1 The diagram shows four Stone Age tools discovered at different archaeological sites in Europe.

			
handaxe	arrow head	cutting stone	hammer stone

(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The Stone Age tool made most recently is the

(1)

- ☐ **A** handaxe
- ☐ **B** arrow head
- ☐ **C** cutting stone
- ☐ **D** hammer stone

(ii) Suggest how these tools may have helped early humans to survive.

(2)

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(b) Mitochondrial DNA can be used as evidence for human evolution.

Explain why mitochondrial DNA is used rather than nuclear DNA.

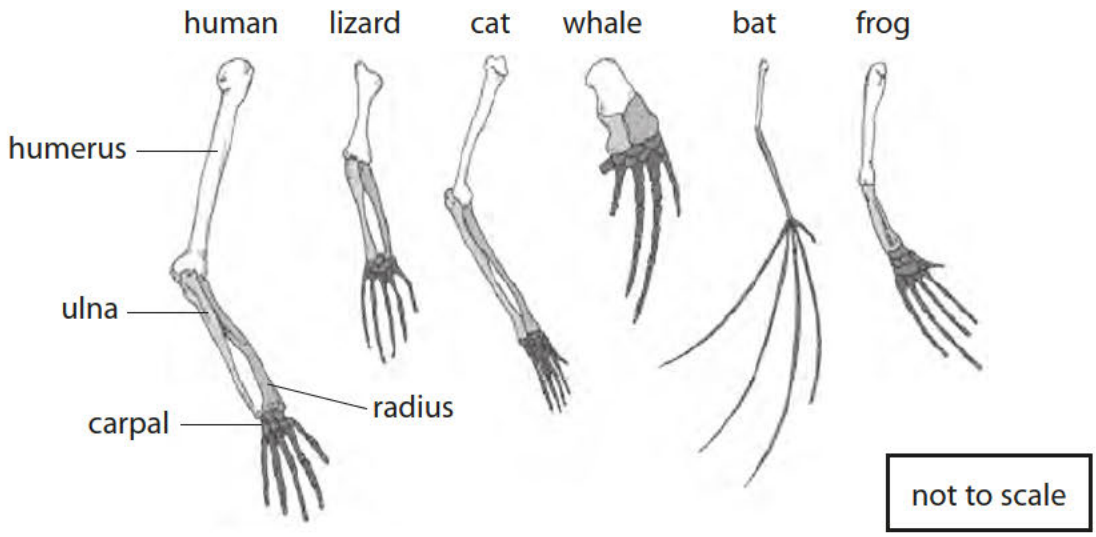
(2)

(c) Describe how fossil evidence can be used to show that humans have evolved.

(2)

(Total for Question 1 = 7 marks)

2 The diagrams show the limbs of six organisms.



(a) Many scientists believe that these six organisms evolved from one common ancestor.

Describe the evidence shown in the diagrams that supports this belief.

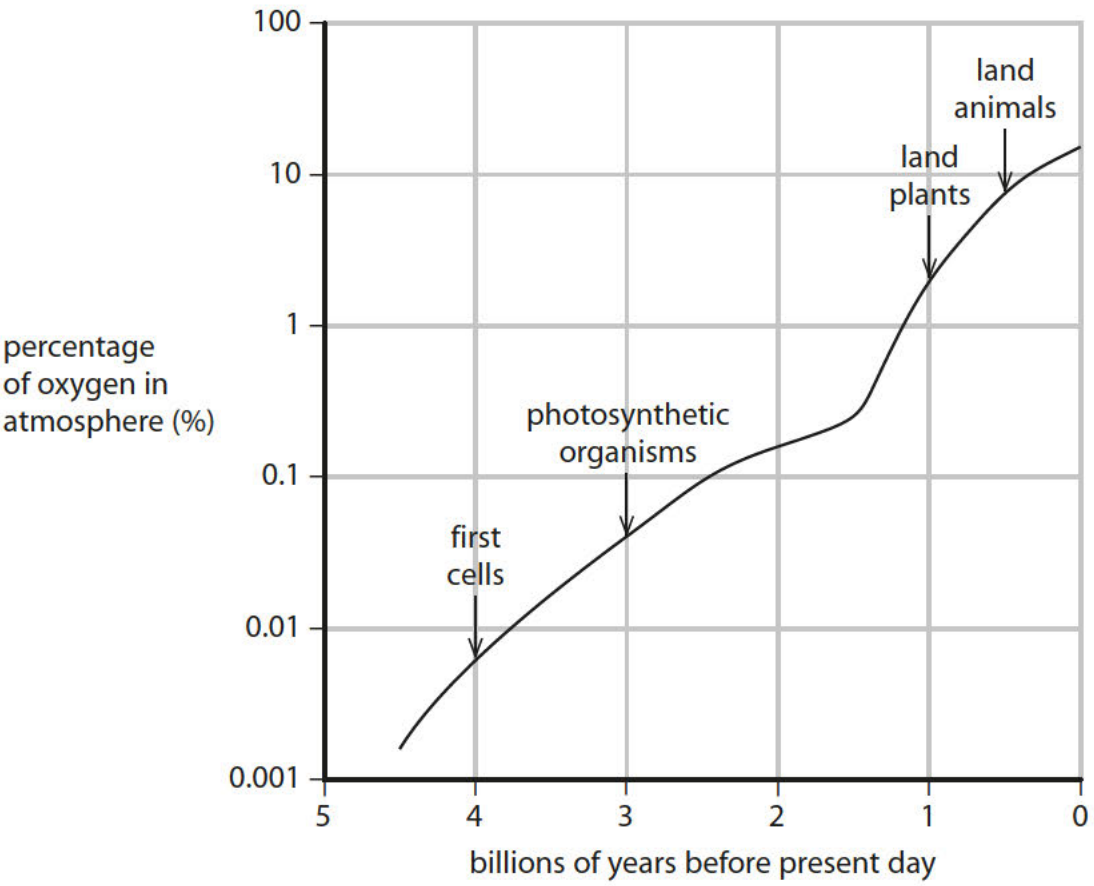
(3)

(b) Fossils can provide evidence for evolution.

Explain why the fossil record is incomplete.

(2)

(c) The graph suggests that the level of oxygen in the atmosphere was important for the evolution of many living organisms.



(i) How much oxygen was needed in the atmosphere for the evolution of land animals?

Put a cross (☒) in the box next to your answer.

(1)

☐ **A** 0.009%

☐ **B** 0.09%

☐ **C** 0.9%

☐ **D** 9.0%

(ii) Suggest how photosynthesis could have changed the gas content of the atmosphere.

(2)

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(iii) Suggest why such a high percentage of oxygen in the atmosphere was needed for large land animals to evolve.

(2)

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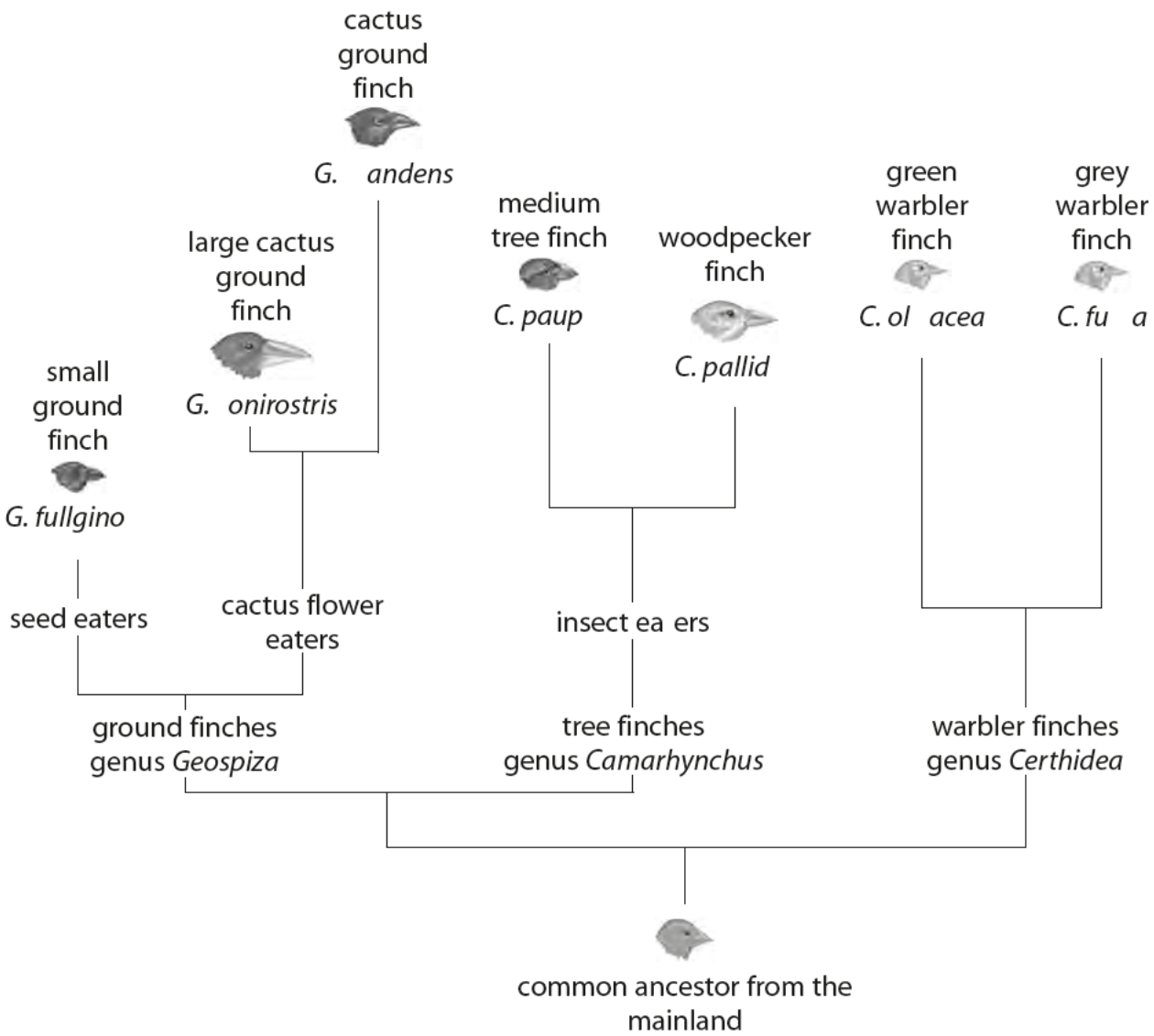
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(Total for Question 2 = 10 marks)

3 Charles Darwin studied the variety of finches on the Galapagos Islands.

He used this information to develop his theory of evolution.

Some of the finches are shown in the diagram.



(a) (i) State the genus and the species of the large cactus ground finch.

(2)

genus .....

species .....

(ii) Suggest how the size and shape of their beaks enabled all of these types of finches to survive.

(2)

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(iii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Darwin's finches are an example of speciation due to

(1)

☒ **A** selective breeding

☒ **B** geographic isolation

☒ **C** hybridisation

☒ **D** the development of ring species

(b) Suggest how these species of finches could have evolved.

(3)

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(Total for Question 3 = 8 marks)

4 In extreme environments organisms have characteristics that enable them to survive.

(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

These characteristics are

(1)

- ☐ **A** adaptations
- ☐ **B** alleles
- ☐ **C** habitats
- ☐ **D** hybrids

(ii) The photograph shows a Pompeii worm.

Pompeii worms are found in hydrothermal vents in the Pacific Ocean.



The temperature of these hydrothermal vents can be very high.

Suggest a feature that helps to protect the Pompeii worm from the extreme heat.

(1)

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(iii) Pompeii worms were discovered by French marine biologists in the early 1980s.

Explain how these biologists may have validated the evidence for the discovery of the Pompeii worms.

(2)

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(b) Variation in a population enables evolution to occur.

(i) Explain, using Darwin's theory of evolution, how variation can lead to a species evolving.

(2)

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(ii) Evolution can lead to speciation.

Describe what is meant by the term **speciation**.

(2)

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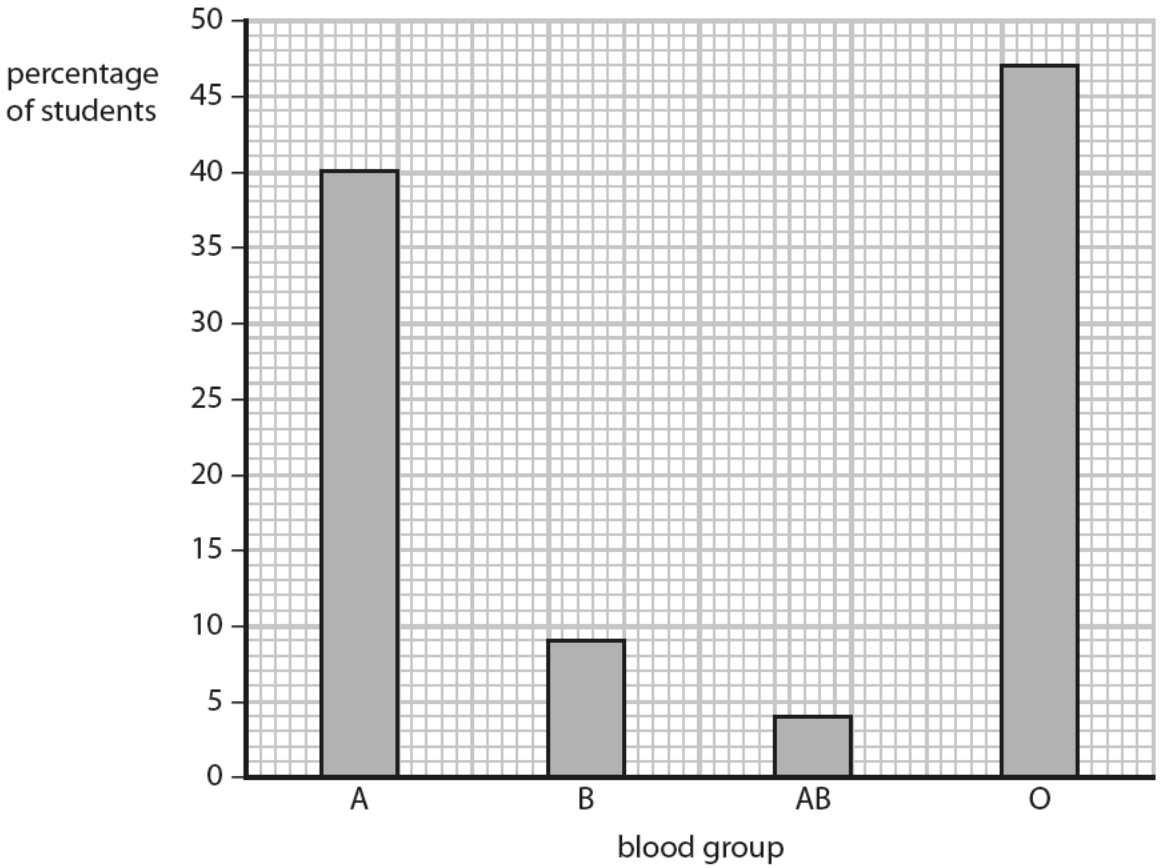
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(Total for Question 4 = 8 marks)

5 Mike was investigating variation in a school of 650 students.
He recorded the blood group and measured the heights of the students.

The graph shows the variation in blood group.



(a) (i) Calculate how many of the 650 students have blood group A.

(2)

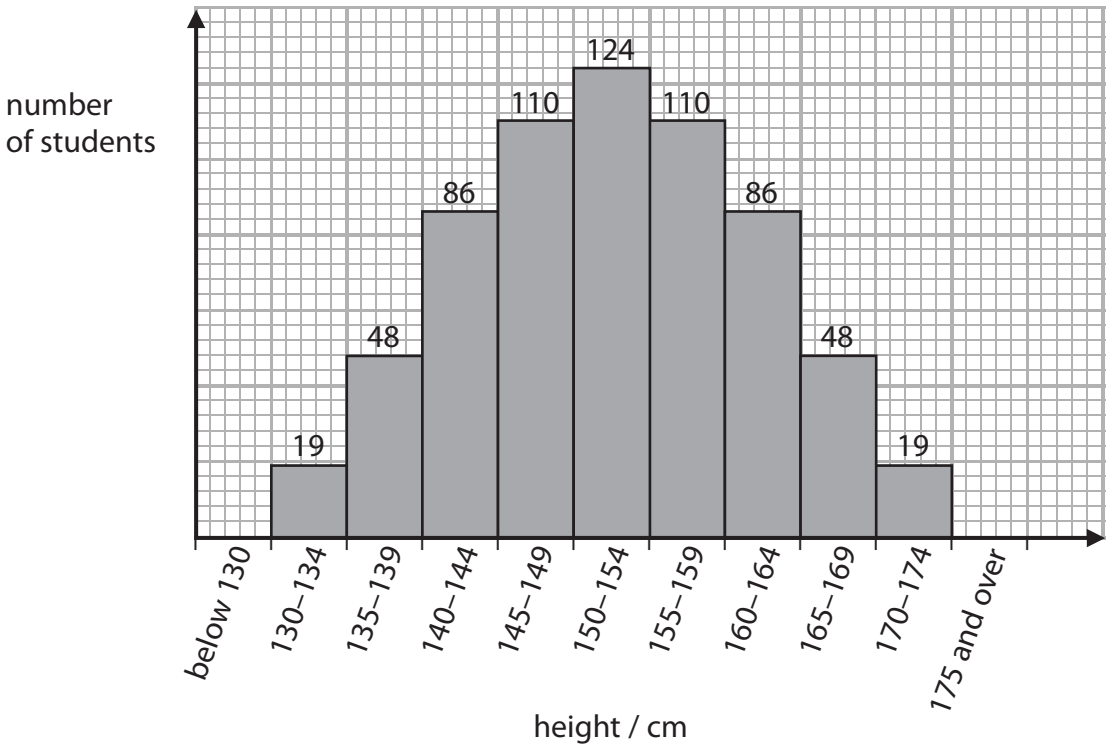
number of students with blood group A = ...

(ii) State the type of variation shown in the graph for the blood groups of students.

(1)

.....

(b) The graph shows the variation in height.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The range in heights of the students is due to

(1)

☒ **A** environmental influences only

☒ **B** genetic influences only

☒ **C** environmental and genetic influences

☒ **D** neither environmental nor genetic influences

(ii) Describe the variation in height of these students, as shown in the graph.

(3)

(c) Taller animals may have an evolutionary advantage.

Explain how evolution by natural selection brings about changes in a species.

(3)

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(Total for Question 5 = 10 marks)