

GRAND ANNUAL CURATED BIOLOGY SEMINAR 2025

553/1 BIOLOGY PAPER 1 (THEORY)

This paper has two sections; section **A** and section **B**. Section **A** comprises three structured scenario items; 1, 2 and 3, which are compulsory. These require usually short but precise responses, given that the space is always limited. Section **B** comprises of two parts; part **I** and part **II**, each with two essay type scenario items. This usually avails you a chance to write even longer responses.

SECTION A

This section has **three** compulsory items

ITEM 1 (ELEMENT OF CONSTRUCT 2)

SAMPLE ITEMS

Item A1.1

Mr. Otim is a renowned farmer in Oyam district and carries out subsistence farming. He recently acquired a piece of land on a hilly place near a dusty marram road. He prepared his garden well, applied fertilisers and later planted beans and maize. At the time of flowering, he observed, that the upper surfaces of all the leaves were covered by dust, turned to dark green and the shoots of the bean plants had developed more flower buds, and the area did not receive rain until the time of harvesting. Mr. Otim received very poor yields from his garden.

Task:

- (a) State the processes in plants that were affected by the conditions in the area.
- (b) Explain how the conditions in the area contributed to the poor yields in Mr. Otim's garden.
- (c) How did some of the plants manage to give some yields despite the conditions?

(ELITE HIGH SCHOOL - ENTEBBE)

Item A1.2

Kakama bought a plot of land where he planted beans. Upon the onset of flowering, the garden experienced windy air conditions and heavy sun, which caused most flowers to fold and leaves to fall off, especially during the heat of the day, and would recover in the early morning hours, which reduced plant growth and productivity.

Task:

- (a) Identify the processes affected in the plants in the garden
- (b) Explain how the conditions observed in the garden affected plant growth and productivity
- (c) How did the bean plants manage to survive through the conditions and give some yields?

(NOTRE DAME ACADEMY BUSEESA)

Item A1.3

Herbalist in Nakwero village obtain plant structures for use in making herbal medicines by removing the barks of trees from the stem together with most of the leaves and roots. This has greatly affected the number of some tree species in the area. The community members have however noticed some trees developing new roots, buds and barks.

Task:

- (a) Identify the processes affected by the activities of the herbalists
- (b) Explain how the actions of the herbalists affected the normal functioning of the plants affected.
- (c) How did some trees manage to survive despite the actions of the herbalist?

(ST. ANDREW KAGGWA GOMBE HIGH SCHOOL)

ITEM 2 (ELEMENT OF CONSTRUCT 4)**SAMPLE ITEMS****Item A2.1**

Ms. Naigaga, a 60-year-old woman, who always complains of back and joint pain, enjoys reading newspapers especially in the morning hours, though she usually places the paper a distance away from her eyes to clearly read the words in it. One day, as she was reading on her table, a cockroach ran over her foot. She quickly jumped, threw the newspaper down but fractured her leg on landing. She was immediately rushed to hospital and doctors managed her fractured limb.

Task:

- (a) How did the body coordinate, leading to the actions of Ms. Naigaga?
- (b) Describe the cause of Ms. Naigaga's health challenges
- (c) Suggest strategies to improve her health condition

(PROGRESSIVE SECONDARY SCHOOL - KITINTALE)

Item A2.2

John, often escapes from school to Katanga where he engages in consumption of alcohol and smoking marijuana. Instead of going back home, he went to Katanga and joined a gang of youths. One night, John and his group were moving from a city bar when furious city dogs confronted them. John's heartbeat and breathing rate increased; ran very fast and escaped from the dogs

Task:

- (a) What are the likely challenges John and his group may face as a result of their lifestyle?
- (b) Explain how John's body coordinated to enable him escape the furious city dog?
- (c) Advise John on what he can do to better his life?

(VERONA HIGH SCHOOL)

Item A2.1

Mr. Lodu, 62-year-old officer in a government agency, retired from active duty, two years ago and now spends much of his time seated at his retirement home. He however experiences persistent back pain, bone weakness frequent urination and feeling thirsty all the time. He also has difficulty in hearing and has resorted to drinking alcohol much of his time.

- (a) Identify the health conditions affecting Mr. Lodu
- (b) Explain the causes of the health conditions affecting Mr. Lodu
- (c) Advise Mr. Lodu on how to improve his health state for a better life in his retirement.

(LEGACY CHRISTIAN HIGH SCHOOL)

ITEM 3 (ELEMENT OF CONSTRUCT 5)**SAMPLE ITEMS****Item A3.1**

A 16-year-old girl became pregnant and claimed that her boyfriend from the same school, was responsible for the pregnancy. She was expelled from school and her parents disowned her. She turned to her boyfriend for support, who denied being responsible and abandoned her. She later started falling sick often, gave birth to a baby with extremely low birth weight, and during delivery her pelvis was damaged. The baby was also an albino. Her boyfriend rejected the baby, claiming it was impossible for such a normal couple to have an albino child.

Task:

- a) Explain the dangers the girl and her boyfriend's behavior caused to her.
- b) Show how the baby could have inherited the condition.
- c) Explain how the condition of the baby can be managed to avoid adverse effects.

(CORNERSTONE H/S NANGABO)

Item A3.2

Mary a university student became pregnant after engaging in multiple sexual relationships occasionally having unprotected sex. During pregnancy, Mary refused to breast feed the baby. Mary's child now frequently falls sick, has low body size and weight, and shows retarded mental and body growth, and also has HIV/AIDS. Mary's child also has a flat face, short neck, and squat hands due to a condition the doctor revealed to be genetic.

Task:

- a) Explain how Mary's behaviour during and after birth affected her child.
- b) Explain how the genetic condition of Mary's child comes about (arose).
- c) Explain to Mary how she can manage the health issues of her child to ensure that her child lives a better life.

(MAY CHRISTIAN COLLEGE ENTEBBE)

Item A3.3

Enock got married to Edith and produced a pair of twins, a boy and a girl. Both twins have swollen and painful joints, frequent sickness, headache and dizziness. When Edith got pregnant again, Enock advised her to abort thinking that they would get a child with similar condition. However, when Enock and Edith went to hospital concerning their twins' condition, the doctor told them that the health challenges experienced by their twins were due to the couple being heterozygous for a genetic condition.

Task:

- a) Explain how the genetic condition resulted into the health conditions/challenges in the twins?
- b) Explain the twins inherited the genetic condition from their parents?
- c) How can Enock manage the genetic condition of his twins to ensure better life?

(LORDS MEADE VOCATIONAL COLLEGE)

SECTION B

This section comprises of **two** parts Part I and Part II. You are to attempt only **two items** from this section, one from each part.

PART 1 (ELEMET OF CONSTRUCT 1)

SAMPLE ITEMS

Item B1.1

In 2017, there was an outbreak of famine in Teso sub-region, in response to this the government through the ministry of Agriculture provided cassava cuttings to the residents to enable them to grow their own food, the residents cleared many shrubs and indigenous trees on their land in order to mass produce cassava which is their staple food. Many also used different insecticides to destroys ant hills to limit chances of termites destroying the cassava plants as well as applying fertilizers to boost the harvest. However, these actions have resulted into a number of environmental challenges

Task:

- (a) Explain to the residents the challenges they have caused to the environment as a result of their actions.
- (b) Why it was important for the residents to conserve their environment amidst the prevailing famine problem.

(KAKUNGULU MEMORIAL SCHOOL)

Item B1.2

Kigezi region is a renown hilly place, however due to the increasing population of the citizens as per the 2024 National census and need to improve livelihood among most residents in the area, many have started to practice human activities like cutting of trees for timber and production of charcoal sold for money, farming and rearing of cattle in most areas previously occupied with vegetation. Those carrying out farming usually first burn the bushes in preparation for planting and dig up and down the hills which has resulted into a lot of negative impacts in the area like fooding of gardens in valleys, mud slides and even strong winds.

Task:

Explain;

- (a) How the different human activities have caused the challenges in the area
- (b) How the above challenges can be overcome.

(WASHINGTON HIGH SCHOOL - NAKASEKE)

Item B1.3

In Uganda, the population growth rate is rapidly increasing as reported in the 2024 National population census, this could have resulted into the increased need for charcoal, space for farming and infrastructure development, most forest reserves across the country have been destroyed for these purposes. More industries have also been established near most lakes which drain their wastes into these lakes affecting their composition thus hindering survival of various organisms and their interdependence with one another. This continuously hinders Uganda from achieving the Sustainable Development Goals (SDGs) 2030, namely; life below water, affordable and clean energy and climate action.

Task:

- (a) Explain how such activities hinder the attainment of the possible SDGs
- (b) Describe strategies for the achievement of the SDGs affected by such activities.

(MPIGI MIXED SECONDARY SCHOOL)

PART 2 (ELEMENT OF CONSTRUCT 3)**Item B2.1**

After a long day at school, David ate a carbohydrate rich meal before soccer practice as he believed this would help him perform better. David even emerged as one of the best players however, during the final minutes of the game, he experienced intense muscle pains, fell to the ground and bruised his knee which began to bleed. Ten minutes later after his substitution, David was surprised that the bleeding had stopped, he no longer felt any pains in his leg muscles and even managed to walk back home.

Task:

- (a) Describe how David's body processed the meal he ate to enable him emerge as one of the best players during the game.
- (b) Explain the cause of David's experiences during the race. How did his body manage to recover and enable him walk back home.

(GODMARK HIGH SCHOOL)

Item B2.2

Mathias has been smoking for the past 20 years, feeds on a lot of fatty foods and rarely brushes his teeth. Recently he started experiencing complications such as tooth decay, difficulty breathing, and trouble moving his limbs on one half of the

body. Following a visit to a hospital, medical examination further revealed that Mathias was also diagnosed with high blood pressure. Doctors advised him to change his lifestyle but he has no idea how to do this.

Task:

- (a) Explain how Mathias's lifestyle has affected the functioning of his body
- (b) Advise Matthias on how to manage his health condition

(KAKUNGULU MEMORIAL)

Item B2.3

Enoch was involved in a car accident lost a lot of blood, sustained injuries became unconscious so was rushed to a hospital where he was administered with a glucose solution, transfused with blood and other medications. After an hour, he regained consciousness and felt stronger and returned to normal state, however further x-ray tests showed that Enoch's lungs had been injured.

Task:

- (a) Explain how the car accident affected the functioning of Enoch's body
- (b) Describe how the doctor's intervention enabled Enoch return to normal state.

(PREMIER HIGH SCHOOL MASAJJA)

PRACTICAL ITEMS 553/2/3

This paper consists of two compulsory Items; 1 and 2.

Item 1 assesses scientific inquiry and investigation skills in Biology. you are required to expect competence in scientific investigations following the scientific method.

Item 2 assesses plant and animal structures. You are expected to exhibit observation and drawing skills, including relating structures of provided specimens to survival in their natural environment

ITEM 1 (ELEMENT OF CONSTRUCT 1)

SAMPLE ITEMS

Item 1.1

Students at Keera High School have been on a hunger strike for three consecutive days, protesting the quality of the meals served by the school. The students claim that the food is not nutritious enough, with the majority opting

to purchase meals from the school canteen, which they consider to be of better quality than those provided in the dining hall. They have vowed to continue the strike until the school management replaces the current menu with meals that match those sold at the canteen. However, the school's catering department says that the current meals are the ones most suitable for the students, given that they are accompanied with fruits and green leafy vegetables every day.

- Solution **A** is a food sample obtained from the meals served at the school dining hall
- Solution **B** is a food sample obtained from the meals students buy from the school canteen.

Task:

Design and carry out an investigation on quality of food samples in **A** and **B**. Use your results to settle the disputes at the school.

Your design and investigation should include the following:

- (a) Aim, hypothesis, variables, apparatus/requirement
- (b) Procedure and results of your experiment.
- (c) Identify the diet most appropriate for the students. Explain your answer
- (d) Use your results to resolve the ongoing conflict at school

Item 1.2

Tara, a passionate gardener and small-scale farmer, is preparing her soil for the upcoming growing season. She plans to grow spinach, beans and pineapples. When she made consultations, she obtained the following information about the pH demands of each of the three plants.

Plant	Suitable pH for proper growth
Spinach	Slightly alkaline
Beans	Slightly acidic
Pineapple	Acidic

Tara would like to grow the three plants in three different parts of her garden. However, she is wondering which portion of the garden would support which plant. You are provided with soil samples **N**, **C** and **S** which were obtained from the Northern, Central and Southern parts of Tara's Garden respectively.

Task:

Design and carry out a scientific investigation to determine the garden most suitable for growing spinach, beans and pineapples.

Your design and investigation should include the following:

- (a) Aim, hypothesis, variables, apparatus, requirements
- (b) Procedure
- (c) Results of the experiment
- (d) Identify the garden most suitable for growing spinach, beans and pineapples. Explain your answer.

ITEM 2 (ELEMENT OF CONSTRUCT 2)

Item 2.1

An outbreak of cholera has been registered in Nampondwe Village. The people in the village have been advised by the Village Health Team (VHT) to ensure each home possesses a well-constructed pit latrine. The village chairperson has also advised that spraying the vectors around homes is an alternative solution. However, the community are not sure of the exact insecticide and others find it expensive to buy insecticides.

Specimens **A**, **B**, **C** and **D**, have been collected with the community around people's homes.

Task:

- (a) (i) Identify with reasons the vector and classify it under; Phylum and class.
- (ii) Using observable features, explain why the specimen is a suitable vector.
- (iv) Suggest possible alternative solutions to control the vector in the community.
- (b) Draw the hind limb of the potential vector and label parts that adapt it for its role

Item 2.2

Jenifer grows plants in her compound that puts 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 sometimes, Jenifer noticed that her plants put on very few of some structures. She's is wondering what could be wrong with her plants.

Task:

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

- (a) Using observable features. Identify the plant part **D** and specimen **E**.
- (b) Explain how specimen **D** was able to cause the animals to always come to it.
- (c) Draw and label parts of specimen **D** after removing all the petals.

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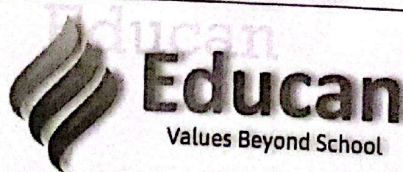
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