Hoërskool Dr. Johan Jurgens
Grade 10 Life Sciences
School Based Assessment
2024 Term 1

Examiner: **Mr K. Da Gama**
Moderator: **Mrs S. Stoltz**

Duration: **90 minutes** **Total Marks:** **90**

Name: _____

Grade: 10 key __

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 SHEET PROVIDED.
3. **START EACH SECTION ON 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 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. You may use a non-programmable calculator, protractor and a compass where necessary.
10. Round off all calculations to two decimals after the comma.
11. Write neatly and legibly.

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–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1. Which of the following are biotic components in an ecosystem?

a. air and water
b. plants and animals
c. light and temperature
d. rocks, soil and climate

1.1.2. The total magnification of the specimen viewed under a microscope is 600x. If the magnification of the eyepiece is 10x, then the magnification of the objective lens is …

a. 200x
b. 60x
c. 6x
d. 600x

1.1.3. A soil has the following characteristics: large particles, large air spaces, holds little water, feels gritty. The type of soil is:

a. clay
b. sand
c. loam
d. silt

1.1.4. Plants that are suited to live in areas with little water are called:

a. terrestrial
b. fynbos
c. xerophytes
d. hydrophytes

1.1.5. In a food chain, energy flows in the following direction:

a. producers → primary consumers → secondary consumers → decomposers
b. decomposers → producers → primary consumers → secondary consumers
c. primary consumers → secondary consumers → producers → decomposers
d. producers → secondary consumers → primary consumers → decomposers

1.1.6. In a stable ecosystem, a wide variety of

a. producers depend on plants for shelter and camouflage
b. micro-organisms depend on plants for carbon dioxide and nitrogen
c. animals depend on plants for food and oxygen
d. plants depend on micro-organisms for pollination and seed dispersal

1.1.7. When a jackal kills and eats a rabbit, the jackal is the ...

a. producer
b. prey
c. predator
d. saprophyte

1.1.8. Which of the following refers to the part of the Earth where organisms live?

a. Atmosphere
b. Lithosphere
c. Biosphere
d. Hydrosphere

1.1.9. Which two climatic factors directly affect the distribution of world biomes?

a. Temperature and altitude
b. Temperature and latitude
c. Altitude and precipitation
d. Temperature and precipitation

1.1.10. Organisms that live in water are called...

a. terrestrial
b. xerophytes
c. buoyant
d. aquatic

(10 x 2 = 20)

1.2. Provide the correct biological term for each of the following descriptions. Write only the term next to the question number on your answer sheet, for example: 1.2.1. Pizza

1.2.1. Refers to the position occupied by an organism in the food chain.

1.2.2. A complex system that consists of all the living organisms in a particular area as well as the environment with which the organisms interact.

1.2.3. If gentle, this factor favours slower flow of surface water, reduces erosion, and increases availability of water to plants

1.2.4. Plants that have adapted and are able to live in ecosystems with a water surplus as found in wetlands.

1.2.5. They make their own food using chemicals and energy sources from their environment.

1.2.6. The factors that are associated with the physical nature of the area.

1.2.7. The number of hours of light that a plant gets a day.

1.2.8. Another name for “dead/decaying feeder”

1.2.9. The study of living organisms, their relationships to one another and the places where they live.

1.2.10. A group of living organisms

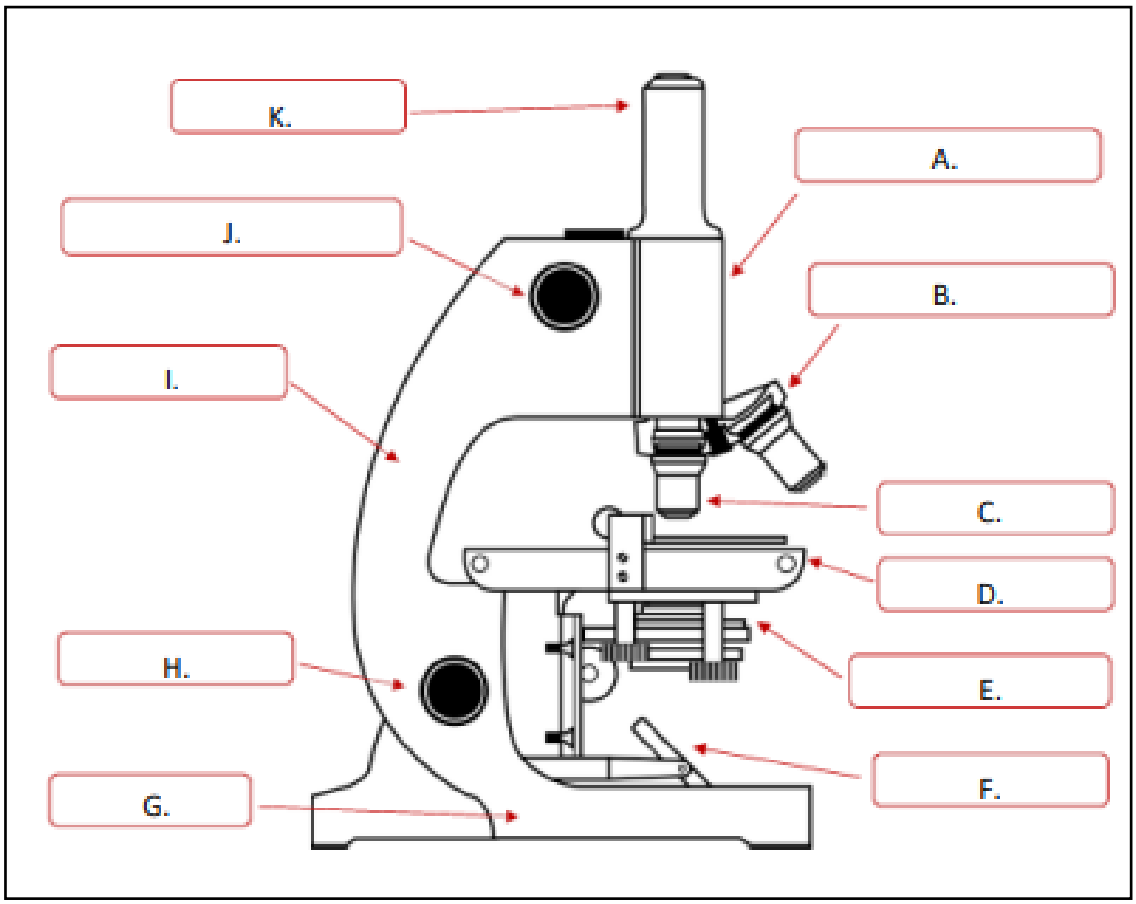
(10 x 1 = 10)

Total Section A: 30 marks

Section B

Question 2

2.1. Study the diagram of the microscope provided below and then answer the questions that follow.



2.1.1. Write down the letter of the part associated with …

a. Holding the objectives in place so that they can rotate and can be changed easily.
b. Moving the stage up and down, bringing the object closer to or further away from the objective lens.
c. Controlling the amount of light which passes through the slide.
d. Bringing the object into initial focus. (4)

2.1.2. Provide one advantage the electron microscope has over the light microscope. (1)

2.1.3. Write down the formula for determining the magnification. (3)

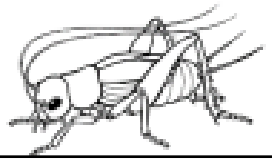
[8]

Question 3

3.1. Esethu and Christine read the extract below in a magazine.

HOW IS A CRICKET'S CHIRP RELATED TO TEMPERATURE?

Crickets are insects. Like all living things they have many chemical reactions going on inside their bodies, such as reactions that allow muscles to contract to produce chirping. Crickets, like all insects, are cold blooded and take on the temperature of their surroundings. This affects how quickly these chemical reactions that allow muscles to contract can occur.



They decided to conduct an experiment. They took 4 wooden boxes and placed 1 cricket in each box. Each box was also fitted with a temperature-controlled heater. These boxes were labelled A, B, C and D. The heater in box A was set at 10 °C, box B was set at 15 °C, box C at 20 °C and box D at 25 °C. Each box was left for 30 minutes for the crickets to get used to the temperature. They then recorded the number of chirps per minute. These results are shown in the table below.

Temperature (°C)	Chirps per minute
10	40
15	75
20	105
25	140

3.1.1. Write a suitable aim for the investigation conducted by these two. (1)

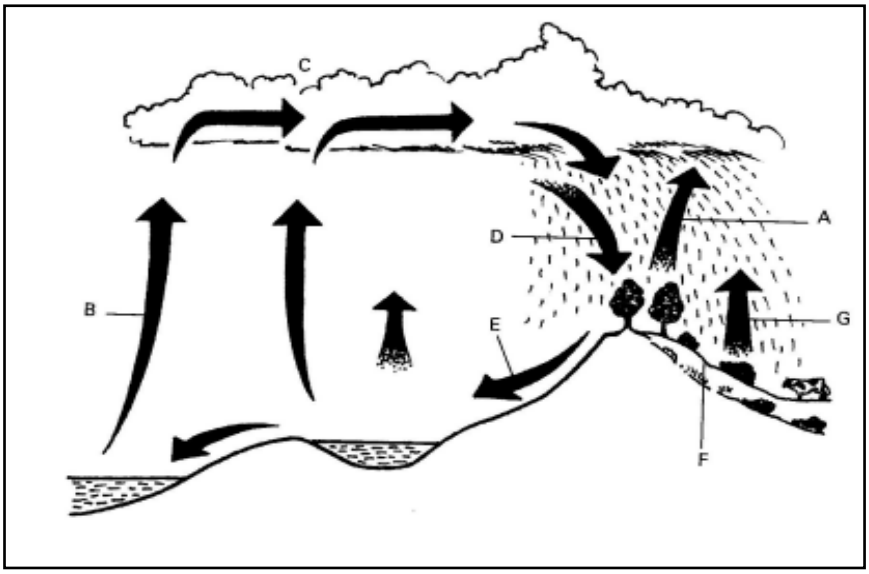
3.1.2. Draw a line graph to represent the data shown in the table above. (6)

3.1.3. How could Esethu and Christine improve the reliability of their investigation? (1)

3.1.4. In which season would you expect to hear more cricket chirping? Give a reason for your answer. (2)

3.1.5. Crickets are more active at night. What is the term used for animals that are active at night? (1)

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



3.2.1. What cycle is depicted in the diagram above? (1)

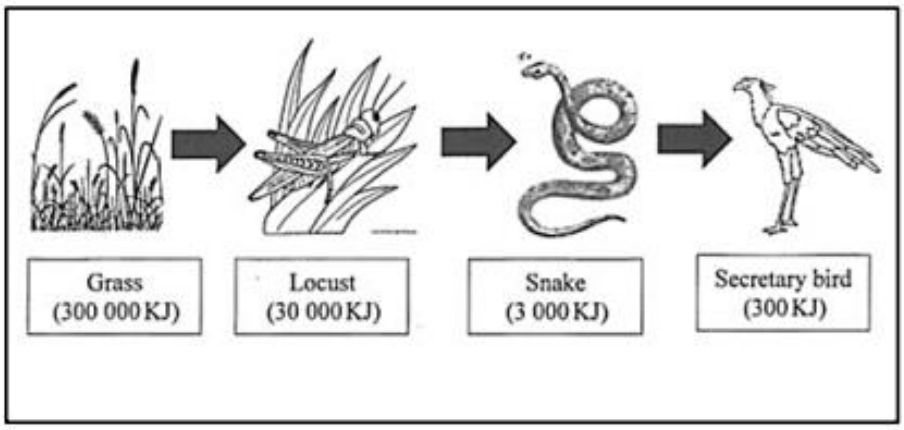
3.2.2. Name the processes labelled A–D. (4)

3.2.3. Besides temperature what other factor affects the rate of the process labelled B? (1)

[17]

Question 4

4.1. Study the food chain below and answer the questions that follow.



4.1.1. Name the primary consumer in the above food chain. (1)

4.1.2. Why does the total energy in each trophic level become less as we move up the food chain? (3)

4.2. Three soil samples, taken from different regions, were analysed for air content, permeability to water and humus content. The results obtained are shown in the table below.

SOIL SAMPLE	A	B	C
Air content (%)	30	10	60
Permeability of water (ml of water passing through 100g of soil per minute)	20	5	70
Humus content (%)	25	10	5

4.2.1. Explain the disadvantages for the plants growing in soil sample B with regards to permeability of water. (2)

4.2.2. Name one factor relating to the composition of soil sample B that resulted in its low permeability to water. (1)

4.2.3. State one advantage of a higher percent in humus for the soil. (1)

[8]

Question 5

Read the points below and answer the questions that follow.

- The largest biome in Southern Africa. It is found mainly in the Northern Cape, North West Province, Northern Province and KwaZulu Natal.
- Summers are hot and wet and the winters are cool with little or no rain. Frost occurs in winter.
- The soil is red/black clay, red/yellow, grey soil and is often sandy
- It is also unofficially known as “the bushveld”

5.1. Define a “biome”. (1)

5.2. Provide the official name of the biome mentioned in the above extract. (1)

5.3. Describe the vegetation found in the above biome. (3)

5.4. Name any two animals that might be found in this biome. (2)

[7]

Total Section B: 40 marks

Section C

Question 6

Describe the negative impact that human activities may have on the environment and reasons why humans should conserve wetlands. Also describe the effect of temperature (day/night and seasons) on the movement and behaviour of animals.

Content: (17)
Synthesis: (3)

(17 + 3 = 20)

Total Section C: 20 marks

Hoërskool Dr. Johan Jurgens
Grade 10 Life Sciences
School Based Assessment
2024 Term 1 MEMORANDOM

Examiner: **Mr K. Da Gama**
Moderator: **Mrs S. Stoltz**

Duration: **90 minutes** **Total Marks:** **90**

Name: _____

Grade: 10 key __

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

12. Answer ALL the questions.
13. Write ALL the answers in the ANSWER SHEET PROVIDED.
14. **START EACH SECTION ON A NEW PAGE**.
15. Number the answers correctly according to the numbering system used in this question paper.
16. Present your answers according to the instructions of each question.
17. Do ALL drawings in pencil and label them in **blue ink**.
18. Draw diagrams, tables or flow charts only when asked to do so.
19. The diagrams in this question paper are NOT necessarily drawn to scale.
20. You may use a non-programmable calculator, protractor and a compass where necessary.
21. Round off all calculations to two decimals after the comma.
22. Write neatly and legibly.

Section A

Question 1

1.1.1. Which of the following are biotic components in an ecosystem?

b. Plants and animals

1.1.2. The total magnification of the specimen viewed under a microscope is 600x. If the magnification of the eyepiece is 10x, then the magnification of the objective lens is …

b. 60x

1.1.3. A soil has the following characteristics: large particles, large air spaces, holds little water, feels gritty. The type of soil is:

b. Sand

1.1.4. Plants that are suited to live in areas with little water are called:

c. Xerophytes

1.1.5. In a food chain, energy flows in the following direction:

a. Producers → primary consumers → secondary consumers → decomposers

1.1.6. In a stable ecosystem, a wide variety of

c. Animals depend on plants for food and oxygen

1.1.7. When a jackal kills and eats a rabbit, the jackal is the ...

c. Predator

1.1.8. Which of the following refers to the part of the Earth where organisms live?

c. Biosphere

1.1.9. Which two climatic factors directly affect the distribution of world biomes?

d. Temperature and precipitation

1.1.10. Organisms that live in water are called...

d. Aquatic

(10 x 2 = 20)

1.2. Provide the correct biological term for each of the following descriptions. Write only the term next to the question number on your answer sheet, for example: 1.2.1. Pizza

1.2.1. **Trophic level**
1.2.2. **Ecosystem**
1.2.3. **Slope**
1.2.4. **Hydrophytes**
1.2.5. **Producers/Autotrophs**
1.2.6. **Physiographic**
1.2.7. **Photoperiod**
1.2.8. **Saprotrophs/Decomposers**
1.2.9. **Ecology**
1.2.10. **Community**

(10 x 1 = 10)

Total Section A: 30 marks

Section B

Question 2

Study the diagram of the microscope provided below and then answer the questions that follow.

2.1. Write down the letter of the part associated with …

a. **B**.
b. **J**.
c. **E**.
d. **K**. (4)

2.2. Provide one advantage the electron microscope has over the light microscope. (1)

- **Learners could have provided any of the following and any other reason within reason.**
  - **It can see smaller objects than a light microscope.**
  - **It can view 3D models of the specimens.**

2.3. Write down the formula for determining the magnification. (3)

Objective lens x Ocular lens magnification = the total magnification

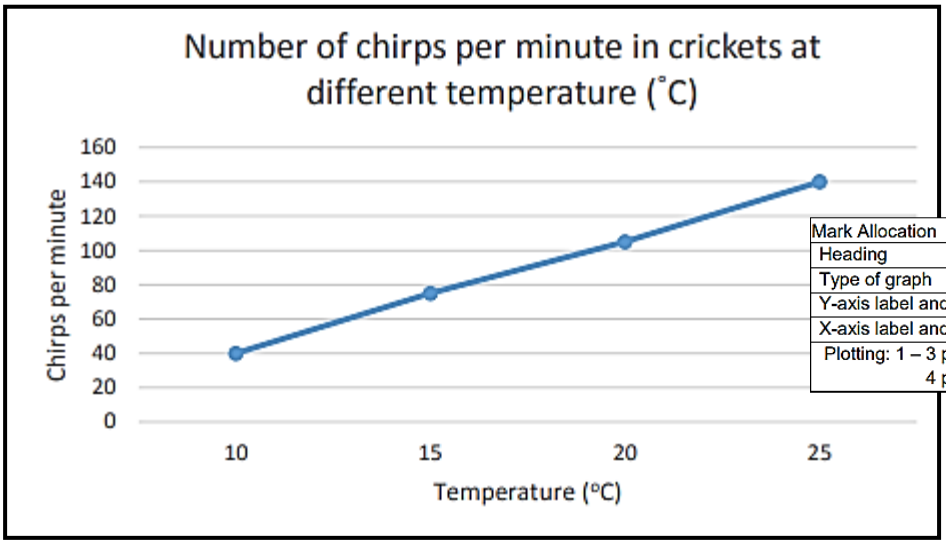
[8]

Question 3

3.1.1. Write a suitable aim for the investigation. (1)

- **Any relevant answer can be awarded a mark, for example:**
  - **To determine whether the chirps per minute are directly proportionate to the temperature of the surrounding environment.**
  - **To establish a relationship between Cricket chirps per minute and temperature.**
  - **To determine if temperature affects the number of chirps per minute in crickets**

3.1.2. Draw a line graph to represent the data shown in the table above. (6)



Mark Allocation	
Heading	✓
Type of graph	✓
Y-axis label and scale	✓
X-axis label and scale	✓
Plotting: 1 – 3 points correct	✓
4 points correct	✓✓

3.1.3. How could Esethu and Christine improve the reliability of their investigation? (1)

- **Any relevant answer can be awarded a mark, for example:**
    - **By doing it more than once/ Repeat the experiment.**
    - **Adding more crickets/ Use a larger sample size.**

3.1.4. In which season would you expect to hear more cricket chirping? Give a reason for your answer. (2)

- **In hotter seasons like summer, because the chirps of the crickets are directly related to how hot it is.**

3.1.5. Crickets are more active at night. What is the term used for animals that are active at night?

- **Nocturnal** (1)

3.2.1. What cycle is depicted in the diagram above? (1)

- **The water/hydrological cycle**

3.2.2. Name the processes labelled A–D. (4)

A = Condensation
B = Evaporation
C = Transportation
D = Precipitation

3.2.3. Besides temperature what other factor affects the rate of the process labelled B? (1)

- **Surface area**

[17]

Question 4

4.1.1. Name the primary consumer in the above food chain. (1)

- **Locust/ Grass Hopper**

4.1.2. Why does the total energy in each trophic level become less as we move up the food chain?

- **Any relevant answer can be awarded a mark, for example:**
    - **At each trophic level energy is lost through the maintenance of body processes, therefore, the next trophic level will receive less energy than the prior.** (3)

4.2. Three soil samples, taken from different regions, were analysed for air content, permeability to water and humus content. The results obtained are shown in the table below.

SOIL SAMPLE	A	B	C
Air content (%)	30	10	60
Permeability of water (ml of water passing through 100g of soil per minute)	20	5	70
Humus content (%)	25	10	5

4.2.1. Explain the disadvantages for the plants growing in soil sample B with regards to permeability of water. (2)

- Learner can be awarded the marks if relevant.
    - Soil can become waterlogged; leading to the roots of the plants rotting.

4.2.2. Name one factor relating to the composition of soil sample B that resulted in its low permeability to water. (1)

- The fine soil is closely packed, has little air content that leads to low permeability of water.

4.2.3. State one advantage of a higher percent in humus for the soil. (1)

- Learner can give any 1 for the mark.
    - It improves the aeration of the soil
    - Increases the water-retaining ability of the soil
    - It improves the mineral content of the soil.

[8]

Question 5

5.5. Define a “biome”. (1)

- **Biomes are regions with similar climate, geography and plant and animal life.**

5.6. Provide the official name of the biome mentioned in the above extract. (1)

- **Savanna**

5.7. Describe the vegetation found in the above biome. (3)

- **Herbaceous plants**
- **Woody plants**
- **Plants that are able to withstand fire.**

5.8. Name any two animals that might be found in this biome. (2)

- Learner is awarded a mark for any of the below: (two marks max)
    - **Kudu**
    - **Springbok**
    - **Lion**
    - **Buffalo**
    - **Elephant**
    - **Mosquitoes**

[7]

Total Section B: 40 marks

Section C

Question 6

Describe the negative impact that human activities may have on the environment and reasons why humans should conserve wetlands. Also describe the effect of temperature (day/night and seasons) on the movement and behaviour of animals.

Negative impact of human activities on the environment

- **Global warming lair pollution/burning of fossil fuels speed up climate changer**
- **Natural habitats are destroyed during cultivation of land**
- **Natural vegetation is cleared during city or town development destroying the habitat of organisms**
- **Human population growth use more natural resources**
- **Leads to the extinction of certain species**

1 mark for any (1x8)

Importance of wetlands

- **Provide water for people and domestic animals**
- **Provide a habitat and breeding place for plants and animals**
- **Purifies water naturally**
- **Prevent flooding during heavy rainfall**
- **Keeps rivers and streams flowing during dry seasons**
- **Some wetlands attract tourists thus creating jobs**

1 mark for any (1x4)

Effects of temperature

- **In winter the temperature drops**
- **Other animals hibernate due to shortage of food**
- **In summer the temperature rises.**
- **Other animals aestivate/become dormant to avoid the high temperature**
- **Some organism burrow to avoid the heat of the day**
- **Some organisms are more active at nighty/nocturnal when it is cooler**

1 mark for any (1x5)

ASSESSING THE PRESENTATION OF THE ESSAY

RELEVANCE	**LOGICAL SEQUENCE**	**COMPREHENSIVE**
All information provided is	**Ideas arranged in a logical**	**Answered all aspects required by the essay in sufficient detail**
All information is relevant to: • **Negative human impact** • **Importance of wetlands** • **the effect or temperature** **There is no irrelevant Information**	**Correct sequence of events for:** • **Negative human impact** • **Importance of wetlands** • **the effect or temperature**	**At least the following points are included:** • **Negative human impact** • **Negative human impact (5/8)** • **Importance of wetlands (2/4)** • **The effect of temperature (3/5)**
1 Mark	**1 Mark**	**1 Mark**

Total Section C: 20 marks

GRAND TOTAL: 90