

Candidate's Name:

Signature: Stream.....

553/1
BIOLOGY
Paper 1
2½ Hours

Uganda Certificate of Education

BIOLOGY

Paper 1

(Theory)

2 Hours 30 Minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists two sections; **A** and **B**.

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

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

Answer **five** items in all.

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

For Scorer's use			
Item No	Basis code	Score	Scorer's initials
Item 1	U₂		
	A₂		
Item 2	U₄		
	A₄		
Item 3	U₅		
	A₅		
Item 4/5	U₁		
	A₁		
Item 6/7	U₃		
	A₃		

SECTION A

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

Item 1.

During a short dry season, a commercial legume plantation was invaded by strange insect larvae which fed on the leaves and the outer layer of the stems. During this season, the legumes became stunted and some wilted.

When the rains returned, all the insect larvae were washed away and died. The legumes revived, nodes emerged, their internodes elongated and a new layer of the stem bark formed around the damaged stems. The legumes managed to give some yields.

Task

- (a) Explain how the insect larvae affected the legumes leading to stunted growth and wilting.

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(b) How did the legumes manage to revive at the return of the rains?

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Item Two:

Adrian, a S.4 teenager in one of the urban schools has recently been diagnosed with osteoporosis by an orthopedic doctor. One day while seated in class, he heard a very loud sound of a tear gas canister from the scuffle between the police and a demonstrating mob in town. His heart pounded, eyes protruded and he sweated profusely. He stood out to go and hide, but in the event he fell down and fractured one of the bones in the legs.

Tasks

a) (i) Expound on the likely effects of the condition diagnosed by the Orthopedic Doctor on Adrian's life.

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(ii) How did Adrian's body coordinate to bring about his reactions after the loud sound of the tear gas canister?

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b) Show Adrian how he can manage the condition diagnosed by the doctor.

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Item 3

David got married to Joan and they produced a son. Their son, when injured, bleeds a lot even with a slight cut on the skin and this causes a lot of distress in the family.

When Joan got pregnant for the second time, David advised her to abort on the belief that they would get a child with similar condition as that of their first born son. However, when David and Joan went to the hospital concerning their son's condition, they were told that the condition was a result of Joan being a carrier of a bleeder's disease.

Task:

(a) (i) Explain why Joan should not take David's advice

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(ii) Show how their son inherited the condition.

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(b) What should Joan and David do to manage the challenges associated with the condition of their son

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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 4:

In order to promote tourism in Murchison fall National, the Uganda Wild life Authority decided to increase on the number of lions, and these were transferred from Queen Elizabeth National park to the area. The Lions population in Murchison falls National Park grew bigger and flourished. However after some time the park increasingly became bushy. The game wardens decided to use fire to control the bushes. During periods of burning, thick smoke covered the atmosphere for the greater part of the day.

The National wild life body made the following observations after some time;

- Many wild animals were diagnosed with respiratory diseases and some died
- The lions population later on dwindled
- The area became hotter than before
- Many other life forms that attracted tourists to the area disappeared

Task:

- (a) Relate the observations made in the park to the actions of the National wildlife body and the game wardens in Murchison falls National Park.
- (b) Suggest why such environments should be conserved.

Item 5

Mr. Mukasa cleared a forest along the slopes of a hill that had fertile soils to extend his farm for growing maize. For several years of growing maize on his farm, he applies artificial fertilizers and uses herbicides for weeding the maize farm. After harvesting, he burns down the garden to clear it for next season before ploughing using tractors.

Task

- (a) Explain the dangers of Mr. Mukasa's farming practices to the environment.
- (b) How can the environment be sustainably utilized by Mr. Mukasa without much damage?

PART II

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

Item 6

Mr. Ssegawa went for a medical examination after suffering from unknown ailments and was diagnosed with multiple organ failure. Below is an extract of the medical report from the health facility.

Kairos Internation Medical Centre	
Organ examination Report For:	
Client: Mr. Ssegawa	
Organ examined	Description of organ status
Liver and pancreas	➤ Malfunctioning islets of Langerhans and hepatocytes
kidneys	➤ Faulty loop of henle of the nephrones
lungs	➤ Blocked air ways and coated alveoli
Alimentary canal	➤ Ulcers in the small intestines, no villi and micro-villi seen

Task:

- (a) Explain to Mr. Ssegawa how the status of his body organs as described can result to poor body functioning and ill health.
- (b) Show how Mr. Ssegawa can manage the conditions observed in the following body organs
 - (i) Liver and pancreas
 - (ii) Alimentary canal

Item 7

A long serving public servant lives a sedentary lifestyle characterized by smoking, sitting in office for long hours and eating a lot of fatty foods. In the long run, he has developed swollen feet, coughs blood and has been diagnosed with cardio-vascular disease and poor oxygen loading by his red blood cells.

Task

- (a) Justify the poor health observed in the public servant In relation to his lifestyle.
- (b) Advice the public servant of how to improve his health

END