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553/1

BIOLOGY

Paper 1

July/August 2024

2½ hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

Uganda Certificate of Education

BIOLOGY

Paper 1

Theory

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **seven** examination items. It has two sections; **A** and **B**.

Section **A** has **three** compulsory items.

Section **B** has two Parts; **I** and **II**. Answer **one** item from each part.

Answer **five** items in all.

Any additional item(s) answered will not be scored.

SECTION A

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

Item 1

Many farmers in Uganda have resorted to coffee growing because of the high market demand worldwide. Farmers in an association called operation wealth creation obtained colonial coffee seeds and germinated them in 3 different plots A, B and C where they were to be grown. Unfortunately in nursery bed A, few seeds germinated, became yellowish and finally wilted.

In plot B, some seeds germinated but after few weeks, they had slender stems and wrinkled pale-yellow leaves. In plot C seeds germinated and were very healthy. This called for concern amongst all group members. One of the members obtained a soil sample from each of the 3 plots of land labelled A, B and C and took them to Kawanda research center where each soil sample was heated in an oven at about 105°C and a table of results was drawn as shown below.

Soil sample	Weight of the crucible in g	Weight of crucible + fresh soil in g	Weight of crucible + heated soil at 105°C in g	Change in mass
A	50	250	240	?
B	50	250	220	?
C	50	250	200	?

Task

- a) i) Which component was being investigated?

water was

- ii) Determine the percentage composition of the component for each soil sample

$$\frac{250 - 50}{250} = 200 \quad \frac{240 - 50}{250} = 190 \quad \frac{200 - 50}{250} = 150$$
$$\frac{190}{250} \times 100\% = 76\% \quad \frac{150}{250} \times 100\% = 60\%$$

for soil sample A is 5%

$$250 - 50 = 200 \quad 220 - 50 = 170 \quad \frac{200 - 170}{200} \times 100\% = 15\%$$

For soil sample B is 15%

$$250 - 50 = 200 \quad 200 - 50 = 150 \quad \frac{200 - 150}{200} \times 100\% = 25\%$$

The soil sample for C is 25%

- iii) Give the importance of the above soil component which was being investigated to plants.

Water is one of the raw material in the production of starch and plants make their own food called starch in the process called Photosynthesis.

Water acts as a material in the transpiration process where by transpiration ~~is~~ the process by which green plants lose their excessive water in the atmosphere.

- (b) Due to higher temperatures the remaining coffee plants wilted which raised the worries of farmers

- (i) Outline the processes by which water moved from the soil to plants until when it was lost to the atmosphere to cause wilting

The roots of the plants absorb water and mineral salts they move by the process called osmosis where by osmosis is the ~~process by which~~ movement of water molecules from the region of high concentration to the region of low concentration through the semipermeable membrane after that it goes to the leaves where ^{manufacture of} food called starch and transpiration take place and that is where water is lost from to the atmosphere.

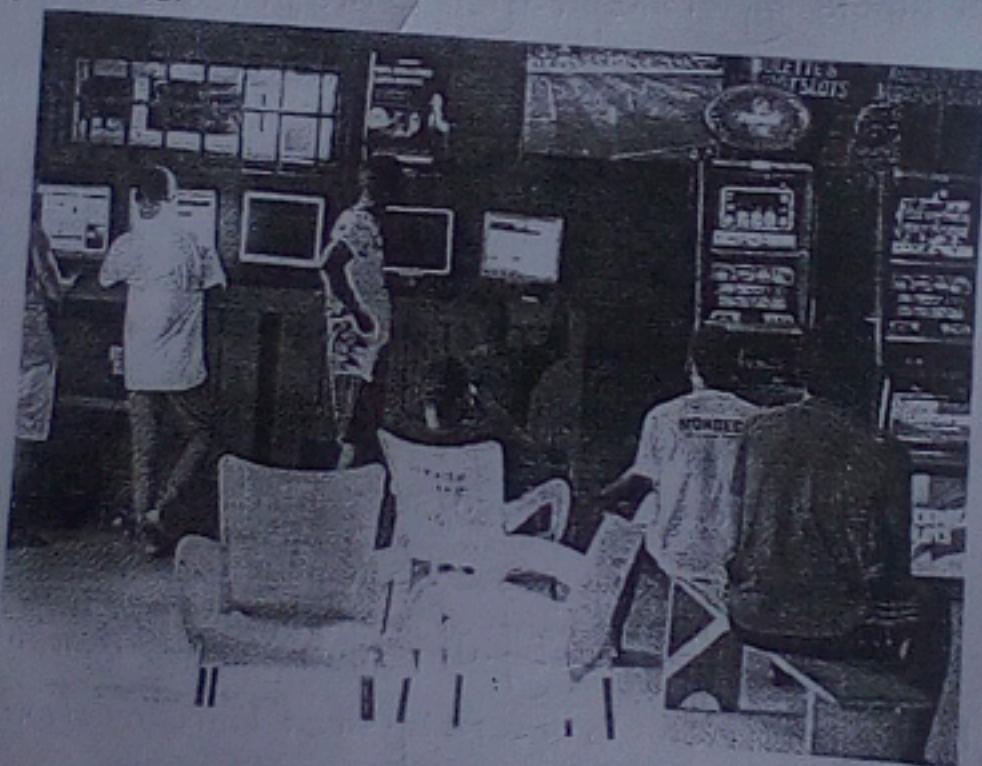
- (c) Farmers thought of watering their plants to avoid wilting of their plants so they went to a nearby sea and collected water which they poured onto their plants for three days consecutively, unfortunately all plants dried up and they made total loss

Explain why watered plants dried to death.

A

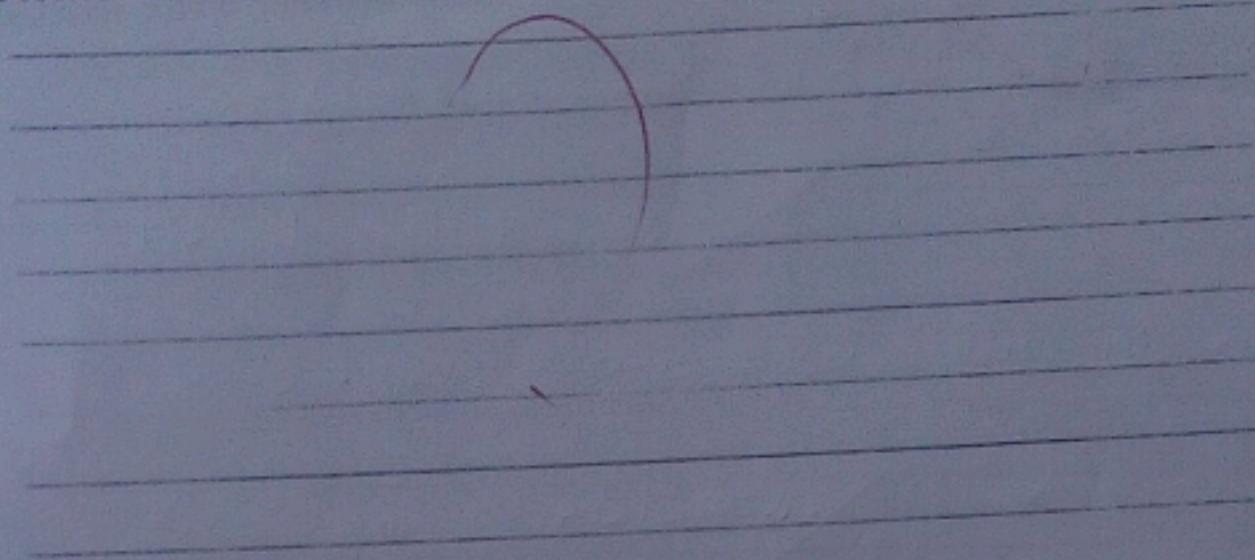
Item 2

Many youths today have failed to work but want to earn money very easily. Okoth a 16 year old boy, and a delinquent went to one of the betting company in his town and used his 200000/= school fees as a stake on Man City expecting to double his money. He was standing 10 meters away from the screen: when he heard people celebrating, he tried to look at the screen but was seeing blurred images. He moved closer and saw that Arsenal had scored. His heart immediately began beating rapidly and he began trembling. One of his friends gave him a cigarette to reduce the tension. Because of much noise in the place, the police arrived and people started running for safety. Okoth ran for only about 3m and got a muscle cramp and was finally arrested.

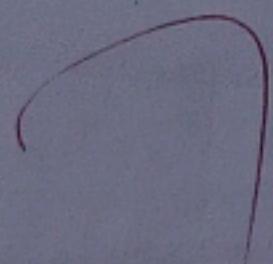


Task

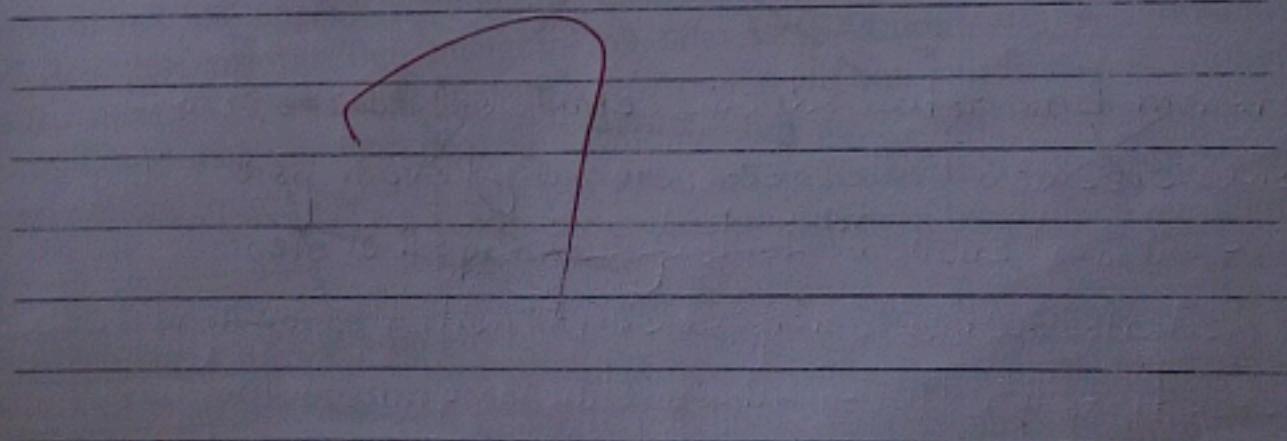
(a) (i) Describe how the blurred images were formed in Okoth's eyes.



(ii) With the aid of a diagram, describe how this eye defect can be corrected.



(b) Describe how Okoth's body coordinated to bring about the trembling.



- (c) What are the likely effects of Okoth's life style basing on the scenario?

- (d) What are the likely causes of muscle cramps in Okoth's body and how can they be controlled?

Item 3

Sama Monday, a college student, has multiple partners. Two days after menstruation, she had intercourse with Atwiine Brian. Later on the 13th and 14th days of her cycle, she had intercourse with Mukundane Reagan and Kizito Joseph respectively. A few months later, she got pregnant and unfortunately, all boys denied the responsibility and the matter was reported to the police. Forensic officers took blood samples from Sama and from the three men to obtain their blood groups. Amniocentesis was carried out on the fetus to obtain its blood group, and the results obtained were tabulated as shown below.

Name	
Sama Monday	A (heterozygous)
Atwiine Brian	B (heterozygous)
Mukundane Reagan	AB
Kizito Joseph	B(heterozygous)

Task

- (a) Help the forensic officers to establish the responsible father to Sama's baby.

- (b) Give the risky factors which Sama is likely to face.

She is likely to state vomiting.

SECTION B

Part I

Answer one item from this part. Answers are to be written on answer booklet(s) provided.

Item 4

Logoro Abubaker, a native of Kwen village in Apac district fled his home after being attacked by LRA rebels who killed his neighbors. He left his Bungalow house which he had constructed near his jackfruit and mango garden. Ten years after the war, he came back and found that garden was in a good state with healthy fruits and leaves but the house had developed cracks from the foundation.

Task

As a Biology learner, explain to Logoro why the fruits were in a food condition and his house had developed cracks in the foundation.

Item 5

Luyimbazi planted his maize crop near a maize milling machine and a palm processing industry around the shores of Namatale Bwemba Island. However his plants produced low yields and exhibited signs of stunted growth. In addition dead fish of some species began to float before the known thermal inversion of November to December which brings about fish deaths. Some people are also complaining about respiratory ailments since the start of the factory. Village members are getting worried about these observations.

Task

Explain to the village members the causes of all problems they are facing. How can the people of Namatale overcome the challenges being faced?

Part II

Answer one item from this part. Answers are to be written on answer booklet(s) provided.

Item 6

In Kansesero landing site the many people because of their life styles have been found with **HIV/AIDS**. The government of Uganda is worried of these people. In addition to that, there has been the outbreak of **corona virus** and **Ebora** which has increased on the death rate of the people in this region.

The health workers are working so hard to curb down the situation, however they have asked you to help them out.

Task

Design a poster showing the signs and symptoms, mechanism of spread and control measures for the above diseases.

Item 7

Pepper Tahiti has been experiencing frequent thirst and frequent urination of colourless urine. She learnt living with the condition by constant rehydration and doing routine exercises like jogging. One morning when she was jogging she was knocked down by a boda-boda and experienced serious bleeding on her left hand. She was rushed to a nearby health facility. When in the hospital she realized that she didn't frequently urinate despite taking much water. When she unveiled her symptoms to the doctor, she was informed that she had kidney failure.

Task

Explain the causes of the symptoms Pepper has and her observation at the health facility.

END