Bergvliet High School

Grade 10 Life Sciences Paper 2 Final Examination

Time: 2 ½ Hours / Marks: 150

Friday 22 November 2024

Examiner: Mrs M. Wentworth

Moderated by: M.Brouwer, S.Lambrechts and G. O' Connor

Full Name:						
Life Sciences Teacher:	**Br**	**La**	**Oc**	**We**		
SECTION A	**Q1**	**50**				
SECTION B	**Q2**	**50**				
	Q3	**50**				
TOTAL	**150**		**%**			
Signature						

Instructions and Information

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions. There are **3 questions** in total and **14 pages.**
2. Write all your answers on Foolscap paper.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Present your answers according to the instructions of each question.
5. Do all drawings in pencil and label them in blue or black ink.
6. Draw diagrams or flow charts only when asked to do so.
7. The diagrams in this question paper are not necessarily drawn to scale.
8. Do not use graph paper.
9. You must use a non-programmable calculator, protractor and a compass, where necessary.
10. Write neatly and legibly.

DETACH THIS SHEET AND STAPLE IT TO THE FRONT OF YOUR FOOLSCAP PAPER

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 to D) next to the question number. (1.1.1 to 1.1.10) in your answer book, for example 1.1.11 D

1.1.1 Organisms in an ecosystem that break down the dead organic matter.

A Producers
B Primary consumers
C Secondary consumers
D Decomposers

1.1.2 Which of the following is responsible for transporting oxygen in the human body?

A Lymphocytes
B Red blood cells
C Platelets
D White blood cells

1.1.3 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

1.1.4 A chamber in the heart with thick muscular walls that pumps blood through the aorta.

A Right atrium
B Left atrium
C Right ventricle
D Left ventricle

1.1.5 Specialised conducting tissue in the heart also known as the pacemaker of the heart.

A Sino-atrial node
B Atrioventricular node
C Sympathetic nerve
D Parasympathetic nerve

1.1.6 The fluid part of blood is called…

A plasma.
B tissue fluid.
C lymph.
D blood.

1.1.7 Scientists have suggested that the trees in the Amazon jungle generate their own clouds and rain. This is most likely caused by…

A precipitation.
B evaporation.
C condensation.
D transpiration.

1.1.8 What would you advise a farmer in South Africa looking for a location to plant crops that require large amounts of sunlight, nutrient rich soil and good drainage?

A Plant on a north facing slope in soil consisting mainly of loam.
B Plant on a north facing slope in sandy soil.
C Plant on a south facing slope in soil consisting mainly of loam.
D Plant on a south facing slope with soil with good clay content.

1.1.9 A sea can be regarded as a … biome.

A aquatic
B terrestrial
C freshwater
D desert

1.10 A blood vessel that takes blood to the kidneys.

A Hepatic artery
B Renal artery
C Mesenteric artery
D Iliac artery 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 1.2.10).

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 A layer of O_3 molecules, surrounding the earth, which absorb harmful UV radiation.

1.2.4 Extinct squid-like creatures with a coiled shell.

1.2.5 The time it takes for half the atoms in a sample of radioactive isotopes to decay.

1.2.6 Refers to height above sea level.

1.2.7 The fossil record shows a sudden appearance of a huge variety of multicellular marine fossil organisms around 540 million years ago.

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.

1.2.10 A type of scientist that studies fossils.

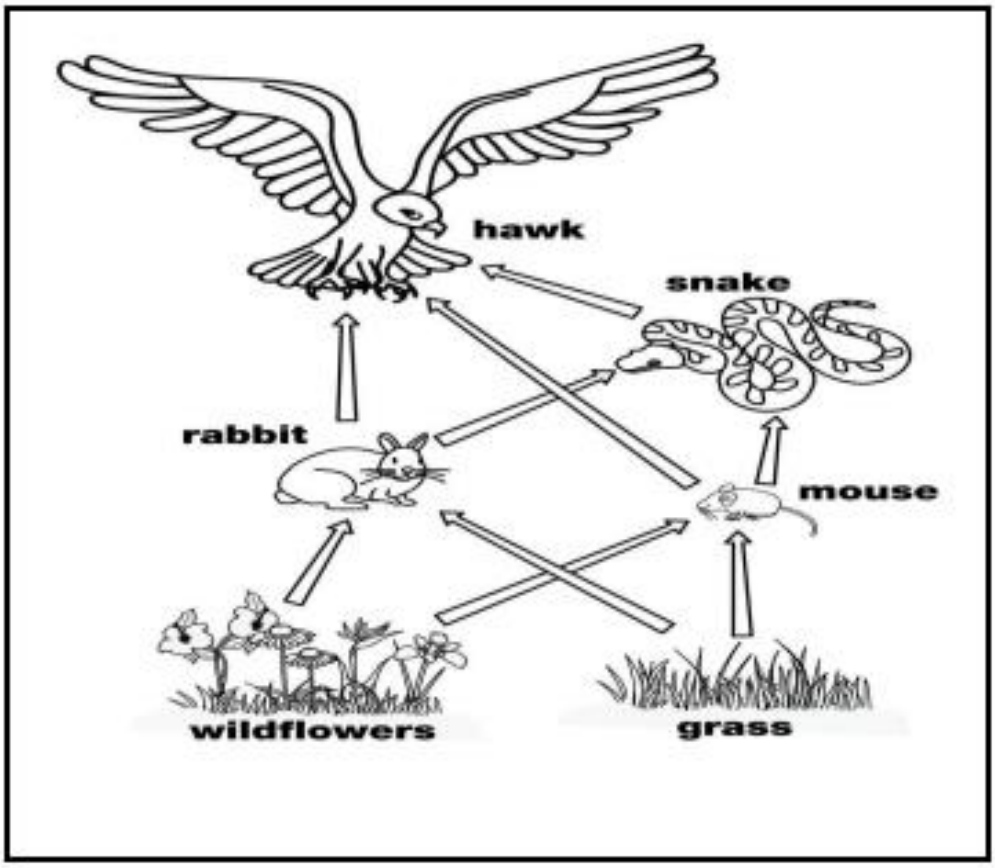
(10)

1.3 Indicate whether each of the descriptions in COLUMN 1 applies to A ONLY, B ONLY, BOTH A and B or NONE of the items in COLUMN 11. Write A only, B only, both A and B or NONE next to the question number (1.3.1 – 1.3.5).

COLUMN 1	**COLUMN 11**
1.3.1 A blood vessel that carries oxygenated blood.	A. Pulmonary artery B. Superior vena cava
1.3.2 An abiotic factor relating to soil.	A. Physiographic B. Edaphic
1.3.3 Organisms that cannot produce their own food.	A. Heterotrophic B. Decomposers
1.3.4 Fossil evidence that the Karoo and other parts of South Africa were once covered in water.	A. Trilobites B. Ammonites
1.3.5 An organism that has no true nucleus as there is no membrane surrounding the DNA.	A. Prokaryotic B. Eukaryotic

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) Primary consumer (1)

b) Tertiary consumer (1)

1.4.4 Draw an energy pyramid to show:

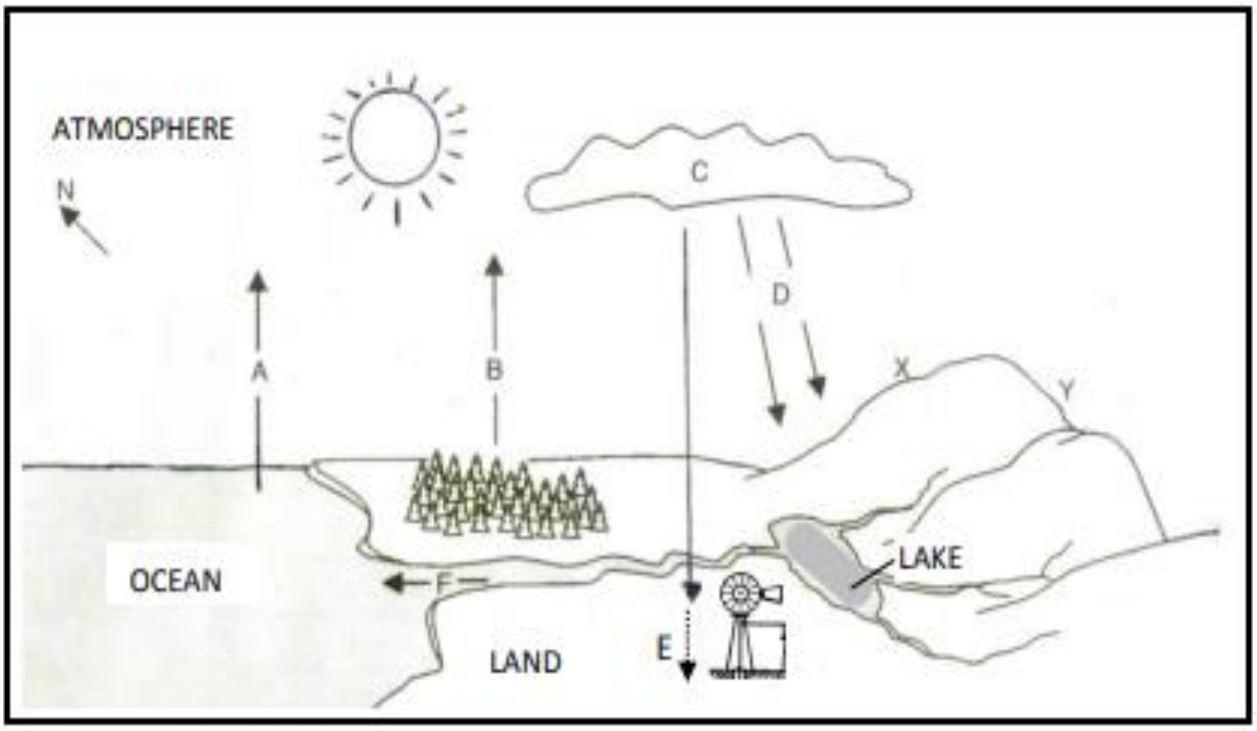
a) Three different trophic levels of organisms in the diagram above and the KJ's on each level, if grass and wildflowers have 300 000KJ's? (5)

[10]

Question 1:50

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 Name the processes indicated by letters **A** and **D**. (2)

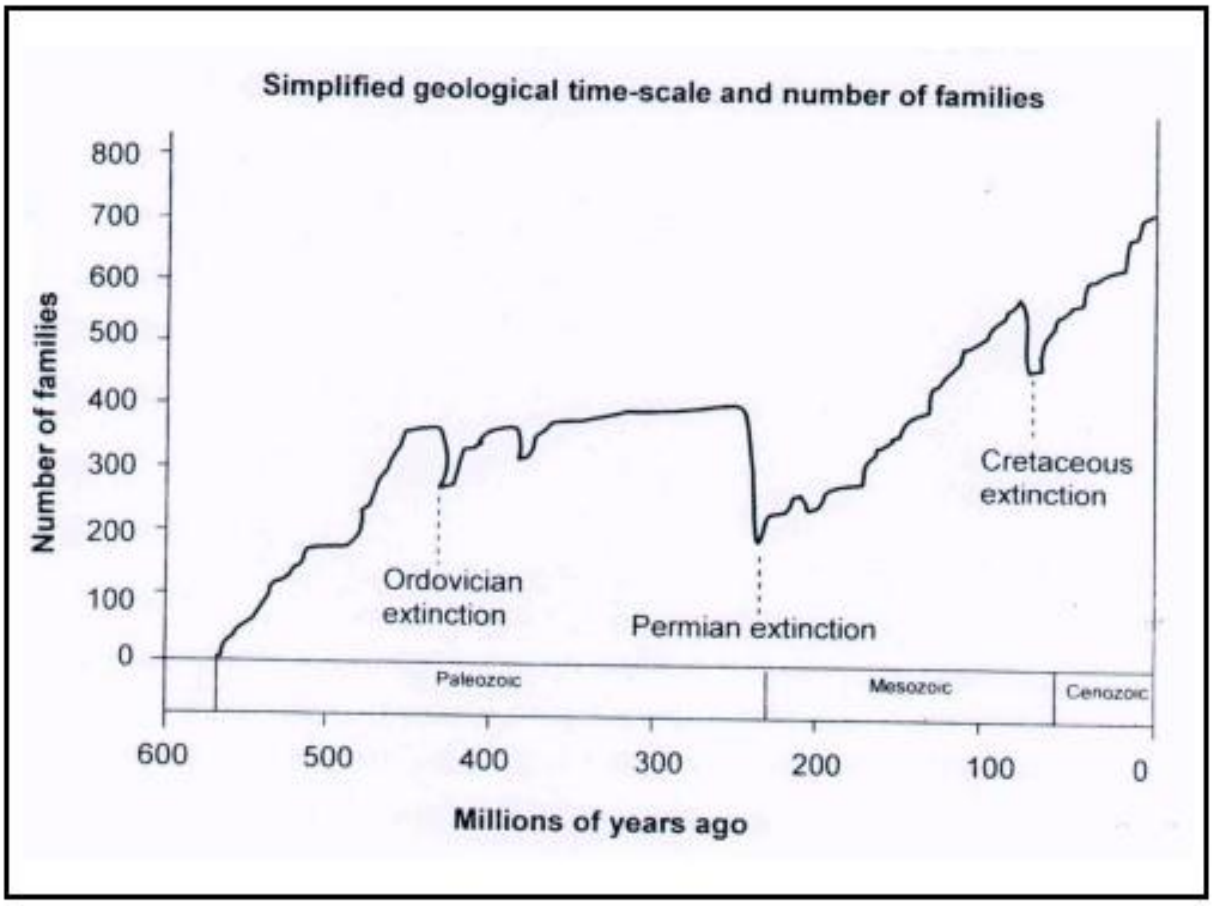
2.1.3 Identify **THREE** observable physiographic factors in this diagram. (3)

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

2.1.5 Provide a reason for your answer in Question **2.1.4**. (2)

[10]

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 the Paleozoic era? (1)

2.2.4 What is significant about the mass extinction identified in Question **2.2.3**? (1)

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

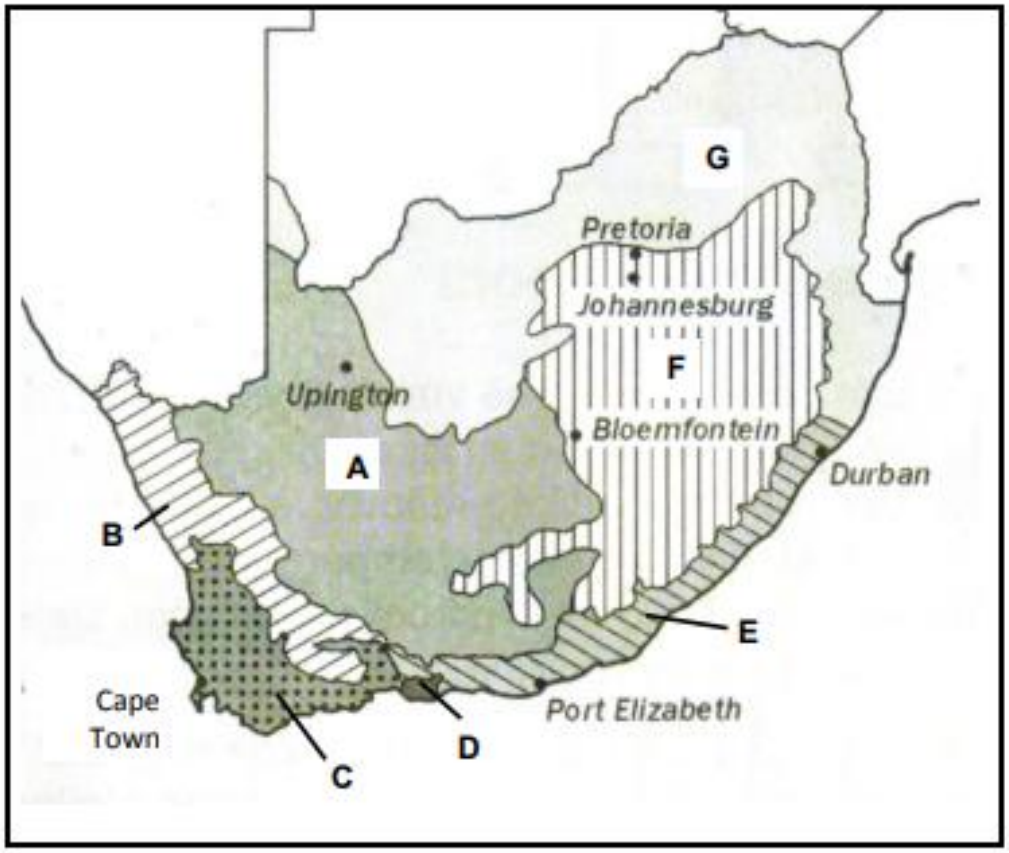
2.2.6 Explain why the number of families increased rapidly after a mass extinction. (2)

2.2.7 Which mass extinction resulted in the extinction of the dinosaurs? (1)

2.2.8 What is unique about the 6th mass extinction compared to the previous 5? (1)

[12]

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



Tabulate the following for the biomes: **Fynbos** and **Succulent Karoo.** (One Table) (2)

- The letter representing the location. (2)
- The specific vegetation. (2)
- **TWO** animals for each biome. (4)

4 + 4 + 2 = **[10]**

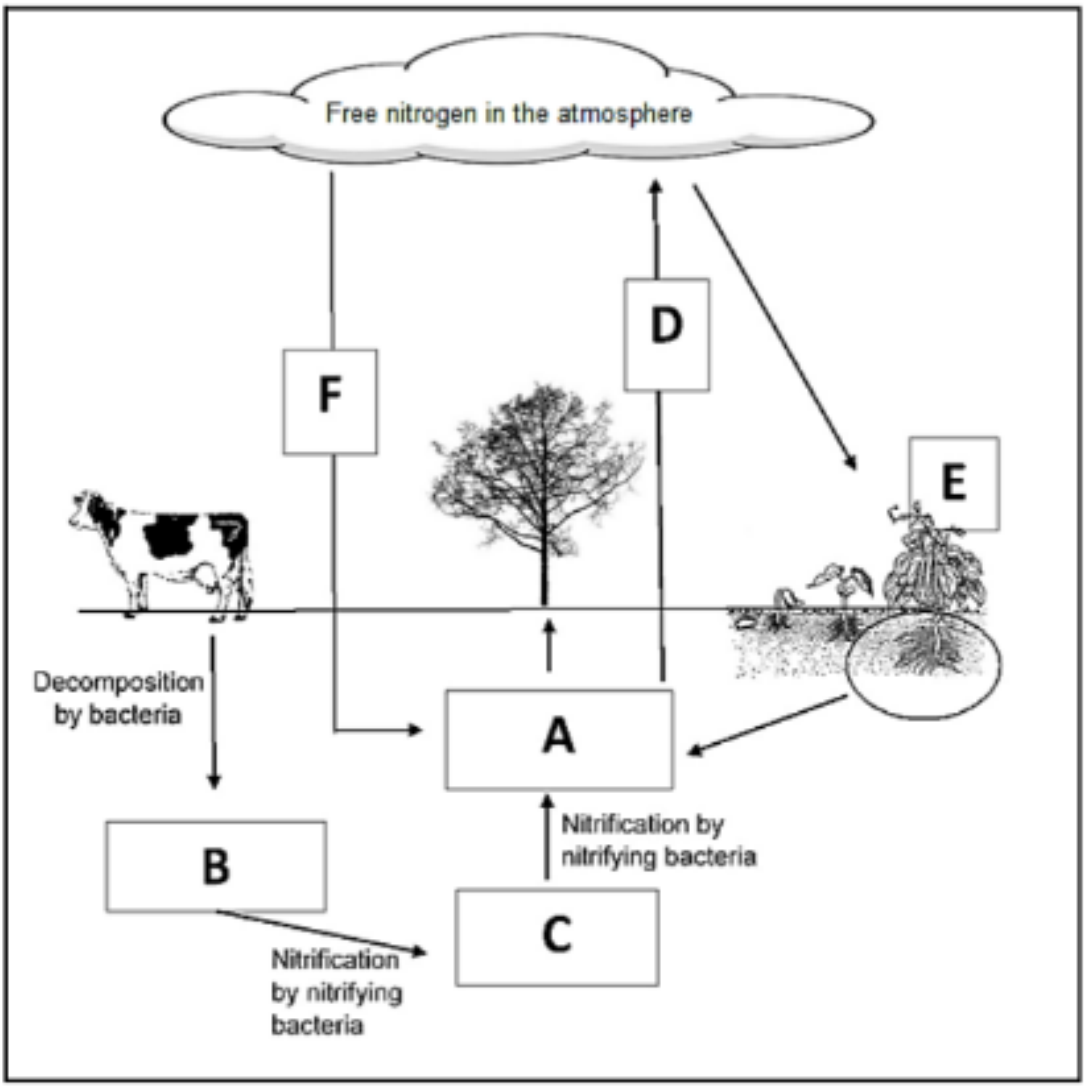
2.4.1 State **FOUR** ways in which the increase in oxygen levels in the atmosphere impacted living organisms on earth. (4)

2.4.2 Define the term *ice age*. (2)

2.4.3 Explain how the ice ages influenced life on earth through extinction and redistribution of species. (4)

[10]

2.5 Study the diagram below showing the nitrogen cycle and answer the questions that follow.



2.5.1 Name the nitrogenous compounds represented by labels **A – C**. (3)

2.5.2 Name the process labelled **D** by which nitrogen is returned to the atmosphere. (1)

2.5.3 Where on the plants labelled **E** do we find nitrogen - fixing bacteria. (1)

2.5.4 a) Name the weather phenomenon labelled **F**. (1)

b) What is it responsible for forming? (1)

c) Why does it have to do this? (1)

[8]

Question 2: 50

Question 3

3.1 A group of Grade 10 learners observed that the mating calls of a population of frogs at the Silvermine Dam had recently become louder. The dam is close to Ou Kaapse Weg, where traffic noise has increased over the years.

They wanted to investigate if the increase in traffic noise had an effect on the loudness of the frogs mating calls, in the mating season.

They recorded the following:

- Average level of traffic noise over a period of 6 years.
- Average loudness of the frogs mating calls during the same period.

The results are shown in the table below:

YEAR	AVERAGE LOUDNESS OF TRAFFIC NOISE (dB)	AVERAGE LOUDNESS OF MATING CALLS (dB)
2018	30	36
2019	32	38
2020	36	40
2021	40	48
2022	55	68
2023	62	74

3.1.1 Identify the

a) Independent variable (1)

b) Dependent variable (1)

3.1.2 Explain the advantage of a louder mating call. (1)

3.1.3 State **TWO** reasons why these results may be considered to be reliable. (2)

3.1.4 Give **TWO** variables that should be kept constant in this investigation. (2)

3.1.5 State a **conclusion** for this investigation. (2)

3.1.6 Draw a line graph on the same set of axes to show the change in average loudness of traffic noise **AND** mating calls for the period **2018 to 2021**. (6)

[15]

3.2 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 family".

The total direct and indirect costs of death and disability from the 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]

3.2.1 Explain why heart attacks and strokes are particularly tragic to families? (2)

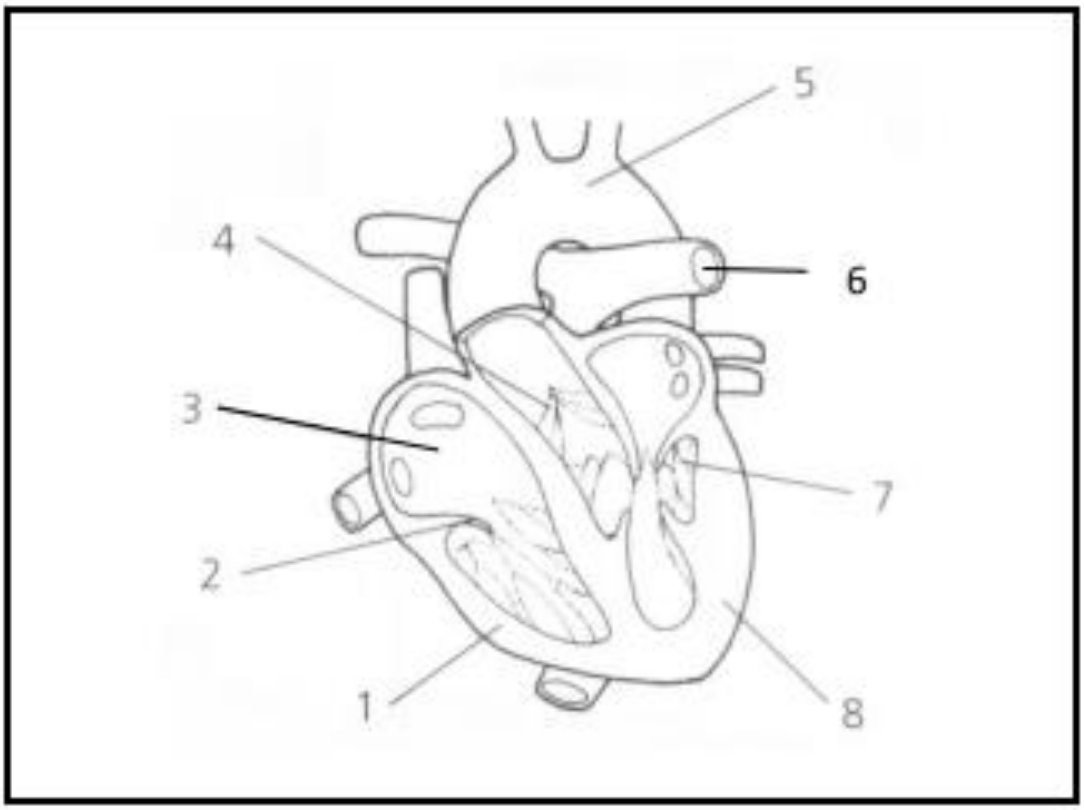
3.2.2 What is the estimated direct and indirect cost for South African families when the breadwinner suffers from heart disease? (1)

3.2.3 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 healthy lifestyle.

Name **THREE** ways that South Africans can adjust their lifestyles to prevent blood vessel disease. (3)

[6]

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



3.3.1 Provide the labels for parts numbered **2**, **3** and **6**. (3)

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

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

3.3.4 Why is the human circulatory system known as a **closed** and **double** system and name **both** these systems. (4)

[14]

3.4 Study the extract below.

SCIENTISTS MAKE HISTORIC FIND IN SOUTH AFRICA

Fossils of the new species, which has been named *Homo naledi*, were discovered during National Geographic's "Rising Star" exploration at one of the world's richest hominid fossil sites in the Cradle of Humankind World Heritage Site. More remarkable, Professor Lea Berger says, that the fossils revealed the newest species to the genus, Homo. The science of palaeoanthropology actually began in South Africa with the discovery of the Taung Child back in 1924.

Adapted from: http://naledifossils.gauteng.net

3.4.1 In which province is the Cradle of Humankind found? (1)

3.4.2 What is the scientific name of the newly discovered species? (1)

3.4.3 Name **TWO** methods scientists will use to determine the age of fossils. (2)

3.4.4 Give **TWO** reasons why fossils are useful. (2)

3.4.5 Name the type of rock where fossils are found. (1)

3.4.6 Name **TWO** places other than rocks where fossils have been found. (2)

3.4.7 Give **ONE** reason why fossil records are incomplete. (1)

3.4.8 Describe how fossils are formed in rocks. (5)

[15]

Total Question 3: 50

Grand Total: 150