Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

GRADE 10

LIFE SCIENCES PAPER 2

FINAL EXAMINATION

13 NOVEMBER 2024

14H00

Stanmorephysics.com

MARKS: **150**

TIME: **2½ hours**

This question paper consists of 16 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in your ANSWER BOOK.
3. Start the answer 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 may use a non-programmable calculator, protractor and a compass where necessary.
11. Write neatly and legibly.

Stanmorephysics.com

Copyright reserved

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 to D) next to the question number (1.1.1 to 1.1.8) in the ANSWER BOOK, for example 1.1.9 D.

1.1.1 An animal that has skin with hairs and nourishes its young with milk.

A Amphibian
B Bird
C Mammal
D Reptile

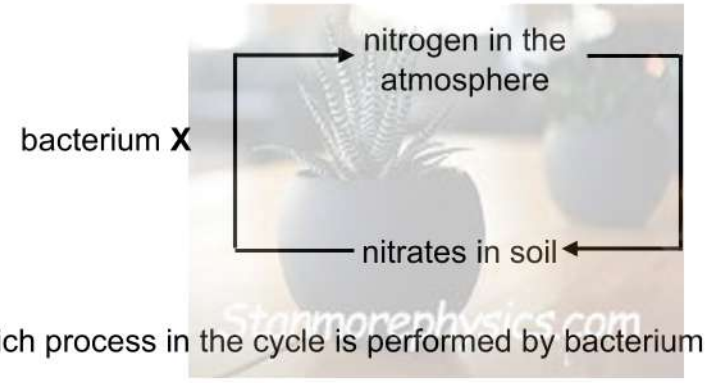
1.1.2 The chamber, found in the heart, that has the thickest wall?

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

1.1.3 Which ONE of the following is a biotic factor?

A Decomposers
B Light
C Water
D Soil

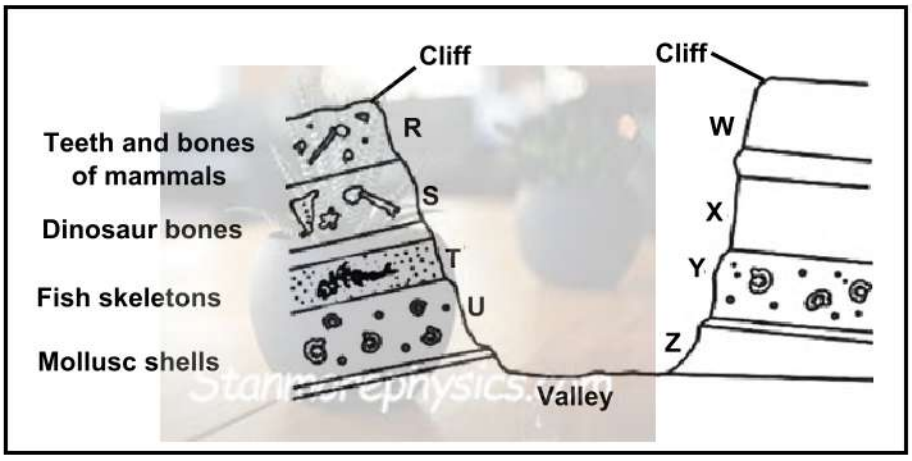
1.1.4 The diagram below shows part of the nitrogen cycle.



Which process in the cycle is performed by bacterium **X**?

A Decomposition
B Nitrification
C Nitrogen fixation
D Denitrification

1.1.5 The diagram shows a section through rock layers containing fossils.



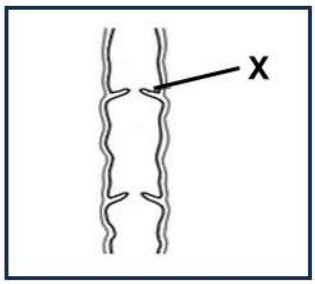
Which ONE of the following statements is CORRECT?

A Mollusc shells are the most recent fossils
B Dinosaur bones are younger fossils than the mollusc shells
C Teeth and bones of mammals are of the same age as the dinosaur bones
D Fish skeletons are the oldest fossils

1.1.6 The longest phase of the cardiac cycle is ...

A atrial systole.
B ventricular systole.
C ventricular diastole.
D general diastole.

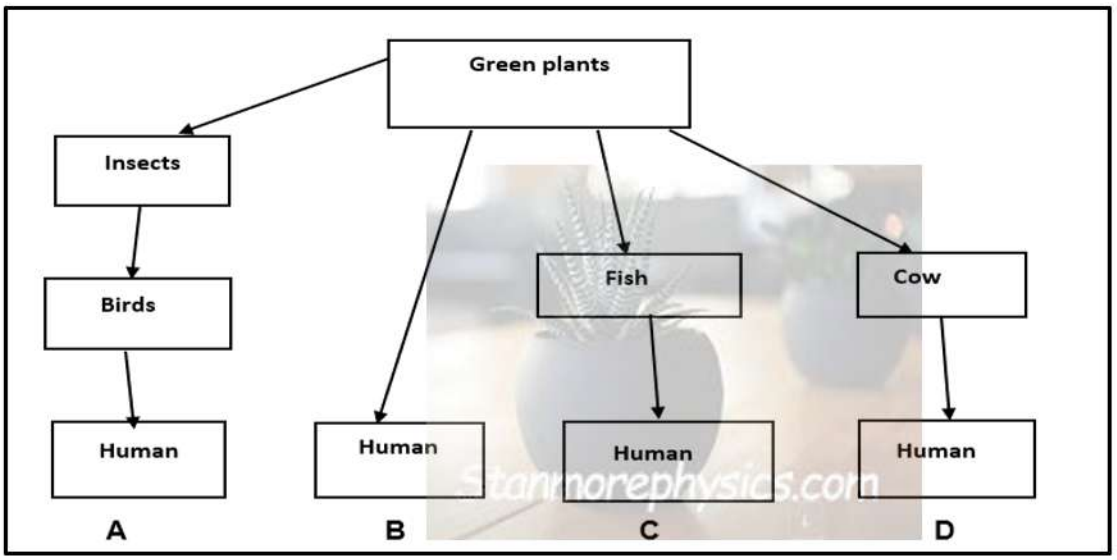
1.1.7 The diagram below shows a section of a human vein.



The function of part labelled **X** is…

A to make sure the blood flows to the lungs.
B to make sure the blood flows to the brain.
C to make sure the blood flows to the kidneys.
D to make sure the blood flows to the heart.

1.1.8 Which of the following pathways transfers the most energy to humans?



A Pathway **A**
B Pathway **B**
C Pathway **C**
D Pathway **D**

(8 x 2) **(16)**

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 1.2.8) in the ANSWER BOOK.

1.2.1 Organisms that do not have a true nucleus

1.2.2 Species found in one area and nowhere else in the world

1.2.3 The study of fossils

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

1.2.5 The large variety of living organisms found on earth

1.2.6 The group name given to the first life forms, such as bacteria, which developed on Earth about 3,8 billion years ago.

1.2.7 A region with distinct climate together with all the organisms that in live in it.

1.2.8 The path taken by the energy as it passes from one organism to the other in an ecosystem (8 x 1) **(8)**

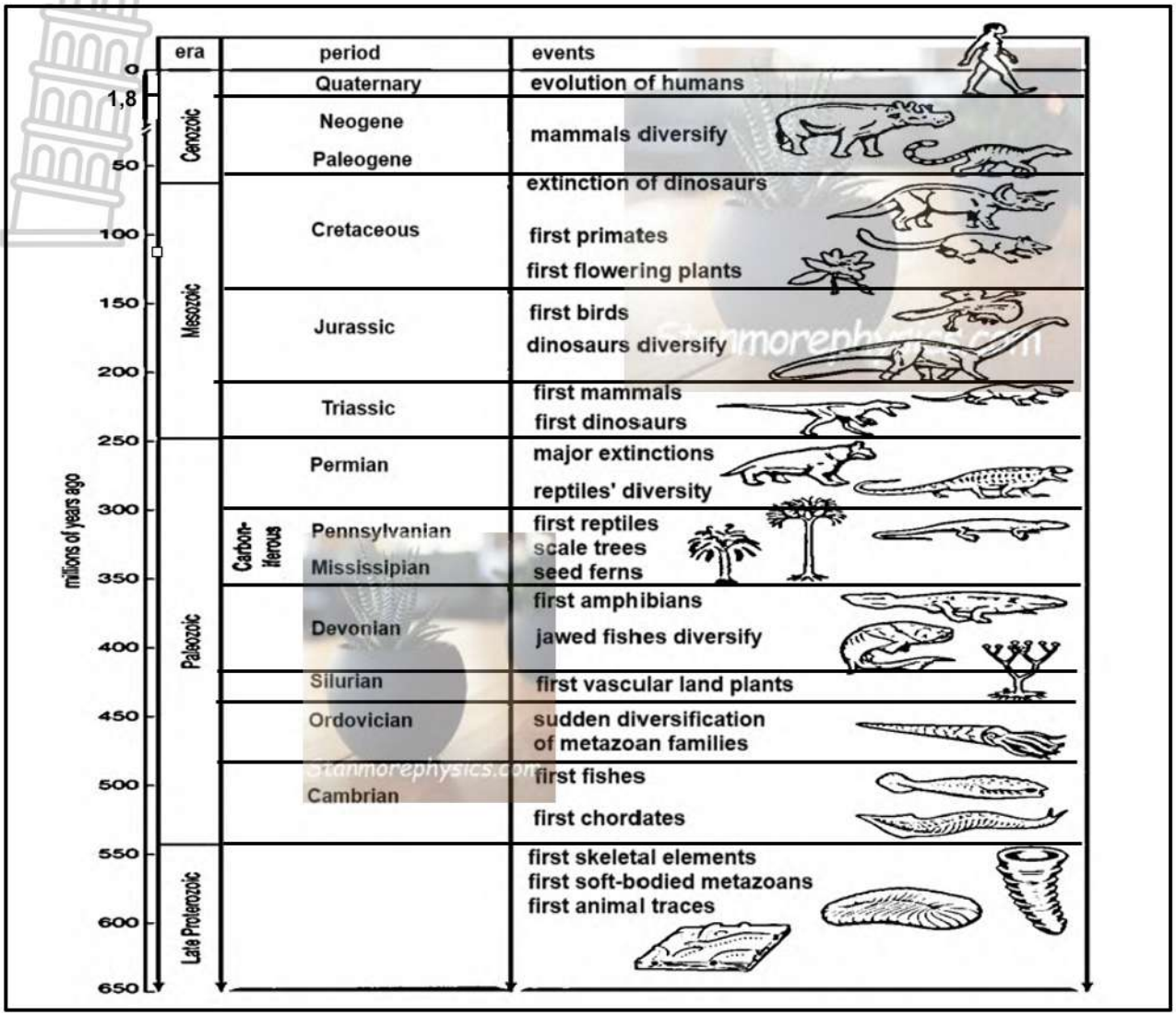
1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.4) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Driven by human impact	A: Continental Drift B: 6th mass extinction
1.3.2	Plants adapted to live in very dry conditions	A: Hydrophytes B: Mesophytes
1.3.3	The scientific way of naming organisms in which the name has two terms	A: Classification B: Binomial nomenclature
1.3.4	Physiographic factor/s	A: Aspect B: Altitude

(4 x 2) **(8)**



1.4 The table below is a timescale showing how life has changed over time



1.4.1 Name the type of timescale shown above. (1)

1.4.2 In which …

(a) period did dinosaurs first appear? (1)

(b) era did humans first appear? (1)

1.4.3 In which period did an explosion (a large increase) in the number and diversity of life on Earth take place? (1)

1.4.4 Identify the period during which by its end the worst mass extinction took place, wiping out approximately 90% of the species. (1)

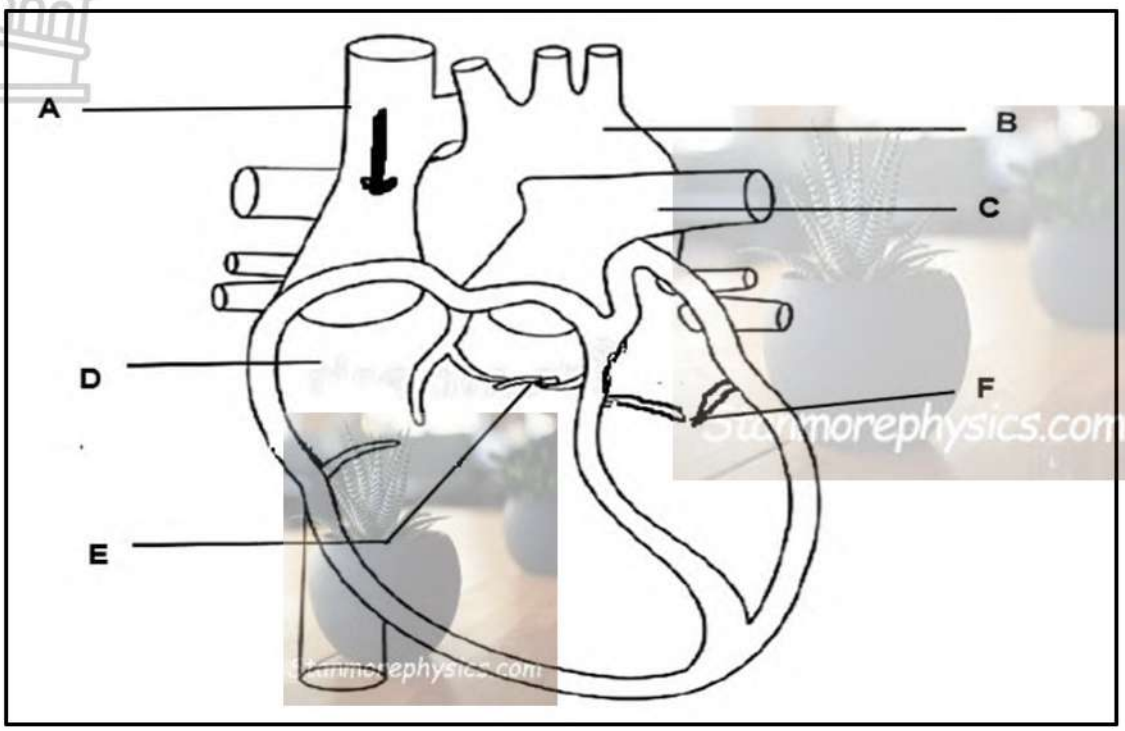
1.4.5 The discovered fossils were used to recreate the sequence in which living organisms appeared, but the fossil record has gaps.

Give TWO reasons why there are gaps in the fossil record. (2)

Copyright reserved

1.4.6 Name TWO other places that fossils are formed, other than in sedimentary rocks. (2)
(9)

1.5 Study the diagram of the heart and answer the questions that follow.



1.5.1 Write down the LETTER and NAME of the blood vessel that transport blood to the lungs. (2)

1.5.2 Describe the type of blood that is found in blood vessel **A**? (1)

1.5.3 Which chamber of the heart contains the pacemaker in its wall? (1)

1.5.4 Give the NAME of the part that prevents oxygenated and deoxygenated blood from mixing. (1)

1.5.5 Give ONE significance of one ventricle wall that is thicker than the other in a human heart. (1)

1.5.6 Describe the function of valve **E**. (2)

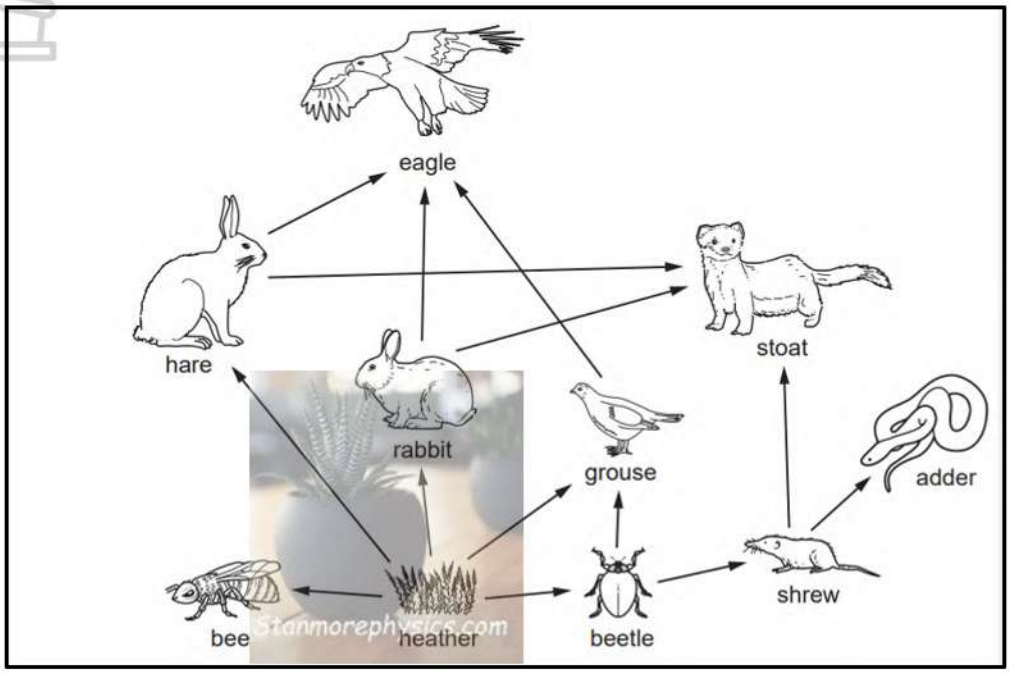
1.5.7 Describe how the blood flow will be affected if part number **F** is damaged and cannot open properly. (1)
(9)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 Study the diagram of organisms in an ecosystem and answer the questions that follow.



2.1.1 Define an *ecosystem*. (2)

2.1.2 Identify the diagram above. (1)

2.1.3 From the diagram above, name ONE organism that represents a:

(a) Primary consumer (1)

(b) Producer (1)

(c) Tertiary consumer (1)

2.1.4 If all the shrews were removed from this ecosystem, explain what would happen to the population of the following:

(a) Adder (2)

(b) Beetle (2)

2.1.5 Draw a food pyramid to show energy flow to the adder if the producer contains 5500kJ/m^2/year of energy and only 14% of this energy is passed on from one trophic level to the next. (5)

2.1.6 Use the food chains in the diagram to explain why the chances of survival of the stoat are higher than that of the adder. (2)
(17)

2.2 Lilitha and Mila learnt that the spekboom plant is very good in absorbing carbon dioxide from the atmosphere. This helps prevent the extreme increase in the Earth's temperature called global warming. This carbon dioxide is used by plants to manufacture their own food by photosynthesis.

They decided to investigate the rate at which different plants absorb CO_2

- They obtained THREE different types of plants from their local nursery (A spekboom, Aloe and Prickly Pear)
- They made sure that the plants are of the same height
- They planted the plants in equal sized pots with the same amount of soil
- All three plants were placed in the same location and received equal amounts of water
- They measured the weight/mass of their plants in the pots at the pots at the start of the investigation.
- They then left the plants to grow for one month and measured their weight/mass again.

The results are shown in the table below.

	Weight / mass (g)		
Plant	**Start**	**End**	**Increase**
Aloe	800	842	42
Prickly Pear	800	853	53
Spekboom	800	896	96

Stanmorephysics.com

2.2.1 Identify the:

(a) Independent variable (1)

(b) Dependent variable in this investigation (1)

2.2.2 State the purpose of measuring the starting weight/mass of the plants. (1)

2.2.3 Give TWO ways that Lilitha and Mila used to ensure the validity of their investigation. (2)

2.2.4 Give ONE way in which the reliability of their investigation could be improved? (1)

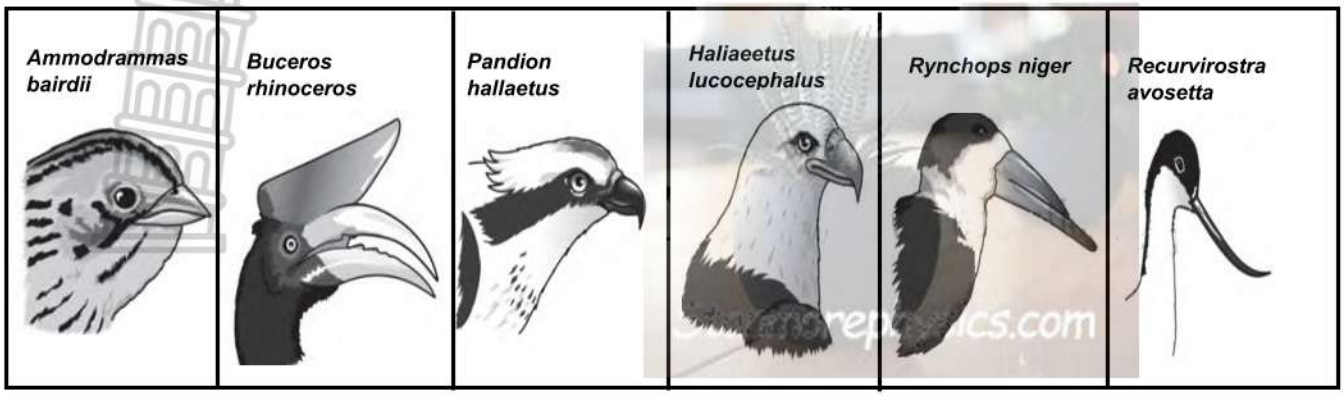
2.2.5 Calculate the percentage increase in mass from the start to the end of the investigation of the spekboom plant. Show ALL your working. (3)

2.2.6 Explain how using the weight gain of the plants will give Lilitha and Mila an idea of how much CO_2 the plants are absorbing. (2)

2.2.7 Plot a bar graph of weight/mass increase of the three plants. (6

(17)

2.3 Study the birds below and answer the questions that follow.



Use the key below to identify each bird above. Write letters **A-F** and their correct scientific names. **(6)**

	KEY	LETTER OF THE BIRD
1(a)	Beak is longer than the head	Go to 2
(b)	Beak is shorter than the head	Go to 3
2(a)	Beak curves upwards	**C**
(b)	Beak does not curve upwards	Go to 4
3(a)	Top part of the beak is hooked over the bottom part of the beak	Go to 5
(b)	Top part of the beak is not hooked over the bottom part of the beak	**E**
4(a)	Top part of the beak is shorter than bottom part of the beak	**B**
(b)	Has a large projection above the beak	**D**
5(a)	Head has a stripe	**F**
(b)	Head does not have a stripe	**A**

2.4 Read the extract below.

> Carolus Linnaeus established a hierarchical classification system of grouping similar organisms together. He grouped them from broad groups called Kingdoms down to the smallest group called species.
>
> Using his system a chimpanzee is fully classified as follows:
> **Animalia, Chordata, Mammalia, Primates, Hominidae, Pan, Troglodytes**

2.4.1 According to Linnaeus' system, to which class does the chimpanzee belong? (1)

2.4.2 Write correctly the scientific name of the chimpanzee. (2)

2.4.3 Identify the genus to which the chimpanzee belongs. (1)

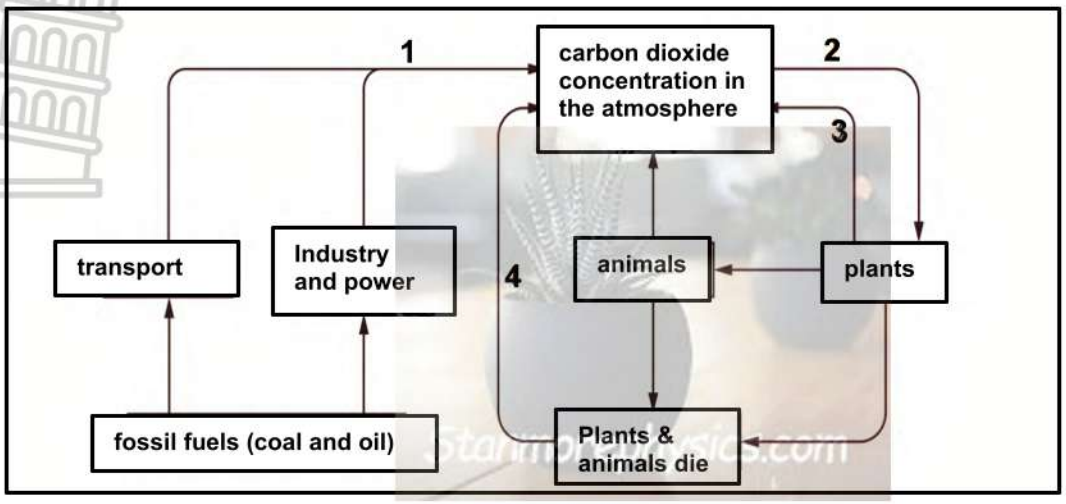
2.4.4 State TWO reasons why organisms are given scientific names. (2)
(6)

2.5 Differentiate between organisms grouped under kingdom animalia and plantae. **(4)**
[50]



QUESTION 3

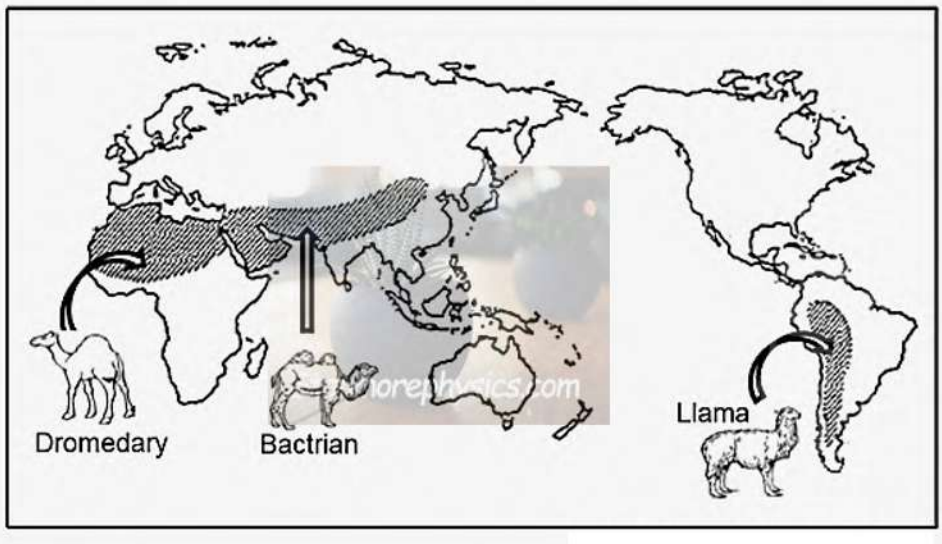
3.1 The diagram below shows part of a carbon cycle.



3.1.1 Identify the THREE processes (**1**, **3** and **4**) that lead to an increase in carbon in the atmosphere. (3)

3.1.2 Identify process number 2 and explain its effect in carbon cycle in ecosystems. (3)
(6)

3.2 The diagram below shows the distribution of members of the camel family on different continents. The arrows indicate the current distribution of the different species.



3.2.1 What do we call the study of the distribution of existing and extinct plant and animal species in specific areas on Earth? (1)

3.2.2 Name the supercontinent that all these continents were originally part of. (1)

3.2.3 Describe how the continental drift which led to the current distribution of camel species, happened. (4)
(6)

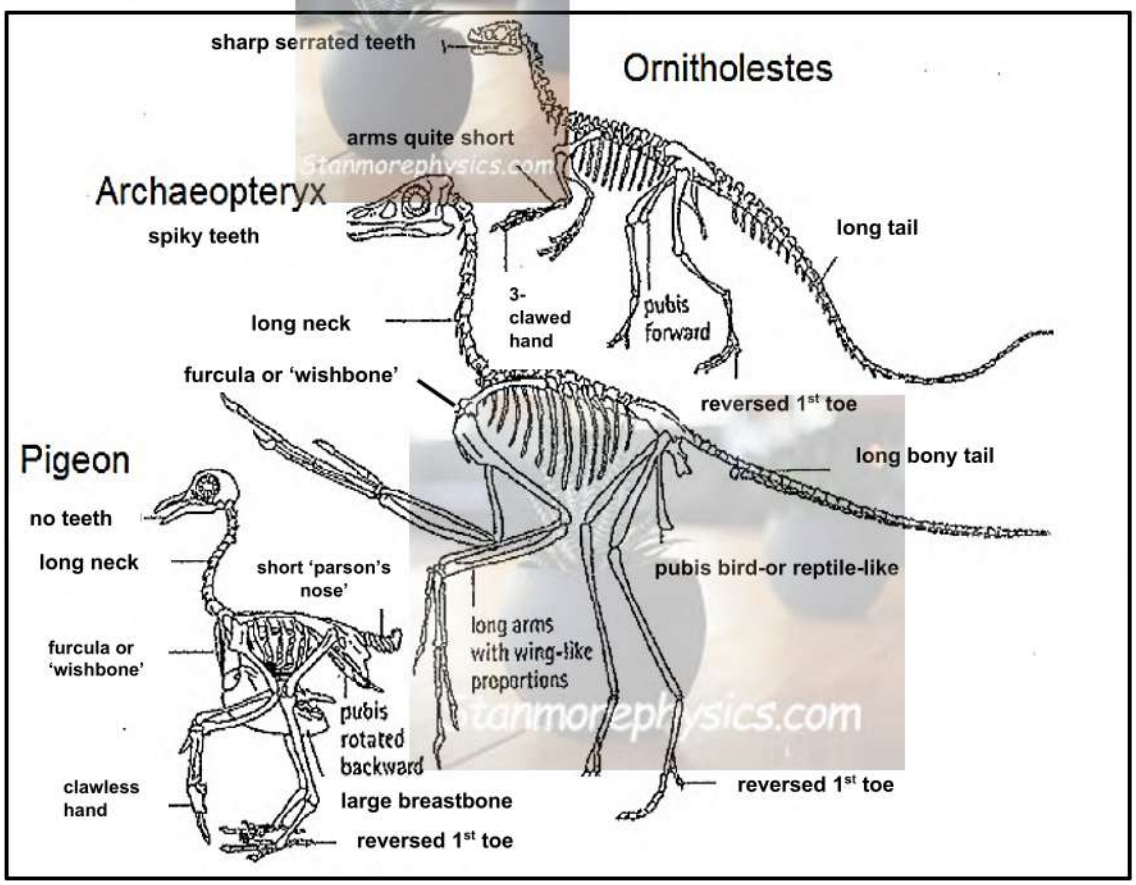
3.3 The questions below are based on fossils.

3.3.1 Describe how a fossil is formed in sedimentary rocks. (5)

3.3.2 Name TWO methods by which the age of fossils can be determined. (2)
(7)

3.4 Archaeopteryx is an early prehistoric bird dating from 150 million years ago. A total of EIGHT fossils of archaeopteryx have been found in Germany. It lived during the Jurassic period when many dinosaurs lived. Archaeopteryx seemed to be part bird and part dinosaur.

The diagram below shows the structure of three closely related organisms.



3.4.1 List THREE similarities ONLY shared between Ornitholestes (dinosaur) and Archaeopteryx. (3)

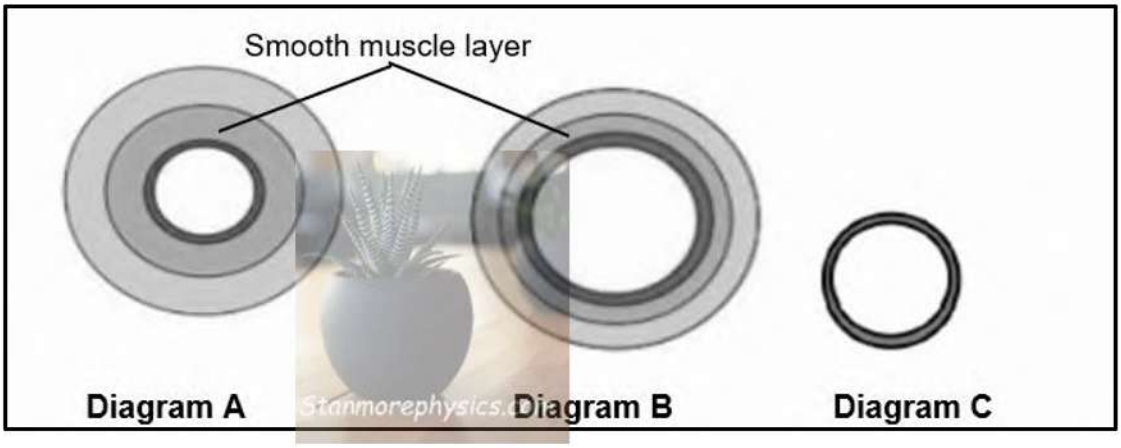
3.4.2 Tabulate TWO differences between a pigeon and the Archaeopteryx. (5)

3.4.3 Archaeopteryx seemed to be part bird and part dinosaur. Explain the significance of this. (2)
(10)

3.5 Scientists discovered that five major extinction events occurred over time. The meteors which crashed into the Earth caused enormous permanent losses in biodiversity.

Explain how the impact affected the planet to cause these major losses of life. **(4)**

3.5 Diagrams **A**, **B** and **C** below represents THREE types of blood vessels



3.6.1 Identify the type of blood vessel in:

(a) Diagram **B** (1)

(b) Diagram **A** (1)

3.6.2 Explain why blood vessel in Diagram **A** has a thicker smooth muscle layer (2)

3.6.3 Explain ONE structural adaptation of the blood vessel in Diagram **C**. (2)

3.6.4 Tabulate TWO differences between the composition of blood in the pulmonary artery and in the pulmonary vein. (5)

3.7 Read the extract below.

> Your liver makes cholesterol for your body. You also can get cholesterol from the foods you eat. Meat, fish, eggs, butter, cheese, and milk all have cholesterol in them. Fruits, vegetables, and grains (like oatmeal) don't have any cholesterol.
>
> Cholesterol is in every cell in your body. You need cholesterol to help your brain, skin, and other organs do their jobs. But eating too much fat and cholesterol is a bad idea.
>
> Cholesterol floats around in your blood and can stick into the walls of the blood vessels. This can cause the blood vessels to get stiffer, narrower, or clogged. If clogging gets worse over many years, it can cause a heart attack or stroke in adults

.

3.7.1 From the extract above, give ONE food type without cholesterol. (1)

3.7.2 Explain what would happen if someone ate food with too much cholesterol over a long period of time (2)
(3)

Stanmorephysics.com

3.8 Describe the events that occur during the ventricular systole of the cardiac cycle. **(3)**
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

Copyright reserved