NAME:..... INDEX NO: | | | | | | | | | |

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SIGNATURE:.....

553/1

BIOLOGY PAPER 1

(THEORY)

MOCK 2024

AUGUST

TIME:2 HRS:30 MIN

MEBU EXAMINATIONS CONSULT

Uganda Certificate Of Education

MOCK ASSESSMENTS 2024

BIOLOGY PAPER 1

(THEORY)

TIME:2HRS:30MINS

INSTRUCTIONS TO CANDIDATES

This paper consists of **Seven** examination items. It has **two** sections; **A** and **B.**

Section **A** has **three** compulsory items.

Section B has two parts; **1** and **11**. Answer **One** item from each part.

Any additional item(s) answered will **NOT** be scored

SECTION A

Attempt all items in this section in the space provided

ITEM1

In a local garden, the plants have recently been showing signs of damage. The leaves have holes, the stems are chewed, and some plants are even uprooted. Upon a closer inspection, you noticed several types of animals around the garden.

TASK.

(a) Describe the types of damage insects, Herbivores and burrowing animals can cause to plant leaves.

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(b) Explain how this damage affects the plant's ability to perform photosynthesis.

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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 changes? How would you integrate climate data and projections into the city's development plan?

PART II

ITEM 6.

You are a wildlife biologist studying animals in the Arctic, where extreme cold and seasonal changes present unique challenges. You're particularly interested in how different species have adapted 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 for 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 function and maintaining overall health?

END

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SECTION B

This section has **two** parts, each with **two** items .Choose **two** items from this section, picking **one** item from each part

PART 1

ITEM 4

Imagine you are a biologist on an expedition deep within the Amazon Rainforest, one of the most bio-diverse places 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 are 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 scientist advising a coastal city that is facing increasing risks due to global warming. The city is experiencing rising sea levels, more frequent and severe storms, and higher temperatures. Local officials are concerned about how these changes will impact the city's infrastructure, economy, and residents.

(c) Explain how continuous damage by these animals could impact the overall health and growth of the plants in the garden and suggest some methods to protect the plants from animal damage.

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ITEM 2

Alex, an athlete, has been experiencing various health issues and decides to visit their doctor for a thorough check-up. They have been training intensively for a major competition, but they are facing several challenges. Alex has noticed fluctuating energy levels, difficulty in maintaining their blood sugar, unusual tiredness, and weight gain despite a healthy diet and regular exercise. Additionally, Alex's partner, Taylor, is planning to start a family, and they both want to understand how their bodies are functioning hormonally.

TASK

(a) Alex wants to boost muscle growth and performance naturally. Which organ in their body is primarily responsible for producing the hormone that plays a key role in muscle growth and what is this hormone called?

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(b) Alex's doctor suspects an issue with their body's ability to regulate glucose. Which organ should the doctor focus on and what hormone is involved in this process?

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(c) Alex has experienced increased thirst and frequent urination. Which organ should be investigated for producing the hormone that regulates water balance and blood pressure and what is this hormone called?

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ITEM 3

Emily is a 15-year-old high school student who recently started experiencing irregular menstrual cycles. Her mother, Sarah, has a genetic disease which affects blood clotting. Emily is concerned about her menstrual health and whether she might have inherited her mother's condition.

TASK

(a) Explain the normal process of the menstrual cycle, including the key phases and their functions

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(b) What could be some common reasons for irregular menstrual cycles in teenagers?

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(c) Describe what the genetic disease is and how it affects the body.

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(d) How is hemophilia inherited, and what are the chances that Emily might have inherited this condition from her mother? Discuss how the genetic disease could potentially affect Emily's menstrual cycle and what symptoms she should look out for.

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