

Candidate's Name:.....

Signature.....

Random No.						Personal No.		

553/1
BIOLOGY
PAPER 1
(Theory)
SET ONE
2 ½ Hours
Ref....2025



SELF-STUDY: HANDS-ON BIOLOGY
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 scored.*

SECTION A

Answer all items in this section in the spaces provides

ITEM ONE

A community garden in a densely populated city noticed their tomato plants growing beneath tall apartment buildings had pale, yellowing leaves and produced very few fruits. The plants received only 2 to 3 hours of direct sunlight daily due to shading. Gardeners observed that the plants grew taller than usual, with weak stems, and their lower leaves eventually dropped. Despite regular watering and application of fertilisers, the tomatoes remained undersized.

TASK:

- (a) Identify the biological processes in the tomato plants that were disrupted by the limited sunlight.

- (b) Explain how the reduced sunlight affected these processes, leading to poor fruit yield.

- (c) Describe the adaptation the plants might have used to maximise light capture in this environment.

ITEM TWO

Alex, a boda-boda rider in Kampala, had been drinking alcohol heavily for several months, believing it would help him stay active. However, he started experiencing blurred vision, slow reaction times, and frequent muscle cramps while riding. One night, as he turned at a busy intersection, a speeding car approached him suddenly. Although he tried to react, his delayed reflexes caused him to crash, leaving him with multiple fractures.

TASK:

- (a) Identify the challenges Alex may face if he continues drinking alcohol while riding.

- (b) Explain how Alex's body coordinated in the moment of danger and why his reaction time was slow.

- (c) Suggest ways Alex can recover from his injuries and improve his body's functioning.

ITEM THREE

Grace and Peter were excited to welcome their first child. However, when their baby was born, they noticed **unusually pale skin, white hair, and extreme sensitivity to sunlight**. Concerned, they visited a hospital, where doctors confirmed that their child had **albinism**, a condition caused by genetic inheritance. Some community members **misunderstood the condition** and spread myths about the child's health.

TASK:

- (a) Explain how their baby inherited albinism.

- (b) Describe the biological basis of skin pigmentation and why albino individuals lack melanin.

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- (c) Suggest ways Grace and Peter can protect their child from skin-related health challenges and societal discrimination.

SECTION B

Attempt a total of two items from this section, taking one item from each part.

PART I

Answer only one item from this part. Answers should be written in the answer booklets provided.

ITEM FOUR

Mrs. Nalwoga owns a banana plantation near Lake Victoria. To boost yields, she sprays her crops heavily with pesticides to kill weevils and aphids. She also drains a nearby wetland to expand her plantation, removing papyrus plants and grasses. Over time, her banana plants produce fewer fruits, and fishermen report fewer fish catches in the lake. Bees, which were common in the area, have also disappeared, affecting local honey production.

Task:

- (a) Explain how Mrs. Nalwoga’s actions caused environmental challenges.
- (b) Suggest why conserving bees and wetlands is important for the ecosystem.

ITEM FIVE

In Nakaseke District, a community cut down a eucalyptus forest to burn charcoal for income. They left the land bare and planted cassava continuously without rotating crops. Later, heavy rains washed away the topsoil, leaving the land rocky. Cassava yields dropped drastically, and the nearby river became muddy, causing fish to die. Wild animals like duikers and birds that once lived in the forest are no longer seen.

Task:

- (a) Link the community's activities to the environmental problems observed.
- (b) Explain why protecting forests benefits both soil and biodiversity.

PART II

Answer only one item from this part. Answers should be written in the answer booklets provided.

ITEM SIX

Akello, a 12-year-old pupil in Kampala, often skips breakfast and eats mostly *posho* (maize flour) with boiled potatoes for lunch and dinner. She complains of constant fatigue, bleeding gums, and poor vision at night. Her teacher noticed she struggles to concentrate in class and has frequent infections. A clinic checkup revealed she has a swollen thyroid gland and pale eyelids.

Task:

- (a) Explain how Akello's diet might be linked to the symptoms she is experiencing.
- (b) Advise Akello's parents on dietary changes to improve her health.

ITEM SEVEN

Mukasa, a fisherman on Lake Victoria, lives in a crowded hut with his family. He often experiences painful swelling in his legs, resembling elephant skin. He also suffers from recurrent fever and headaches. A community health worker noted that Mukasa's village lacks mosquito nets and has stagnant water near homes. Blood tests confirmed he has microfilariae in his bloodstream.

Task:

- (a) Relate Mukasa's living conditions to his health problems.
- (b) Suggest practical measures Mukasa's family can take to prevent these conditions.