *extinct*.

2 (b) (i) What is meant by *extinct*?

.....

.....

(1 mark)

2 (b) (ii) It is important to prevent species from becoming extinct.

Give **one** reason why.

.....

.....

(1 mark)

6

4.6.3.6 Extinction

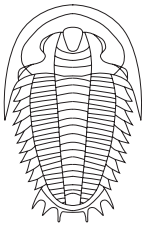
Question 11

June 2009 | BLY1BP | Original Q4 | Legacy

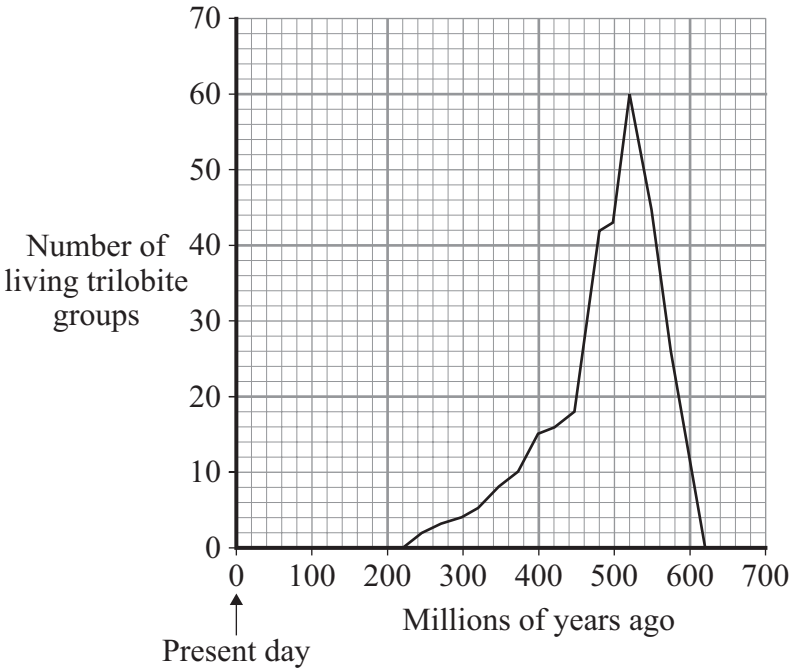
QUESTION FOUR

Trilobites are an extinct family of animals.

The drawing shows one species of trilobite.



The graph shows how the number of different groups of trilobites has changed over time.



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

A when trilobites first appeared on the Earth

B when trilobites had finally become extinct

C when there were most groups of trilobites

D the beginning of the largest scale extinction of trilobite groups.

	Millions of years ago
1	220
2	480

4.6.3.6 Extinction

Question 12

June 2009 | BLY1F | Original Q4 | Legacy

4 Some organisms are in danger of extinction.
The photograph shows an African elephant feeding on tree leaves.



4 (a) Read the information about elephants and humans in Africa.

- The African elephant is the largest land animal.
- The African elephant feeds on lots of leaves.
- Adult African elephants have no natural predators.
- Elephants are killed by poachers for their ivory tusks.
- African elephants live for about 70 years.
- Most African elephants live in large herds.
- Land available to elephants is disappearing rapidly.

The African elephant is now extinct in many parts of Africa.

Use information from the list to give **three** reasons why.

1.....

.....

2.....

.....

3.....

.....

(3 marks)

4.6.3.6 Extinction

Question 12 · continued

for mark

4 (b) Organisms that are in danger of extinction can be cloned.

List A gives the names of three different cloning techniques.

List B gives information about these techniques.

Draw a line from each technique in **List A** to the correct information about it in **List B**.

List A **Technique**	**List B** **Information**
	Small groups of cells from parts of a plant are grown on a special jelly.
Adult cell cloning	
	Cells from a developing animal are separated before they become specialised and then placed into host mothers.
Embryo transplanting	
	Genes are cut out from chromosomes and inserted into other organisms.
Tissue culture	
	A nucleus is removed from an unfertilised egg cell. The nucleus from a body cell is inserted into the egg cell. An electric shock causes the egg to start to divide.

(3 marks)

6

4.6.3.6 Extinction

Question 13

November 2009 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

Organisms have changed since life began on Earth.

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

A evolution

B extinction

C natural selection

D reproduction

1	the theory that all living species developed from simple life forms over billions of years
2	genes being passed on from one generation to the next
3	a species dying out
4	organisms that are most suited to their environment survive to breed

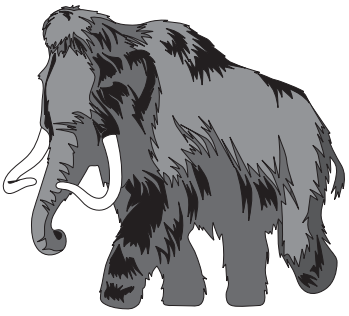
4.6.3.6 Extinction

Question 14

November 2009 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

Woolly mammoths are extinct mammals that are related to modern elephants.



8A There are several possible reasons for the extinction of the woolly mammoth.

Which one of these was the most likely cause of their extinction?

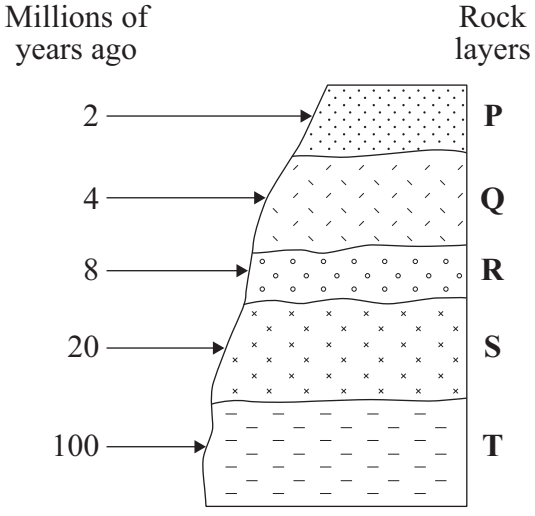
1 continents moving apart

2 an increase in the number of plant species

3 formation of new mountain ranges

4 an increase in the temperature of the Earth

The diagram shows the rocks in a cliff, which were exposed when other rocks wore away.
The times when these rocks were formed are shown.



4.6.3.6 Extinction

Question 14 · continued

8B Woolly mammoths lived on Earth between 4.8 million years ago and 4 thousand years ago.

In which layers of rock could woolly mammoth fossils be found?

1 **T** and **S** only

2 **Q** only

3 **R**, **S** and **T** only

4 **P** and **Q** only

8C Living things are thought to have developed over 3 billion years ago. We cannot be sure what these living things looked like.

This is because . . .

1 no rocks were being formed 3 billion years ago, so there are no fossils.

2 geological activity has destroyed many of the fossils.

3 there are no records because humans had not evolved then.

4 scientists are unable to agree on their appearance.

8D Recently, a pregnant female woolly mammoth was discovered preserved in ice. The cells of this mammoth are still in good condition. Scientists plan to transfer the nucleus from a mammoth skin cell into an elephant egg cell from which the nucleus has been removed. After the cell is given an electric shock, it will be transferred to the womb of a female elephant.

What term is used to describe this process?

1 tissue culture

2 sexual reproduction

3 adult cell cloning

4 taking cuttings

4.6.3.6 Extinction

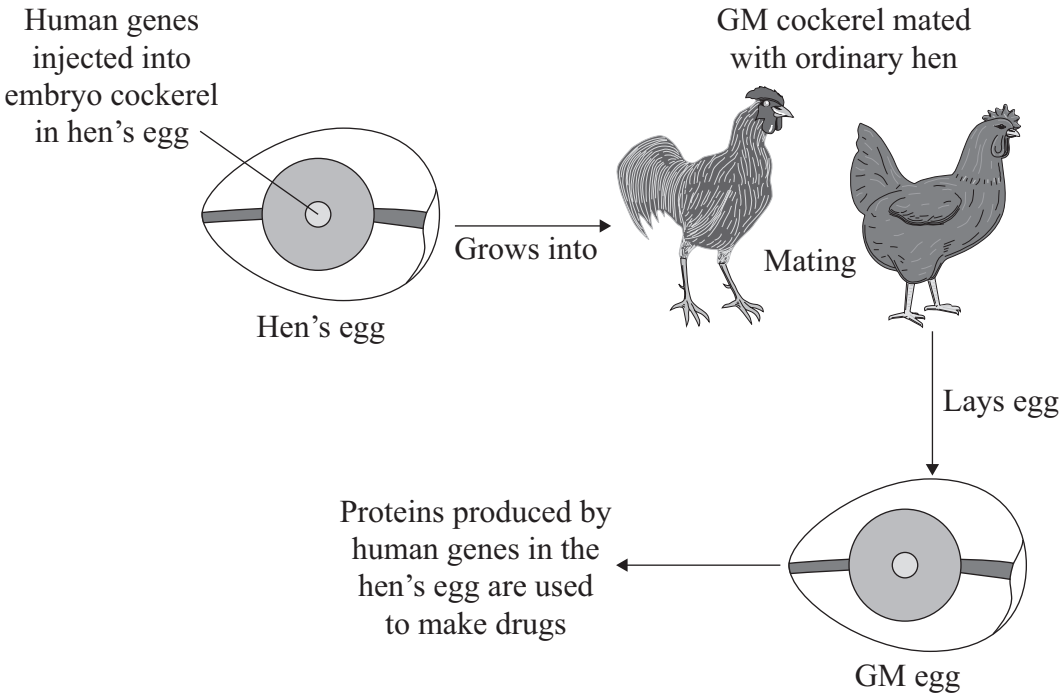
Question 15

January 2010 | BLY1F | Original Q4 | Legacy

4 Scientists have discovered how to produce genetically modified (GM) hens' eggs.

Some proteins produced in GM eggs can be used as drugs to treat humans.

The diagram shows how this is done.



4 (a) Which type of reproduction is involved when the cockerel mates with the hen?

Tick (✓) **one** box.

Asexual ☐

Cloning ☐

Sexual ☐

(1 mark)

4 (b) From which part of a human are the genes cut?

Tick (✓) **one** box.

Chromosome ☐

Embryo ☐

Gland ☐

(1 mark)

4.6.3.6 Extinction

Question 15 · continued

for mark

4 (c) Read the information about genetically modified animals.

- GM animals might escape and breed with wild animals.
- Genetic modification can produce fast-growing animals for food.
- Genetic modification can be used to clone animals in danger of extinction.
- Using GM animals can reduce the number of animals used in medical research.
- Animals have the right to be free from genetic modification.

Use **only** this information to answer these questions.

4 (c) (i) Give **two** reasons why many people are in favour of genetically modified animals.

1 .....

.....

2 .....

.....

(2 marks)

4 (c) (ii) Give **two** reasons why many people are against genetically modified animals.

1 .....

.....

2 .....

.....

(2 marks)

6

4.6.3.6 Extinction

Question 16

March 2010 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

Tasmanian tigers are similar to Tasmanian devils. Tasmanian tigers became extinct in the 20th century.

The picture shows a Tasmanian tiger.



Scientists are trying to create living Tasmanian tigers. They are using cells from the well-preserved remains of a pregnant Tasmanian tiger. They are trying several methods.

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

A sexual reproduction

B tissue culture

C embryo transplants

D adult cell cloning

	Description
1	Splitting cells from the Tasmanian tiger embryo and transplanting them into the womb of a Tasmanian devil.
2	Joining female gametes from the Tasmanian tiger with male sperm cells from a Tasmanian devil.
3	Growing small groups of cells in a special nutrient solution.
4	Transferring the nucleus from a Tasmanian tiger skin cell into a Tasmanian devil egg cell. After the cell is given an electric shock, it is transferred to the womb of a female Tasmanian devil.

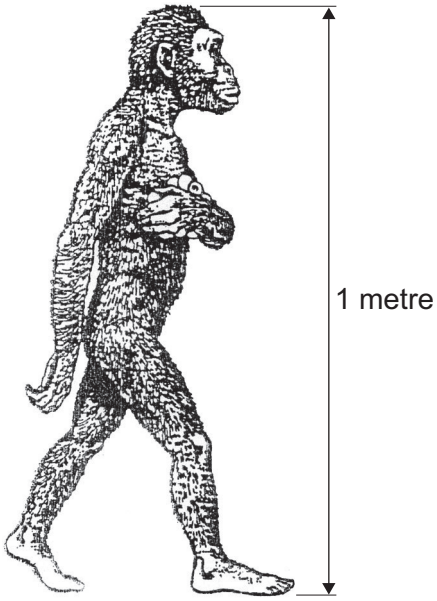
4.6.3.6 Extinction

Question 17

June 2010 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

The drawing shows what we think an extinct human-like animal looked like. The animal has been nicknamed 'Lucy'.



6A There are many differences between Lucy and modern humans.

One difference is that modern humans have . . .

1 shorter legs.

2 a more upright posture.

3 a more protruding jaw.

4 less body hair.

4.6.3.6 Extinction

Question 17 · continued June 2010 | BLY1BP | Original Q6 | Legacy

6B What caused the differences between Lucy and modern humans?

1 temperature increases in the environment

2 mutations in the genes

3 new diseases

4 competition with each other for food

6C Scientists have found evidence for the existence of Lucy by . . .

1 doing genetic engineering.

2 extracting DNA from apes.

3 watching modern apes.

4 studying fossils.

6D Darwin's theory of evolution states that all species of living things have evolved from simple life forms.

It took a long time for Darwin's theory of evolution to be widely accepted because . . .

1 books were expensive.

2 Darwin was not a scientist.

3 Lamarck had a better theory.

4 the causes of variation were not known at that time.

4.6.3.6 Extinction

Question 18

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

4.6.3.6 Extinction

Question 19

November 2010 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

This question is about evolution.

6A Approximately how long ago did the first simple life-forms appear on Earth?

1 300 000 years

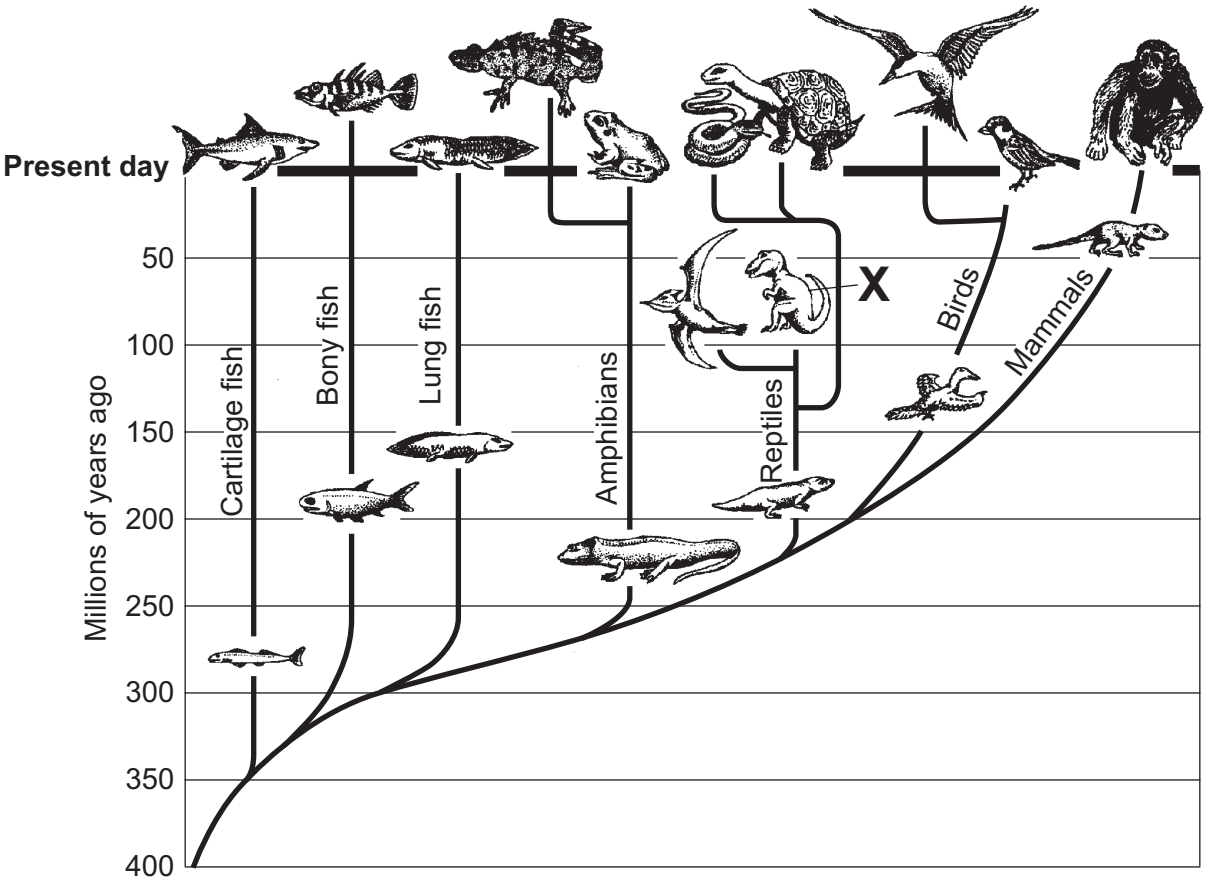
2 3 million years

3 300 million years

4 3 billion years

The diagram shows an evolutionary tree for some groups of animals.

All the species below the line for present day are extinct.



4.6.3.6 Extinction

Question 19 · continued

6B Which group of animals shown on the diagram evolved first?

1 mammals

2 birds

3 reptiles

4 cartilage fish

6C Which two groups of animals evolved at nearly the same time?

1 cartilage fish and bony fish

2 reptiles and birds

3 mammals and birds

4 reptiles and amphibians

6D The animal labelled **X** has been extinct for over 50 million years.

How do we know that animal **X** once lived?

1 Drawings of the animal were made when the animal was alive.

2 Fossils of the animal have been found in rocks.

3 People were alive to see the animal.

4 Reptiles are alive today.

4.6.3.6 Extinction

Question 20

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** . . . .

4.6.3.6 Extinction

Question 21

November 2011 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

Climate change is affecting an American national park.

- Temperatures are rising and winters are becoming less severe (less cold).
- Severe winters normally kill insects which eat pine trees in the national park.
- Many pine trees are now dying.

7A The most likely reason for the increase in the death rate of the pine trees is that . . .

1 more insects are being killed by severe winters.

2 pine trees are being killed by severe winters.

3 more insects are surviving winter.

4 pine trees prefer drier conditions.

7B Pine trees produce lots of pine seeds.

The seeds are food for squirrels and nutcracker birds.

The less severe winters result in . . .

1 less competition between squirrels for mates.

2 more competition between young pine trees.

3 increased numbers of nutcracker birds.

4 increased competition for pine seeds between squirrels and nutcracker birds.

7C When the pine trees die, gaps develop in the forest.

More small plants are now able to grow in the gaps on the forest floor because there is . . .

1 more competition for water.

2 less competition for light.

3 more competition for growing space.

4 less competition for mates.

4.6.3.6 Extinction

Question 21 · continued

7D The long-term result of the less severe winters could be that some species of animal in the forest will become extinct.

Extinction means that . . .

1 there will be a decrease in the number of squirrels in the forest.

2 there will be a decrease in the number of pine trees in the forest.

3 some animal species will die out.

4 no animals will be left in the forest.

Turn over for the next question

4.6.3.6 Extinction

Question 22

June 2012 | BL1FP | Original Q4 | Legacy

4 When animals die, they usually fall to the ground and decay.
In 1977 the body of a baby mammoth was discovered.
The baby mammoth died 40 000 years ago and its body froze in ice.

The picture shows the mammoth.



© Ria Novosti/Science Photo Library

4 (a) Explain why the body of the baby mammoth did **not** decay.

.....

.....

.....

.....

(2 marks)

4.6.3.6 Extinction

Question 22 · continued

4 (b) Mammoths are closely related to modern elephants.
The pictures show these two animals.

What scientists think a mammoth looked like



© Christian Darkin/Science Photo Library

Modern elephant



Mammoths are *extinct*. What does *extinct* mean?

.....

.....

(1 mark)

Question 4 continues on the next page

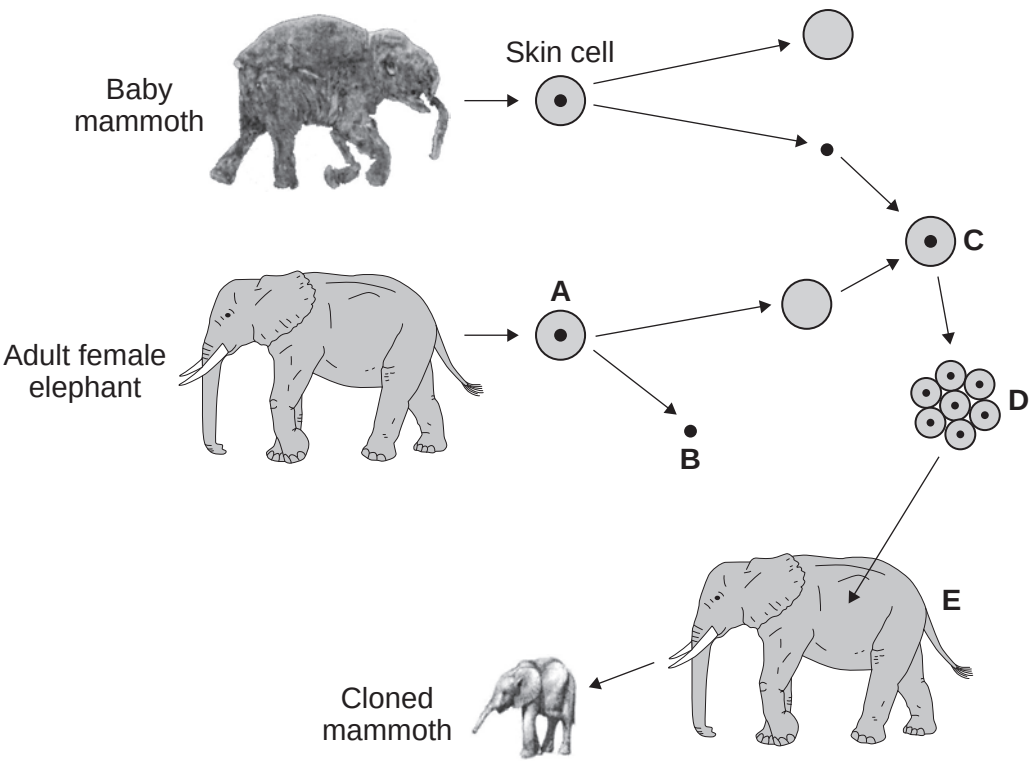
4.6.3.6 Extinction

Question 22 · continued

4 (c) Scientists believe they may be able to use adult cell cloning to recreate a living mammoth.

The scientists will use a skin cell from the baby mammoth.

The diagrams show how the skin cell will be used.



In each question, draw a ring around the correct answer.

4 (c) (i) What type of cell is cell **A**?

skin cell **egg cell** **sperm cell**

(1 mark)

4 (c) (ii) Part **B** is removed from cell **A**.

What part of the cell is part **B**?

nucleus **cytoplasm** **cell membrane**

(1 mark)

4.6.3.6 Extinction

Question 22 · continued

June 2012 | BL1FP | Original Q4 | Legacy

4 (c) (iii) After cell **C** is formed, it divides into embryo cells.

What is done to cell **C** to make it divide?

Cell **C** is

- treated with enzymes.
- mixed with sperm cells.
- given an electric shock.

(1 mark)

4 (c) (iv) The embryo cells form a ball of cells. The ball of cells will be put into female elephant, **E**.

Which part of elephant **E** is the ball of cells put into?

womb **stomach** **ovary**

(1 mark)

4 (d) The scientists expect any offspring of the adult cell cloning to look like a mammoth and **not** like an elephant.

Why?

.....

.....

(1 mark)

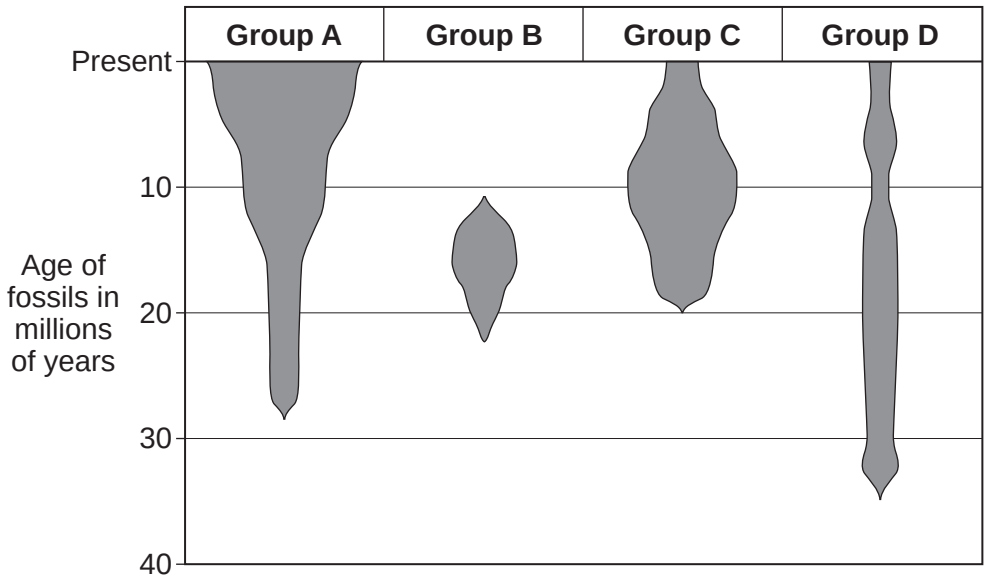
8

4.6.3.6 Extinction

Question 23

June 2012 | BL2FP | Original Q3 | Legacy

3 In the Grand Canyon, scientists have found fossils of several different groups of organisms.
The diagram shows the number and age of the fossils that the scientists found.
The width of each shaded area shows the number of fossils found.



3 (a) What is a fossil?

.....

.....

.....

.....

(2 marks)

3 (b) (i) Which group of organisms, **A**, **B**, **C** or **D**, was the first to evolve? ☐

(1 mark)

3 (b) (ii) Which group of organisms, **A**, **B**, **C** or **D**, is now extinct? ☐

(1 mark)

4.6.3.6 Extinction

Question 23 · continued

3 (b) (iii) Give **one** environmental factor that might have caused this group of organisms to become extinct.

.....

.....

(1 mark)

3 (c) Scientists suggested that, 10 million years ago, organisms of **Group C** were more common than organisms from any of the other groups.

What is the evidence for this in the diagram?

.....

.....

(1 mark)

3 (d) The scientists suggested that the four groups of fossilised organisms evolved from a common ancestor.

Which of the following would provide the best evidence that their suggestion is correct?

Tick (✓) **one** box.

Statement	Tick (✓)
All the groups lived in the same area.	
Fossils from each group were found in the same rock layer.	
Members of the groups have similar physical structures.	

(1 mark)

7

4.6.3.6 Extinction

Question 24

January 2013 | BL2FP | Original Q3 | Legacy

3 The photograph shows a fossil footprint. The fossil was found in a rock at the bottom of a shallow river.

Scientists believe this is the footprint of a dinosaur. The dinosaur was alive 110 million years ago.



3 (a) (i) Suggest how the fossil shown in the photograph was formed.

.....

.....

(1 mark)

3 (a) (ii) Fossils may also be formed by other methods.

Describe **one** other method of forming a fossil.

.....

.....

(1 mark)

3 (b) Dinosaurs are now extinct.

Give **two** factors that can cause extinction.

1 .....

.....

2 .....

.....

(2 marks)

4.6.3.6 Extinction

Question 24 · continued

3 (c) How can fossils give evidence for evolution?

.....

.....

(1 mark)

3 (d) Scientists are uncertain about how life began on Earth.

Why?

.....

.....

(1 mark)

6

Turn over for the next question

4.6.3.6 Extinction

Question 25

June 2013 | BL2FP | Original Q2 | Legacy

2 Evolution is the development of new species over time.
Evidence for evolution comes from *fossils*.

2 (a) (i) What is a *fossil*?

.....

.....

.....

.....

(2 marks)

2 (a) (ii) How can fossils give evidence for evolution?

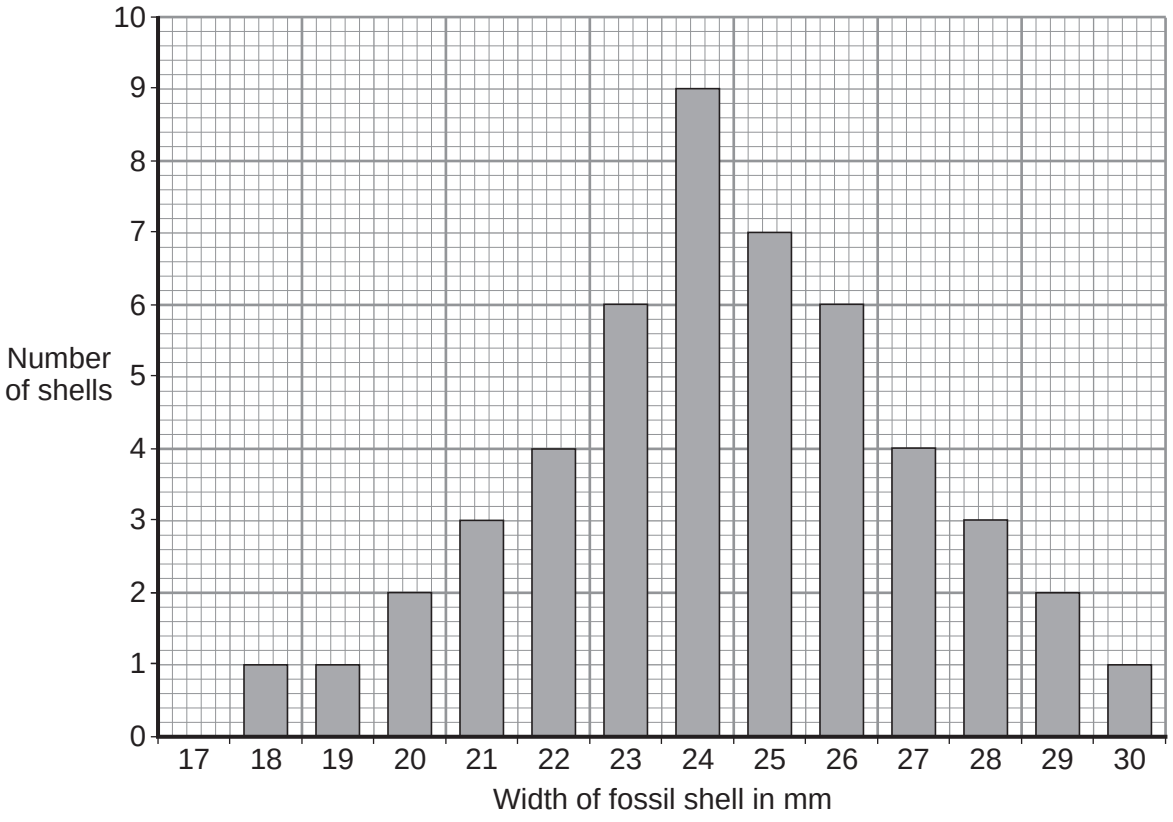
.....

.....

(1 mark)

2 (b) A species of snail lived 400 million years ago.
Scientists measured the width of 49 fossil shells of this snail.

The bar chart shows the scientists' results.



4.6.3.6 Extinction

Question 25 · continued

2 (b) (i) What is the range of the values for the width of the fossil shells for this species?

From ..... to .....

(1 mark)

2 (b) (ii) The scientists **cannot** be sure that this is the full range of fossil shell widths for this species.

Why?

.....

.....

(1 mark)

2 (c) This species of snail became extinct 380 million years ago.

Give **one** possible reason why species become extinct.

.....

.....

(1 mark)

6

4.6.3.6 Extinction

Question 26

June 2014 | BL1FP | Original Q6 | Legacy

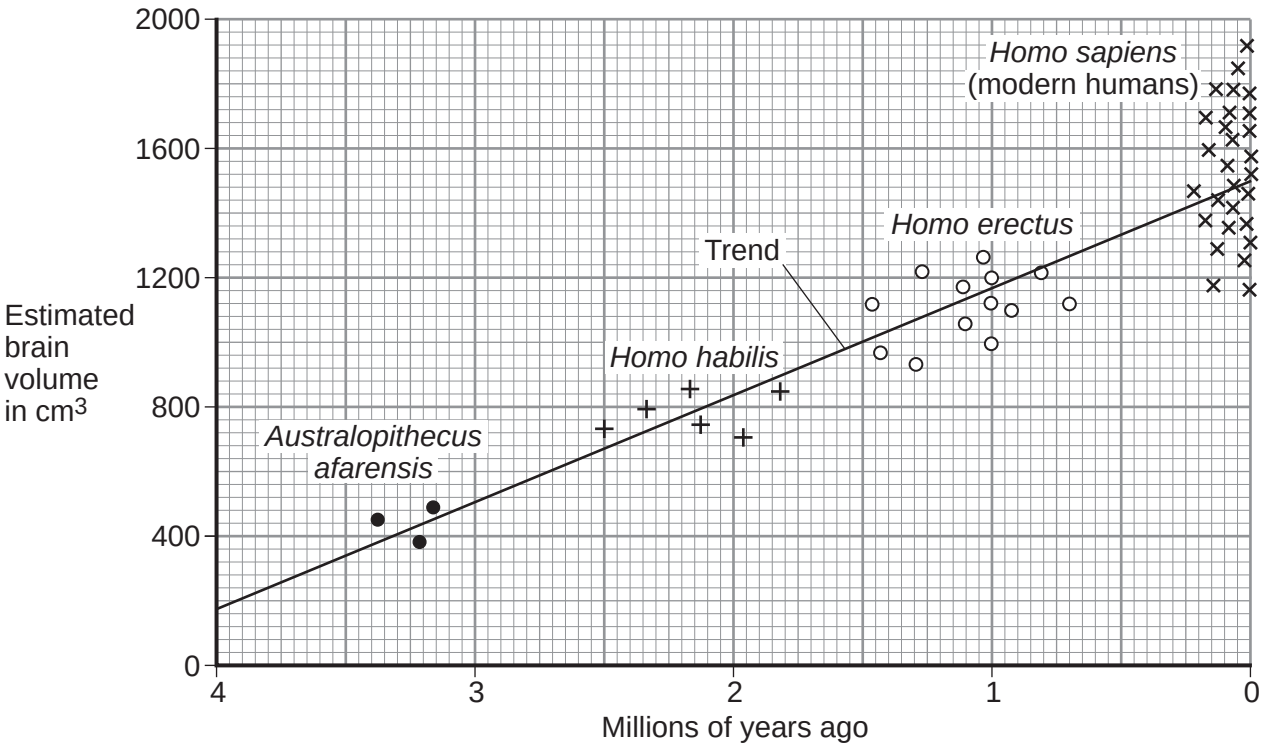
6 This question is about evolution in humans.

Figure 7 shows:

- the estimated brain volume of different species of humans
- the time when the different species existed on Earth.

The data is plotted for modern humans (*Homo sapiens*) and for three types of extinct ancestors of humans.

Figure 7



Key
Each point plotted on the graph shows the estimate for one human.

6 (a) (i) As humans evolved, their brain volume changed.

What has happened to human brain volume over the past 4 million years?

[1 mark]

.....

.....

4.6.3.6 Extinction

Question 26 · continued

6 (a) (ii) Why is the evidence for estimated brain volume for *Homo sapiens* stronger than the evidence for *Australopithecus afarensis*?

[1 mark]

.....

.....

6 (b) In a book, the brain volume of a different species, *Australopithecus africanus*, is stated to be about 600 cm^3.

Use evidence from **Figure 7** to estimate when *Australopithecus africanus* lived on Earth.

[1 mark]

Estimate = ... million years ago

6 (c) Scientists believe that modern humans evolved by natural selection from *Australopithecus afarensis*.

6 (c) (i) Complete the following sentence.

[1 mark]

In the nineteenth century, the scientist who suggested the theory of evolution by

natural selection was Charles ..... .

6 (c) (ii) In the nineteenth century, many people did **not** accept this scientist's theory.

Give **one** reason why.

[1 mark]

.....

.....

5

4.6.3.6 Extinction

Question 27

June 2014 | BL2FP | Original Q4 | Legacy

4 **Figure 6** shows a fossil of a sea animal called a Plesiosaur.
The Plesiosaur was alive about 135 million years ago.

Figure 6



4 (a) How can fossils give evidence for evolution?

Tick (✓) **one** box.

[1 mark]

Newer fossils are simpler than older fossils. ☐

Fossils show change over time. ☐

All fossils show the bones of animals. ☐

4 (b) Plesiosaurs lived in the sea. There was mud at the bottom of the sea.

Suggest how the fossil shown in **Figure 6** may have been formed after the animal died.

[3 marks]

.....

.....

.....

.....

.....

.....

4.6.3.6 Extinction

Question 27 · continued

4 (c) **Figure 7** shows what scientists think a living Plesiosaur may have looked like.

Figure 7



Scientists think that the Plesiosaur had smooth skin, with no scales.

The scientists **cannot** be certain what the skin of a Plesiosaur was like.
Suggest why.

[1 mark]

.....

.....

4 (d) Plesiosaurs are now extinct.

Give **two** possible reasons why.

[2 marks]

1 .....

.....

2 .....

.....

7

4.6.3.6 Extinction

Question 28

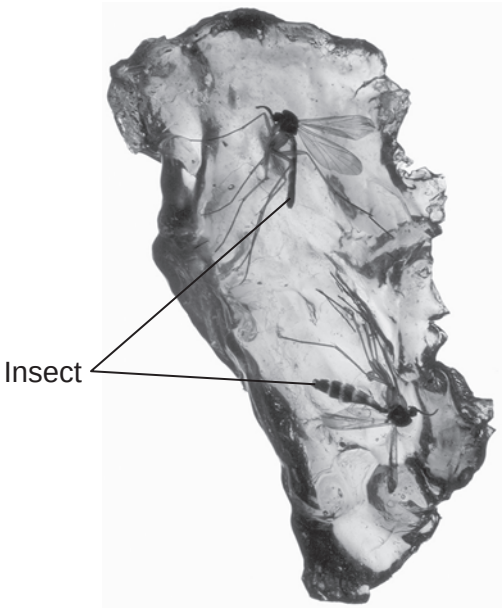
June 2015 | BL2FP | Original Q6 | Legacy

6 Fossils give us information about organisms from a long time ago.

6 (a) Amber is a solid, glass-like material. Amber is formed from a thick, sticky liquid which oozes out of pine trees.

Figure 6 shows two fossil insects in amber.

Figure 6



6 (a) (i) Suggest how the insects came to be preserved in the amber.

[2 marks]

.....

.....

.....

.....

6 (a) (ii) Give **two** other ways fossils are formed.

[2 marks]

1 .....

.....

2 .....

.....

4.6.3.6 Extinction

Question 28 · continued

6 (b) The fossil record shows that many organisms, including the dinosaurs, became extinct 65 million years ago.

One theory was that volcanic activity might have caused this mass extinction. Many scientists believe that this extinction was caused when an asteroid collided with the Earth.

6 (b) (i) A new scientific theory may replace an old theory.

Why might this happen?

[1 mark]

Tick (✓) **one** box.

Evidence from amber is unreliable. ☐

Internet evidence is more reliable than fossil evidence. ☐

New technology provides more valid evidence. ☐

6 (b) (ii) Give **three** reasons, other than volcanic activity and collision with an asteroid, why a species may become extinct.

[3 marks]

1 .....

.....

2 .....

.....

3 .....

.....

8

4.6.3.6 Extinction

Question 29

June 2016 | BL2FP | Original Q5 | Legacy

5 Over millions of years:

- new groups of organisms have evolved
- other groups of organisms have become extinct.

5 (a) If an asteroid collided with the Earth, large amounts of dust and water vapour would be thrown up into the air. This would mean less light and heat would reach the Earth's surface from the Sun.

5 (a) (i) A reduced amount of light and heat could have caused the extinction of plants.

Suggest how.

[1 mark]

_____

_____

5 (a) (ii) How could the extinction of plants have caused the extinction of some animals?

[1 mark]

_____

_____

5 (a) (iii) Give **two** reasons, other than collision with an asteroid, why groups of animals may become extinct.

[2 marks]

1 _____

_____

2 _____

_____

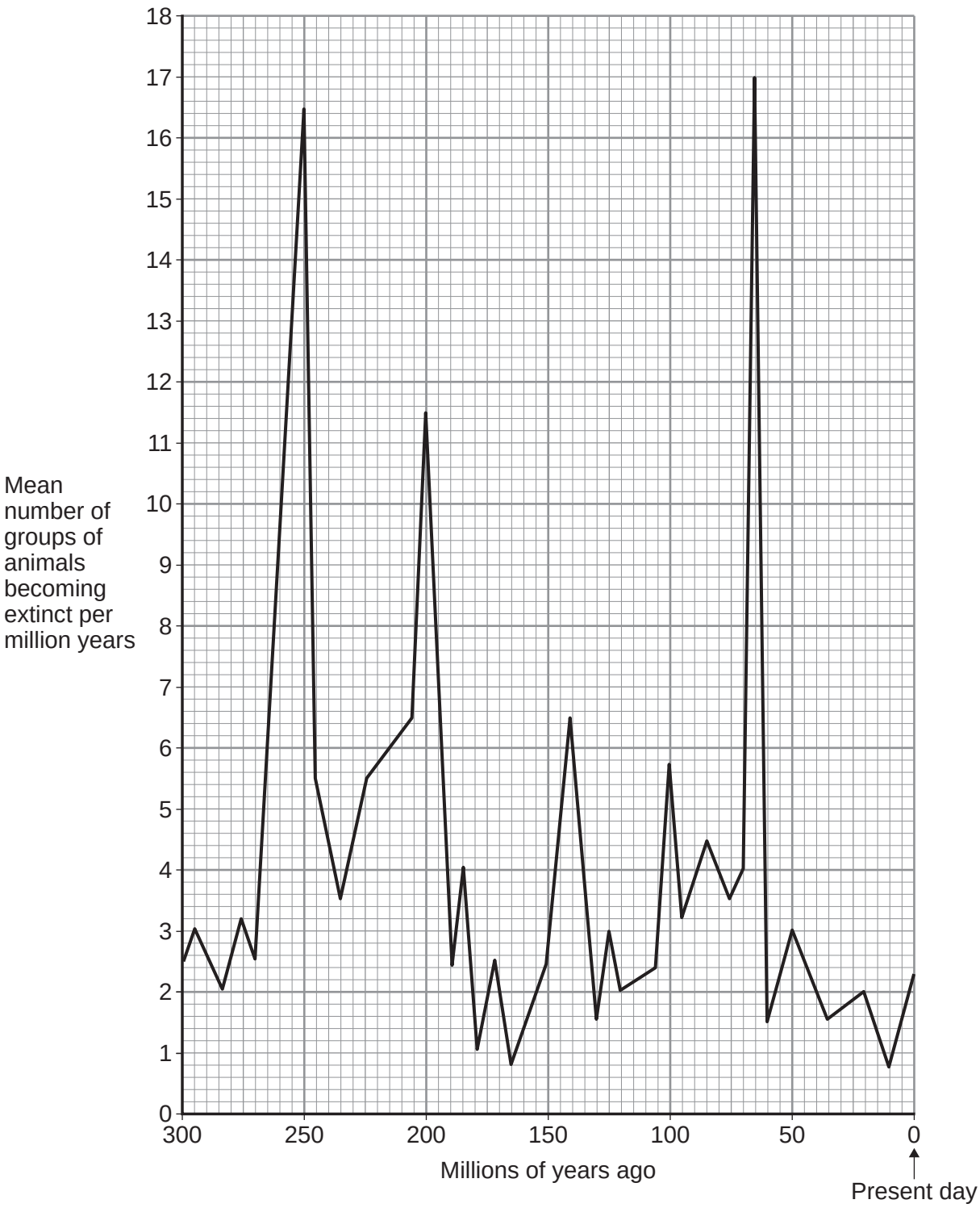
Question 5 continues on the next page

4.6.3.6 Extinction

Question 29 · continued

5 (b) **Figure 6** shows how the rate of extinction of groups of animals has varied over the past 300 million years.

Figure 6



4.6.3.6 Extinction

Question 29 · continued

5 (b) (i) If more than 10 groups of animals become extinct in a 1 million year period, scientists call this a 'mass extinction'.

How many mass extinctions occurred over the past 300 million years?

[1 mark]

_____

5 (b) (ii) How do we know what types of animals lived hundreds of millions of years ago?

[1 mark]

_____

_____

5 (c) Use information from **Figure 6** to answer questions **(c)(i)** and **(c)(ii)**.

5 (c) (i) How many years ago did the most recent mass extinction of animals occur?

[1 mark]

Tick (✓) **one** box.

50 million years ago ☐

65 million years ago ☐

250 million years ago ☐

5 (c) (ii) What was the mean number of groups of animals becoming extinct per million years in the most recent mass extinction?

[1 mark]

_____ groups per million years

5 (c) (iii) Why are scientists not sure how many groups of animals became extinct in the most recent mass extinction?

[1 mark]

_____

_____

9

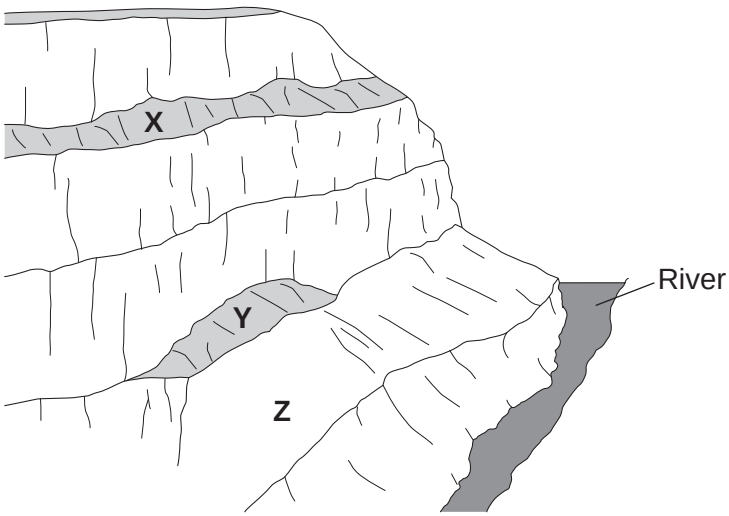
4.6.3.6 Extinction

Question 30

June 2017 | BL2FP | Original Q2 | Legacy

2 (a) **Figure 2** shows layers of rock in the Grand Canyon.

Figure 2



Scientists found fossils of three different species of animal, **X**, **Y** and **Z**, at the positions shown in **Figure 2**.

2 (a) (i) What is a fossil?

[2 marks]

2 (a) (ii) Scientists think that animal **Y** was alive at an earlier time than animal **X**.

How does **Figure 2** provide evidence for this?

[1 mark]

4.6.3.6 Extinction

Question 30 · continued

2 (a) (iii) Which **two** of the following are evidence that animal **Y** may have evolved from animal **Z**?

[2 marks]

Tick (✓) **two** boxes.

The fossils of animals **X**, **Y** and **Z** are the same size. ☐

The fossils of animals **Y** and **Z** have many features in common. ☐

The fossils of animals **Y** and **Z** have the same skin colour. ☐

The fossil of animal **Y** is more complex than the fossil of animal **Z**. ☐

The fossil of animal **Y** is more similar to the fossil of animal **X** than to the fossil of animal **Z**. ☐

2 (b) Animals **X**, **Y** and **Z** are all now extinct.

2 (b) (i) Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

2 (b) (ii) Scientists cannot be sure about what caused animals **X**, **Y** and **Z** to become extinct.

Suggest why.

[1 mark]

_____

_____

8

4.6.3.6 Extinction

Question 31

June 2018 | 8461/2F | Original Q3

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

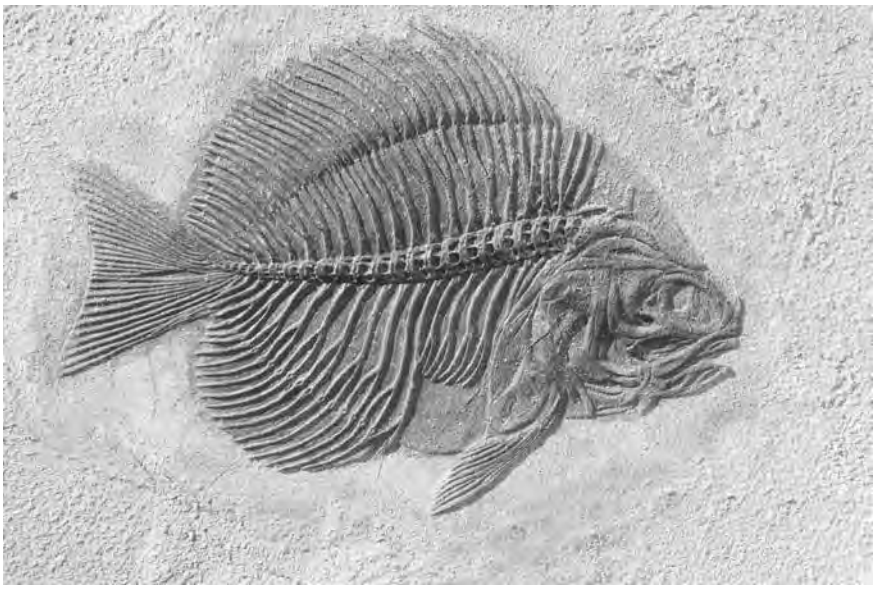
0 3 . 1 Scientists have found very few fossils of the earliest life forms.

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]

4.6.3.6 Extinction

Question 31 · 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

4.6.3.6 Extinction

Question 32

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 ☐

4.6.3.6 Extinction

Question 32 · 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 32 · 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 ☐

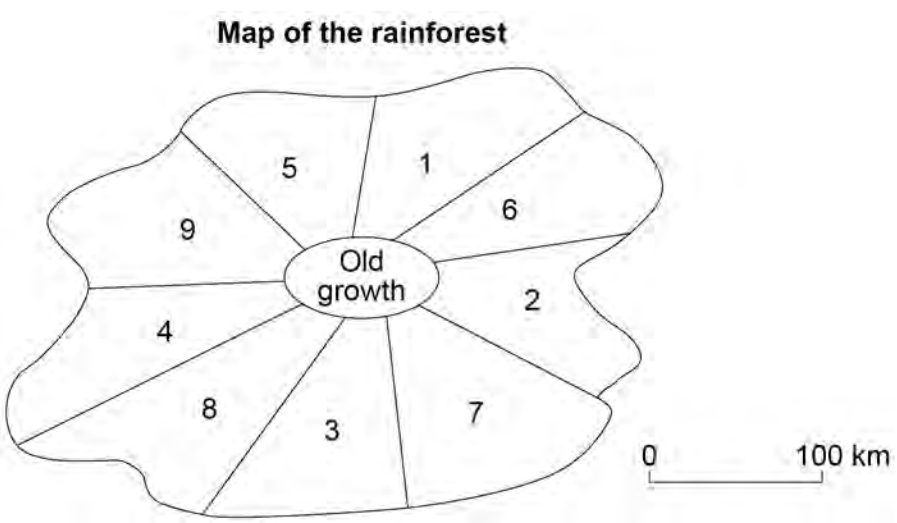
Stay the same ☐

'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.

4.6.3.6 Extinction

Question 32 · 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

4.6.3.6 Extinction

Question 33

November 2020 | 8461/2F | Original Q6

0 6 **Figure 8** shows what the extinct Siberian rhinoceros (*Elasmotherium sibiricum*) might have looked like.

Figure 8



0 6 . 1 What is the genus of the Siberian rhinoceros?

[1 mark]

Tick (✓) **one** box.

Elasmotherium ☐

Elasmotherium sibiricum ☐

sibiricum ☐

4.6.3.6 Extinction

Question 33 · continued

November 2020 | 8461/2F | Original Q6

The 'three-domain system' of classification places all living organisms in one of three domains.

0 6 . 2 Which domain was the Siberian rhinoceros in?

[1 mark]

Tick (✓) **one** box.

Archaea ☐

Eukaryota ☐

Prokaryota ☐

0 6 . 3 Who developed the 'three-domain system' of classification?

[1 mark]

Tick (✓) **one** box.

Carl Woese ☐

Charles Darwin ☐

Gregor Mendel ☐

0 6 . 4 The horn of the Siberian rhinoceros is estimated to have been 150 cm long.

Suggest **one** advantage of this adaptation to the Siberian rhinoceros.

[1 mark]

_____

_____

Question 6 continues on the next page

Question 33 · continued

0 6 . 5 The only parts of the Siberian rhinoceros that have been found are fossilised bones.

Give **one** reason why **only** the bones of the body of the Siberian rhinoceros became fossils.

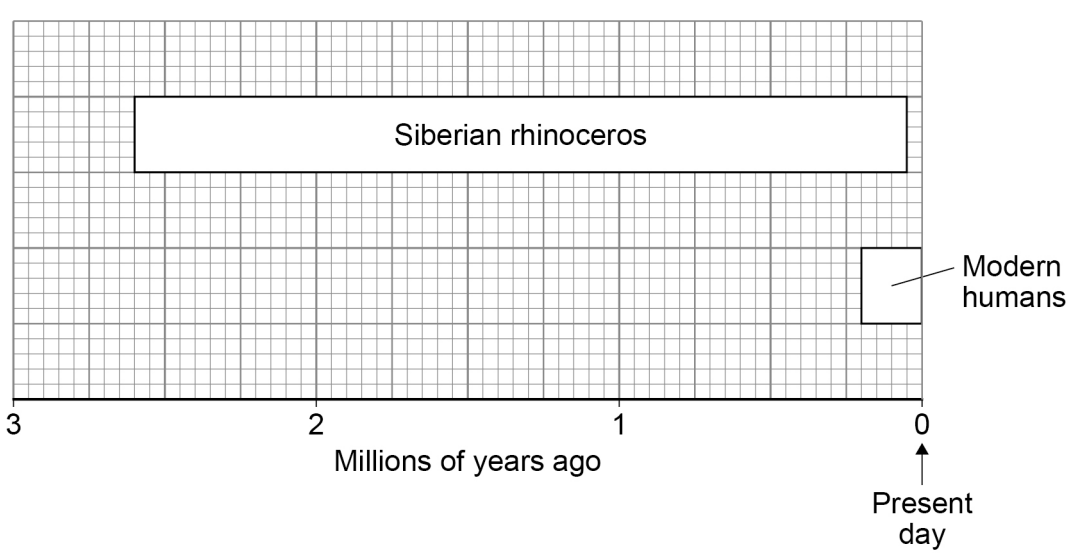
[1 mark]

0 6 . 6 Suggest how scientists can estimate when the Siberian rhinoceros was alive.

[1 mark]

Figure 9 shows when the Siberian rhinoceros existed and when modern humans existed.

Figure 9



4.6.3.6 Extinction

Question 33 · continued

0 6 . 7 How many million years ago did the Siberian rhinoceros become extinct?

[1 mark]

_____ million years ago

0 6 . 8 Determine the time in years when both the Siberian rhinoceros and modern humans existed together.

Use **Figure 9** and your answer to Question **06.7**.

[3 marks]

_____

_____

_____

_____

Time = _____ years

0 6 . 9 Suggest **two** factors that may have caused the extinction of the Siberian rhinoceros.

[2 marks]

1 _____

_____

2 _____

_____

12

4.6.3.6 Extinction

Question 34

November 2021 | 8461/2F | Original Q1

0 1 The theory of evolution states that organisms alive today evolved by natural selection from other species that are now extinct.

0 1 . 1 Which **two** scientists proposed the theory of evolution by natural selection?

[2 marks]

Tick (✓) **two** boxes.

- Alexander Fleming ☐
- Alfred Russel Wallace ☐
- Carl Linnaeus ☐
- Carl Woese ☐
- Charles Darwin ☐

Fossils provide evidence for evolution.

Figure 1 shows a fossil footprint of a dinosaur.

Figure 1



4.6.3.6 Extinction

Question 34 · continued

0 1 . 2 What is a fossil?

[2 marks]

0 1 . 3 How was the fossil in **Figure 1** formed?

[1 mark]

Tick (✓) **one** box.

Body parts were replaced by minerals. ☐

The animal walked on mud. ☐

The animal was frozen in ice. ☐

0 1 . 4 Dinosaurs are extinct.

Give **two** causes of extinction.

[2 marks]

1

2

Question 1 continues on the next page

4.6.3.6 Extinction

Question 34 · continued

November 2021 | 8461/2F | Original Q1

0 1 . 5 Which **two** of the following provide evidence for evolution?

[2 marks]

Tick (✓) **two** boxes.

Bacteria can become resistant to an antibiotic. ☐

Early forms of life lived in the ocean. ☐

Older fossils are simpler than more recent ones. ☐

Older layers of rock are closer to the surface. ☐

9

4.6.3.6 Extinction

Question 35

June 2022 | 8461/2F | Original Q7

0 7 Living organisms can be classified into groups.

Trilobites are animals that lived in the sea 400 to 500 million years ago.

Table 3 gives the classification of two species of trilobite.

Table 3

Classification group	Trilobite A	Trilobite B
	Animalia	*Animalia*
Phylum	*Arthropoda*	*Arthropoda*
Class	*Trilobita*	*Trilobita*
Order	*Ptychopariida*	*Ptychopariida*
Family	*Alokistocaridae*	*Marjumiidae*
	Elrathia	*Modocia*
Species	*kingii*	*typicalis*

0 7 . 1 Complete **Table 3**.

[2 marks]

Choose answers from the box.

Community	**Genus**	**Kingdom**	**Mammal**	**Population**

4.6.3.6 Extinction

Question 35 · continued

0 7 . 2 Which scientist invented the classification system given in **Table 3**?

[1 mark]

Tick (✓) **one** box.

- Darwin ☐
- Lamarck ☐
- Linnaeus ☐
- Mendel ☐

0 7 . 3 What is the binomial name of trilobite **A**?

Use information from **Table 3**.

[1 mark]

Tick (✓) **one** box.

- *Arthropoda kingii* ☐
- *Elrathia kingii* ☐
- *Trilobita kingii* ☐

Question 7 continues on the next page

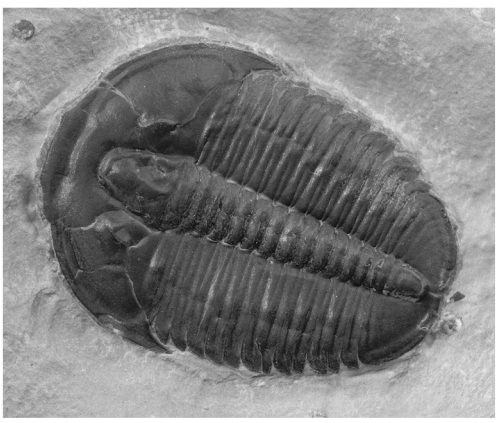
4.6.3.6 Extinction

Question 35 · continued

Figure 10 shows fossils of the two species of trilobite.

Figure 10

Trilobite A



Trilobite B

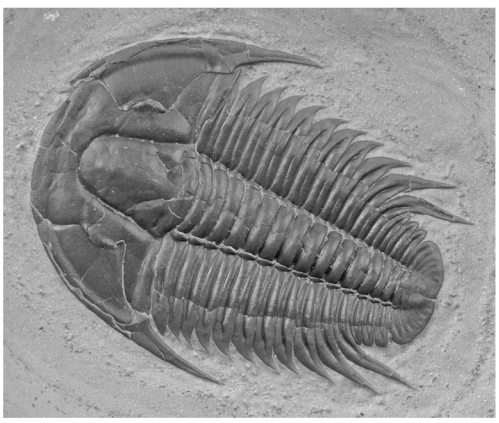
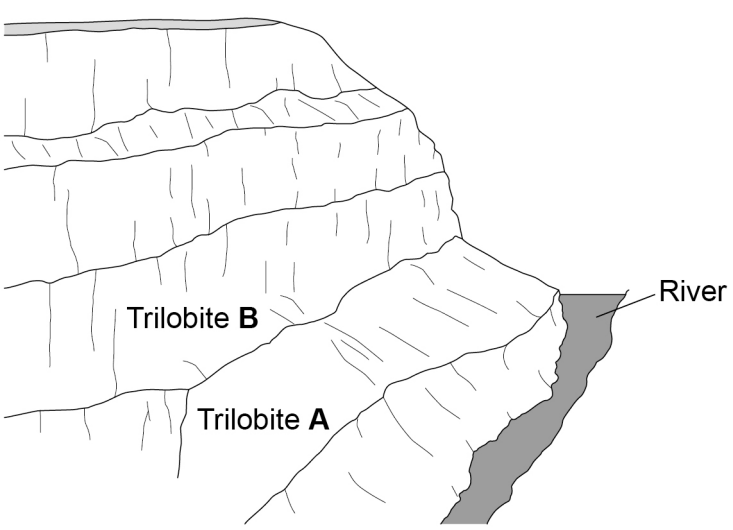


Figure 11 shows:

- layers of rock in a cliff
- where the trilobite fossils were found.

Figure 11



4.6.3.6 Extinction

Question 35 · continued

A scientist made the hypothesis:

'Trilobite **B** may have evolved from trilobite **A**.'

0 7 . 4 What **two** pieces of evidence from **Figure 10** and **Figure 11** support the scientist's hypothesis?

[2 marks]

Tick (✓) **two** boxes.

Trilobite **A** and trilobite **B** were in the same type of rock. ☐

Trilobite **A** was found in older rocks than trilobite **B**. ☐

Trilobite **B** has a smaller mass than trilobite **A**. ☐

Trilobite **B** is a different colour from trilobite **A**. ☐

Trilobite **B** is more complex than trilobite **A**. ☐

0 7 . 5 Trilobites are animals that lived in the sea.

Complete the sentences about how the fossils of trilobites **A** and **B** were formed.

Choose answers from the box.

[3 marks]

acids	**bones**	**hard parts**	**minerals**
rocks	**sediments**	**soft parts**	

The animal dies and falls to the sea bed.

The animal is buried in _____.

The _____ of the animal decay.

The remains which do **not** decay are replaced by _____.

4.6.3.6 Extinction

Question 35 · continued

0 7 . 6 Trilobites **A** and **B** are now extinct.

Give **three** possible causes of extinction.

[3 marks]

1 _____

_____

2 _____

_____

3 _____

_____

0 7 . 7 Suggest **one** reason why scientists **cannot** be sure what caused the trilobites to become extinct.

[1 mark]

_____

_____

13

4.6.3.6 Extinction

Question 36

June 2024 | 8461/2F | Original Q2

0 2 Carl Linnaeus invented a classification system that places organisms into groups.

0 2 . 1 What is the name of the largest classification group in Linnaeus's system?

[1 mark]

Tick (✓) **one** box.

- Family ☐
- Kingdom ☐
- Order ☐

0 2 . 2 Linnaeus gave each species a binomial name.

Which **two** classification groups form the binomial name?

[2 marks]

Tick (✓) **two** boxes.

- Class ☐
- Genus ☐
- Order ☐
- Phylum ☐
- Species ☐

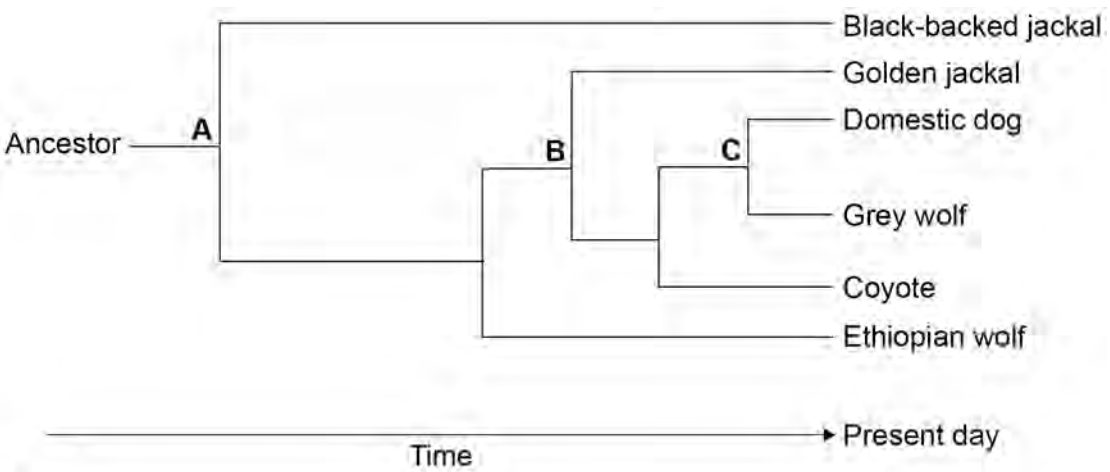
Question 2 continues on the next page

Question 36 · continued

Scientists think that the animals in **Figure 2** all evolved from an ancestor that lived about 6 million years ago.

Figure 2 shows how the animals may have evolved.

Figure 2



Key

A 6 million years ago
B 3 million years ago
C 32 thousand years ago

0 2 . 3 What was the **most recent** time that the domestic dog and the golden jackal shared a common ancestor?

[1 mark]

Tick (✓) **one** box.

- 32 thousand years ago ☐
- 3 million years ago ☐
- 6 million years ago ☐

4.6.3.6 Extinction

Question 36 · continued

0 2 . 4 Which present-day animal in **Figure 2** is the **most distant** relative of the domestic dog?

[1 mark]

Question 2 continues on the next page

4.6.3.6 Extinction

Question 36 · continued

Scientists think the grey wolf and the domestic dog had a common ancestor.

The common ancestor:

- lived about 32 thousand years ago
- is now extinct.

0 2 . 5 Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

0 2 . 6 32 thousand years ago, humans hunted other animals for food.

Wolves also hunted other animals for food.

Suggest **one** reason why wolves began to follow groups of humans.

[1 mark]

_____

_____

0 2 . 7 Some wolves are more aggressive than other wolves.

Describe how selective breeding of wolves could produce a domestic animal that is less aggressive than the wolf.

[2 marks]

_____

_____

_____

_____

10

4.6.3.6 Extinction

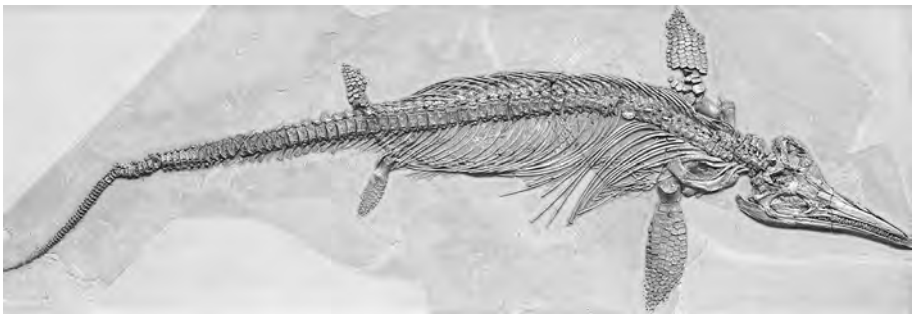
Question 37

June 2025 | 8461/2F | Original Q8

0 8 Ichthyosaurs are reptiles that lived in the sea millions of years ago.

Figure 13 shows the fossilised remains of an ichthyosaur.

Figure 13



0 8 . 1 Suggest how the fossil in **Figure 13** was formed after the ichthyosaur died.

[2 marks]

0 8 . 2 The length of the image of the ichthyosaur in **Figure 13** is 120 mm.

The real length of the ichthyosaur was 17 times longer than the image in **Figure 13**.

Calculate the real length of the ichthyosaur.

Give your answer in metres.

[3 marks]

Real length of ichthyosaur = _____ metres

4.6.3.6 Extinction

Question 37 · continued

0 8 . 3 **Table 5** gives the classification of the ichthyosaur in **Figure 13**.

Table 5

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

Complete **Table 5**.

[2 marks]

Choose answers from the box.

Community	Family	Mammal	Phylum	Population

0 8 . 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