NAME……..

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BIOLOGY
Paper 1
(Theory)
Aug. 2026
1½ hours

REGINA PACIS HIGH SCHOOL – MUKONO
Uganda Certificate of Education
S.2 BIOLOGY
PAPER 1
(Theory)
1½ hours

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of **three** examination items. Respond to **all** items.*
- *Answers to **item 1** and **2** should be written in the spaces provided whereas answers to **item 3** should be written on the answer sheet provided.*

Item 1

Farmers in Kiryandongo village experienced a season of poor crop performance, where their crops showed yellowing of the leaves, stunted growth, and frequent wilting during hot afternoons since there was inadequate rainfall.

However, as the season progressed, some crops surprisingly managed to survive. These developed deeper roots systems, some showed increased root branching, while the others had smaller or rolled leaves. Few plants also had thicker stems and maintained turgidity even during the hottest times of the day. Eventually, some reasonable yields were produced at the end of the season.

The community is interested in the understanding how these plants managed to survive under such conditions to produce reasonable yields.

TASK

(a) Explain the cause of the observations earlier in the season leading to the poor crop performance.

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(b)Explain how the observed adaptations in some crops contributed to their survival and some yields at the end of the season.

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Item 2

Ms. Nakagwa, a farmer in Kasongo village, has been growing maize continuously on a sloping piece of land for the past three years without applying fertilizers or practicing soil conservation methods. In the fourth year, she observed a significant decline in her maize yields and decided to consult a soil scientist.

The soil scientist collected a soil sample from her garden together with Nakagwa's son, an S.4 student, and took it to the village laboratory to determine its composition.

In the laboratory, the following procedure was carried out:

- The mass of an empty crucible was **15.0 g**.
- Soil was added and the total mass recorded as **25.0 g**.
- The sample was heated in an oven at **105°C** and then cooled. The **loss in mass was 2.8 g**.
- The sample was then heated strongly (to red-hot), cooled, and reweighed as **5.5g**.

Due to other urgent duties, the soil scientist asked Nakagwa's son to complete the analysis and interpret the results.

Task

a) Determine the percentage composition of the soil components in the sample.

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b) Advise Ms. Nakagwa on sustainable methods she can use to improve maize yields in the coming seasons without damaging the ecosystem.

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Item 3

Bahati, a senior two candidate, had won a gold medal in the previous year's inter-house athletics competition during the school sports day. However, due to the pressure of preparing for her final examinations, she had not been training regularly. A day before the current year's competition, she attempted to train but felt general body weakness, which made her worried about her performance. She visited the school nurse, who examined her and found no illness, and advised her to eat properly before participating in the race. On the day of the competition, Bahati ate chapatti and two slices of bread accompanied by hot water, then rested for an hour before the race. She participated in the race, she felt weak, had muscle pain, very sweaty and thirsty, she failed to win the race. After the race, she experienced deep breathing, increased heart rate, she lay down to rest, took a glass of juice and glucose and she felt better after a while.

Task

(a) Explain how the food Bahati ate would be processed to enable her win.

(b) How do carbohydrates, proteins and lipids important to the athlete.

END