

ST. NOA MAWAGGALI SECONDARY SCHOOL

Uganda Advanced Certificate of Education

Mid Term II Assessment 2025

S.5 Biology

Time: 2 Hours

Instructions

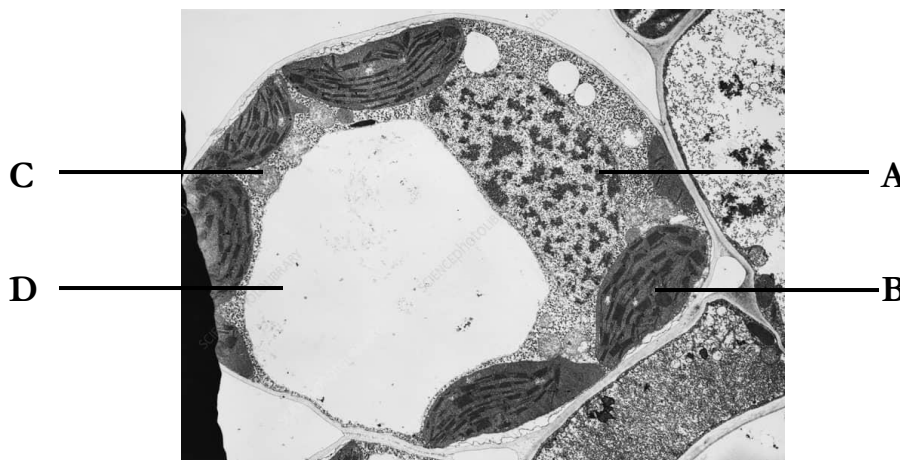
- *The paper has two sections A and B.*
- *Section A is compulsory.*
- *Attempt two items from section B.*

SECTION A

All items in this section are compulsory.

ITEM 1

A group of S.5 learners were studying specialized cells are modified to suit specific functions that enable plants to survive. They wanted to understand how tissues in the leaf ensure its efficient functioning. Their teacher gave them a slide to observe under a microscope. They observed cells similar to this in the figure below.



The micrographs of their observations were taken as follows.

Task

a) Name the following parts of the cell labelled with letter:

A _____

B _____

C _____

D _____

b) Giving a reason for your answer, identify the name of the cell under study.

c) Describe the differences between the structure of organelle B and D.

d) How are the above cells adapted to their function?

ITEM 2

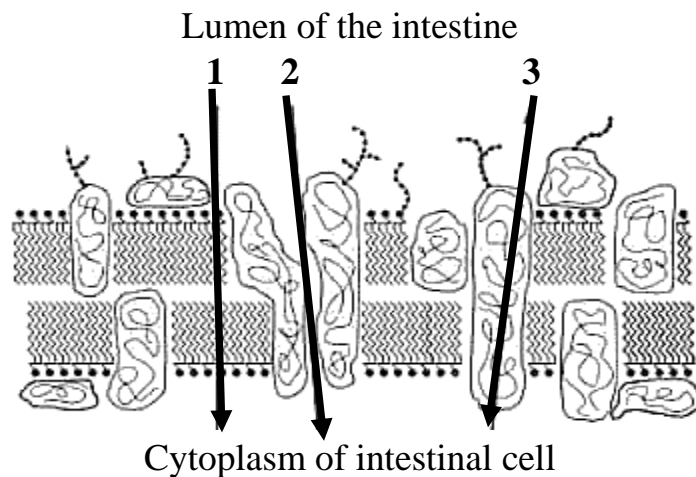
A biotechnology company produced an enzyme that breaks down its sewage containing cellulose and lignin materials. The enzyme mixture contains another substance Q and it is effective at the treatment of sewage when used at suitable temperature and pH of sewage. However, during the trials, it was observed that the presence of a certain substances P from a nearby chemical plant contaminated the sewage further impeding efficiency of the enzyme being manufactured. The results for rate of enzyme activity of their investigation were represented as shown on the graph below. The control shows the activity of the enzyme without any substance.

(ii) Describe what the factory should do to ensure that enzyme performs its work at similar conditions.

d) What would happen if the temperature and pH of sewage were allowed to fluctuate?

ITEM 3

A physiologist used radioactive isotopes to trace the movement of materials W, X and Y during the absorption in to cells of an intestinal lining. The radioactive tracers showed that all materials passed through the membrane though at different rates. Material Y moved very faster than the rest. However, when he introduced a respiratory poison, material X accumulated in the intestinal lumen. After his experiment, he represented the paths taken by the materials as 1, 2 and 3 through the cell membrane as shown the figure below.



Task

a) (i) Identify the path taken by the following materials

SECTION B

Attempt two (2) items from this section.

ITEM 4

Kyeyune likes potted plants but whenever he buys them, they wither and eventually die within a few days. In his last trial, he bought two plants A for outdoor pot and B for an indoor pot. He tightly tied the outdoor plant with a transparent polythene bag, without leaving any pore to prevent it from being browsed on by his domestic animals. Kyeyune's room has wooden windows and doors and he usually shuts it down whenever he goes to school in the morning, it stays shut until evening hours. His friend advised him to purchase shady plant species so as to manage this challenge for the indoor plants. On coming back, he also found the plant withered.



Task

- Identify what caused the changes in plants A and B that lead to the death of the plants.
- Explain the advice you would give to Kyeyune so as to solve his challenge, to enable the plants to make food and survive.
- Which features do shady plants have that can enable Kyeyune benefit from the lifestyle he wants?
- Why is it important to grow plants within our daily habitats?

ITEM 5

After long period of practicing anorexia nervosa, Charity started severely losing weight. She explained that she feels stomachache whenever she ingests food, then eventually develops diarrhea. When she went to the health Centre, she was diagnosed with severe stomach ulcers. The doctor informed her as she was lucky that the ulcers had not reached the intestines, although they had infected up to the inner layers of the stomach. She was prescribed with ulcer medication and advised to stop her nutritional life style but instead feed on a balanced diet. She was later observed gaining weight after a short period of following the advice and proper use of medication.

Task

- Identify the possible tissues that were affected by the ulcers in Charity's stomach.
- Explain how the damage of the above tissues resulted in to her symptoms.
- How did the tissues in the intestines enable her body to utilize the balanced diet she fed on in order to restore her weight?
- Apart from advice she was provided by the doctors, which other ways can she prevent the development of ulcers again.

ITEM 6

Kenneth bought land with water streams on one side. Whenever it rained, he observed many mud fish playing in water, as well as being attacked by many mosquitoes. He was told that mudfish feed on algae, aquatic plants, small fish algae and crustaceans, from which it obtains proteins and lipids. To curb mosquito bites, Kenneth poured oil on the streams. This caused majority of the organisms to disappear during that season. During dry seasons when water had reduced and the ground was relatively warm, Kenneth saw only a few mud fish in the streams.



Task

- State how the mudfish uses the diet it obtains from its habitat to ensure normal body functioning and survival.
- Using examples from the scenario, explain the various properties of water that enable it to be a suitable habitat for organisms.
- Describe how the oil interacted with the water in the streams in Kenneth's attempt to eradicate mosquito bites.
- Identify suitable strategies Kenneth could use to prevent mosquito bites without contaminating the water streams.

END