

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

NOVEMBER 2017

LIFE SCIENCES P2

MARKS: 150

TIME: 2½ hours



This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start EACH question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. ALL drawings MUST be done in pencil and labelled in blue or black ink.
7. Draw diagrams, tables or flow charts ONLY when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The part of the Earth where organisms live is called the ...

- A atmosphere.
- B lithosphere.
- C biosphere.
- D hydrosphere.

1.1.2 Study the list below:

- (i) Decomposers
- (ii) Sunlight
- (iii) Plants
- (iv) Edaphic factors

Which of the following combinations can be considered as biotic factors?

- A (i) and (iii)
- B (ii) and (iv)
- C (i), (ii) and (iii)
- D (i), (iii) and (iv)

1.1.3 Proteas are common to which biome?

- A Forest
- B Grasslands
- C Savannah
- D Fynbos

1.1.4 The kingdom to which bacteria belong:

- A Plantae
- B Protista
- C Monera
- D Animalia

1.1.5 Which of the following does NOT form part of the systemic circulation?

- A Right atrium
- B Aorta
- C Left lung
- D Vena cava

1.1.6 During the carbon cycle, carbon dioxide is removed from the atmosphere by ...

- A primary consumers.
- B secondary consumers.
- C decomposers.
- D producers.

1.1.7 The largest blood vessel in the human body that transports oxygenated blood is the ...

- A pulmonary artery.
- B aorta.
- C superior vena cava.
- D coronary artery.

1.1.8 Study the list below and answer the question which follows:

- (i) Plate tectonics
- (ii) Ice ages
- (iii) Decrease in carbon dioxide levels
- (iv) Fossil tourism

Which of the above changes were an important influence on the history of life on Earth?

- A (i) and (ii)
- B (i) and (iii)
- C (i), (ii) and (iii)
- D All of the above

1.1.9 The site in Gauteng where humans were thought to originate is ...

- A the Cradle of Humankind.
- B the Drakensberg Mountains.
- C Mapungubwe.
- D Egoli.

1.1.10 The relatively short geological time frame during which organisms diversified, thus increasing the diversity of species on Earth:

- A Palaeozoic era
- B Cambrian Explosion
- C Jurassic period
- D Cretaceous period

(10 x 2) (20)

1.2 Give the correct BIOLOGICAL TERM for each of the following descriptions. Write only the term next to the question number (1.2.1–1.2.9) in the ANSWER BOOK.

1.2.1 The muscle layer separating the right and left side of the heart.

1.2.2 The large variety of living organisms found on Earth.

1.2.3 The process of the formation of large sheets of ice called glaciers.

1.2.4 Blood vessels that contain one way valves.

1.2.5 'Living fossil' found on the Northern KwaZulu-Natal Coast.

1.2.6 The timescale used to measure the history of life on Earth.

1.2.7 A person who studies fossils.

1.2.8 The layer of gases around the Earth.

1.2.9 Blood plasma that leaves the capillaries and surrounds the cells.

(9 x 1)

(9)

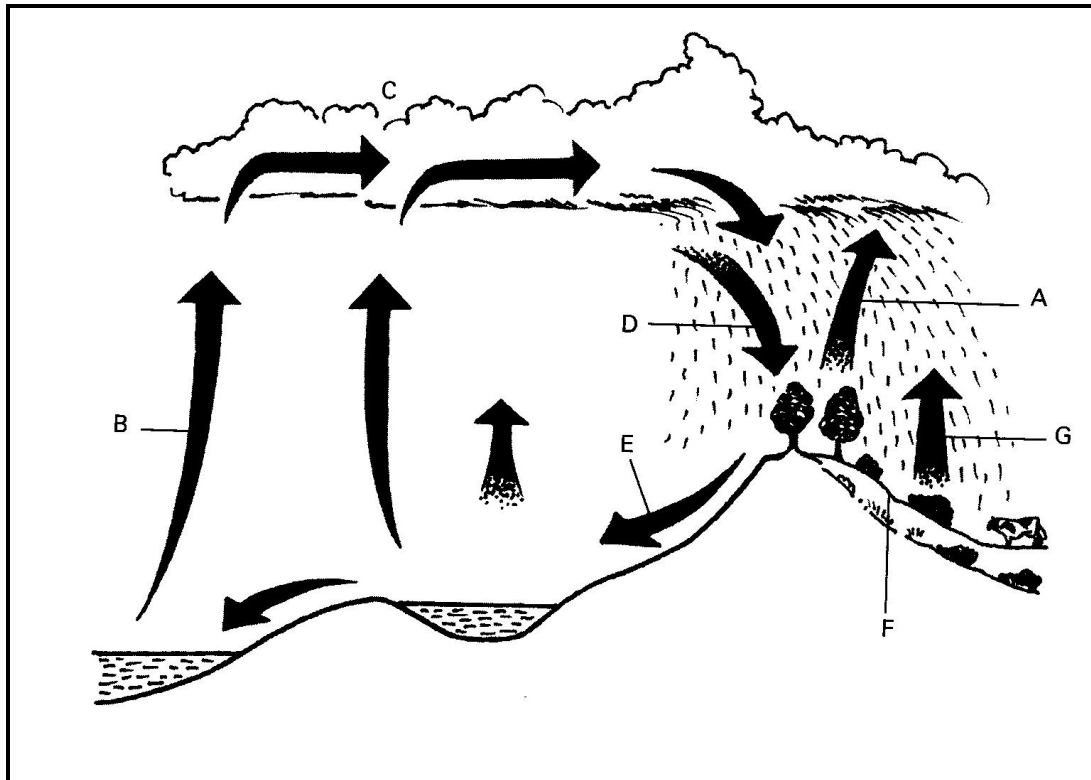
1.3 Indicate whether each of the statements in COLUMN I, applies to **A ONLY**, **B ONLY**, **BOTH A and B**, or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B**, or **none** next to the question number in the ANSWER BOOK.

	COLUMN I	COLUMN II	
1.3.1	Source of nitrates in the soil	A	Bacteria
		B	Photosynthesis
1.3.2	Abiotic factors	A	Temperature
		B	Light
1.3.3	Lymph vessels	A	Valves
		B	Longitudinal muscle

(3 x 2)

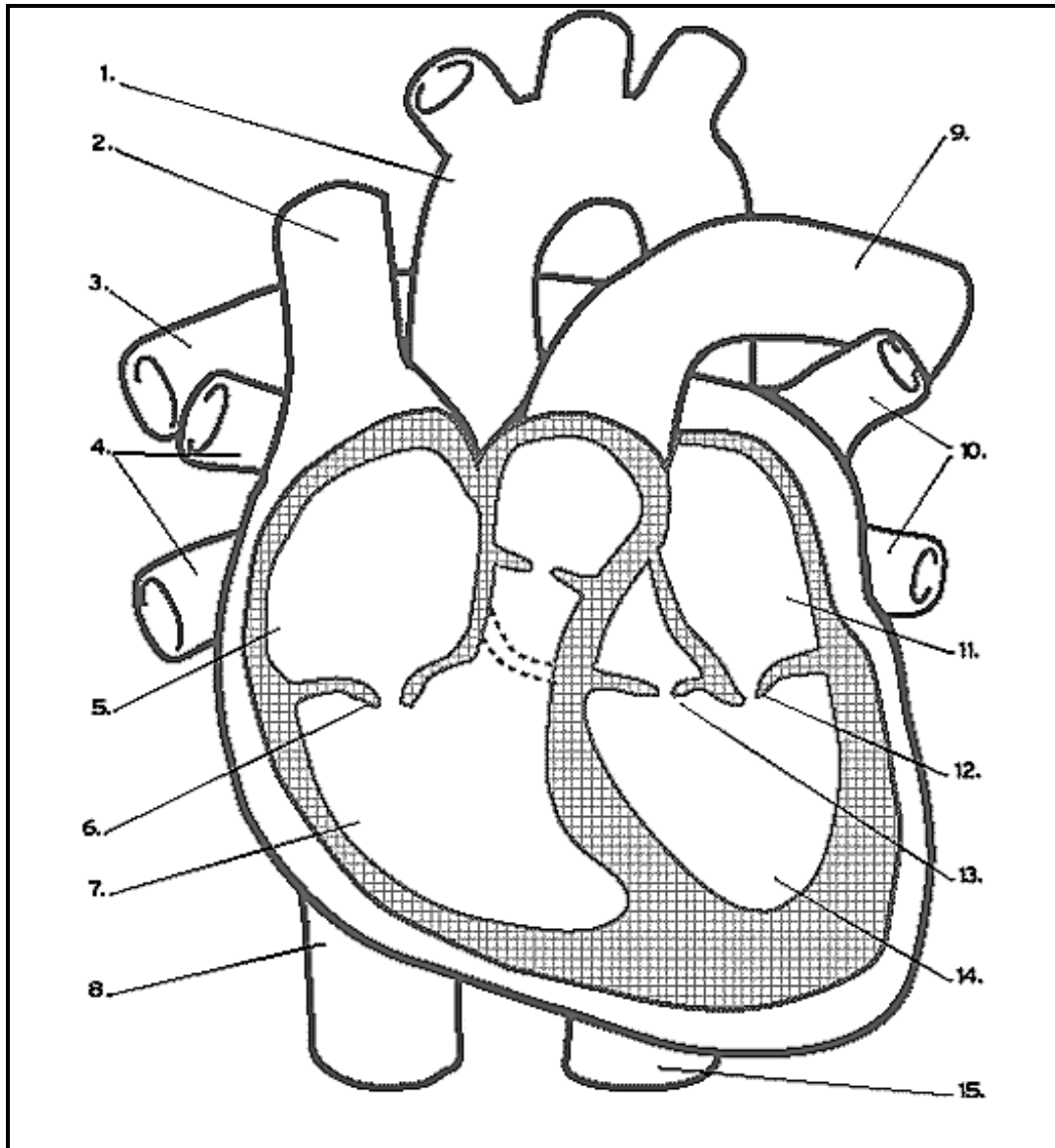
(6)

- 1.4 Study the diagram of the water cycle below and answer the following questions.



- 1.4.1 Name the processes labelled **A–D**. (4)
- 1.4.2 Name **ONE** human activity which can affect the water cycle. (1)
- 1.4.3 What is the most important factor that affects the rate of the process labelled **B**? (1)

1.5 Study the diagram of the heart below and answer the questions which follow.



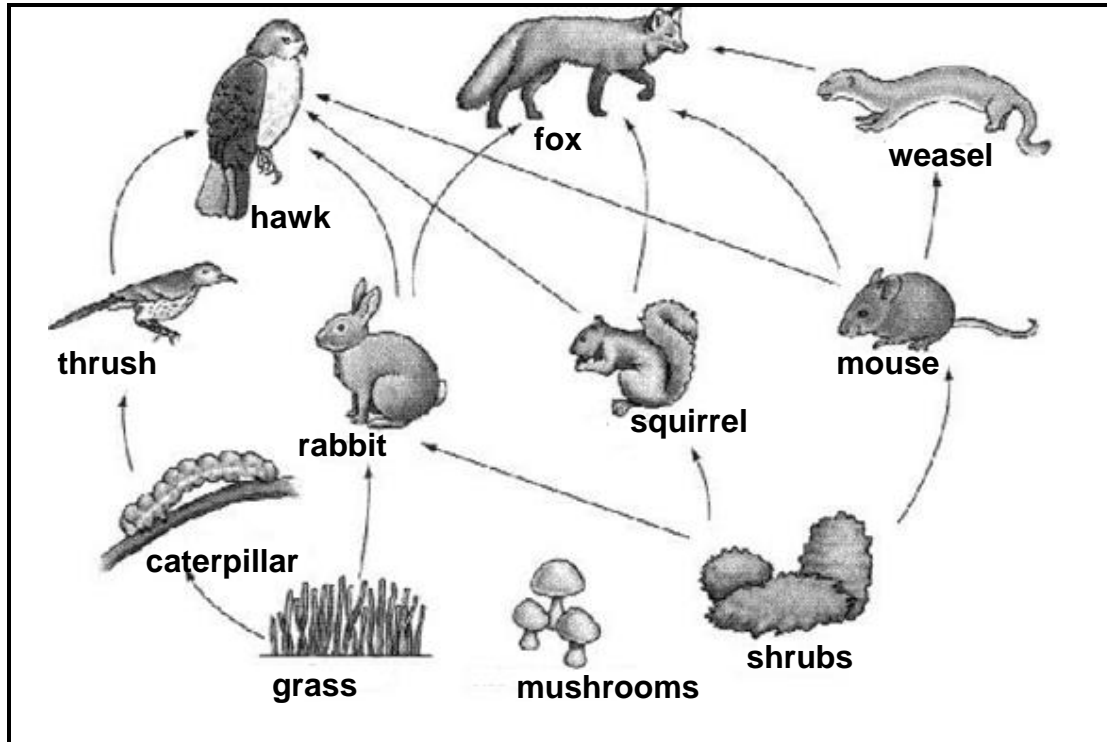
- 1.5 1.5.1 Name the blood vessels labelled 1 and 2. (2)
- 1.5.2 Give the NUMBER of the chamber/s in the diagram that contain deoxygenated blood. (2)
- 1.5.3 Write down the NUMBER and NAME of the valve which prevents backflow of blood into the right atrium when the right ventricle contracts. (2)
- 1.5.4 Which type of muscle tissue is the heart made up of? (1)
- 1.5.5 List TWO structural ways in which the heart is protected. (2)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 Study the ecosystem below and answer the questions which follow.



[www.phinglink.com]

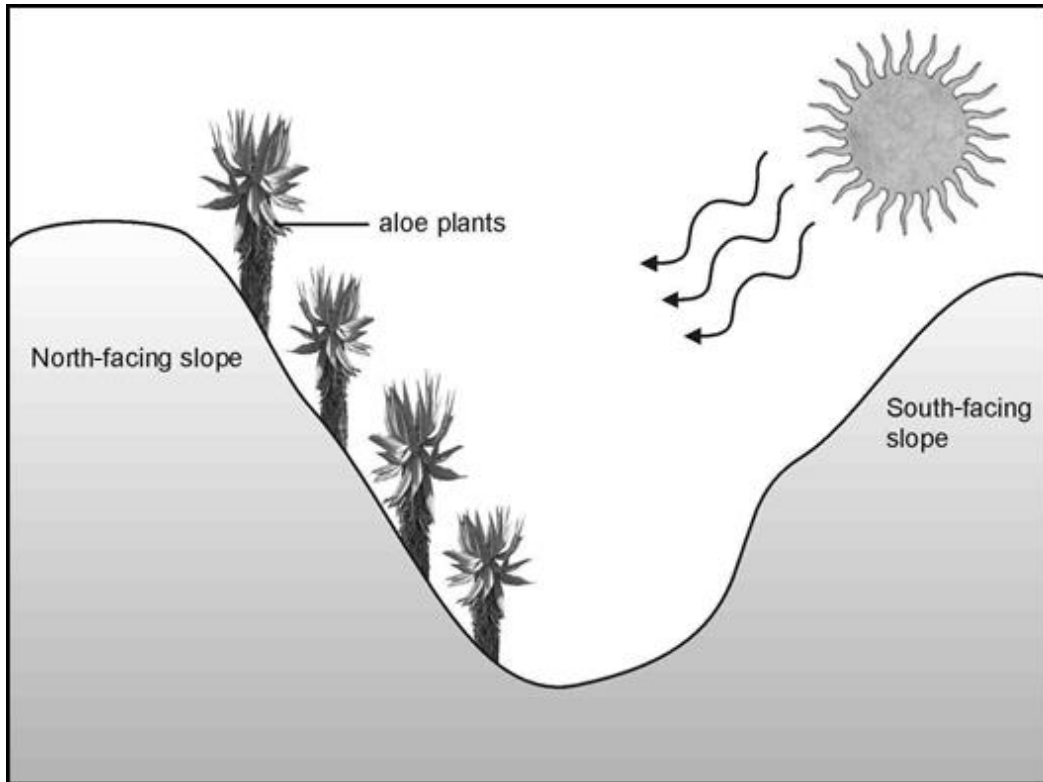
2.1.1 From the food web above name:

- (a) ONE producer (1)
- (b) TWO secondary consumers (2)

2.1.2 Use a food chain from the above ecosystem to draw a fully labelled pyramid of energy with FOUR trophic levels. (7)

2.1.3 What would happen if all the weasels were removed from the ecosystem? (2)

2.2 Aloes generally grow on rocky north-facing slopes, especially in the Eastern Cape. Study the diagram below and answer the questions that follow.



- 2.2.1 Give ONE structural adaptation of the leaves of aloe plants to its xerophytic mode of life. (2)
- 2.2.2 Why do aloes prefer to grow on a north-facing slope rather than on a south-facing slope? (2)
- 2.2.3 Explain what is meant by the terms:
 - (a) Aspect (1)
 - (b) Altitude (1)
- 2.2.4 Give TWO abiotic factors that can be seen in the diagram above. (2)

- 2.3 The table below shows the results of an investigation which measured the average global carbon dioxide levels in the atmosphere over a five-year period.

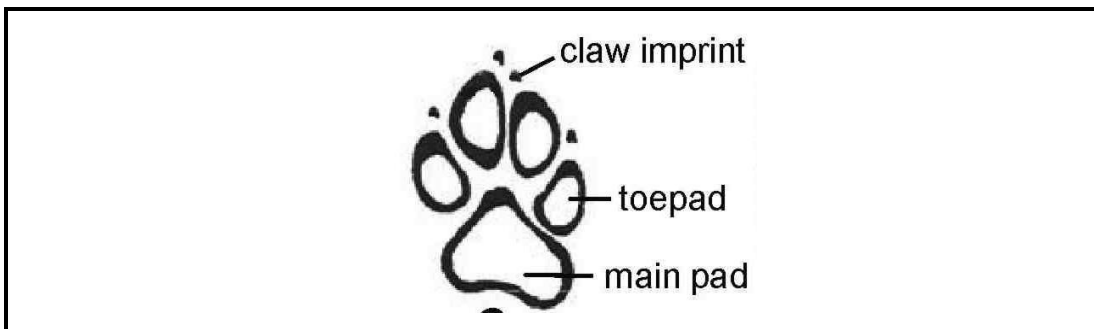
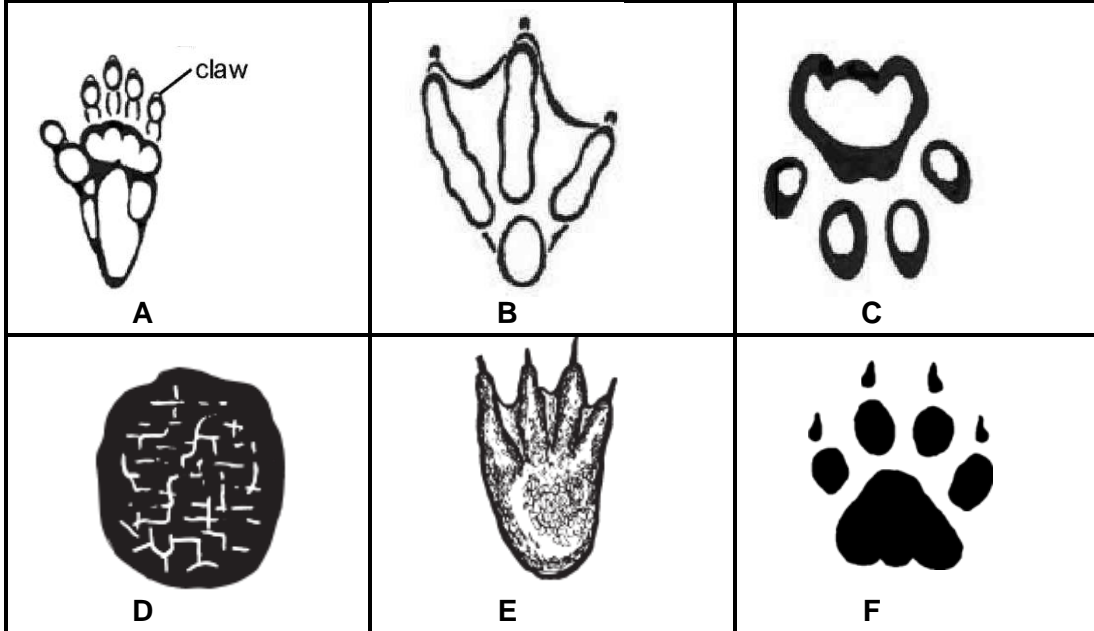
Year	Carbon dioxide level (parts per million)
2004	376,0
2005	377,0
2006	379,5
2007	381,0
2008	383,5

- 2.3.1 Draw a line graph to show the change in carbon dioxide levels over time. (6)
- 2.3.2 Describe the trend shown in the graph you drew in QUESTION 2.3.1. (2)
- 2.3.3 What is the dependent variable in the above investigation? (1)
- 2.3.4 Calculate the increase in carbon dioxide from 2004 to 2008. Show all calculations. (2)
- 2.3.5 Describe how an increase in carbon dioxide levels can lead to climate change. (4)
- 2.3.6 Your carbon footprint is the amount of carbon dioxide you release into the atmosphere during your daily activities.
- (a) Name THREE human activities that cause an increase in the carbon footprint in the atmosphere. (3)
- (b) List TWO ways in which you and your family could decrease your carbon footprint. (2)
- [40]**

QUESTION 3

3.1 Kuhle and Bongile found the animal tracks shown below while walking with their class in a nearby field.

Their teacher gave them the key below to help them identify the footprints.

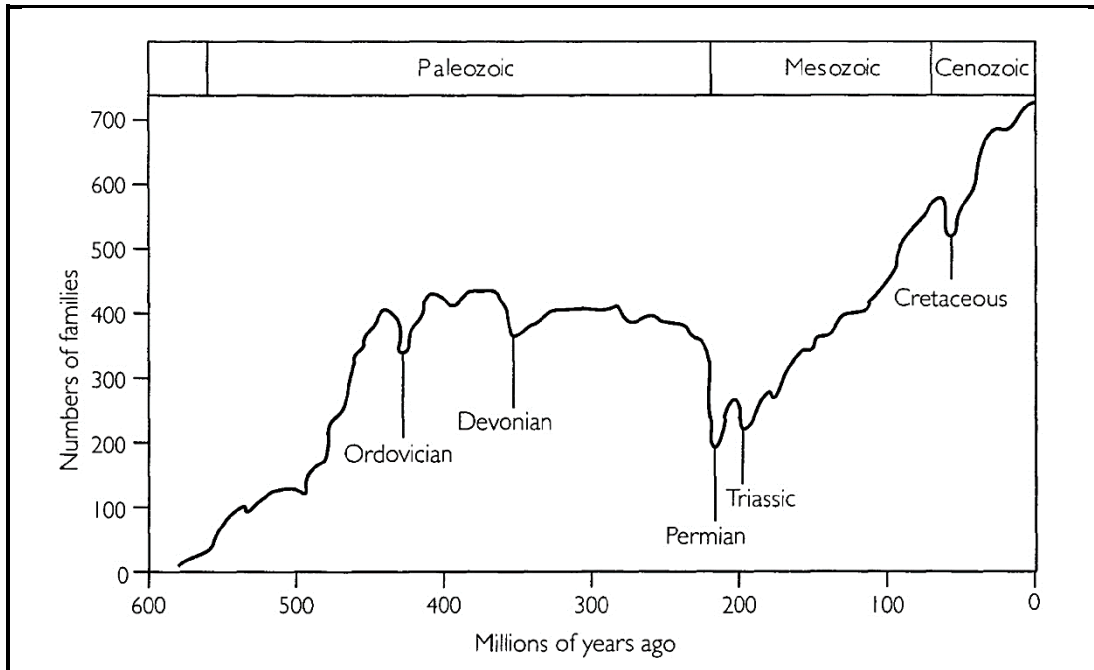


1	Track has distinct claw imprints	Go to 2
	Track does not have claw imprints	Go to 5
2	Track has four toepads	Go to 3
	Track has three or five toepads	Go to 4
3	Webbed foot	Crocodile
	Foot not webbed	Cheetah
4	Three toepads	African Penguin
	Five toepads	Baboon
5	Toepad imprints visible	Go to 6
	Toepad imprints are not visible	Elephant
6	Four toepad imprints	Leopard
	Three toepad imprints	Dassie

Use the key above to identify footprints **A**, **B**, **C** and **D**. Write down only the letter (**A**, **B**, **C** or **D**) and the name of the animal.

(4)

- 3.2 The diagram below represents a simplified geological time-scale showing how the number of families (groups of related species) has changed over a period of time.

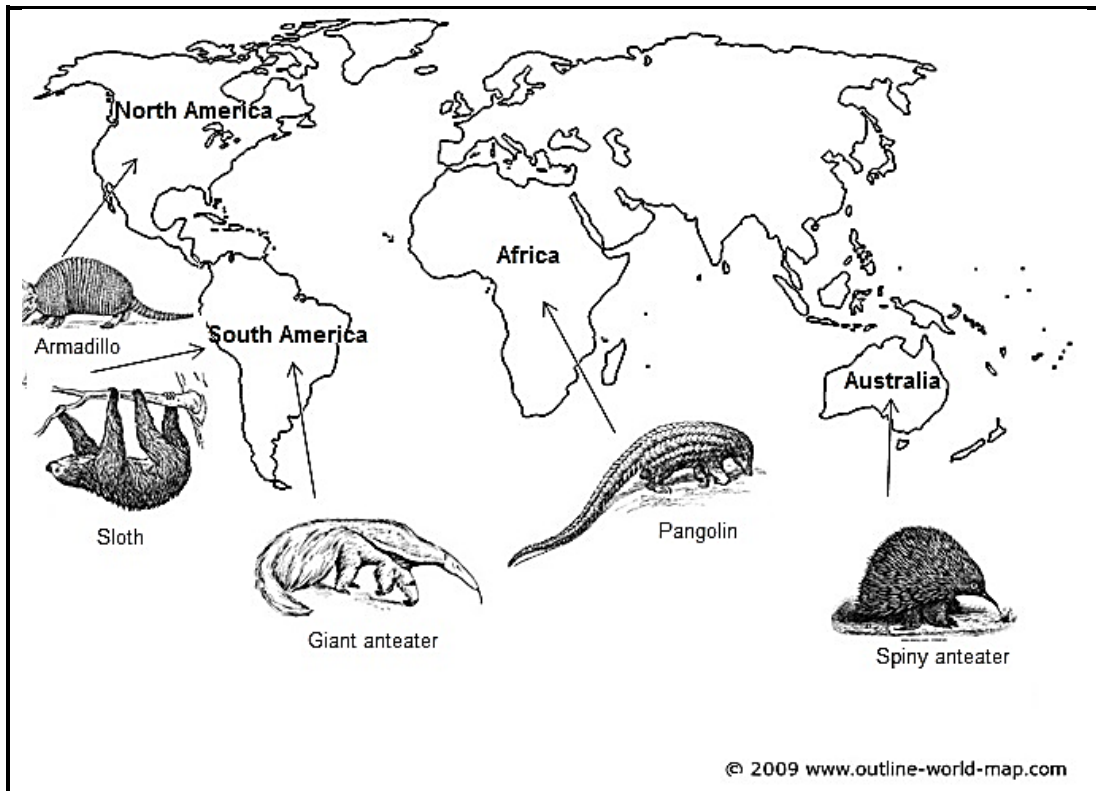


- 3.2.1 How many mass extinctions took place since the creation of the earth? (1)
- 3.2.2 Which mass extinction took place towards the end of the Palaeozoic era? (1)
- 3.2.3 Which era had the longest duration? (1)
- 3.2.4 Name TWO factors or events known to have caused mass extinctions. (2)
- 3.2.5 When did the Triassic extinction take place? (1)
- 3.2.6 Which extinction was the biggest in terms of the number of families that went extinct? (1)
- 3.2.7 Scientists believe that we are currently experiencing the sixth mass extinction. What is thought to be the cause of this mass extinction? (1)

3.3 Read the passage below and answer the questions which follow.

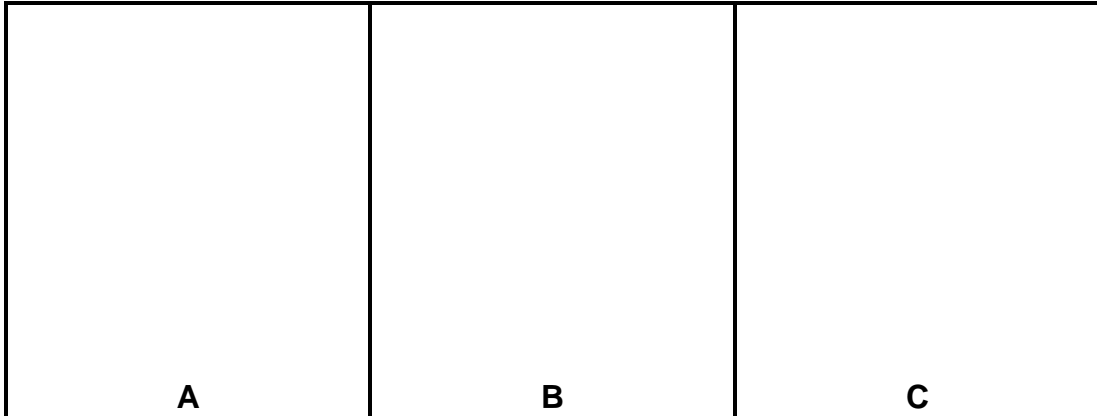
Armadillos, anteaters and sloths all belong to the mammalian order Xenarthra. They all look very different as you can see in the diagram below. However, they are genetically more similar to each other than any other mammals. This suggests that these three different groups of animals descended from a common ancestor. Xenarthra are also distantly related to pangolins which are found in Africa.

Today we find sloths and the giant anteater (*Myrmecophaga tridactyla*) in South America, the nine banded armadillo (*Dasypus novemcinctus*) in North America, the spiny anteater in Australia and 44 species of pangolin in Africa.



- 3.3.1 What do we call the study of the distribution of existing and extinct plant and animal species in specific areas on Earth? (1)
- 3.3.2 Name the continent that South America, Africa and Australia formed part of after it broke away from Pangaea. (1)
- 3.3.3 Briefly explain the **continental drift theory**. (3)
- 3.3.4 Do giant anteaters and armadillo's belong to the same genus? (1)
- 3.3.5 Give a reason for your answer in QUESTION 3.3.4. (2)
- 3.3.6 Write the scientific name for the nine banded armadillo correctly. (2)

- 3.4 Explain how the change in oxygen levels in the atmosphere affected the history of life on Earth. (5)
- 3.5 The diagrams below form part of the cardiac cycle. Study them carefully and answer the questions which follow.



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- 3.5.1 Name stages **A**, **B** and **C** respectively. (3)
- 3.5.2 Describe what happens in the heart during phase **B**. (4)
- 3.5.3 Name the special tissue that sends electrical impulses to the muscle fibre of the atria causing them to contract. (1)
- 3.5.4 How long does each cardiac cycle last? (1)
- 3.5.5 Explain how high carbon dioxide levels in the blood will cause a change in the speed at which the heart beats. (4)

[40]

TOTAL SECTION B: 80

SECTION C**QUESTION 4**

Fossils are the preserved remains or traces of animals, plants, and other organisms from the past. Fossils are important evidence for evolution because they show that life on earth was once different from life found on earth today.

Describe how petrified fossils are formed in sedimentary rock and give examples of fossils found in places other than rock. Explain how scientists date these fossils and how fossil tourism can be an advantage to the country.

Content: (17)
Synthesis: (3)

NOTE: NO marks will be awarded for answers in the form of flow charts, tables or diagrams.

TOTAL SECTION C: 20
GRAND TOTAL: 150

