Candidate's Name: .....

Signature: .....

Random No.						Personal No.		

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

For Scorers' Use Only		
Total weighted Score		
Initials		

553/2
BIOLOGY
Paper one
Jul./Aug, 2026
2 hours

ALLIANCE JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY

2 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **two** examination items.*

*Respond to **both** items in the spaces provided.*

*Drawings should be made in the spaces provided. Use a **sharp pencil** for your drawings. Coloured pencils or crayons should **not** be used.*

***No additional sheets** of writing paper are to be inserted in this booklet.*

*Work on additional sheets of paper will **not be scored**.*

For Scorer's Use only

Item No.	Basic code	Weighted Score	Scorer's Initials
1	A_1		
	H_1		
	V_1		
	AP_1		
	P_1		
	D_1		
	DP_1		
	C_1		
	IR_1		
2	I_2		
	S_2		
	D_2		
Total Weighted Score:			

allianceexaminationsboard@gmail.com

TURN OVER

Item one

A local youth cooperative in Kasese has started a small-scale factory to produce clear passion fruit juice for export. During processing, the extracted juice is thick, cloudy, and has a slimy texture due to a plant substance called pectin.

To clear the juice and increase its yield, the cooperative uses a locally extracted enzyme called **Enzyme S**. However, the reaction in their mixing tanks is currently very slow, delaying production. A local agricultural officer advises them that the enzyme works best at a specific pH, and that adding a suitable pH medium could drastically speed up the clearing process.

Currently, the local market supplies three different cheap mineral salts that can alter pH, labelled as **Solutions W, X, and Y**. The cooperative needs to find out which solution creates the most suitable pH medium for Enzyme S to work efficiently.

Hint: *The faster the cloudy juice turns completely clear and forms a watery layer, the faster the rate of enzyme action.*

You are provided with:

- **Solution S:**
- **Liquid Q:**
- **Solutions W, X, and Y:** Media of different pH levels.

Task:

As a biology student, design and carry out a scientific investigation to determine which of the solutions **W, X, or Y** provides the most suitable pH medium for the breakdown of the cloudy substances in **Liquid Q** by **Enzyme S**. Write a report to give an appropriate recommendation to the youth cooperative.

a) Aim, variables, hypothesis and materials.
……
……
……
……
……
……
……
……
……
……

……
……
……
……
……
……
……
……
……
……
……
……
……
……
……

b) Procedures of the investigation.

……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……

……
……
……
……
……
……
……

c) Results, analysis and conclusion.

……
……
……
……
……
……
……
……
……
……
……
……
……
……

d) Explanation and recommendation.

……
……
……
……
……
……
……
……
……
……
……
……
……
……

Item 2

Ms. Babirye, a commercial farmer in Luwero district, recently established a large orange and mango orchard. However, over the last two harvesting seasons, she noticed that although her fruit trees produce plenty of flowers, very few of them develop into actual fruits, leading to heavy financial losses.

A visiting agricultural officer inspected the farm and observed that there are very few insects visiting the orchard. He advised Ms. Babirye that the low fruit yield is due to poor pollination. He suggested she introduce managed hives to the farm to help stimulate transfer pollen grains. To help her workers identify these beneficial insects and understand how they interact with the flowers, the officer collected samples of these specimens.

You are provided with one of these preserved insects, labelled as **Specimen K**, and a fresh insect-pollinated flower from the orchard, labelled as **Specimen F**.

Task:

As a Senior 4 biology student, use your knowledge of classification, insect anatomy, and plant reproduction to examine **Specimen K** and **Specimen F**. Write a detailed advisory report to help Ms. Babirye and her workers understand how the structure of the bee matches the structure of the flower to bring about successful pollination.

Your report must address the following:

a) State the Kingdom and Phylum to which **Specimen K** belongs, providing **two** observable features on the specimen's body to justify each group.

……
……
……
……
……
……
……
……
……
……
……
……
……
……

b) Carefully examine **Specimen K** (using a hand lens) and **Specimen F**. Explain how the structural features of the specimen K's body are adapted to collect pollen and nectar, and how the structural parts of the flower are adapted to ensure that the bee successfully transfers pollen grains from the anthers to the stigma.

……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……

c) Make a large, clear, and well-labeled drawing of **Specimen K** to show its main body parts (head, thorax, and abdomen) and highlight at least two specific structures used in flight or pollen gathering. State the magnification of your drawing.

END