HILLCREST HIGH SCHOOL

GRADE 10

NOVEMBER 2020

LIFE SCIENCES

PAPER 2

Time: **2 hours** ***Marks:*** **120**

EXAMINER: MRS L. PRIOR

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

N.B. This question paper consists of 3 Questions and 10 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. **Multiple Choice**: Write down the numbers 1.1.1 to 1.1.9 alongside the margin and next to it, write down **ONLY** the correct letter of your choice.

1.1.1. The biotic components of an ecosystem are...

A. temperature
B. mineral salts
C. plants and animals
D. atmospheric gases

1.1.2. Study the characteristics listed below.

(i) simple, single-celled
(ii) complex, multicellular
(iii) prokaryotic
(iv) eukaryotic

Which ONE of the following combinations is characteristic of the Kingdom Animalia.

A. (i) and (iii) only
B. (ii) and (iii) only
C. (i) and (iv) only
D. (ii) and (iv) only

1.1.3. Which of the following describes a community within an ecosystem?

A. All the plants in an area.
B. All the animals in an area.
C. All the plant and animals in an area.
D. The total number of one species in an area.

1.1.4. The vertebrae to which the ribs are attached are the...

A. Lumbar
B. Cervical
C. Thoracic
D. Coccyx

1.1.5. The bones that make up the foot are the...

A. Carpals, Metacarpals, Phalanges
B. Tibia, Fibular, Phalanges
C. Tarsals, Metatarsals, Phalanges
D. Radius, Ulna, Phalanges

1.1.6 The correct way to write the scientific name for a domestic dog is ...

A. canis familiaris
B. Canis Familiaris
C. Canis familiaris
D. Canis Familiaris

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

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

1.1.8. In a closed circulatory system, blood flows from arteries into

A. Venules
B. Body spaces
C. Capillaries
D. Lymph vessels

1.1.9. The type of skeleton that turtles have ...

A. hydrostatic skeleton
B. cartilaginous skeleton
C. endoskeleton
D. exoskeleton

[9 x 2 = 18]

1.2. **Terminology**: Write down the numbers 1.2.1 to 1.2.9 alongside the margin and next to it, write down **ONLY** the correct biological term.

1.2.1. The membrane which encloses and protects the heart.

1.2.2. A region characterisied by a certain climate, soil and a particular type of vegetation.

1.2.3. The compound form in which the element nitrogen is taken into plants.

1.2.4. Organisms which are unable to manufacture their own food.

1.2.5. The first vertebra that connects the neck to the skull.

1.2.6. Animals found naturally in a country.

1.2.7. The variety of organisms living on earth.

1.2.8. The layer of gases formed around the Earth.

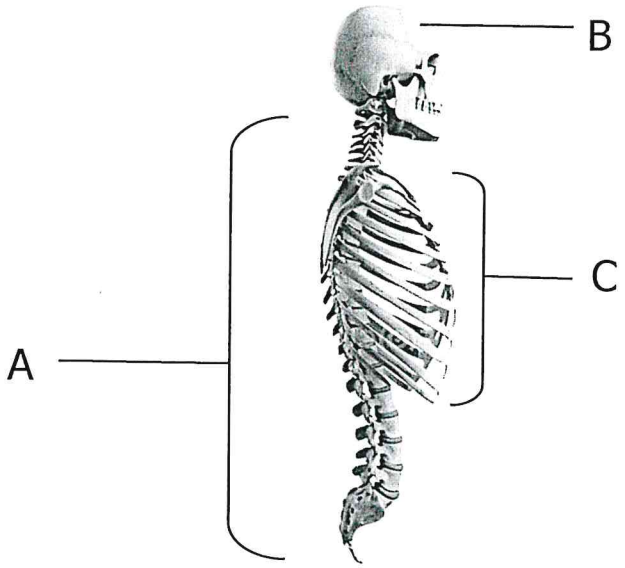
1.2.9. The tissue that connects muscle to bone. **[9]**

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. Organisms with a true nucleus.	A. Prokaryote
	B. Eukaryote
1.3.2. Plants that are adapted to a dry climate.	A. Mesophytes
	B. Hydrophytes
1.3.3. A physiographic factor.	A. Temperature
	B. Aspect
1.3.4. A movable joint.	A. Hinge
	B. Gliding

[4x2=8]

1.4. Study the diagram of part of the human skeleton below and answer the questions that follow.



1.4.1. Identify the part of the skeleton that **A**, **B** and **C** form part of. (1)

1.4.2. a) Name the joints found in **B.** (1)

b) State whether they are movable or immovable. (1)

1.4.3. State the functions of parts **A** and **C.** (2)

[5]

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SECTION B:

QUESTION TWO:

2.1. Soil samples **A**, **B** and **C**, from different places in a garden, were analysed for water content, permeability to water (millilitres of water passing through 100g soil) and the humus content. The results are shown in the following table.

Factor Analysed	Soil Samples		
	A	B	C
Water Content (%)	30	10	60
Permeability (mL)	25	50	5
Humus Content (%)	15	5	10

2.1.1. a) Which soil sample is considered best for plant growth? (1)
b) Give **TWO** reasons for your answer. (2)

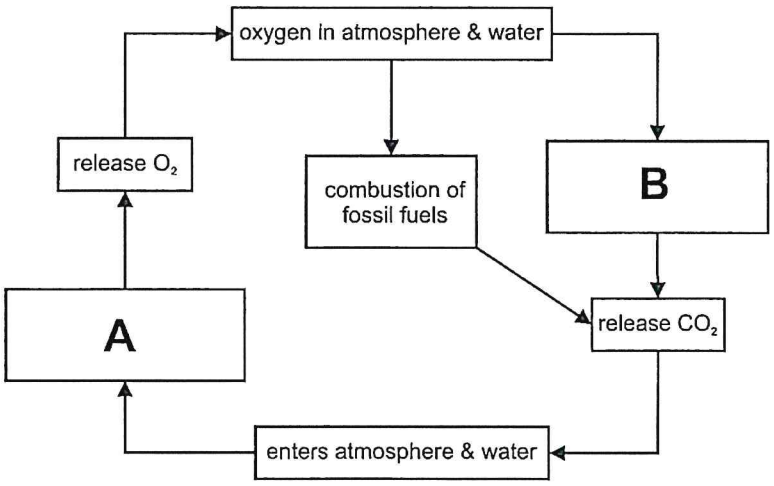
2.1.2. a) Which one of the three soils would most easily become waterlogged? (1)
b) Explain your answer. (1)

2.1.3. List **TWO** reasons why soil should contain sufficient air. (2)

2.1.4. Draw a bar graph showing the water content of soils A, B and C. (5)

[12]

2.2. Study the diagram of a nutrient cycle below, then answer the questions that follow.



2.2.1. Name the nutrient cycle shown in the diagram above. (1)

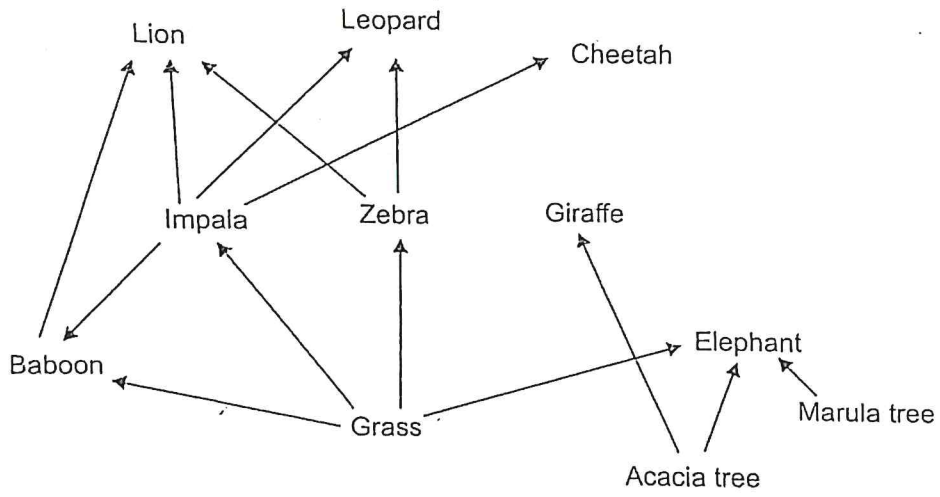
2.2.2. Name the processes occurring at **A** and **B**. (2)

2.2.3. Discuss briefly how the oxygen levels in the atmosphere decreased. (2)

2.2.4. Describe the negative effect which high levels of carbon dioxide would have in the atmosphere. (2)

[7]

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



2.3.1. Provide a heading for the diagram above. (2)

2.3.2. Identify **ONE** producer. (1)

2.3.3. Name one predator and explain its role in the ecosystem. (2)

2.3.4. Draw **ONE** food chain consisting of four trophic levels. (3)

2.3.5. Discuss the role of bacteria and fungi within the ecosystem. (2)

2.3.6. Explain what would happen if all the impala died? (2)

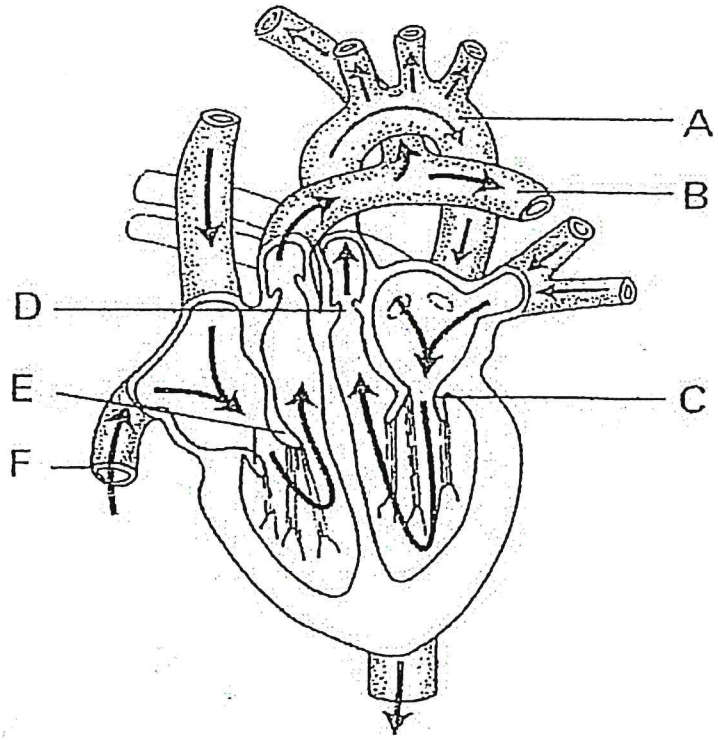
2.3.7. Define ecotourism and provide **ONE** example of how it benefits South Africa. (3)

[15]

2.4. The human heart has a double circulatory system, <u>name and describe</u> double circulation in humans. **[6]**

QUESTION THREE:

3.1. Study the diagram of the internal structure of the heart and answer the questions that follow:



3.1.1. Identify parts labelled **A, B** and **F.** (3)

3.1.2. a) State the function of valves in the heart. (2)
b) Provide the name of the valves labelled **C** and **D.** (2)

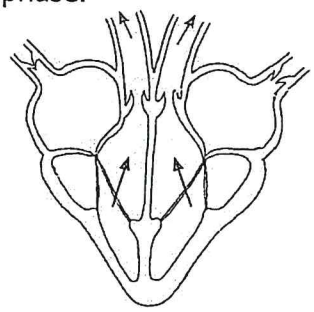
3.1.3. Provide the NAME of the parts of the heart that has the following functions:

a) Muscular wall that separates the ventricles. (1)

b) Blood vessels that transports deoxygenated blood into the heart from the upper part of the body. (1)

c) Chamber of the heart that receives oxygenated blood from the lungs. (1)

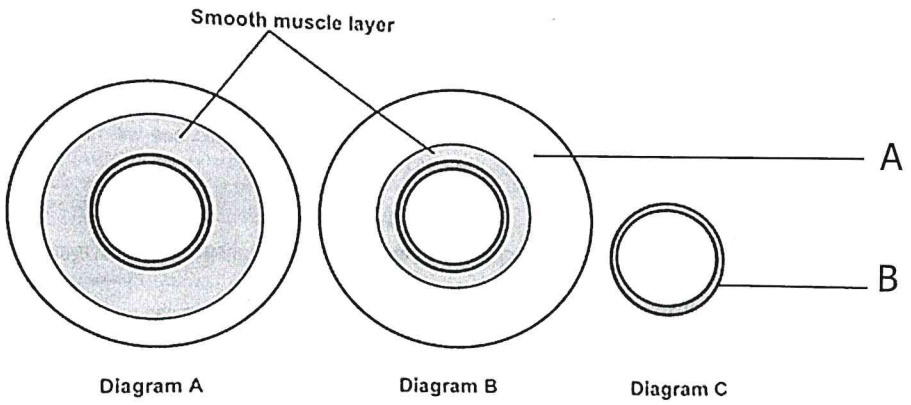
3.1.4. Name the phase of the cardiac cycle shown in the diagram below and then describe what happens during this phase. (3)



3.1.5. Name the blood vessels in which blood leaves the heart. (2)

[15]

3.2. Diagrams **A, B** and **C** below represent three types of blood vessels.



3.2.1. Identify the type of blood vessel in:

a) Diagram **B** (1)
b) Diagram **C** (1)

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

3.2.3. Identify the layers labelled **A** and **B.** (2)

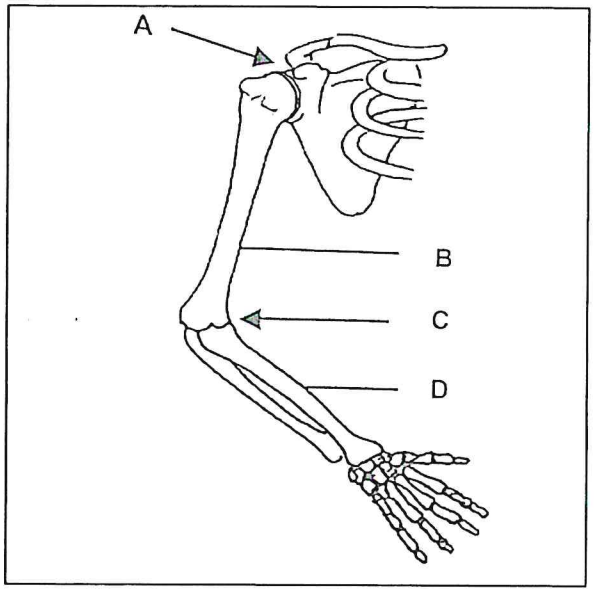
3.2.4. Explain ONE structural adaptation of the blood vessel in Diagram **C.** (2)

3.2.5. What is the difference in the composition of blood between the pulmonary artery and pulmonary vein. (2)

3.2.6. Draw a labelled diagram showing the composition of blood. (5)

[15]

3.3. The diagram below represents part of the human skeleton.



3.3.1. Identify the bones labelled **B** and **D.** (2)

3.3.2. Name the girdle this part of the skeleton forms part of. (1)

3.3.2. a) Name the type of synovial joint at **A** and **C.** (2)

b) Describe the type of movement at each joint. (2)

3.3.3. Name the mineral that may cause osteoporosis if it is in short supply. (1)

3.3.4. Name the tissue surrounding the ends of bone **B** and **D** and state its function. (2)

[10]

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