PEARSON EDEXCEL GCSE BIOLOGY (HIGHER) · 1BI0

BIOLOGY



EXAM QUESTION PACK

TOPIC 4: NATURAL SELECTION AND GENETIC MODIFICATION (PACK 1)

SCORE	PERCENTAGE
/39	%

STEMUP

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Q1.

Figure 1 shows the times when *Homo sapiens* and some of their ancestral species are thought to have lived.

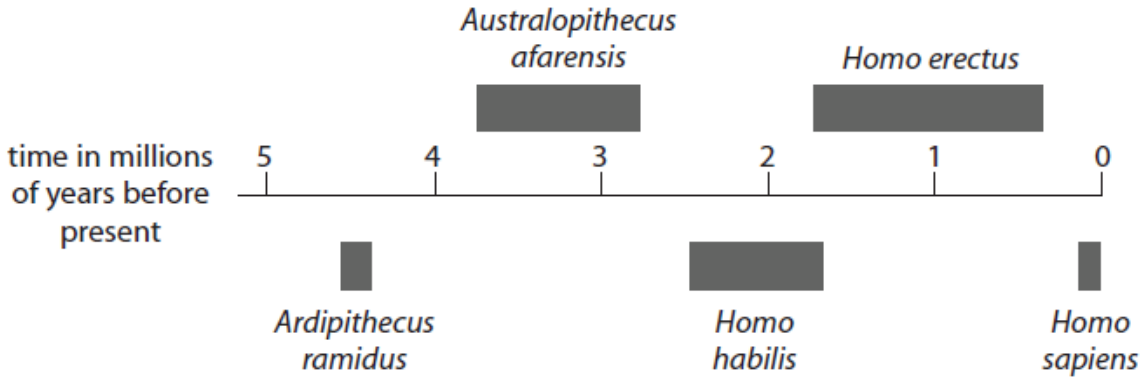


Figure 1

Fossil remains of *Ardipithecus ramidus* were discovered in Ethiopia.

(i) Describe the evidence that scientists might have used to show that *Ardipithecus ramidus* inhabited the Earth earlier than *Homo habilis*.

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(ii) Suggest an explanation for the extinction of *Homo habilis*.

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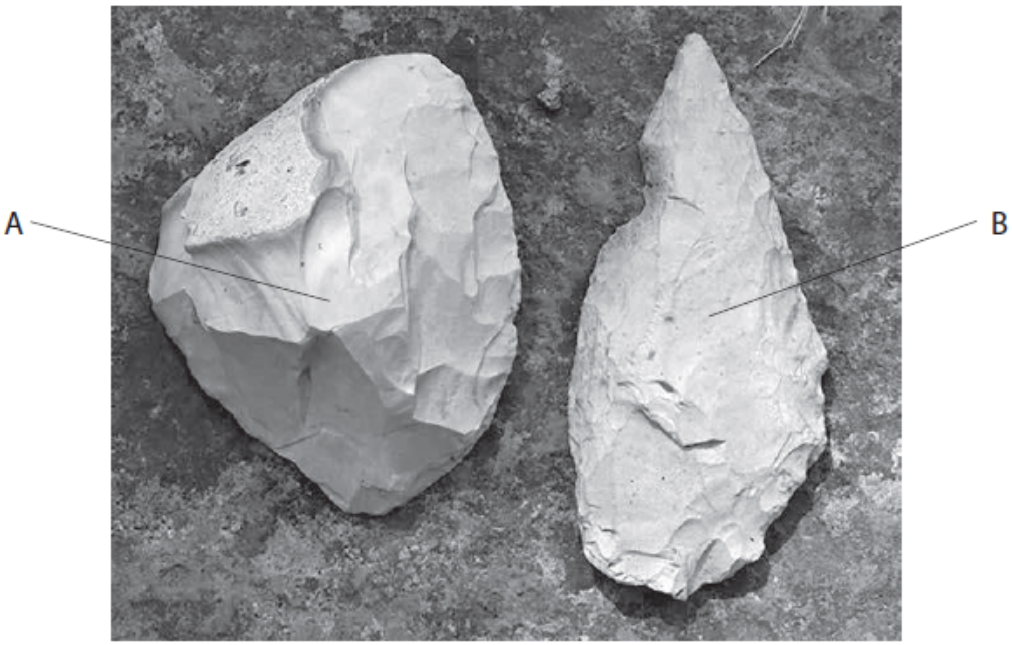
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(iii) Figure 2 shows two stone tools, one used by *Homo habilis* and one used by *Homo erectus*.



(Source: Frederic Surmely/look at sciences/Science Photo Library)

Figure 2

Explain which stone tool was most likely to be used by *Homo erectus*.

Use information from Figure 1 and Figure 2.

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(Total for question = 6 marks)

Q2.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Birds are classified in the domain Eukarya.

(i) Why are the cells from birds described as eukaryotic?

(1)

☒ **A** they have membrane-bound organelles

☒ **B** they do not have nuclei

☒ **C** they have a rigid cell wall

☒ **D** they have a cell membrane

(ii) Give **one** reason why the three domain classification system was proposed.

(1)

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(Total for question = 2 marks)

Q3.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Birds are classified in the domain Eukarya.

(i) Why are the cells from birds described as eukaryotic?

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☒ **C** they have a rigid cell wall

☒ **D** they have a cell membrane

(ii) Give **one** reason why the three domain classification system was proposed.

(1)

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(Total for question = 2 marks)

Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

In 2017, a new strain of *Klebsiella pneumoniae* bacteria was discovered that was resistant to 26 different antibiotics.

(i) Explain how *Klebsiella pneumoniae* bacteria developed resistance to antibiotics.

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(ii) State how the use of antibiotics could contribute to *Klebsiella pneumoniae* bacteria developing resistance to antibiotics.

(1)

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(iii) *Klebsiella pneumoniae* is a prokaryotic cell.

Which is a characteristic feature of a prokaryotic cell?

(1)

☒ **A** it has chloroplasts

☒ **B** it does not have a nucleus

☒ **C** it does not have ribosomes

☒ **D** it cannot reproduce without a host

(Total for question = 6 marks)

Q5.

Bacillus thuringiensis contains a gene that codes for a toxin.

Explain **one** advantage and **one** disadvantage of introducing this gene into crop plants.

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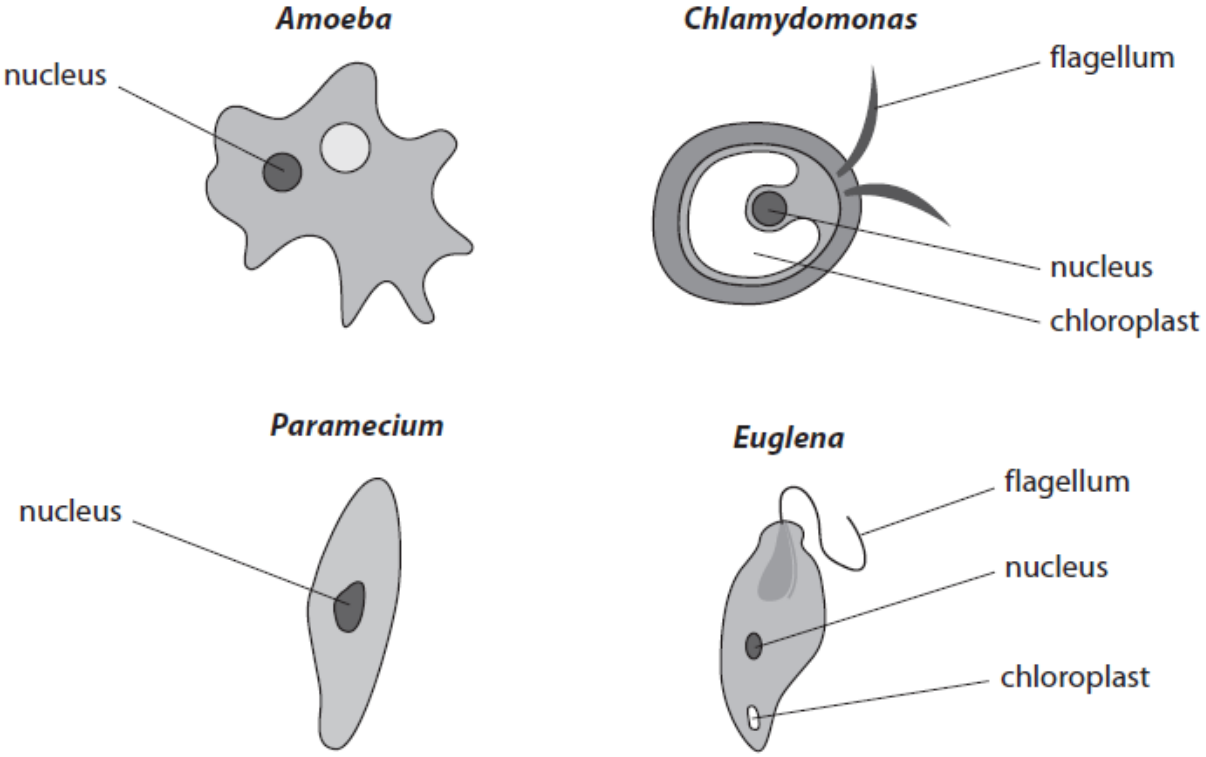
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Q6.

Classification

(a) All the organisms in the diagram belong to one Kingdom.



(i) Which Kingdom do these organisms belong to?

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

(1)

☒ **A** Animalia

☒ **B** Fungi

☒ **C** Protoctista

☒ **D** Prokaryotes

(ii) In which structure are the chromosomes of these organisms found?

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

(1)

☒ **A** cilia

☒ **B** chloroplast

☒ **C** flagellum

☒ **D** nucleus

(iii) Suggest **one** reason why both *Euglena* and *Chlamydomonas* could be placed into the

Kingdom Plantae.

(1)

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(b) (i) *Euglena* is unusual because it is both heterotrophic and autotrophic.

Explain how this helps *Euglena* to survive.

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(ii) A scientist discovered a new species of *Euglena* in boiling acidic mud in Costa Rica.

Explain how this discovery could be validated by the scientific community.

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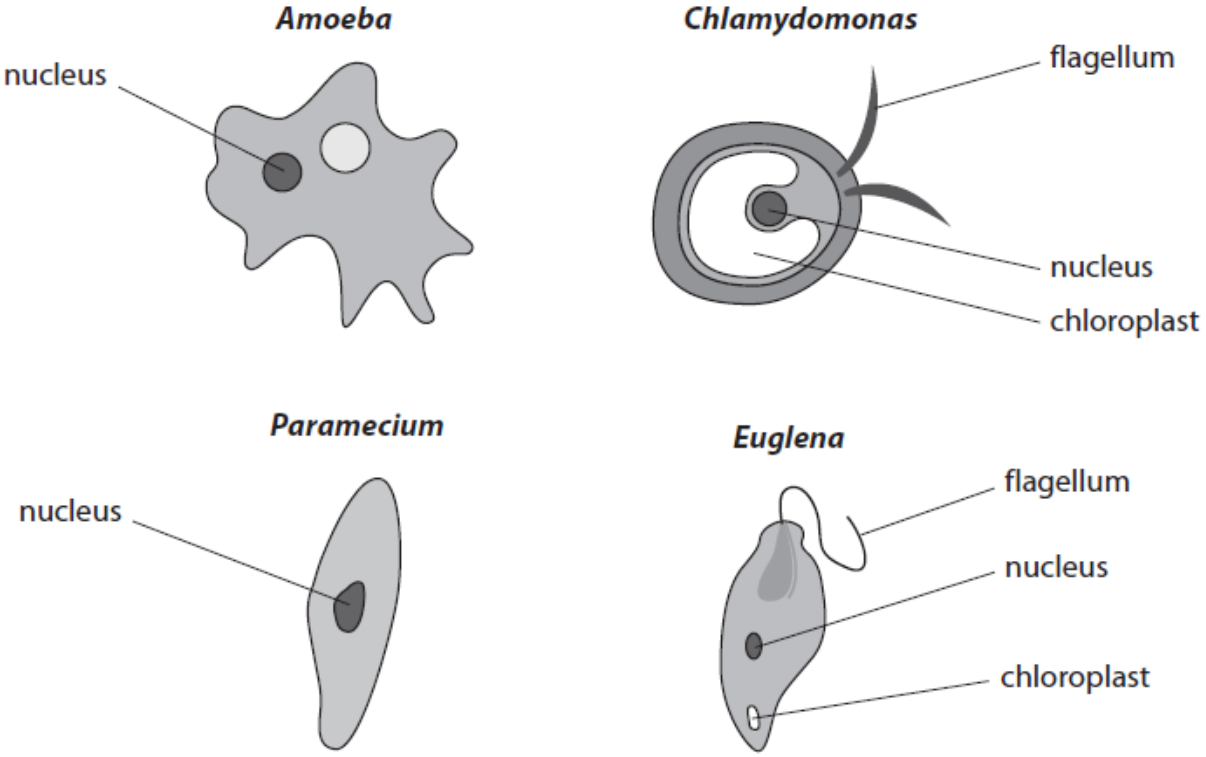
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(Total for question = 8 marks)

Q7.

(a) All the organisms in the diagram belong to one Kingdom.



(i) Which Kingdom do these organisms belong to?

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

(1)

☒ **A** Animalia

☒ **B** Fungi

☒ **C** Protoctista

☒ **D** Prokaryotes

(ii) In which structure are the chromosomes of these organisms found?

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

(1)

☒ **A** cilia

☒ **B** chloroplast

☒ **C** flagellum

☒ **D** nucleus

(iii) Suggest **one** reason why both *Euglena* and *Chlamydomonas* could be placed into the

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Explain how this helps *Euglena* to survive.

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Explain how this discovery could be validated by the scientific community.

(2)

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(Total for question = 8 marks)

Q8.

Suggest the advantages of cloning mammals, such as dogs, for use in medical research into

human diseases.

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Q9.

Suggest the advantages of cloning mammals, such as dogs, for use in medical research into human diseases.

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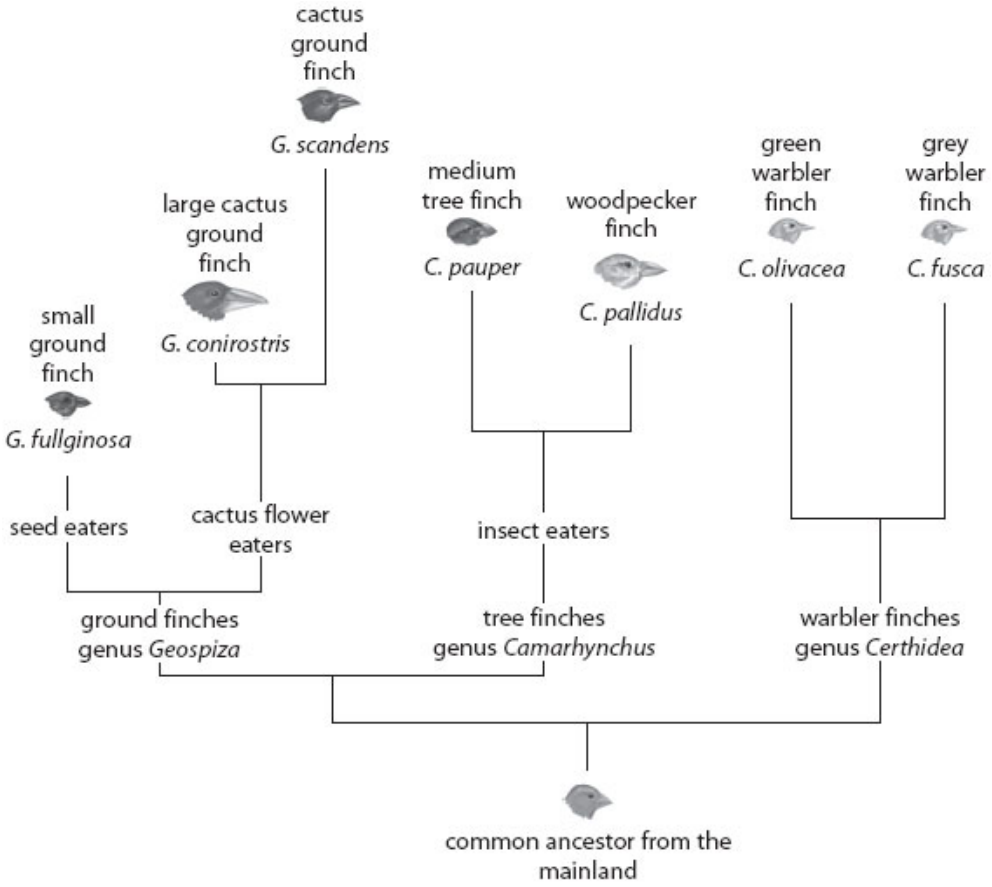
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Q10.

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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(ii) 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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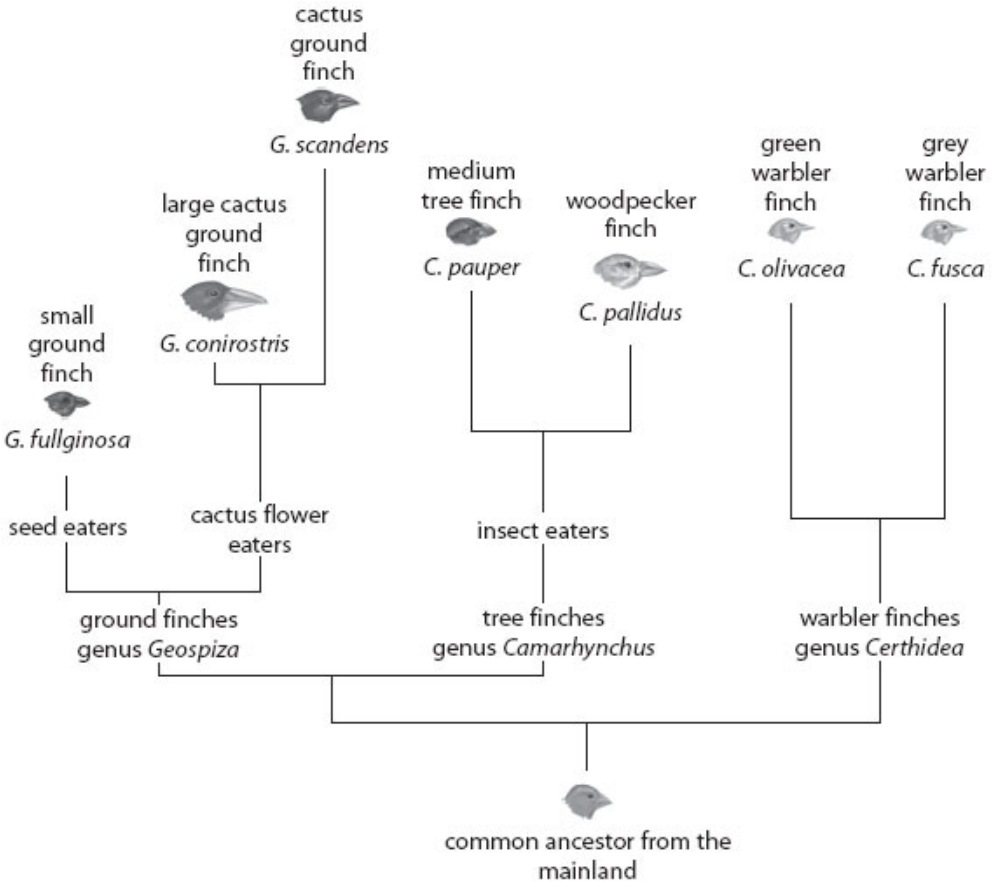
(Total for Question is 8 marks)

Q11.

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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(ii) 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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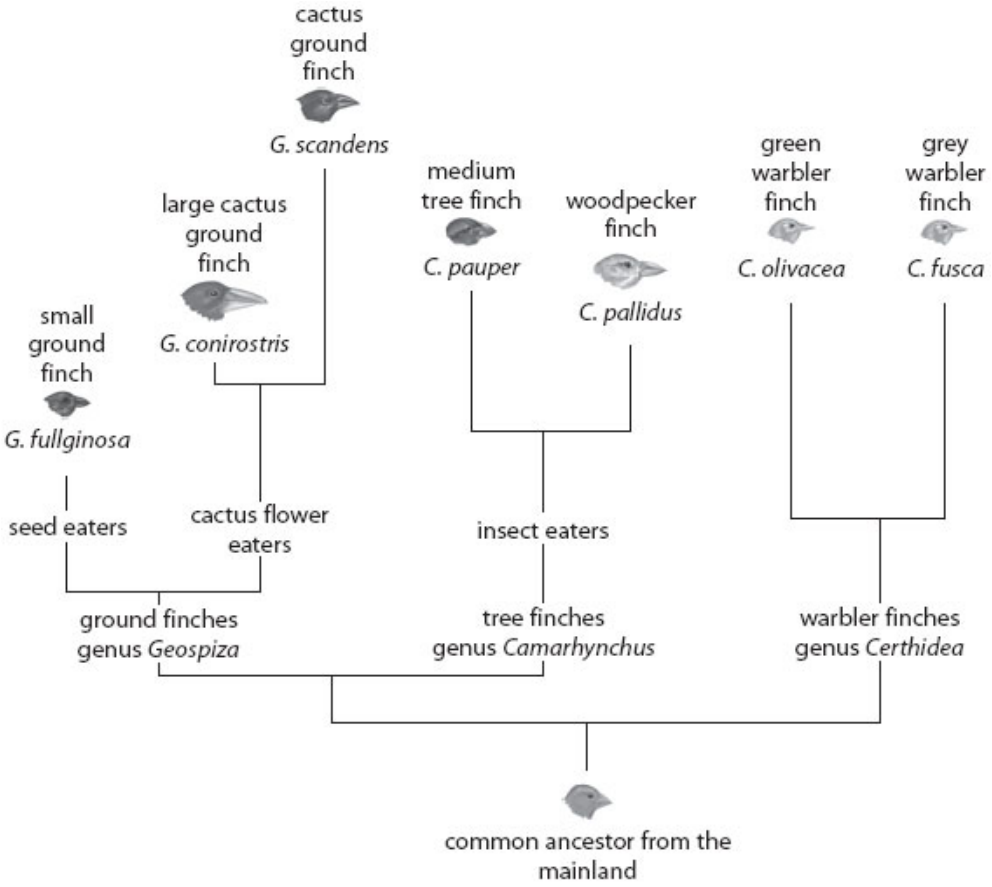
(Total for Question is 8 marks)

Q12.

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.



(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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(ii) 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

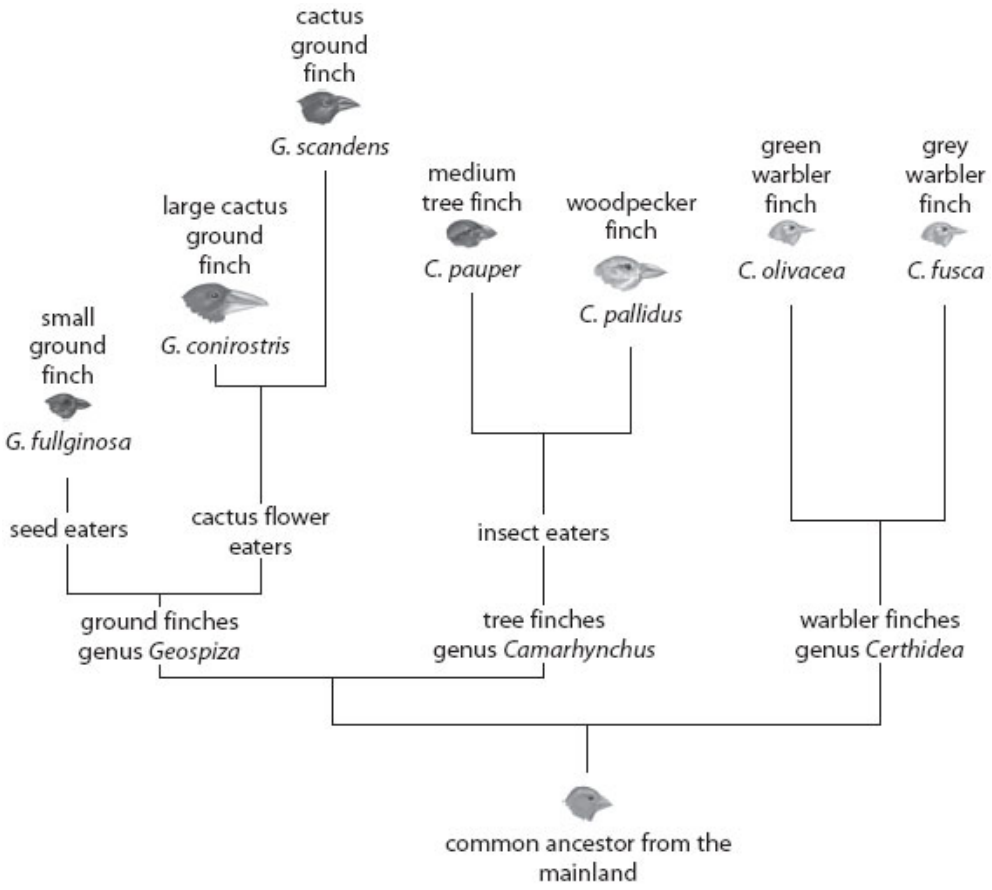
☒ **D** the development of ring species

Q13.

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.



(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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(ii) 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

Q14.

Figure 7 shows the limbs of five animals.

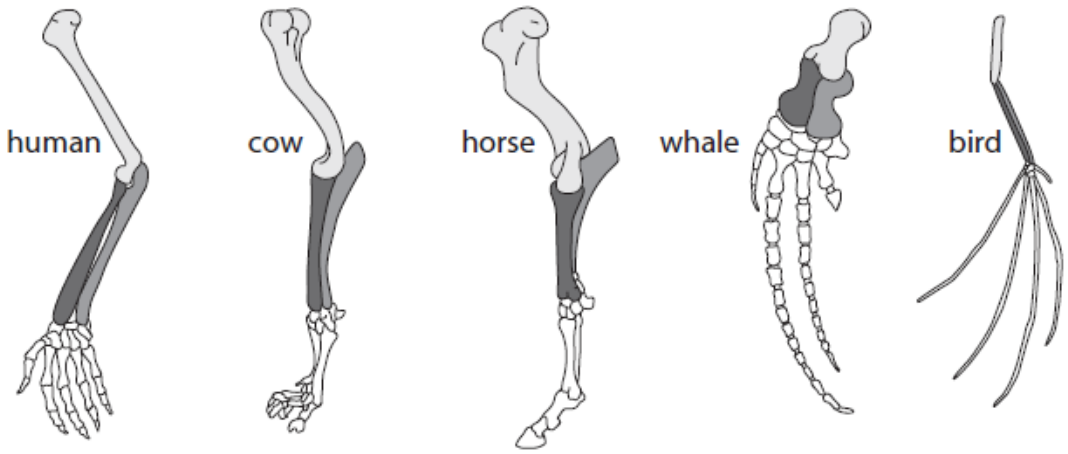


Figure 7

Describe how the structure of these limbs provides scientists with evidence for evolution.

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(Total for question = 3 marks)

Q15.

Penicillin, isolated from a fungus, was the first antibiotic used to treat bacterial infections and is still widely used today

Scientists have genetically engineered bacteria to produce large amounts of penicillin.

Describe how scientists would produce a genetically modified bacterium that produces penicillin.

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(Total for question = 4 marks)