HILLCREST HIGH SCHOOL

GRADE 10

NOVEMBER 2021

LIFE SCIENCES – PAPER 2

Time: **2 hours** ***Marks:*** **100**

EXAMINER: MRS L. PRIOR

MODERATORS: MRS R. HARMSE, MR A. MAHABEER.

N.B. This question paper consists of 3 Questions and 12 Pages.

INSTRUCTIONS TO CANDIDATES

READ THESE INSTRUCTIONS CAREFULLY BEFORE ANSWERING THE QUESTIONS.

1. Answer **ALL** the questions in the answer booklet provided.
2. Number the questions exactly as the questions are numbered.
3. Write neatly and legibly.
4. All drawings should be done in pencil and labelled in ink.
5. Use **ONLY** blue or black ink.
6. Non-programmable calculators, protractors and compasses may be used.

SECTION A:

QUESTION ONE:

1.1. Various possible options are provided as answers to the following questions/statements. 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.

1.1.1. The atria of the heart pump blood to the...

A. arteries
B. body cavities
C. veins
D. ventricles

1.1.2. The chamber of the heart that receives oxygenated blood from the lungs.

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

1.1.3. Which of the following animals is a primary consumer?

A. spider
B. impala
C. cheetah
D. vulture

1.1.4. Organism in a food chain that receives the most energy.

A. Herbivore
B. Carnivore
C. Producer
D. Decomposer

1.1.5. Coiled molluscs which swam or floated in the sea.

A. Fish
B. Trilobites
C. Ammonites
D. Amphibians

1.1.6. Organisms that do not have a membrane bound nucleus.

A. unicellular
B. multicellular
C. prokaryote
D. eukaryote

1.1.7. The first word in the binomial system represents the …

A. genus
B. species
C. kingdom
D. family

1.1.8. A measure of the rate at which elements decay.

A. Relative dating
B. Fossilisation
C. Sedimentation
D. Radiometric dating

1.1.9. When more than 50% of the Earth's species vanish in the geological instant of a few million years.

A. Extinction
B. Mass extinction
C. Natural extinction
D. Global death

1.1.10. Which of the following is NOT a characteristic of plants.

A. Contains cell walls.
B. Autotrophic.
C. Saprophytic.
D. Multicellular.

(10)

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 – 1.2.10).

1.2.1. Animals found naturally in a country

1.2.2. A scientist who studies fossils

1.2.3. The kingdom to which mushrooms and molds belong to.

1.2.4. The large variety of living organisms found in an area.

1.2.5. The double membrane surrounding the heart.

1.2.6. The movement of large masses of land over millions of years.

1.2.7. When large numbers of organisms die out on a large scale,

1.2.8. Organism made of one cell only.

1.2.9. Blood vessels that have a thick muscular layer.

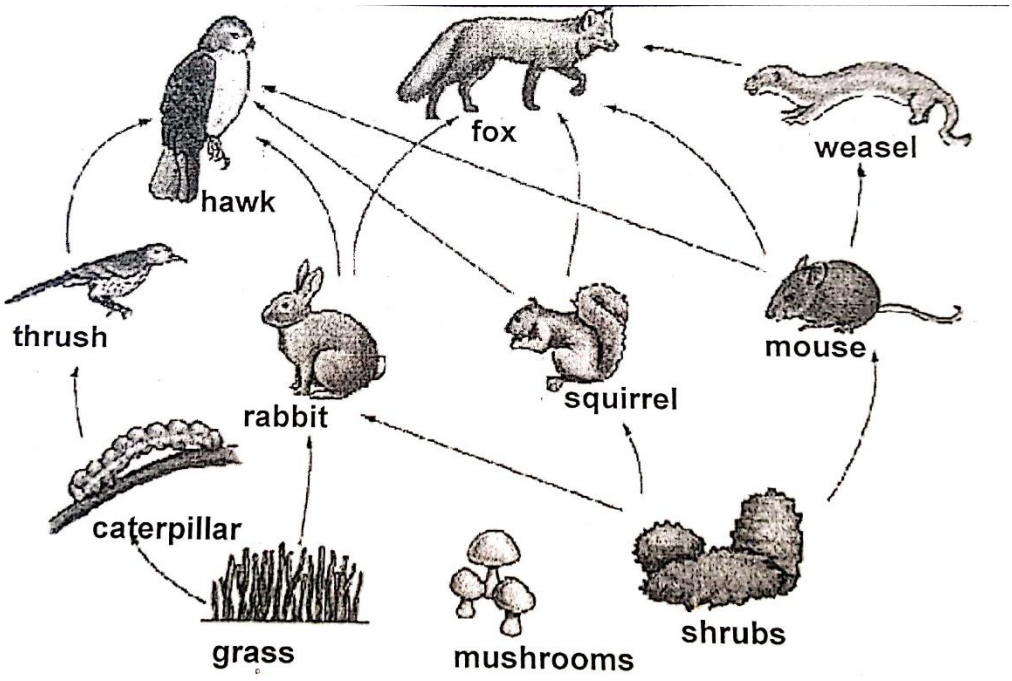
1.2.10. Type of ecotourism where the main attraction of a site is its fossils. **(10)**

1.3. State whether for each of the phrases in COLUMN I, applies to **A only, B only, BOTH A and B** or **NONE** in COLUMN II.

COLUMN I	**COLUMN II**
1.3.1. The phase of the cardiac cycle where the ventricles contract.	A. Atrial systole
	B. Ventricular diastole
1.3.2. The type of plant that grows in arid/dry areas.	A. rose bush
	B. cactus
1.3.3. The height above sea level.	A. Altitude
	B. Aspect
1.3.4. A footprint of an extinct animal is known as...	A. exposed fossil
	B. trace fossil
1.3.5. The person who suggested the five-kingdom classification system.	A. Darwin
	B. Linnaeus

(5)

1.4. Study the diagram of a food web below and answer the questions that follow.



1.4.1. From the food web above name:

a) ONE producer (1)

b) TWO secondary consumers. (2)

1.4.2. Use a food chain from the above ecosystem to draw a fully labelled pyramid of energy with FOUR trophic levels. (5)

1.4.3. Explain what would happen if all the caterpillars were removed from the ecosystem? (2)

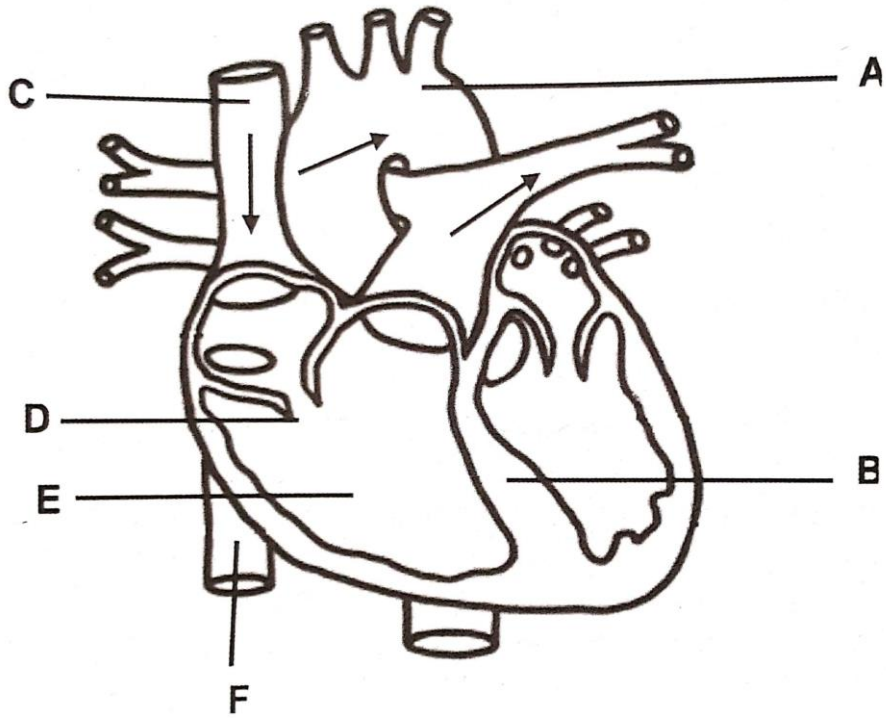
(10)

<u>TOTAL SECTION A : 35</u>

SECTION B:

QUESTION TWO:

2.1. The diagram below shows the human heart.



2.1.1. Identify the parts of the heart labelled **A**, **E** and **F**. (3)

2.1.2. Give the **LETTER** and the **NAME** of the part that:

a) Returns blood from the upper part of the body to the heart. (2)

b) Prevents blood from flowing back into the right atrium. (2)

c) Is a muscular wall that separates the ventricles. (2)

2.1.3. Give the name and function of the components that make up blood tissue. (6)

(15)

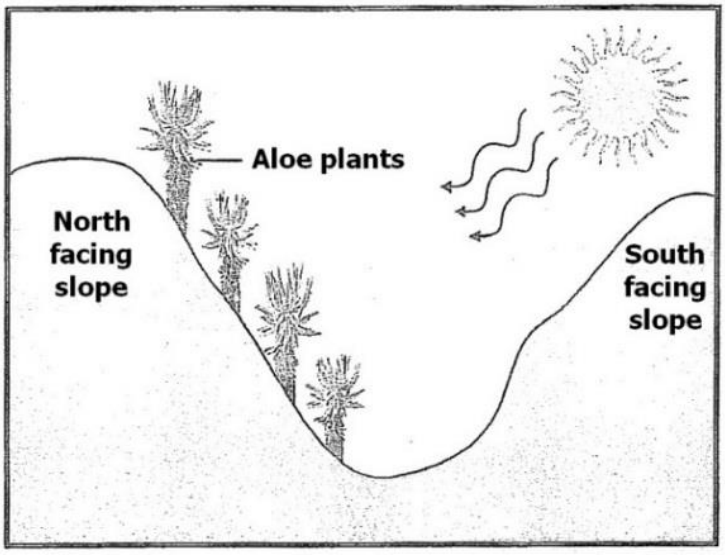
2.2. An investigation was carried out to determine the shortage of blood type 'O' that faces South Africa in three different blood banks (A, B and C). Blood from a person with blood type 'O' can be used safely in transfusions into patients of any other blood type.

The table below shows the blood units available and the blood units required by each blood bank.

BLOOD BANK	UNITS OF TOTAL BLOOD in 2016 (litres)	
	Units of blood available	Units of blood required
A	20	35
B	122	550
C	181	510

2.2.1. Draw a bar graph to represent the units of blood available in each of the three different blood banks. **(5)**

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



2.3.1. a) Are aloes hydrophytes, xerophytes or mesophytes? (1)

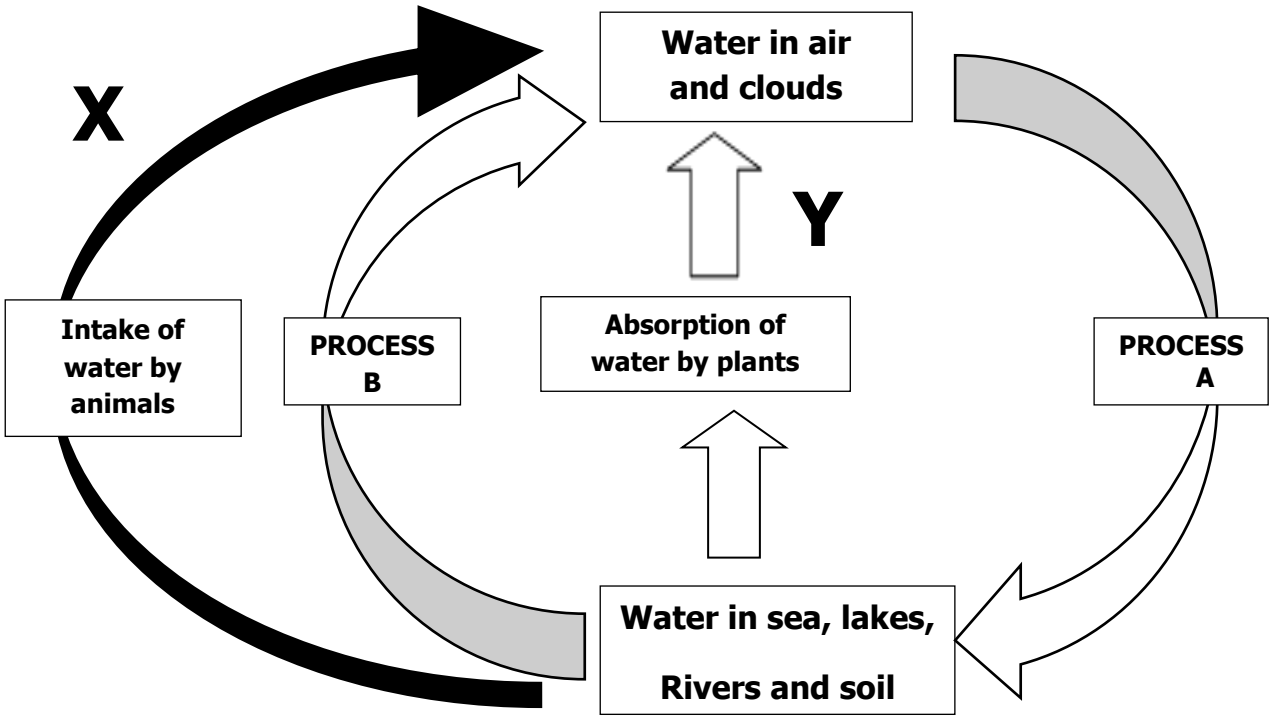
b) Give **ONE** adaptation of these plants. (2)

2.3.2. Name and describe any **ONE** abiotic factor shown in the diagram above. (3)

2.3.3. Why do aloes prefer to grow on a north-facing slope rather than on a south-facing slope? (1)

(7)

2.4. Study the diagram of the water cycle below and then answer the questions.



2.4.1. Name the processes **A** and **B** as shown in the diagram above. (2)

2.4.2. Explain **ONE** way in which water gets returned into the atmosphere at **X.** (2)

2.4.3. NAME and describe the process at **Y**. (2)

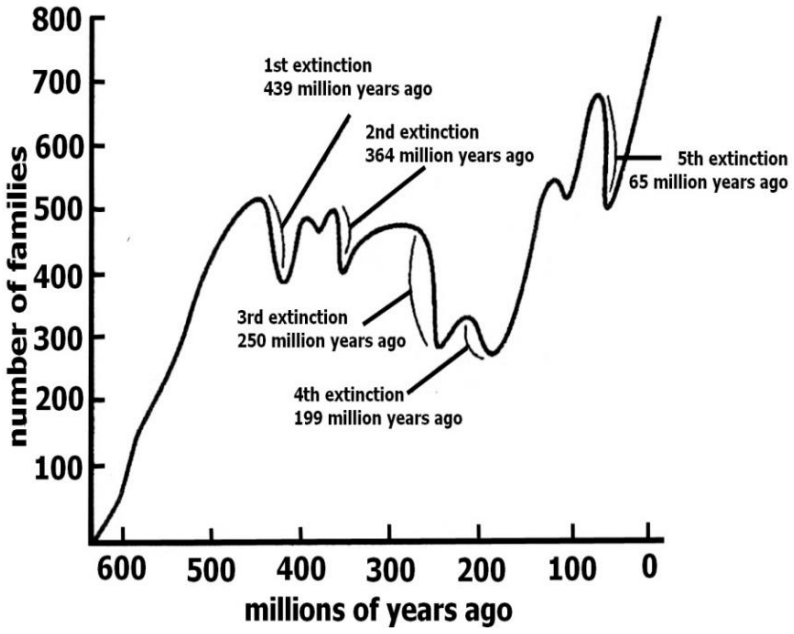
2.4.4. Discuss the importance of the water cycle. (2)

(8)

Question 2 = 35

QUESTION THREE:

3.1. Study the graph and table below and then answer the questions that follow.



Millions of years ago	ERA	PERIOD
100	CENOZOIC	Miocene
		Oligocene
		Eocene
		Paleocene
	MESOZOIC	Cretaceous
200		Jurassic
		Triassic
300	PALEOZOIC	Permian
		Carboniferous
400		Devonian
		Silurian
500		Ordovician
		Cambrian
600	PRECAMBRIAN	

3.1.1. a) Which era had the longest duration? (1)
b) How many periods occur in this era? (1)

3.1.2. Which was the shortest period in the Mesozoic era? (1)

3.1.3. During which period did the planet first reach 500 families of species? (1)

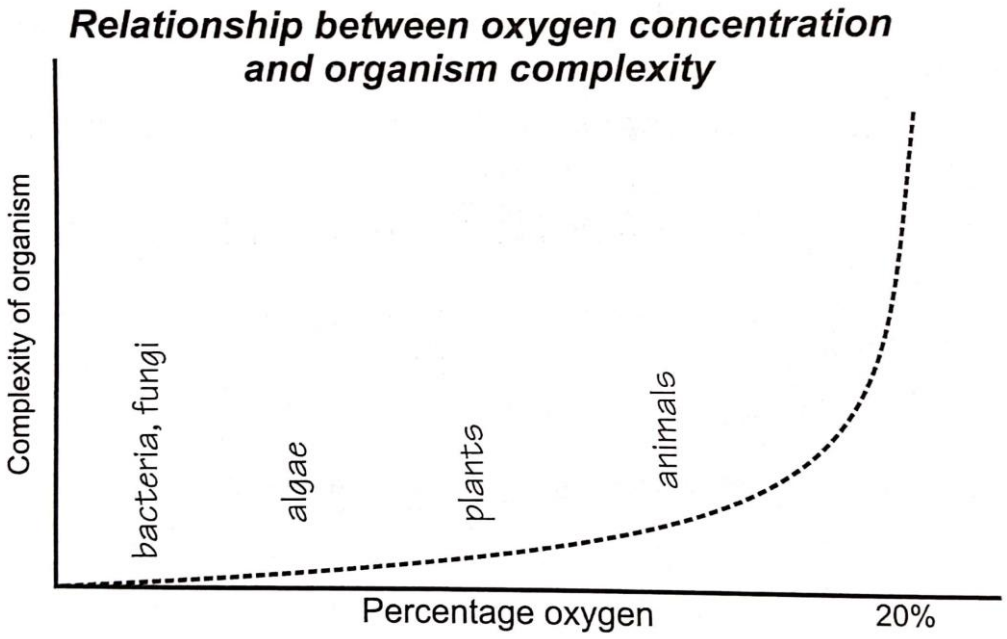
3.1.4. During which period did the second mass extinction occur? (1)

3.1.5. NAME and describe **ONE** theory of mass extinction that could account for the 5th mass extinction, 65 million years ago. (3)

3.1.6. List **TWO** ways in which fossils are preserved. (2)

(10)

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



3.2.1. Explain why oxygen is important to all organisms. (2)

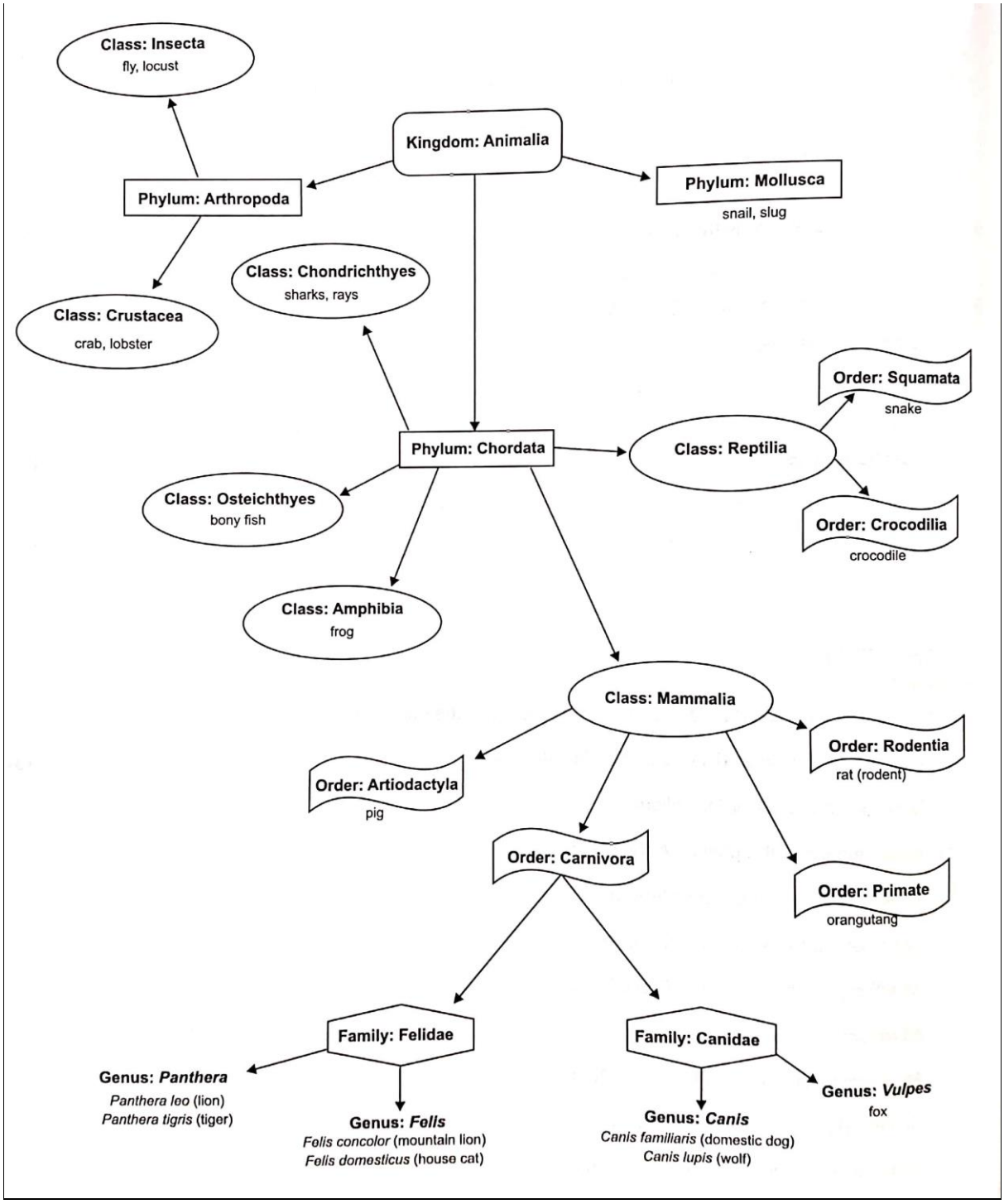
3.2.2. Identify the dependent variable. (1)

3.2.3. Describe the relationship illustrated by this graph. (2)

3.2.4. Explain the impact plants have on the evolution of animals.
Use evidence from the graph to support your answer. (3)

(8)

3.3. Study the classification chart below and answer the questions that follow.



3.3.1. Identify the Kingdom in this classification chart. (1)

3.3.2. List the 5 classes of the Phylum Chordata as seen in the diagram. (5)

3.3.3. Explain why all mentioned in **3.3.2** above, are all considered to be 'chordates'. (1)

3.3.4. In each of the following two sets of organisms are listed. Write down the set of organisms that is most closely related.

a) Snakes and Crocodiles / Snakes and Frogs (1)

b) Lions and Tigers / Lions and Mountain lions (1)

3.3.5. How many animals in the diagram belong to the order Carnivora. (1)

3.3.6. List **TWO** species names that belong to the Felidae. (2)

(12)
Question 3 = 30

<u>TOTAL SECTION B : 65</u>