Students Name: .....

School Name..... Index Number .....

553/1
BIOLOGY
Paper 1
(Theory)
July/Aug.2025
$2\frac{1}{2}$ hours

HES MOCK EXAMINATIONS 2025

UGANDA CERTIFICATE OF EDUCATION

BIOLOGY

PAPER 1
(THEORY)

2HOURS 30 MINUTES

INSTRUCTIONS

- *This paper consists of two sections; **A** and **B**. It has **seven** examination items.*
- *Section A has **three compulsory items**.*
- *Section B has two parts, **Part I** and **II.** Answer **one item** from each part.*
- *In total, attempt **five** items. **Any additional items**(s) answered will not be marked.*
- ***Responses** to items in section **A must** be written in spaces provided while answers to section **B** be written in the answer booklet(s) provided.*

SECTION A

*Answer **all** the items in this section in the spaces provided.*

Item 1.

Mr. Mugisha owns a small passion fruit farm in Wakiso. Last season, during the flowering stage of his crops, he noticed some yellowing of leaves and pest attacks. He sprayed a mixture of a given broad-spectrum insecticide and foliar fertilizers to his crops to improve crop growth. To his surprise, most of the flowers simply withered and dropped off without forming fruits and those that did form were small and underdeveloped. He also noticed a decline in number of bees and butterfly around his passion fruits. He is however worried of the big loss this season.

Task

(a) Describe the processes involved in the formation of the small fruits in passion fruit plants from the time he observed few bees and butterfly around his plants.

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(b) Explain how his farming practice affected the processes described in (a) above.

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(c) Explain how the passion fruit plants managed to bare some fruits even after the challenges faced.

Item 2

Peter, a 16-year old student, has recently fallen under peer influence, leading him to regularly consume alcohol and occasionally smoke cigarette. One Saturday evening, after a heavy alcohol drinking, Peter was walking unsteadily along a dimly lit, busy road and suddenly a heavy truck passing by got a loud tyre burst directly besides him. Peter got scared, felt his heart rate surge, and his breathing became rapid and shallow. He however managed to run away up to home despite struggling to maintain balance.

Task

(a) Explain how Peter's body coordinated from the time of the loud tyre burst until he reached home.

(b) Describe the likely challenges to be faced by Peter if he never revises his life style.

(c) Explain how Peter can overcome the challenges likely to be associated with his life style.

Item 3

Mr. Okello is a maize farmer in Luwero district. He consistently faces significant challenges due to a common fungal disease that severely affects his local maize variety, leading to yield loss and impacting his income. He recently learned from an agricultural expert that disease resistance is a dominant trait in maize over disease susceptibility trait. He managed to acquire some seeds from a special maize plant that is pure bred for diseases resistance and he has a dream of having disease resistant plants in his garden but he is not certain of how to achieve it.

Task

(a) Explain to Mr. Okello how he can achieve his dream of having disease resistant maize plants in the second generation offsprings. ***(Use correct genetic symbols to show how he can achieve it.)***

(b) Describe the significance of cultivating disease-resistant maize to Mr. Okello's farm and the local community.

(c) Explain how Mr. Okello can ensure that maintenance of the disease resistant maize plants every season.

SECTION B

PART I

*Attempt only **ONE** item from this part. Answers should be written in the answer booklet (s) provided.*

Item 4

Lake Kyoga, a vital fresh water body in Uganda is surrounded by a diverse ecosystem. Over the past decade, a cluster of new chemical industries including a textile dyeing factory, a pesticide manufacturing plant and a fertilizer production unit have been established along its shores and the banks of its feeder rivers. They offer jobs to native people however; recent observations and community reports raised an alarm, which called for a research by environmental activists. The research reported listed the following findings and the research team recommended for an immediate action.

- Fisher men complained of declined fish catches.
- Increased cases cholera and respiratory infections among people staying new the shores
- The surface of the waters became green and water is discolored.
- Increased environmental temperatures in the locality.

Task:

Explain;

(a) The cause of the different environmental and health challenges faced in the community near Lake Kyoga and how they can be overcome.

(b) Why the community should keep Lake Kyoga in its undisturbed state.

Item 5

In the past decades, Masaka city was surrounded by several forest reserves and swamps. Due to increasing population, people cleared away these ecosystems for settlement, agriculture and industrial set-up. Several environmental and health challenges are continuously being faced in the area and due to the worsening claims, the National Environment Management Authority (NEMA) has urged and warned the people in the most affected areas to leave these places. The people are however resistant and ready to rebel due to NEMA's directive.

Task:

Explain;

(a) How the different human activities have resulted into the environmental and health problems in experienced in masaka city.

(b) The possible mitigations to overcome the problems and advise the community why they should leave the forest reserves and wetlands in masaka city in their undisturbed state.

PART II

Attempt only **ONE** number from this part. Answers are to be written on the answer sheet.

Item 6

At 11 months of Joan weaned her son Akiki. She frequently fed the son on porridge and cassava due to her low earnings. After two months, Joan noticed some concerning changes in her son which included slowed weight gain, distended belly, thinner arms and legs, sparse and pale hair and the child frequently fallen sick. Due to worsening health conditions, Joan took the son to the nearby hospital but the physician advised her to improve the child's diet by including more fish, and eggs. After four weeks, the child had improved greatly and had normal growth, which made the mother surprised about the physician's advice.

Task:

Explain;

(a) Why the child experienced the above symptoms after the two months since weaning began and later improved greatly after the physician's advice.

(b) The processes through which the foods recommended by the physician underwent to greatly improve Akiki's health condition.

Item 7

Mr. Opio is a 45 year old farmer in central Uganda. He began noticing persistent swelling in the feet, especially in the evening. He also felt tired, had repeated infections, and his wounds from small cuts took longer to heal and was finding it hard to move long distances. After medical analysis in a given clinic, the doctor found out that the swelling was not due to injury or infection but seemed to be caused by a buildup of fluid under the skin. When he was referred to the hospital, the results indicated poor lymphatic circulation, which led to swelling and observed symptoms.

Task

(a) Identify the affected system and explain how the swelling in his legs developed.

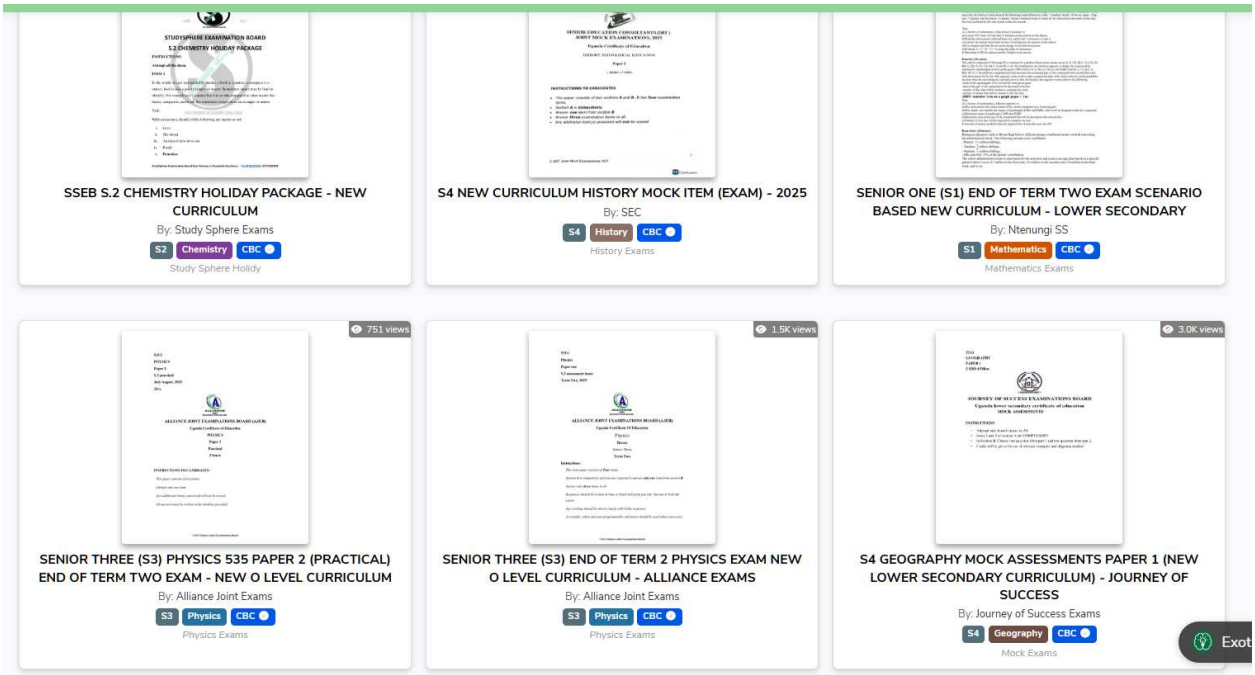
(b) Describe how;

(i) The fluid should flow from the legs throughout the body.

(ii) The effect of the system resulted into other symptoms besides swelling of the feet and how he can overcome the symptoms.

END

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