

KAMSSA

SET TWO

KAMSSA PRE REGISTRATION EXAMINATIONS 2026

Uganda Advanced Certificate of Education

BIOLOGY

Paper 2 (Practical)

Time: 3 Hours

INSTRUCTIONS TO CANDIDATES

- *This paper consists of two examination items. Answer all items.*
- *Write all your answers in the spaces provided within this question paper booklet. Use sharp pencils for drawings. Coloured pencils or crayons should not be used.*
- *For any calculations, show all your workings clearly in the space provided.*
- *Silent, non-programmable scientific calculators may be used.*
- *No extra paper is allowed. Any work written on additional sheets will not be scored.*

ITEM 1

The Luma community members carry out commercial tomato farming. However, the plants are frequently attacked by small insects that damage the leaves and stems. The farmers use chemical B to eliminate the insects, but after some time, the plants begin to wilt and eventually die. This has led to reduced yields and economic losses, prompting the farmers to seek assistance from the Ministry of Agriculture.

A research team from the Ministry discovered that chemical B is a small, water-soluble molecule that is polar and easily passes through the beetroot cell membranes into the cytoplasm, where it disrupts normal cell activities leading to cell death after a few days. One farmer observed that when she mixes chemical B with solution X before spraying, the plants remain healthy and do not wilt. The agricultural team is considering recommending the combined use of solution X and chemical B, but they lack scientific evidence to support this observation.

You have been provided with fresh beetroot samples, chemical B, solution X, and a cork borer.

Task

Design and carry out an investigation on how solution X affects the cell membrane to prevent damage by chemical B and assess its potential use together with chemical B.

ITEM 2

Many rabbits in Lwengo parish take a long time to gain weight, which has frustrated many commercial farmers in the area. The farmers requested scientists to investigate and suggest ways of reducing the time taken for the rabbits to fatten.

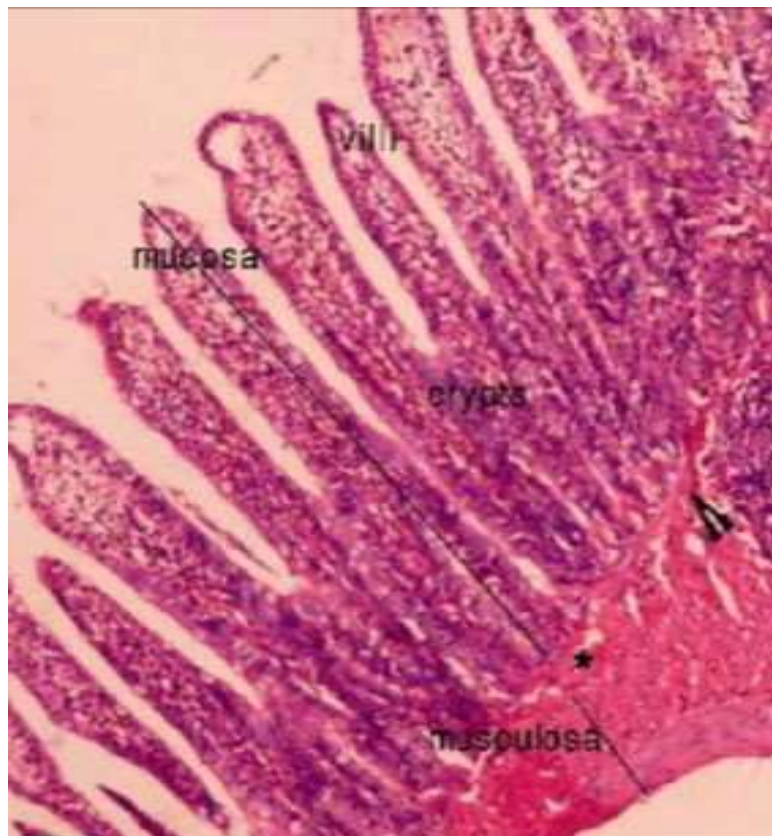
The scientists suspected that the problem was due to inefficient nutrient absorption and reduced efficiency of blood circulation. They developed a liquid supplement intended to improve the structure of digestive organs for better nutrient absorption in the ileum and enhance the efficiency of the heart. For ethical considerations, the supplement was first tested in laboratory rat months. Rat same age, sex, and health status and they were fed on oral supplement regularly

You have been provided with, a light microscope, a dissection kit, an image of the ileum of X observed under medium power of a light microscope, and measurements of the external sizes of its heart chambers.

Chamber	Measurement
Left atrium	2.0 mm
Left ventricle	5.5 mm
Right atrium	3.0 mm
Right ventricle	3.8 mm

Figure 1: Photomicrograph of the rat ileum villus structure of a rat group X, viewed under a medium-power objective lens ($\times 10$).

You are required to investigate the effect of the supplement on the histology of the ileum and the relative external sizes of the heart chambers.



Task

Design and carry out an investigation to evaluate the effectiveness of the supplement and advise the farmers on whether to adopt its use or not. Your design should include planning, methods of data collection, data presentation, analysis of results, and recommendation.

END