

KIYALA HIGH SCHOOL

MID-TERM ASSESSMENT TEST 2025

BIOLOGY

S.4

Time: 2 Hours: 30mins

INSTRUCTIONS:

- The paper contains **seven** items and two **sections A and B**
- Section **A** is **compulsory**.
- Section **B** has two **parts I and II**, chose **one item** from each of the **parts I and II**
- **ALL the** items carry equal marks.

Section A

Item 1

Mr. Odeke prepared his garden well and planted beans which were looking healthy for the first three weeks. Suddenly, a dry spell set in and most beans had their leave turning yellow and some wilted. At flowering stage though, the garden was invaded by numerous bees for some time. At the visit by the bees, the bean pods started forming and finally the beans gave good yields.



Task

- a) Identify the major challenges faced by the bean plants in Mr. Odeke garden. **(3 scores)**

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- b) Explain the internal processes that took place in the bean pants form the time bees visited until when then the yields were realized. (06 scores)

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- c) How did the beans overcome the prevailing conditions to glue some yields? (02 scores)

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Item 2

Flavia a S.3 student at Kiyala High School frequently urinates and feels thirsty. One day while seated in class, she heard a very loud sounds of tear gas canister from the scuffle between the police at Kanapa and a demonstrating mob. He heart pounded, eyes protruded and her heartbeat increased. She stood out to go and hide, her legs were too weak to support her, so she fell down and her friends laughed at her.



Task

- a) Explain show Flavia's body coordinated from the time the loud sound was produced by the tear gas canister until she fell down while trying to run and hide. (5 scores)

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b) Point out her bodily metabolic disorder and explain its causes. **(5 scores)**

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c) Show Flavia how she can manage her health condition.

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Item 3

During a research study by a group of physiologists, it was discovered that certain materials can enter or exit cells. The entry or exit of these materials was found to be under the control of the cell membrane. They also discovered that these materials enter or leave the cells by certain processes which they noted in their research report.

Task

a) i) Explain how the cell membrane controls entry and exit of materials into or out of the cell. **(02 score)**

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ii). State why it's important for movement of materials in and out of cells. **(03 scores)**

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b) Describe how the following factors affect the process of diffusion.

i). Temperature. **(2 scores)**

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ii). Concertation gradient. **(02 scores)**

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- c) Apart from diffusion, name any two other processes by which materials enter or exit cells.
(01 scores)

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Section B

Part I (choose only one item)

Item 4

Imagine you are a biologist on an expedition deep within the Amazon rainforest, one of the most bio-diverse place on earth. Your mission is to study the diversity of living organisms in a specific area of the forest. As you set up your research station, you begin to observe and document various forms of life around you. One of your team members argues that conserving the biodiversity of the rainforest is crucial and during your exploration, you come across an area that has been deforested.

Task

What some reasons you might provide to support the importance of biodiversity in this ecosystem and what are some potential impacts of deforestation on the biodiversity of Amazon rainforest? How might this affect the organisms you are studying.

Item 5

You are a climate scientific advising a coastal city that is facing increasing risks due to global warming. The city is experiencing rising sea levels, most frequent and severe storms and higher temperatures. Local officials are concerned about how these changes will impact the city's infrastructure, economy and residents.

Task

How would you assess the specific risks that global warming poses to the city's infrastructure, such as its transportation systems, buildings and utilities? What factors would you consider in your assessment? What long-term planning measures would you suggest to ensure the city remains resilient to future climate change? How would you integrate climate data and projections into the city's development plan?

Part II (choose only one item)

Item 6

You are a wildlife biologist studying animals in the Arctic, where extreme cold and seasoned changers present unique changes. You are particularly interested in how different species have adopted their body structures and physiological processes to survive in this harsh environment.

Task

You observe that Arctic foxes have different fur densities compared to other canids. How does this adaptation help them survive the extreme cold? What role does their fur play in thermoregulation? Polar bears are known from their large size and energy demands. How do their respiratory and circulatory systems adapt to ensure they get sufficient oxygen and nutrients in the cold, low oxygen environment of the arctic.?

Item 7

You are a nephrologist working in a hospital where a patient has been admitted with symptoms of severe dehydration and electrolyte imbalance. The patient's medical history reveals that they have been experiencing frequent urination and abnormal lab results showing elevated levels of urea and creatinine in their blood.

Task

Describe the key steps in the excretion process in the human body including how the kidneys filter blood, produce urine, what treatment options would you consider addressing the patient's dehydration and electrolyte imbalance. How might these treatments support or restore normal kidney function? Based on the patient's condition, what preventive measures or lifestyle changes would you recommend avoiding future issues with kidney functions and maintaining overall health?

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