NAKATEETE SECONDARY SCHOOL

END OF TERM 1 2025 EXAMINATIONS

SENIOR FIVE

BIOLOGY PAPER 1

P530/1

Time: 1hour 30minutes

Attempt both items

Item 1:

During a school science fair on Visitation Day, students from three different groups presented microscopic images of cells they have studied under the electron microscope. The first group showed a cell with chloroplasts, a large central vacuole, and a cellulose cell wall. The second group displayed a cell with a nucleus and many small vesicles but no cell wall or chloroplasts. The third group presented a much smaller cell with no visible nucleus but with a cell wall made of peptidoglycan and small circular DNA floating freely in the cytoplasm.

Using your knowledge of cell ultrastructure, respond to the following tasks :

(a) Identify the type of cell each group observed and give reasons for your answers.
(b) Compare and contrast the internal structures of the cells presented by the first and third groups.
(c) Explain how the differences in cell ultrastructure relate to the functions of plant, animal, and bacterial cells.
(d) Suggest a staining technique or tool that could be used to enhance the visibility of internal cell structures for each cell type.
(e) In what ways does the fluid mosaic structure of the cell membrane benefit cells in:

i)communication

ii)transport

iii)recognition of substances

Item 2.

In Kyotera District, a group of students from Greater Masaka Teachers' Association schools participated in a community outreach program on sustainable farming. During their visit to a model farm, they observed that several banana plants had weak stems and drooping leaves. At the same time, some goats on the farm had poorly healing wounds and appeared unusually tired and inactive.

The farm owner explained that he uses natural methods to grow crops and rear animals, but he has limited knowledge of plant and animal tissue systems. He asked the students to help him understand why the plants and animals might be unhealthy, based on their biological structure and function.

Task

(a) (i) Identify the types of plant tissues that could be responsible for the weak stems and poor leaf support in the banana plants.

(ii) Explain how the structure and function of each identified tissue contribute to the normal growth and support of a plant.

(b) (i) Identify two types of animal tissues that may be affected in goats with poor wound healing and fatigue.

(ii) Describe the role of each tissue in maintaining the health and function of the body.

(iii) Recommend a dietary or veterinary intervention to help restore the affected tissues and improve animal health.

END