

BUDDO SECONDARY SCHOOL

ORDINARY LEVEL BIOLOGY SEMINAR 2024

553/1 BIOLOGY PAPER 1

Biology paper 1 consists of 7 examination items. It has two sections; A and B.

SECTION A

Section A has three compulsory items.

ITEM 1 SAMPLE QUESTIONS

- 1.1** Peter discovered strange moth species in his maize garden which was just beginning to flower. He observed that the moths were laying eggs inside the enclosed flowers and beneath the leaves. The larvae of these moths were found to feed on many parts of the plants, including boring through the stem. Peter was advised to consider changing crops grown, nonetheless, his maize managed to give some yields.

Task

- Identify the plant structures affected by the moths in Peter's garden
(03 scores)
- How did the activities of the moths affect the normal functioning of peter's maize?
(06 scores)
- Explain how peter's maize finally managed to give some yields.
(03 scores)

- 1.2** Mr. Waiswa, a farmer in Buyende, planted beans and maize in his garden, alongside mature banana plants. Just before the beans and maize could mature, a severe hailstorm hit the garden, destroying all his crops. A month later, Mr. Kaggwa was surprised to see that new young banana shoots were growing, but there were no signs of new beans or maize growth.

Task

- Identify the plant structures that were affected by hailstorm.
(03 scores)
- Explain how the hailstorm affected the normal functioning of the crops?
(06 scores)
- Explain why Mr. Kaggwa did not have to worry about his banana but Instead got worried about beans.
(03 scores)

ITEM 2 SAMPLE QUESTIONS

- 2.1 A house maid was cooking milk for the baby and suddenly the boiling milk raised and spilled out of the sauce pan into the fire. The maid heard the hissing sound from the cooking place. She got scared, her heartbeat and breathing rate increased and she strongly rushed to remove the sauce pan from the stove. On touching the pan, she immediately released it.

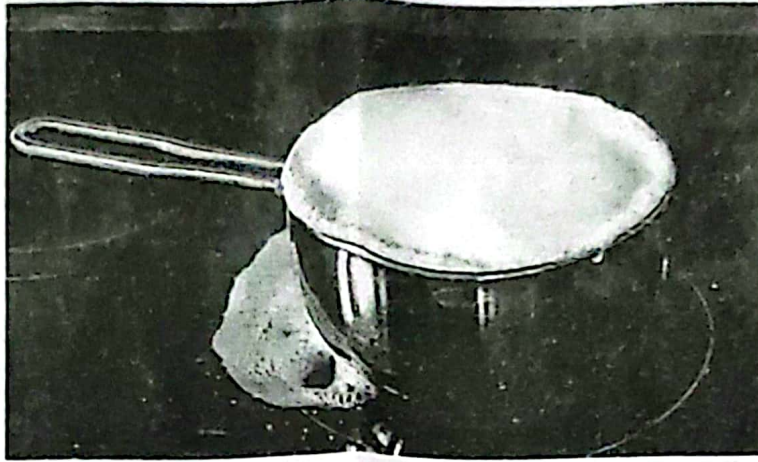


Fig. 1 shows the boiling milk

Task

- What physiological responses occurred in maid's body? (03 marks)
 - Describe how maid's body coordinated to bring about her reactions from the time the milk spilled out of the sauce pan up to when she started to rushed towards the cooking place. (06 scores)
 - Explain what happened in the maid's body so as to withdraw her hands. (03 scores)
- 2.2 In a small village in Buganda, a young mother named Nalongo is an alcohol addict. One day, while drunk, she attempted to prepare lunch for her family but accidentally left the cooking fire unattended to. The fire quickly spread, engulfing the kitchen and threatening to burn down the main house. Fortunately, her neighbor, Sarah noticed the thick smoke and rushed to her aid, extinguishing the fire just in time.

Task

- Describe how Sarah's ^{several parts of Sarah's body enabled her to} body coordinated to bring about her reactions from the time she noticed the smoke until she reached to Nalongo's kitchen. (06 scores)
- What are the likely effects of Nalongo's lifestyle? (03 scores)
- Explain how Nalongo can recover from her lifestyle to live a productive life. (03 marks)

- 2.3** During his holiday visit, Opio noticed that his family members were struggling with various health issues. His elder brother would feel thirsty, hungry and urinates frequently. Their grandmother had a noticeable swelling on her neck, and their father was having trouble of seeing close objects. Concerned about their health, Opio took it upon himself to ensure his relatives received the appropriate medical attention and support necessary to restore their well-being.

Task

- Identify the health conditions of Opio's relatives. (03 scores)
- Explain how the conditions arise. (06 scores)
- How can the conditions be managed. (03 scores)

- 2.4** In Kampala, Uganda, a group of health researchers conducted a study on the impact of urbanization and modern lifestyle on the health of the population. Through the study, the results indicated a rise in chronic diseases, such as diabetes, hypertension, and obesity, among the urban population of Kampala. The factors contributing to the above were identified as:

- The sedentary lifestyle, for example, lack of physical exercise and sitting for long hours.
- Feeding on a lot of junk foods.
- Stressors of city (much noise and air pollution)

All those lead to a decline in the overall health and well-being of the people.

Task

- Explain how the identified factors contribute to the chronic diseases among the urban population as pointed by the Researchers. (09 scores)
- Point out the symptoms of any one Chronic disease as indicated in the Research Report among the urban population of Kampala. (03 scores)
- Advise the urban dwellers on how to manage the health conditions and live a better life. (03 scores)

ITEM 3 SAMPLE QUESTIONS

- 3.1** John and Sarah, married for 15 years, have three children - Michael, Olivia, and Sophia. Michael has sickle cell anaemia. Olivia shows strong resistance to diseases; however, Sophia is oftenly disturbed by malaria. John, without any illness, doubts the children's paternity. This tension has resulted into a family misunderstanding between John and Sarah.

Task

- Using scientific facts, prove to John that they are both responsible for the health conditions present in their children. (06 scores)

- b) Mention the symptoms present in Michael due to his health condition. (03 scores)
- c) Suggest to the couple how they can manage the health conditions in their children to live a happy life. (03 scores)

3.2 In a certain family, a paternity dispute has arisen between a man, Mr. Kabuye, and a woman, Ms. Ndagire, over their 2-year-old child. Mr. Kabuye denies being the biological father of the child since they have different blood groups, while Ms. Ndagire claims he is the right father. The child's blood type is AB, while Ms. Ndagire's blood type is O. Mr. Kabuye's blood type is A. Recently, the child was diagnosed with a bleeders' disease after an injury, where he even needed blood transfusion.

Task

- a) Clearly show to Mr. Kabuye the possibility of being the father of their 2-year-old child basing on the scientific facts of blood groups. (06 scores)
- b) What are the likely effects of the disease discovered in the 2-year-old? (03 scores)
- c) Advise the couple on how a successful blood transfusion of their child can be done. (03 scores)

3.3 Mary conceived at 13 years while in P.5 and was expelled from home, she was forced to stay with her boy-friend in the nearby village. She had a lot of difficulties during pregnancy and did not attend antenatal care. Mary gave birth to an albino child. Her boy-friend denied being the father, citing the fact that he's dark-skinned.

- a) Scientifically convince Mary's husband that he is the father of their child. (06 scores)
- b) Point out the consequences of Mary's actions to her life. (03 scores).
- c) Advise Mary on how she can improve her life and also ensure survival of her child. (03 scores)

SECTION B

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

Part I

Answer only one item from this part. Answers should be written in the answer booklet(s) provided.

Part I Sample Questions

- 4.1** The residents of Kigezi cultivate their crops on hillsides. A recent heavy rainfall caused damage to several life forms. Stagnant water pools formed in the valleys, and the water spread to people's homes. Different ailments have been reported among the people. The district environmental officer holds the residents responsible for the damage and they seek to understand their role in order to address the issues without leaving their ancestral land.

Task

Explain to the residents how the challenges they face came about, give them advise on how they can sustainably use the natural resources in area and why it is good to do so. (15 scores)

- 4.2** The Uganda Wildlife Authority (UWA) has noted an increase in poaching near game parks, encroachment on park boundaries for agriculture, and a rise in wildlife attacks on humans and livestock. Furthermore, the nearby industries on Lake Victoria have been releasing untreated sewage into the water body leading to reduced aquatic wildlife diversity and impacting the country's economy.

Task

Explain the effects of these human activities and provide solutions to the challenges experienced by the affected communities. How important is maintaining such natural environments? (15 scores)

- 5.1** The public health officer in Hoima, has observed significant water pollution in Lake Albert and nearby water sources due to oil refinery and industrial activities. In addition, the local community has been experiencing an outbreak of malaria and bilharzia, with many cases reported among children and fishermen.

Task

What are the effects of the activities being done around the Lake? Suggest control measures to mitigate these effects and disease outbreak. (15 scores)

- 5.2 OilTech Corporation has discovered significant oil reserves in Murchison Falls National Park, near Lake Albert in western Uganda. The company plans to extract the oil and construct a refinery nearby, generating employment opportunities and revenue for the government. However, environmentalists and local communities are concerned about the potential risks to the ecosystems in the area.

Task

Explain the problems associated with oil exploration activities in the area. Suggest possible solutions and show the value of leaving the ecosystems in the area undisturbed. (15 scores)

Part II

Answer only one item from this part. Answers should be written in the answer booklet(s) provided.

Part II Sample Questions

- 6.1 Peter and Paul, both considered strong contenders as athletes, were expected to lead their respective classes to victory in the inter-class competitions. However, on the day of the event, Paul consumed a heavy carbohydrate meal while Peter abstained from eating. Despite this, Paul won all his races while Peter struggled and eventually collapsed during one of the races. Peter had to be carried off on a stretcher, breathing rapidly and heavily and was able to recover after giving him glucose and enough resting time.

Task

Explain the physiological role of nutrition in athletic performance, identify the problems faced by Peter, and propose solutions to optimize performance and prevent adverse outcomes in similar situations. (15 scores)

- 6.2 John, a 13-year-old was experiencing general body weakness and was scared that he may not participate in the school interhouse athletic competitions. He was advised to first eat before engaging in any sports activities which he did take a meal of posho and beans. After resting for about an hour, he felt stronger and managed to even win his race. However, after the competition John experienced deep breathing and muscle pain causing him to walk with a lot of difficulty.

Task

- Describe the process that led to the success of John and why he experienced some challenges thereafter and explain how he was able to recover (15 scores)

- 7.1 Tom's 3-year-old son was attacked by fever that resulted in the breathing difficulties, vomiting and diarrhea. The baby was rushed to the hospital and immediately some injections were given and breathing normalized. Further tests revealed that the boy did not have enough blood. Compatible blood was added to the body and the doctor advised him to feed the boy on foods rich in proteins and iron. After one month in hospital the boy recovered completely from the disease.

Task

Explain how the body of Tom's son responded to the actions of the doctors and how the boy's body regained its normal functions. (15 scores)

- 7.2 In many schools in Uganda, students are served a staple meal of unfried beans and posho for lunch and supper, throughout the term. While this diet provides essential nutrients for growth and energy, some students at Kabale Primary School are unaware of the nutritional benefits of this food. The school's nutrition club wants to educate their peers about the importance of beans and posho in their diet.

Task

What scientific explanations can the nutrition club provide to their fellow students to help them understand how beans and posho contribute to their energy levels and overall growth?

553/2/3 BIOLOGY Paper 2 or Paper 3 (Practical)

Biology paper 2 or paper 3 consists of two compulsory examination items.

ITEM 1 SAMPLE QUESTIONS

- 1.1 Teddy makes bread to earn a living. Her customers have started demanding that they want sweeter bread. Teddy is worried of the cost of buying more sugar which is very expensive. Mark, Teddy's friend has suggested a biological enzyme that Teddy can use to make her bread sweeter even without adding any sugar. Teddy mixed the product with wheat flour and added hot water at 60°C for 30 minutes and went ahead to add other ingredients. On baking her bread, the customers complained that the bread is still not sweet. Teddy is worried of losing her customers. You have been provided with the following; Solution **K** which is a sample of the biological enzyme and solution **R** which is a sample of the wheat flour Teddy used.

Task

Design and carryout a scientific investigation(s) on the samples provided and advise Teddy on what she can do to make her bread sweet using the biological enzyme.

- 1.2 In most communities of Uganda, weaning is commonly abrupt and unplanned. This is because most parents are unaware of the dietary needs of their children, and this leads to nutritional deficiencies. However, some few parents plan for weaning and their children are always healthy. You are provided with two solutions prepared from two different foods for weaning children: solution **A₁** given to a child in a family that planned for weaning and solution **A₂** given to a child in a family that did not plan for weaning.

Task:

Carry out investigations on solutions **A₁** and **A₂** and give appropriate guidelines to parents in the affected family.

ITEM 2 SAMPLE QUESTION

- 2.1 Jenifer grows hibiscus plants in her compound that put on many healthy structures. In the nearby bush her neighbor keeps some animals that regularly visit the plants. One day a bush fire killed and chased away all the neighbor's animals. After sometime, Jenifer noticed that her plants put on very few of some structures. She's is wondering what could be wrong with her plants.

Tasks

You are provided with specimen **D** one of structures affected on the plant and **E** a sample of the neighbor's animals.

- Using observable features, identify the plant part **D** and specimen **E**.
- Explain how specimen **D** were able to cause the animals to always come to them.
- Draw and label parts of specimen **D** after removing all the petals.

END

'Sending you all our best wishes for a future marked by success, discovery, and excitement in the field of Biology!'