

Candidate's Name:

Signature:

Random No.					Personal No.		

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

553/1
BIOLOGY
Paper 1
2024
2½ hours



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY

Paper 1
Theory

2 hours 30 minutes

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; **I** and **II**. Answer **one** item from each part.*

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

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

SECTION A

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

Item 1.

Mr. Nsamba's cassava garden was invaded by the neighbour's goats at the time of tuber formation. The owner of the goats has refused to compensate Mr. Nsamba, and Mr. Nsamba is worried that the yields will be poor.



Fig. 1 shows Mr. Nsamba in his garden which was invaded by the neighbour's goats.

Task

- (a) Identify the plant structures affected by the goats.

- (b) Explain how the goats affected the processes in the cassava plants.

- (c) Why should Mr. Nsamba be compensated even if the cassava plants were able to grow again?

Item 2.

John was suspended from school as a result of drinking alcohol. He engages in heavy drinking of alcohol in the nearby trading centre. One day, as John approached a swamp on his way home staggering from drinking alcohol at 6:00 pm, he encountered a snake. His heart started beating faster and his breathing rate increased. He tried to pick a nearby stick but he could not get hold of it on several attempts, so the snake escaped.



Fig. 2 shows John walking home from drinking alcohol.

Task

- (a) Describe how John's body coordinated to bring about his reactions from the time he encountered the snake up to when his rate of breathing increased.

(b) What are the likely effects of John’s lifestyle as described in the scenario?

(c) Suggest ways in which John can change his lifestyle.

Item 3.

Mrs. Kasuru had been taking her baby boy for routine immunization and the nurses kept on plotting the baby's weight as a growth curve on the immunization card. On one of the visits, the nurses got concerned and referred the baby to the doctor, who diagnosed the baby with a genetic inherited disease. Mrs. Kasuru could not understand how her baby got the disease since both her and the father of the baby look healthy and normal. The doctor explained to her that the baby's condition was because of genetic disease.

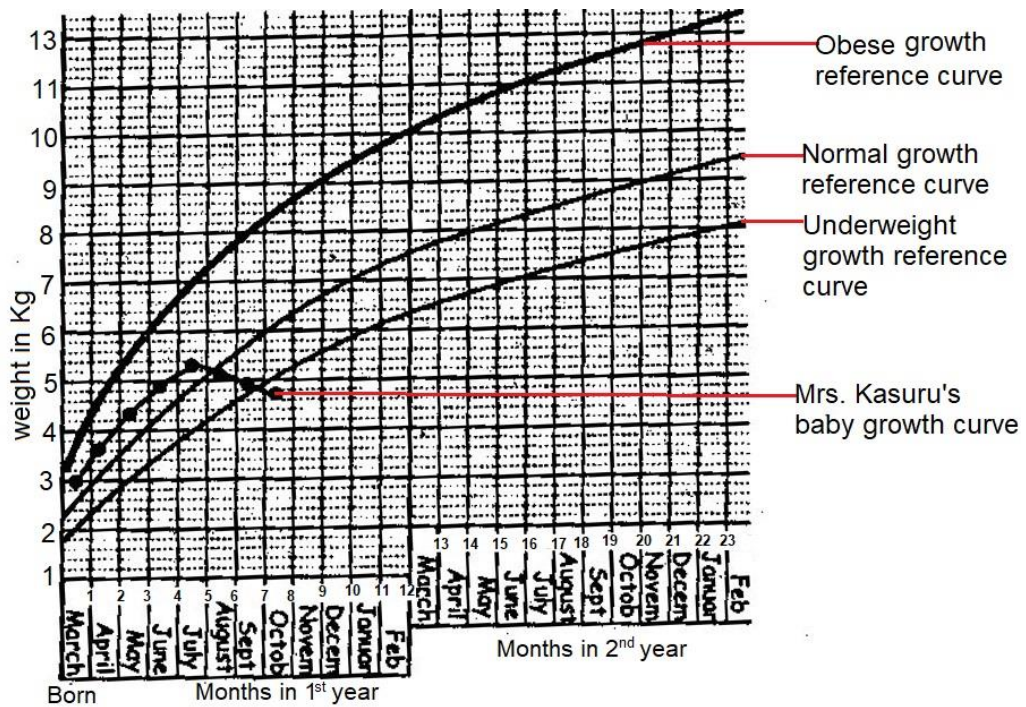


Fig. 3 shows growth curve of Mrs. Kasuru's baby.

Task

- (a) Identify the genetic disease and show how it was genetically passed on to the baby.

(b) Describe the likely appearance of Mrs. Kasuru's baby boy.

(c) Suggest how the family can manage their baby's condition.

SECTION B

Part I

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

Item 4.

In a village in western Uganda, swamps have been cleared for cattle farmlands and sand mining. The area environment officer organized a radio talk show on sustainable use of natural resources in swamps. Unfortunately, Mary a resident of the area only heard the concluding statement, "*From the presentation, I kindly request everybody to use our natural resources sustainably.*"

Task

Explain to Mary the environmental problems being addressed by the environment officer and how they can be solved. Explain why the village should conserve the natural resources in the swamps.

Item 5.

As a result of a civil war in one of the countries neighbouring Uganda, many people entered Uganda as refugees. The local authority decided to settle the refugees on a piece of land, part of which was covered by a forest reserve next to a swamp. Several challenges arose in the community.

Task

Explain to the community how the environmental challenges came about. Advise them on how to minimize effects of the challenges and show the value of conserving the environment in the area.

Part II

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

Item 6.

Two Ugandan Towns **A** and **B** each have industries that release carbon dioxide gas, smoke and dust. The levels of air pollution in the two towns are as shown in table 1.

Table 1: levels of air pollution in two towns **A** and **B**.

Town	Level of air pollution (units)
A	30
B	70

(According to **American Lung Association**, 2023, the normal range of air pollution is 0 – 50 units).

Samuel was living in town **A**. He used to jog everyday, and would experience normal changes in his body during and after jogging.

When he shifted to town **B**, he continued with his usual routine of jogging. However, he started experiencing complications such as difficulty in breathing, chest pain and coughing.

Task

Explain to Samuel his experiences while living in town **A** and the new ones encountered in town **B**. Advise Samuel on how to manage the challenges experienced in town **B**.

Item 7.

In preparation for an inter-house competition, Chesang, a 40 kg female athlete ate a meal containing 470 g of carbohydrates in the morning. She believes the meal will help her perform better during the competition. However, her young brother does not seem to understand how the meal will contribute to Chesang's success.

Chesang finally won the competition but experienced muscle cramps. She rested for 20 minutes, returned home walking but the brother wondered how she still had the strength to walk home after the competition.

[The recommended daily carbohydrate intake of a 40 kg female athlete is (280 – 480 g)]

Task

Explain to Chesang's brother the processes that the meal she ate went through to enable her win the race, be able to come back home and how her body regained the normal state.