

Candidate's Name: .....

Signature.....Index No.....

553/1

Biology

Paper 1

JULY, 2025

2½ hours



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.

Item No	For Scorer's use			
	Basis code	Score	Scorer's initials	Total
Item 1	U <sub>2</sub>			
	A <sub>2</sub>			
Item 2	U <sub>4</sub>			
	A <sub>4</sub>			
Item 3	U <sub>5</sub>			
	A <sub>5</sub>			
Item 4/5	U <sub>1</sub>			
	A <sub>1</sub>			
Item 6/7	U <sub>3</sub>			
	A <sub>3</sub>			

**SECTION A**

*Answer all questions in this section in the spaces provided*

**Item 1**

Musa is an agricultural officer and a farmer in Maddu village. He has a large garden which has numerous mango trees. Last season he planted beans in the whole garden even under the trees. He observed the following differences in the structural features of plants in the open area and those under the trees.

*Table I shows structural features of plants*

Plants in open area	Big in size with many flowers
Plants under mango trees	Small in size with few flowers

He attributed these structural differences to variations in the amounts of light received by the plants. Later some plants under mango trees developed long internodes, broad leaves which were thin and managed to give some few yields. However, Musa got higher yields from the plants in the open area than those under the mango trees.

**Task:**

- a) Identify the plant processes that were affected by the condition experienced by plants under the trees.

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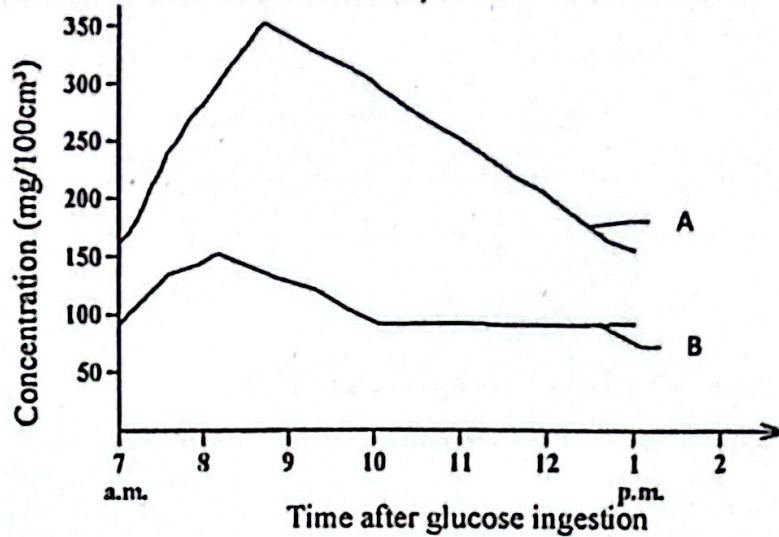
- b) Explain how the condition experienced by plants under the trees affected each of the above plant processes leading to low yields.

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Study figure 1 below and use the information to respond to tasks that follow.



**Task:**

a) Identify the individual who is;

(i) Diabetic

.....  
 .....

(ii) Normal

.....  
 .....

b) Describe how the body of individual B coordinated to bring about the response;

i) in blood glucose levels between 8:10 and 10:00am

.....  
 .....

ii) that protected his foot from much injury of body tissues.

.....  
 .....





## SECTION B

### Part 1

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

#### Item 4.

In a village in western Uganda, swamps have been cleared for sand mining and timber cutting activities by the local community. This has resulted into reduced biodiversity, flooding, high prevalence of malaria, poor water quality, hot and dry conditions in the village.

#### Task:

- a) Explain how the activities of the local community have resulted into the challenges being experienced.
- b) Show the benefits of conserving such an ecosystem.

#### Item 5

An Environmental quality report was published highlighting the conditions at a certain landing site on a fresh water lake. Below are some of the activities highlighted in the report:

- The local community wash clothes using detergents containing phosphates and they later dump the water to the lake.
- Cut down trees surrounding the lake
- The surrounding swamp has been taken over by real estate dealers and have raised residential houses.
- The small nets used extract several other small organisms from the lake other than fish.
- Fish mongers extract fish from the lake day and night all year round.

The above challenges are believed to have caused a decrease in the number of fish extracted from the lake.

#### Task:

- (a) Explain how each of the highlighted activity has affected the lake ecosystem leading to a decrease in the number of fish extracted from the lake.
- (b) Suggest why it is important to conserve the ecosystem on which the report was made.

### Part 11

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

#### ITEM 6

Musa a resident of Kamwokya village recently experienced the following the following symptoms; swollen feet, passes out bloody urine and frequent fatigue. When he went to the hospital, examinations were conducted and later the doctor reported that he has a body mass index (BMI) of 32 and had developed kidney failure.

**BMI** is the mass of an individual in kg divided by the height in metres squared ( $BMI = m/h^2$ )

*Table II shows BMI classification.*

BMI range	Classification
Less than 18.5	Underweight
18.5-24.5	Normal
25-29.5	Overweight
Above 30	Obese

**Task:**

- Show how the above symptoms Musa is experiencing have been brought about.
- Explain the likely effects of Musa's BMI on his normal body functioning.
- Advise Musa on how he can manage his health challenges.

**ITEM 7**

Collin is a volleyballer and he smokes cigarettes. Recently he has started facing challenges of shortness of breath and frequent muscle cramps during the game, which has lowered his performance during the game.

One time John a S.3 biology student told Collin that during exercise the body cells produce carbon dioxide and its amounts in blood rises, then immediately the body reacts by increasing the rate and depth of breathing so as to remove the excess carbondioxide.

**Task:**

- Describe how the body's reaction John told Collins is brought about.
- Explain the ways Collin's habit has led to shortness of breath during exercise.
- With a reason in each case, suggest ways Collin should manage the challenges he is facing to become a better performing player.

**END**