education

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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES P2

NOVEMBER 2019

MARKS: 150

TIME: 2½ hours

This question paper consists of 13 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 the answers to EACH question at the top of 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. Do ALL drawings in pencil and label them 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 given as possible answers to the following questions. Choose the answer and write only the letter (A – D) next to the question number (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 A population is made up of …

A individuals of the same species.
B communities.
C ecosystems.
D different species.

1.1.2 The correct sequence of the group of ecological terms from the simplest to the most complex, is:

A Organism, population, ecosystem, community
B Population, organism, ecosystem, community
C Organism, population, community, ecosystem
D Population, community, organism, ecosystem

1.1.3 The correct sequence of strata in a forest from top to bottom is:

A Canopy layer, herbaceous layer, understory layer, shrub layer
B Understory layer, canopy layer, shrub layer, herbaceous layer
C Canopy layer, understory layer, shrub layer, herbaceous layer
D Herbaceous layer, shrub layer, understory layer, canopy layer

1.1.4 Decomposers …

A are secondary consumers.
B produce their own organic food.
C do not form part of food chains.
D feed on dead organic matter.

1.1.5 Which one of the following food chains is correct?

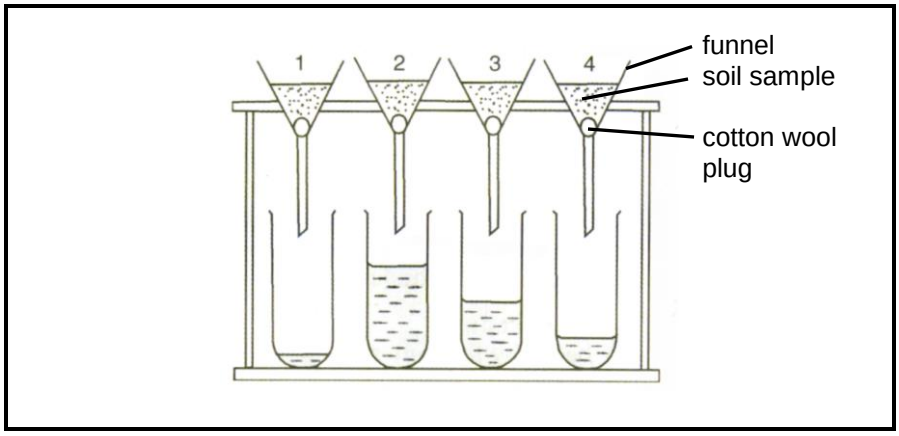
A Producer → carnivore → herbivore
B Plants → secondary consumers → tertiary consumers
C Producers → herbivores → secondary consumers
D Plants → herbivores → primary consumers

1.1.6 A series of changes, from pioneer to climax, is called …

A recycling.
B decomposition.
C a food chain.
D succession.

QUESTIONS 1.1.7 and 1.1.8 refer to the experiment below.

Cotton wool plugs are placed in glass funnels and equal amounts of different soil samples are placed in the funnels. Then equal volumes of water are poured into the funnels.



1.1.7 The correct aim of this experiment is to show that …

A air is present in all soil types.
B air is replaced by water.
C a certain soil is able to absorb more water than other soil types.
D water drains through all soil types.

1.1.8 Which funnel contains sandy soil?

A 1
B 2
C 3
D 4

QUESTIONS 1.1.9 and 1.1.10 refer to the investigation below.

Mary heats 50g of damp soil to drive off the water in contains. After the soil cooled, she weighs it and sees that the mass is 45 g.

1.1.9 What percentage of water was in the soil?

A 5%
B 10%
C 15%
D 45%

1.1.10 The soil that Mary used, is most probably…

A clay soil.
B loamy soil.
C mud.
D sandy soil.

(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 to 1.2.9) in the ANSWER BOOK.

1.2.1 The gas that was in extremely small quantities or completely absent when life started on Earth millions of years ago

1.2.2 The study of past and present distribution of individual species

1.2.3 The chemical element that is found in raindrops after lightning has struck

1.2.4 Exotic species of plant or animal that do not naturally live in a particular habitat and can cause harm to the ecosystem

1.2.5 The process of finding out the ages of rocks and fossils using radioactive elements

1.2.6 The process of finding out the ages of rocks and fossils by comparison with another fossil

1.2.7 Organisms that have virtually not changed over millions of years and are similar to the fossils of their ancestors

1.2.8 The southern land mass that formed when Pangaea broke up

1.2.9 A strange-looking fish, once thought to be extinct over 70 million years ago, caught again off the coast of East London in 1938

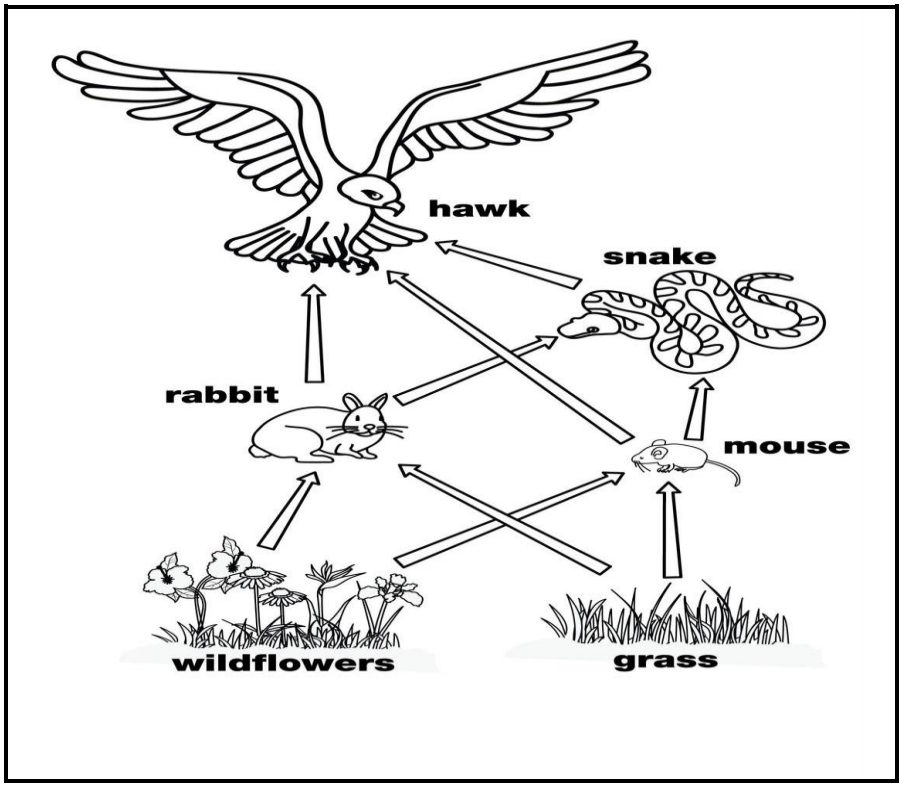
(9 x 1) **(9)**

1.3 Indicate whether each of the descriptions 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 (1.3.1 to 1.3.5) in the ANSWER BOOK.

COLUMN I		COLUMN II
1.3.1	A kingdom without a definite nucleus	A: Monera B: Protista
1.3.2	Organisms that are autotrophic	A: Animalia B: Plantae
1.3.3	Organisms that grow on dead organic matter	A: Saprophytic B: Saprotrophic
1.3.4	Living organisms that do not naturally live in South Africa	A: Exotic species B: Alien species
1.3.5	Binomial classification system	A: Darwin B: Linnaeus

(5 x 2) **(10)**

1.4. The diagram below illustrates a feeding relationship of different animals in an ecosystem. Study the diagram and answer the questions that follow.



1.4.1 What is the name of this type of diagram? (1)

1.4.2 What is an ecosystem? (2)

1.4.3 Identify an organism in this diagram which is a:

(a) Herbivore (1)
(b) Tertiary consumer (1)

1.4.4 Draw a food pyramid to show three different trophic levels of organisms in the diagram above. (4)

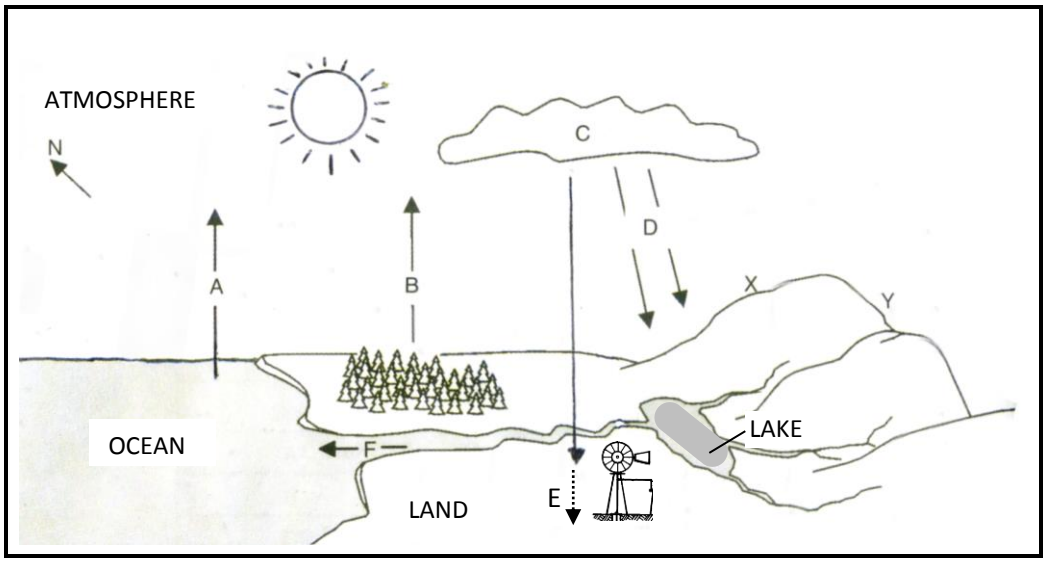
1.4.5 Explain the changes that may result in the ecosystem if the wild-flowers and grass are removed from the area. (2)
(11)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1. Study the following diagram which shows the water cycle and part of the ecosystem and answer the following questions.



2.1.1 What is a water cycle? (2)

2.1.2 Which TWO chemical elements are involved in this cycle? (2)

2.1.3 Identify THREE observable physiographic factors in this diagram. (3)

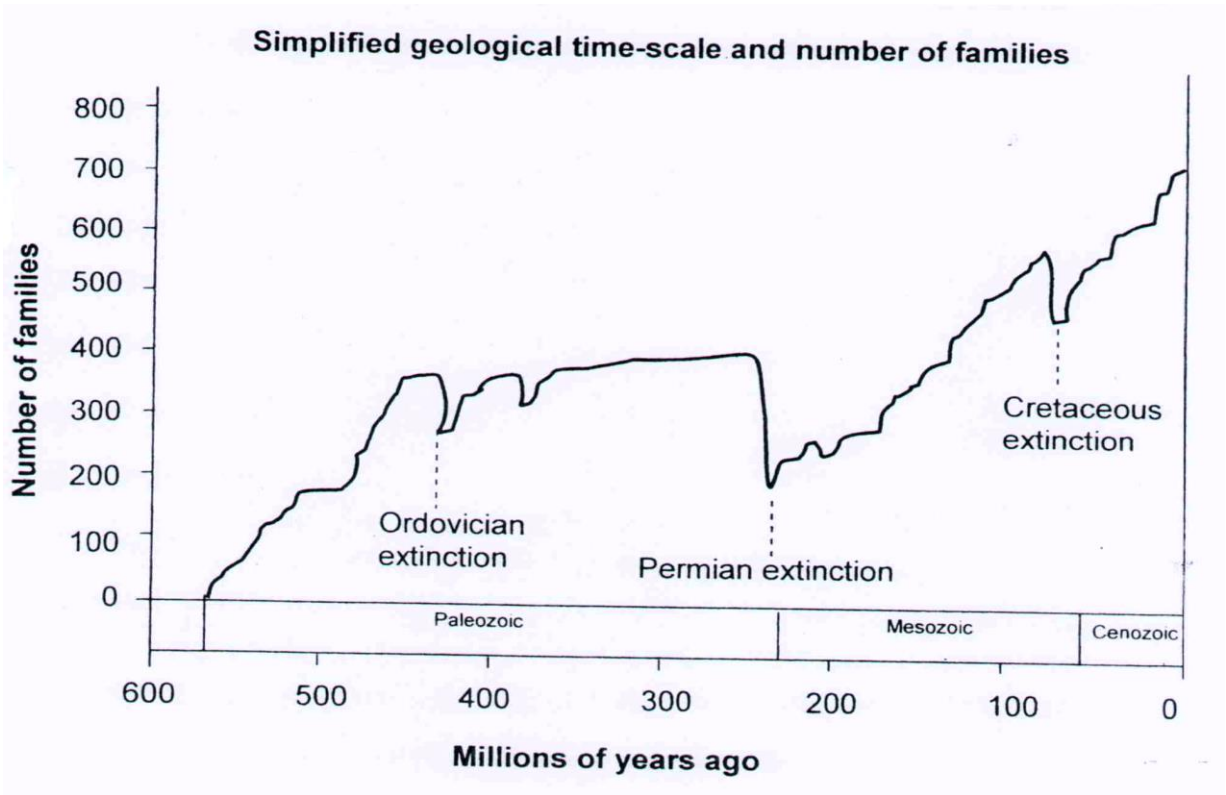
2.1.4 Which side of the mountain (**X** or **Y**) is the coldest? (1)

2.1.5 Give a reason for your answer in QUESTION 2.1.4. (2)

2.1.6 Describe the importance of the sun in the water cycle. (4)

2.1.7 Name and explain the processes involved in the water cycle indicated by the letters **B**, **C** and **E**. (6)
(20)

2.2. 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.



2.2.1 What is a mass extinction? (1)

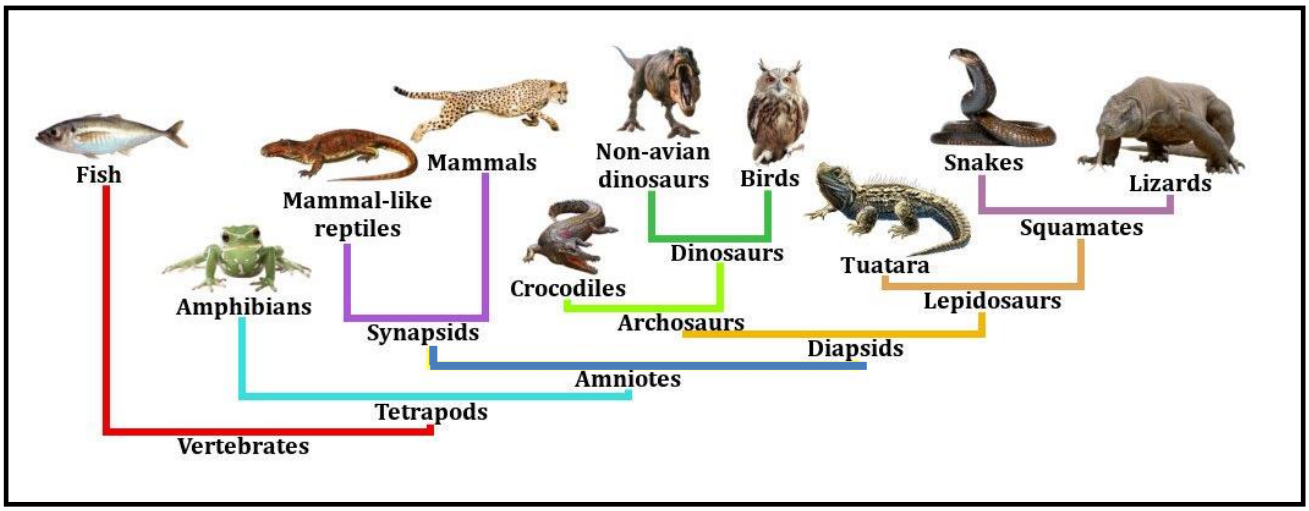
2.2.2 When did the Cenozoic era begin? (2)

2.2.3 Which mass extinction took place towards the end of Paleozoic era? (1)

2.2.4 Approximately how many families went extinct at the end of the Paleozoic era? Show ALL workings. (3)

2.2.5 Explain why the number of families increased rapidly after a mass extinction. (5)
(12)

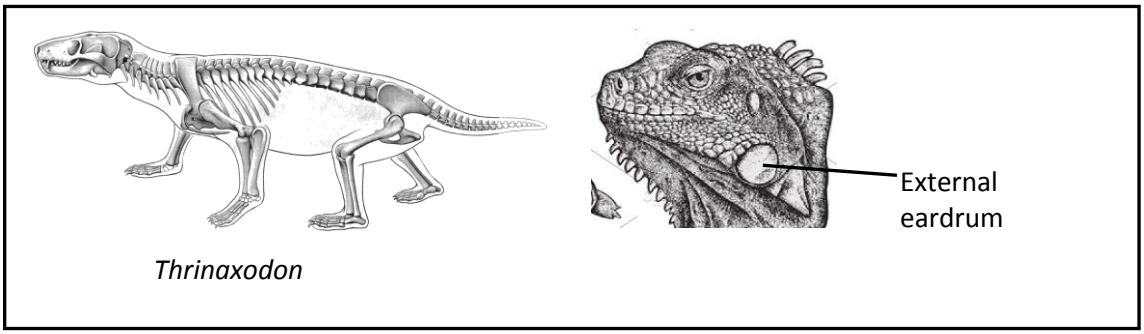
2.3 According to classification diagrams of vertebrates, some ancient reptiles developed into mammals and other reptiles developed into birds. Study the classification diagram below of reptile related families and answer the questions that follow.



2.3.1 Which group of vertebrates was the ancestor of mammals and mammal-like reptiles according to the diagram above? (1)

Thrinaxodon was a mammal-like reptile which lived in the Karoo in the Eastern Cape millions of years ago. Its features are listed below.

<u>*Thrinaxodon* (mammal like reptile)</u>
Strong limbs for burrowing
Teeth
External eardrum
Hair
Warm blooded metabolism
Laying eggs
Body lifted from the ground.



2.3.2 List ONE typical reptile-like feature of *Thrinaxodon*. (1)

2.3.3 List TWO typical mammal-like features of *Thrinaxodon*. (2)

Archaeopteryx was a bird-like reptile that went extinct about 150 million years ago and had the following features:

<u>*Archaeopteryx* fossil</u>
Small teeth
Feathers
Vertebrae in the tail
Claws on forelimbs
Hollow bones
Wings
Laying eggs
Beak


Archaeopteryx

2.3.4 *Archaeopteryx* had features of both reptiles and birds. List TWO typical bird-like features of this fossil. (2)

2.3.5 List ONE typical reptile-like feature of *Archaeopteryx*. (1)

2.3.6 What is the biological term used to describe a fossil that shows characteristics of two different families and seen as "in-between" e.g. *Archaeopteryx*? (1)
(8)
[40]

QUESTION 3

3.1 Read the passage below and answer the questions that follow.

According to professor Anton Mbewu, president of the Medical Research council, "heart attacks and strokes are particularly tragic as they often strike down the victims in their productive years of life, removing the breadwinner from families. When non-fatal they result in severe disability and consequent impoverishment for the entire families".

The total direct and indirect costs of death and disability from heart disease and strokes, are more than R8 billion per annum.

The findings of the report are that between 1997 and 2004 in South Africa, 195 people died per day due to some form of cardio vascular disease.

[Source: Shock statistics on heart disease and stroke in South Africa, Heart Foundation SA]

3.1.1 Describe ONE way why heart attacks and strokes are particularly tragic to families. (2)

3.1.2 What is the estimated direct and indirect cost for South African families when the breadwinner suffers from heart disease? (1)

3.1.3 According to the report, premature deaths are expected to increase by 41% due to heart and blood vessel diseases. Up to 80% of heart diseases and strokes could be prevented by maintaining a healthy lifestyle.

Name FOUR ways how South Africans can adjust their lifestyles to prevent blood vessel disease. (4)

3.1.4 Explain the difference between a heart attack and a stroke. (4)
(11)

3.2 Study the table below and answer the questions that follow.

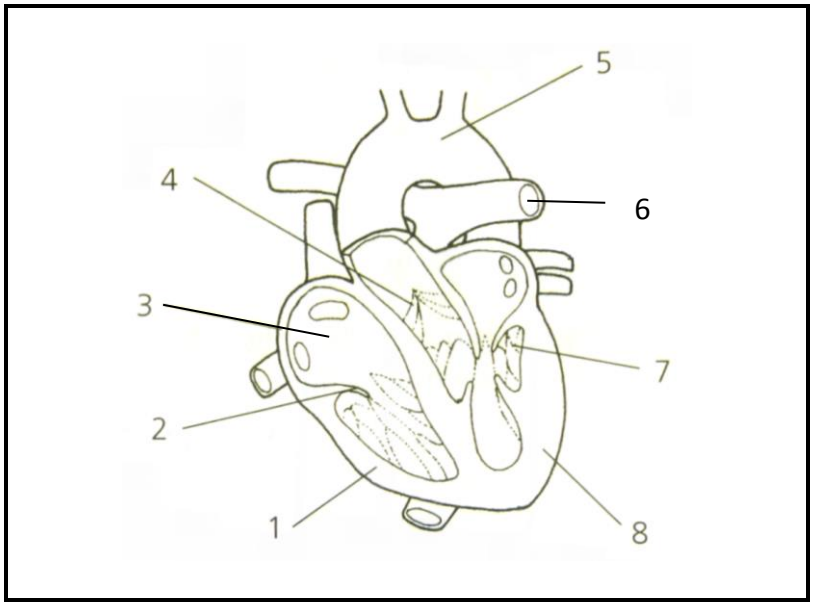
Percentage incidence of high cholesterol in different population groups in South Africa

Population groups	% of high cholesterol
Blacks	28
Whites	85
Coloureds	81
Indians	82

3.2.1 Draw a pie chart of the population groups making up the total number of people with high cholesterol. (9)

3.2.2 Which group has the highest incidence of high cholesterol? (1)
(10)

3.3 Study the diagram of a human heart and answer the questions that follow.

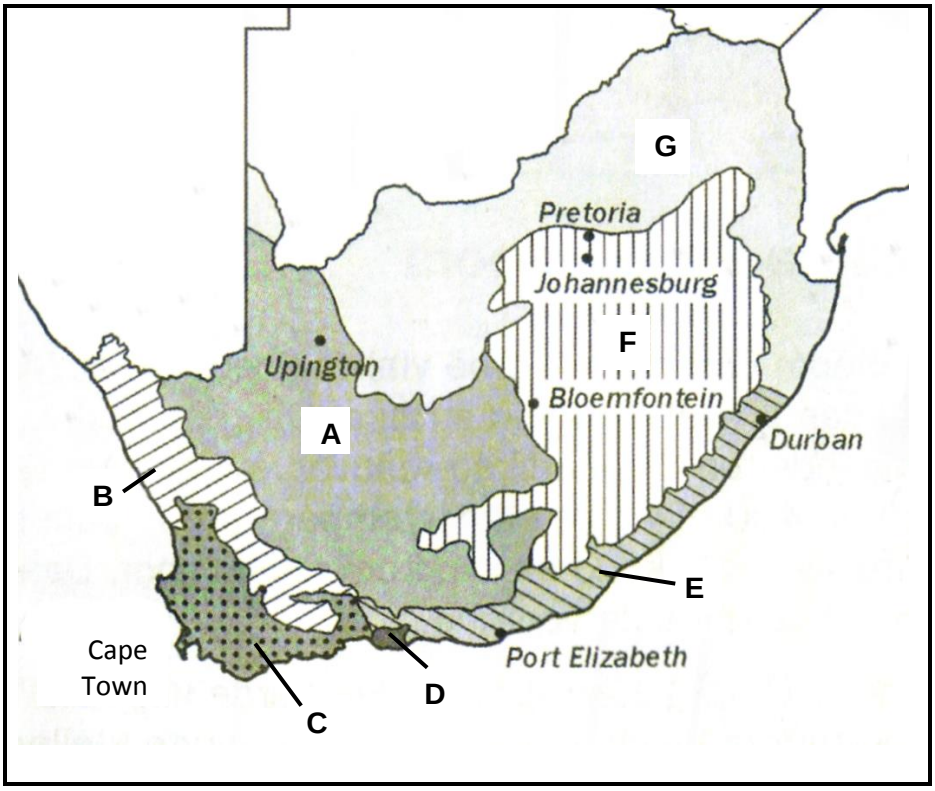


3.3.1 Label parts numbered **2**, **3** and **6**. (3)

3.3.2 Why is the wall of part **8** thicker than the wall of part **1**? (2)

3.3.3 Briefly describe what happens during atrial systole. (5)
(10)

3.4. Study the map below that shows the biomes of South Africa and answer the questions that follow.



3.4.1 Tabulate TWO differences between the vegetation of the Forest biome and the Succulant Karoo biome. (5)

3.4.2 Give the LETTER and NAME of the biome which:

a) Is known for its *Protea*, *Erica* and *Restio* species. (2)
b) Consists largely of grasses, large shrubs and trees. (2)
(9)
[40]

TOTAL SECTION B 80

SECTION C

QUESTION 4

The world's biodiversity is under serious threat.

Write an essay in which you discuss FOUR possible ways on how biodiversity is threatened by man and explain how such threats can be managed.

Content: (17)
Synthesis: (3)
(20)

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

TOTAL SECTION C: 20
GRAND TOTAL: 150