

Candidates name:

Signature:

Random No.						Personal No.		

(Do not write your School/Centre name or Number anywhere on this Booklet)

553/1
Biology
Paper 1
(Theory)
July/Aug., 2025
2 ½ hours



MATIGO EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY
Paper 1
(Theory)
2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **two** sections: **A** and **B**. It has seven examination items.*

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

*Section **B** has **two** parts; **I** and **II**. Answer **one** item from each part.*

*Answers to section **A** **must** be written in the spaces provided while answers to section **B** **must** be written in the answer booklet(s) provided.*

*Answer **five** items in all.*

Any additional item(s) answered will not be marked.

SECTION A

*Answer **all** the items in this section in the spaces provided.*

Item 1

Musa is a tomato farmer. During one season, weeds grew in his garden while he was away for two weeks. On his return, he noticed that the tomato leaves were small and the stems were thin. During weeding, Musa uprooted a few tomato plants and noticed that they had few roots. After removing the weeds, the leaves became larger and the plants grew taller (increased in height).

Task

- (a) State how the processes affected by the presence of weeds contribute to the normal functioning of tomato plants.

- (b) Describe how structural changes caused by weeds in tomato plants affected their ability to grow successfully.

- (c) Explain how tomatoes were able to recover and grow taller.

Item 2

James is a first-year student at Makerere University. After becoming familiar with the University community, he joined a group of students who regularly smoke Sisha and drink alcohol. Over time, the group started stealing fellow students' property, missing lectures (lessons) and engaging in fights with other students on the University Campus. One day, during a fight, James broke his only pair of eye glasses. Since then, he has been struggling to read what is written on the blackboard during lectures (lessons).

Task

- (a) In what ways can James' behaviour affect his academic success?

(b) Explain why James was using eye glasses to read before they got broken.

(c) How can the University management guide students on ways of avoiding the academic challenges faced by James?

Item 3

A report from the forest rangers shows that there are two types of wild rabbits living in Budongo Forest Park. Some have white fur while others have brown fur. These rabbits live on the dark forest floor containing a thick vegetation cover. Both types of rabbits are fed on by the same predators which also live in the same forest. On several occasions, the rangers observed that matings between white and brown rabbits have always produced brown offspring. As time went by, rangers noticed that the forest had become dominated with brown rabbits.

Task

- (a) Explain why the matings between white and brown rabbits produced only brown offspring.

- (b) Using suitable genetic diagrams, illustrate the results of the mating between white and brown rabbits.

- (c) Explain why the forest became dominated by rabbits with brown fur overtime.

SECTION B

Part I

*Answer only **one** item from this part. Answers should be written in the answer booklet(s) provided.*

Item 4

Lawrence cleared a thick vegetation cover and large trees along the slope of a mountain where many animals lived and he planted millet. During the rainy season, the mountain received heavy rains that caused large amounts of top soils to run down into the wetlands, that later become flooded with muddy water. Around this time, wild animals attacked surrounding communities and cases of malaria were high. Lawrence had a poor yield of millet at the end of the season.

Task

- (a) Explain how Lawrence's farming activities caused the ecological challenges described in the scenario and suggest ways they can be addressed.
- (b) Why is it important for Lawrence to conserve the environment within the community he lives.

Item 5

A mountainous area that was once covered with medicinal plant species has recently been taken over by mining activities. During the start of the operations, the natural vegetation was cleared. The mining process released dust into the air, caused frequent waste runoff into nearby swamps and produced loud noise and ground vibrations. Additionally, the machines used in metal extraction emitted toxic fumes into the air. As a result, several environmental problems developed in the area.

Task

- (a) Explain how the mining activities caused the environmental problems in the area and suggest ways these problems can be reduced.
- (b) Explain why it was necessary to conserve the environment during the mining activities.

Part II

*Answer only **one** item from this part. Answers should be written in the answer booklet(s) provided.*

Item 6

Joseph, an obese student, registered to participate in the upcoming district athletic competitions. To increase his chances of winning the competitions, Joseph was advised to reduce his weight. Therefore, he started taking dietary weight loss pills regularly in order to lose weight quickly before the training began. After a few days, Joseph began experiencing unusual changes in his body that included, a dry mouth, frequent urination and an intense feeling of body heat. These symptoms forced him to go for a medical check-up. The doctor explained that the weight loss pills had reduced his gut's ability to digest carbohydrates properly. As a result, Joseph was advised to withdraw from the competitions.

Task

- (a) Explain how the weight loss pills caused the changes that occurred in Joseph's body.
- (b) Why was Joseph advised to withdraw from participating in the competition?

Item 7

Samuel, an adult, has been feeding on a salt-rich diet that was deficient in Iron for a period of two years and he only takes one liter of water a day. Recently, he started experiencing certain symptoms that caused him to go for a medical check-up at a health Centre IV. The doctor explained to Samuel that he had developed high blood pressure, anaemia and kidney malfunctioning. In addition, doctors emphasized that these health problems were caused by Samuel's life styles but he did not accept.

(Hint: The recommended adult daily water intake is 3 litres)

Task

- (a) Using your biological knowledge, convince Samuel to accept the doctors' findings.
- (b) Advice Samuel on how to solve his health challenges.

END