

***UGANDA CERTIFICATE OF EDUCATION  
COMPETENCE BASED CURRICULUM  
2026.***

***BIOLOGY REVISION ITEMS  
(THEORY AND PRACTICAL)***

***PREPARED BY***

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***(From different sources)***

***CALL., 0759514302 /0765821032***

***For both biology and chemistry***

God bless you in 2026

**Item 1**

During a short dry season, a commercial legume plantation was invaded by strange insect larvae which fed on the leaves and the outer layer of the stems. During this season, the legumes became stunted and some wilted. When the rains returned, all the insect larvae were washed away and died. The legumes revived, nodes emerged, their internodes elongated and a new layer of the stem bark formed around the damaged stems. The legumes managed to give some yields.

Task

- (a) Identify the processes affected within the legumes when invaded by the strange insect larvae.
- (b) Explain how the insect larvae affected the legumes leading to stunted growth and wilting.
- (c) How did the legumes manage to revive at the return of the rains?

**Item 2.**

**Paul a s.4** student experienced fatigue and frequent urination. When he went to the hospital, examinations of his urine were done and later the doctor reported that his urine contained glucose and the doctor advised him to manage his diet. On his way back home, he saw a fierce dog about to attack him and his heart and breathing rate increased and later he ran away.

Task

- a) Other than those present (fatigue and frequent urination), explain other likely health challenges Paul is facing as result of his condition.
- b) Show how Paul's body coordinated to bring about his reaction on his way back home.
- c) Clearly show the various ways Paul can implement the doctor's advice to live a health life

**Item 3**

Mary a university student became pregnant after engaging in multiple sexual relationships occasionally having unprotected sex. Since she became pregnant, Mary refused to visit any hospital for antenatal care. Mary gave birth to a child with a flat face, short neck, squat hands, mentally retarded and also HIV-positive. The doctor revealed that the mental and physical deformations of the child were due to a genetic disorder.

- (a) Explain how the child's genetic disorder or condition comes about.
- (b) Explain the dangers of Mary's refusal to attend antenatal care during pregnancy to her child.

**Item 4**

Charcoal burning is one of the commonest economic activities carried out by people of Kibuku District. During the practice people cut down trees on large scale and gather pieces in heaps of soil through which fire is put to facilitate the process. However, this practice is threatening the quality of the environment a thing that many residents are afraid of.

Task

- a) Explain the environmental problems this practice has caused.
- b) Suggest ways these problems can be minimized.
- c) Why should the people of Kibuku district conserve such natural resources being maintained

**Item 5**

Mr. Kato has been engaging in heavy alcohol drinking for the last 20years. Recently, he developed fatigue, weight loss and swollen feet. When he went the hospital, several examinations were done and later the doctor reported that the alcohol had increased acid secretion in his stomach, damaged his liver cells, made him more forgetful and reduced the functioning of the essential excretory organ, the kidney.

Task

- a) Explain how Mr. Kato's habit has affected his life style leading to the symptoms he is experiencing.
- b) Show how Mr. Mukasa can manage the challenges of the named excretory organ

A rural farming community has cultivated the same land continuously for many years. To increase farmland, trees were cut down, leaving large areas of bare soil. Crops are grown season after season without fallowing, and crop residues are removed or burned after harvest. During the rainy season, large amounts of soil are washed away, leaving shallow and less fertile ground. In the dry season, the soil becomes hard, cracked, and dusty, making it difficult for

crops to grow. Livestock are allowed to graze freely on harvested fields, further exposing the soil surface. Over time, farmers notice a steady decline in crop yields and poor plant growth.

Task

- a. Identify and explain the effects of human activities described in the scenario on the environment. (8 scores)
- b. Propose and explain appropriate soil conservation strategies that could restore soil quality and improve crop production. (7 scores)

**Item 6**

In a crowded settlement, pools of water remain around houses long after rainfall. Health records from a nearby clinic show frequent cases of fever-related illness, especially among children. Inside homes and food storage areas, cockroaches are commonly seen, particularly at night. Nearby farms have several raised soil mounds, and some wooden structures show signs of weakening. Despite complaints, these insects continue to thrive in the area.

Task

- a. Based on the conditions described, what actions by the community would reduce the health problems linked to the insects breeding around homes? Give reasons. (5 scores)
- b. Considering the presence of cockroaches and termites, what useful roles might these insects be playing in the environment despite the problems they cause? (5 scores)
- c. How to manage the insect problem without harming the environment

**Item 7**

Gabrimmy, a Senior Three student, ate a breakfast consisting of an egg, cooked cassava, and groundnuts before going back to class for her mid-morning lessons. Later, Gabrimmy began to wonder how the food she had eaten was processed in her body and how it eventually became useful to her cells.

TASK

Using your understanding of nutrition and digestion in animals, trace and explain the journey of the food Gabrimmy ate through her body. ( 15 scores)

**Item 8**

Fred is a 15 year old boy who lives with his grandmother in the village. He usually helps his grandmother in fetching water, collecting firewood and other house chores. One day he was collecting fire wood, however he was accidentally scratched by a stick on the hand and he started bleeding for some time. On his surprise after a short while, the blood stopped coming

and he observed a thick fiber of blood on the affected area. This surprised him and he was wondering how it came to

#### TASK

Fred has come to you for explanation, help him to stop being surprised of the incidence and explain to him the effects of losing blood in the body. (15 scores)

#### Item 9

A rural farming community has cultivated the same land continuously for many years. To increase farmland, trees were cut down, leaving large areas of bare soil. Crops are grown season after season without fallowing, and crop residues are removed or burned after harvest. During the rainy season, large amounts of soil are washed away, leaving shallow and less fertile ground. In the dry season, the soil becomes hard, cracked, and dusty, making it difficult for crops to grow. Livestock are allowed to graze freely on harvested fields, further exposing the soil surface. Over time, farmers notice a steady decline in crop yields and poor plant growth.

#### Task

- a. Identify and explain the effects of human activities described in the scenario on the environment. (8 scores)
- b. Propose and explain appropriate soil conservation strategies that could restore soil quality and improve crop production. (7 scores)

#### Item 10

In a crowded settlement, pools of water remain around houses long after rainfall. Health records from a nearby clinic show frequent cases of fever-related illness, especially among children. Inside homes and food storage areas, cockroaches are commonly seen, particularly at night. Nearby farms have several raised soil mounds, and some wooden structures show signs of weakening. Despite complaints, these insects continue to thrive in the area.

#### Task

- a. Based on the conditions described, what actions by the community would reduce the health problems linked to the insects breeding around homes? Give reasons. (5 scores)
- b. Considering the presence of cockroaches and termites, what useful roles might these insects be playing in the environment despite the problems they cause? (5 scores)
- c. How to manage the insect problem without harming the environment

**ITEM 11**

A village in western Uganda has recently experienced an unusual pattern of illness. Several people developed sudden fever, tiredness, joint pain, and vomiting. After a few days, some started to bleed from the nose and gums.

Most of the first cases had attended a traditional burial where the deceased person had died of a "strange fever." Villagers shared meals, hugged the body, and washed it without gloves. Later, a nurse at the local clinic also fell sick after treating two patients without full protective gears

Task

(a)What could be disturbing the village according to your analysis?

(b)Explain the ways how the above identified problem is transmitted in the village?

What advice can you offer to the villagers to stop all the misery?

**ITEM 12**

Maria is a 28-year-old woman who weighs 92 kg and is 1.62 meters tall. She recently visited her doctor due to fatigue and joint pain. During the consultation, she shared that she often follows strict diets during the week but tends to overeat when feeling stressed or emotional, especially on weekends.

She also mentioned feeling unhappy with her body and avoiding social events involving food. The doctor is concerned about her physical and mental health and decides to begin by calculating her Body Mass Index (BMI) but lacks an idea on how to do it.

Underweight: < 18.5

Normal weight: 18.5–24.9

Overweight: 25–29.9

Obese: ≥ 30

Task

(a)Help the doctor to know her weight status by calculating her BMI.

(b)Advise her according to the doctor's findings on her health.

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**ITEM 13**

Alex and Anna after being married for 6 years, they failed to produce children, Alex blamed his wife for failing to produce for him children. As a result Alex decided to search for another women who would produce for him children, however, he did not produce any child and when he visited the hospital was told that he had few reproductive cells and it was also discovered that he had contracted HIV AIDs in the process.

Task.

What is the special name of Alex's cells that were said to be in low amount

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...

How can Alex live safely with his other medical condition mentioned in the scenario

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Which advise can you give to the gemmates of Alex to avoid the problems tha clever is undergoing through.

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**ITEM 14**

Mr. Opio cleared a piece of land with many shrubs and indigenous trees in the swamp for settlement and growing crops. In addition, these caused a number of challenges to the environment.

Task.

Explain;

To Mr. Opio the challenges he caused to the environment.

How the challenges can be overcome

Why it was important for him to conserve the environment.

**ITEM 15**

Mr. Kamau, a farmer in a dry region, has been growing maize on the same land for 10 years. He uses chemical fertilizers but doesn't rotate crops or add organic matter. Recently, his yields have dropped, the soil has become hard, and rainwater quickly runs off the land. Gullies are beginning to form in some areas.

Task

(a) Explain to Mr. Kamau the cause of the dropped yields.

(b) Explain the impacts of his actions to the environment

(c) Why is it important to conserving the environment

**Item 16**

Kampala city council authority (KCCA) has constructed a garbage dumping site in some village in Mukono district. In the site they collect plastics like polyethene bags which wind normally blows to the nearby household and they also collect their dead decaying organic matter among others. Community members have observed a foul smell, decreased soil

fertility, water contamination and disease outbreak like cholera.

Task

- a) Explain how the action by the city authority has resulted to the challenges experienced at the dumping site.
- b) How can such problems be minimised

**Item 17**

A group of marine biologists conducted an investigation on the distribution of living things within a 25m<sup>2</sup> area in two mangroove ecosystem at two different locations in a Caribbean country. Location A was found along the undeveloped coast of the island which has no human inhabitants and industries and location B found near one of the country's major industrialized towns.

The distribution of organisms is shown in the table 2 below.

<b>Organism</b>	<b>Location A</b>	<b>Location B</b>
Red mangroove	15	5
Algac	Few	Numerous
Fish	200	40
Migrant bird	25	10
Heron (feeds on rats)	8	3

Task

- a) Explain the reason(s) for the lower biodiversity of each organism in location B
- b) Show the benefits of conserving such ecosystems.

**ITEM 18**

Musa is a participant in athletics in Masaka SS. During the day for the competitions he ate a meal containing starch, later, when he had just ran half way the competition distance, he began to breath deeply and fast, his heart rates increased and also, he began sweating. As he was almost finishing the race, he developed muscle cramps and was not able to finish the race.

Task

- a) Explain the significance of
  - i) the processes the meal underwent to enable Musa engage in the competitions
  - ii) the changes Musa's body underwent during exercise
- b) Show ways athletes can prevent the challenge that failed Musa to finish the race.

**ITEM 19**

Musa is a 50year old resident of Kalerwe area. After experiencing fatigue and shortness of breath for two weeks, he went to the hospital. After examinations, the doctor reported that he had developed hypertension (high blood pressure) and swelling in the bronchial tubes of the lungs. The doctor recommended that he should be put on a special diet and treatment involving aerobic exercises.

Task

- a) Explain the conditions the doctor reported have affected Musa's normal body functioning.
- b) Clearly show how the doctor's advice will improve Musa's healthy condition.

**Item 20**

Mr. Kakooza is a prominent farmer in Kazo district. Recently he hired a new land for crop farming. He later planted the seeds, and few seedlings managed to grow, these later produced crops which were small in size, with small flowers and yellow leaves. He observed that most plants had hairy small leaves and a deep root system and these later gave low fruit yields. Later when he brought a specialist to analyse the cause of the low yields, the specialist reported that the soils had low water retention and were deficient in some essential mineral ions.

Task:

- a) Identify the plant processes that were affected.
- b) Explain how the conditions in the land affected plant processes leading to low yields.
- c) How were some plants able to give some yields.

**Item 21**

Sarah is a P.7 pupil who is very bright in class. However, when she sits on the front row near the chalk board, she cannot see the writings on the chalk board, and she complains of pain in her eyes when she strains them to see in the work in her books. One day as she was coming from school, she closed her eye very fast and unconsciously as a speeding insect approached her eyes. She later wondered how such a response happened to protect her eyes.

Tasks:

- a) Describe a series of events that occurred in Sarah's body to bring about the response that protected her eyes.
- b) Using scientific facts, explain Sarah's problem and its cause to her parents.
- c) Using an illustration, show how Sarah's problem can be managed.

**Item 22**

Recently a couple which has produced so far four children, all girls, were told by their neighbour that there is a higher probability that their next child is a boy, they didn't believe the statement. One day when they went to the hospital, the doctor explained to them about the probabilities of the next child being a boy or a girl. Later their 14-year-old daughter went through menstruation, a scenario she was worried about. When she shared the scenario with her older sisters, they told her that the scenario is a normal biological change.

Task:

- a) Explain the possible probabilities the doctor explained.
- b) Describe the changes that occurred in the body of the 14-year-old daughter in the past 4 weeks to bring about a scenario she was worried about.
- c) Show the ways how the 14-year-old can cope up with such biological changes to live a healthy lifestyle.

**Item 23**

In the recent times, there has been a cry of climate change, which is believed to be caused mainly by increased levels of gases. The increased gas levels are mainly due to increased fossil fuel burning, industrialisation and agriculture.

The table below shows how the concentrations of three gases have increased between 1890 and 1990 and their expected concentrations in 2030

Gas	Concentration of gas in the atmosphere in a million.	
	1890	1990
Carbondioxide	290	354
Methane	0.9	1.7
Nitrous oxides	0.28	0.3

(a) Explain the challenges the above changes in gases have caused to environment and provide practical remedies to lower their concentration.

b) How is it important to nature to maintain the above gases at environmentally friendly levels.

#### Item 24

Environment conservationists are against use of Pesticides and inorganic fertilizers while farmers are in favour of their use in order to get more crop yields and food for the increasing human and animal population.

Task:

a) Explain the environmental challenges the farmers practice imposes on terrestrial and aquatic ecosystems.

b) Show the value of not using the above chemicals in agriculture.

c) Explain some options farmers can use to increase yield than the above

#### Item 25

Recently a volleyballer started smoking cigarettes because of some of his friends who also smoke. He often feels short of breath during training, has painful gums, increased risk of fractures. He is worried about his decline in sports performance and isn't sure that the challenges are as a result of smoking.

Task

a) Identify the affected body structures.

- b) Show how his life style is responsible for the challenges experienced in his body leading to a decline in sports performance.
- c) Suggest how he can regain his performance.

**Item 26**

Peter and John who are blood group A and B respectively got a fatal accident and lost a lot of blood. When they were taken to the health centre IV, the doctor used their blood to test the blood group of individuals X, Y and Z so as to find a suitable donor. Later examinations revealed that John had severely injured his pancreas and had an obstruction of the ureters in his urinary system.

The table below shows the result.

Person	X	Y	Z
Peter	Clump	Clump	No clump
John	No clump	Clump	No clump

Task:

- a) Identify the blood groups of individuals X, Y and Z.
- b) Explain how the accident affected John`s body normal functioning.
- c) Without referring Peter and John to another hospital, suggest with reasons which individuals could donate blood to Peter and John.

**Item 27**

In a botanical garden, observations were made about a seed-bearing plant whose flowers were always picked by herbalists due to its medicinal properties. They also usually shred off its bark and dug out its roots to prepare medicinal extracts. Although such plant trees die off in the long run, they usually develop scar-like structures around their shred stems, numerous apical buds and nodes after the herbalists' activity.

Task:

Explain how

- a) the herbalists affected the functioning of the plant trees in the long run.
- b) the plant trees managed to survive after the herbalists' activity

### Item 28

Adrian, a S.4 teenager in one of the urban schools has recently been diagnosed with osteoporosis by an orthopedic doctor. One day while seated in class, he heard a very loud sound of a tear gas canister from the scuffle between the police and a demonstrating mob in

town. His heart pounded, eyes protruded and he sweated profusely. He stood out to go and hide, but in the event, he fell down and fractured one of the bones in the legs.

Tasks

- a) Expound on the likely effects of the condition diagnosed by the Orthopedic Doctor on Adrian's

life.

b) Explain how Adrian's body coordinated from the time the loud sound was produced by the tear gas canister until he started sweating.

c) Explain how Adrian's body coordinated from the time the loud sound was produced by the tear gas canister until he started sweating.

### Item 29

Jane and Peter got married. Both are both dark-skinned, however, Jane gave birth to a baby with light hair and very light skin, Peter denied the child

Task

Explain how the Jane can manage the disorder of the baby for him to have a better future.

### Item 30

Charcoal burning is one of the commonest economic activities carried out by people of Kibuku District. During the practice people cut down trees on large scale and gather pieces in heaps of soil through which fire is put to facilitate the process. However, this practice is threatening the quality of the environment a thing that many residents are afraid of.

Task

a) Explain the environmental problems this practice has caused.

b) Suggest ways these problems can be minimized.

c) Why should the people of Kibuku district conserve such natural resources being mismanaged.

**Item 31**

An Environment status report was published highlighting the state of affairs at a certain landing site on a fresh water lake. Below are some of the issues highlighted in the report:

- The local community wash clothes using detergents containing phosphates and they later dump the water to the lake.
- Cut down trees surrounding the lake
- The surround swamp has been taken over by real estate dealers and have raised residential apartments.
- The nets extract several other small organisms from the lake other than fish.
- Fish mongers extract fish from the lake day and night all year round.

The above challenges are believed to have caused a decrease in the number of fish extracted from the lake.

Task:

(a) Explain how the highlighted activities have affected the lake ecosystem leading to a decrease in the number of fish extracted from the lake.

(b) Suggest why it is important to conserve such ecosystems

**Item 32**

Two Ugandan Towns A and B each have industries that release carbon dioxide gas, smoke and dust. The levels of air pollution in the two towns are as shown in table

Town	Level of air pollution
A	35
B	75

According to American Lung Association, 2023, the normal range of air pollution is 0 – 50 units). Samuel was living in town A. He used to jog every day, and would experience normal changes in his body during and after jogging. When he shifted to town B, he continued with his usual routine of jogging. However, he started experiencing complications such as difficulty in breathing, chest pain and coughing.

Task

- a) Explain to Samuel his experiences while living in town A and the new ones encountered in town B.
- b) Advise Samuel on how to manage the challenges experienced in town B.

Item 33

Mr. Kato has been engaging in heavy alcohol drinking for the last 20years. Recently, he developed fatigue, weight loss and swollen feet. When he went the hospital, several examinations were done and later the doctor reported that the alcohol had increased acid secretion in his stomach, damaged his liver cells, made him more forgetful and reduced the functioning of the essential excretory organ, the kidney.

Task

- a) Explain how Mr. Kato's habit has affected his life style leading to the symptoms he is experiencing.
- b) Show how Mr. Mukasa can manage the challenges of the named excretory organ.

PRACTICAL WORK

ITEM 1

In the factory during the manufacture of liquid fertilizers, scientists test the ability of the fertilizers to change the length and texture of the tomato stem before they are sold to the farmers. You are provided with 2 sample solutions of fertilizers T and U and specimen V which has similar tissues as a tomato stem tissue

Task:

Carry out scientific investigations on the effect of solution T and U on specimen V and use your findings to choose the best fertilizer which causes faster elongation of tomato stems.

(Aim; Hypothesis; Variables; Materials)

(Procedure) and (Results/ observations)

(Analysis/ explanation/interpretation/ conclusion and recommendation)

(T-0.0M, U-0.6M, V- Irish potato)

ITEM 2

After weaning her baby, Jane introduced a new diet to her baby. After 3month, the baby developed a pot belly and frequently fell sick with a bleeding gum. Her husband claimed that the change in diet her was the cause of the symptoms which she denied. Jane would wish to know whether the change of diet is the cause of her child's conditions.

You are provided with food sample M and N which Jane feeds the baby on.

(M-2% glucose, N-1% starch)

Task: Design and carry out a scientific investigation on the food sample M and N and use your findings to explain to Jane the relationship between the food samples M and N with the child's condition and recommend the food to correct the baby's condition.

- (a) Plan of the experiment (Aim, hypothesis, variables, materials and apparatus)
- (b) Procedure and results of your experiment
- (c) Using your results, explain to Jane the cause of the baby's symptom and advise her.

ITEM 3

Njovu secondary school kitchen store has tomatoes, onions, bananas and bread. It is 45meters away from an open garbage pit. There was an outbreak of stomach-ache, vomiting and diarrhoea after eating some of the food in the store.

Some students think specimen X is responsible which others think it is specimen Y which is

responsible for the outbreak You are provided with specimen X and Y which were obtained from the school kitchen store.

#### TASK

- i) Using observable features and reasons, identify specimens to the students?
  - ii) which of the specimens is responsible for the student's condition and give reasons for your answer?
- b). using a hand lens, draw and label the structure(s) for movement.

(X housefly and Y termite

#### Item34

Cypriano is a prominent maize farmer of Kamuli district. During the flowering stages, his garden was invaded by army worms caterpillars that feed on most of the plant's structures including leaves, making holes in the stems of the plants. He however also noticed that some plants had started wilting, when uprooted some of the wilted plants he found out that the plants are attacked by fungal disease. However, on spraying the larva stage disappeared and the maize plants. Gave some good yield.

#### Task

- (a). Identity plant processes affected by the problems in the garden
- (b). Explain how the fungal and caterpillars affected the normal functioning of the plant process.

(c). Explain how the plants survived after spraying.

**Item 35**

In attempt to maintain her slender figure, Sarah of weight 12kg and height 0.8M decided to avoid having lunch and super. She depends mainly on water with simple snacks. However, recently she has become bony, frequently falls sick, has soft bones, cannot see well at night and has turned pale She once collapsed due to lack of energy While giving a presentation in class and was recommended a diet consisting of maize porridge mixed with milk. He also advised her to take some supplement which if followed Can improve her health.

Task.

- (a). Explain how her lifestyle has caused her to suffer from different challeng
- (b). Explain how the various challenges will be overcome by the doctor's recommended supplements in order raise her esteem.

**Item 36**

Mr. Mukasa always set fire to his garden after harvesting as a way of clearing his garden for growing maize. After several years of planting maize on his farm, the maize plants planted started to grow slowly with yellow leaves which greatly reduced the maize yields. He is therefore worried about the decline of the yields in his garden

Task

- (a) Explain how his practice of farming affecting yields in his garden.
- (b) What solutions can Mr. Mukasa apply to get good harvest?

**Item:37**

Residents of Butansi village living near a pool of stagnant water in the swampy area are always associated with challenges of their children suffering from malaria, cholera and attack by wild animals. When consulted the health officers, the report indicated that frequent sickness is due to the surrounding environment and lack of latrines in the area.

Task

- a) Explain the causes of the challenges in the scenario basing on the medical report.
- b) Advice people on what should be done to overcome such problems.

#### Item 38

John always feeds on fatty and sugary foods, rarely brushes and enjoy watching movies seated for the whole day. This has become part of his addiction. He has however, been faced with a number of challenges including, tooth decay, high blood pressure, excessive weight gain and reduced heart rate. The doctor diagnosed him to have developed heart disease due to his life style.

Task

- (a) Explain how his lifestyle and choice of his meals has caused the challenges.
- (b)What advise can you give him to leave a happy life.some supplement which if followed Can improve her health

#### Item 39

Kato a 10-year-old boy got a motor accident on his way home from school. He had severe bleeding and lost a lot of blood. When rushed to the hospital he was unconscious. The doctor decided that he needed a blood transfusion. Kato is of blood group parents at the hospital are of blood group A, his brother is of blood group AB, and his sister is of blood group O

Task

- a) Work out the possibility of each relative to transfuse blood to save Kato, give reasons for rejected blood.

b) explain any other possible strategies to manage Kato's conditions.

**ITEM 40**

Fred a farmer in Kitala village established a large tree plantation. His young trees were growing well but at some point, he noticed that a large number of trees were drying up. On close examination, he noticed that some of the roots had been destroyed, bark stripped off from the lower part of the stem. Trees on the hilly areas were also stunted with yellow leaves while those at the bottom of the hill were taller with green leaves.

Task

(a) Explain to Fred why some of his trees were drying up, others being stunted with yellow leaves.

(6 scores)

- Bark of the tree and roots were damaged as a result of being eaten by large animals.
- Bark of the tree were for transportation of water and mineral salts to the roots.
- The tree is on the hill were not getting enough water and important nutrients hence turn to yellow and stunted growth.

(b) Advice Fred on what he can do to reduce further damage to his trees.

(3 scores)

- Fred should protect his trees by fencing around the trees to keep animals away from eating the roots and bark of the trees.
- Fred should use manure around the soil on the hill to improve on the soil fertility.

**ITEM 41**

Derrick a 17-year-old boy, who is bright in class. However, as a result of his peers, he started taking alcohol and marijuana which prompted him to always escape from school, declined in performance, stealing plenty of cash from parents. One day when the subject teacher Mr. Ssematimba was organizing the class, Derrick refused to sit at the back insisting that he

could not see clearly on the chalk board while at the back.

Task

(a) Explain the reason as to why Derrick insisted not to sit at the back of the class room when the teacher was pushing him

- Derrick could not want to sit at the back because his eyes were not working well as their used to using alcohol and marijuana which made his eyes not to see clearly the words (blurred)
- Derrick also was having a problem of not seeing well at a distance.

(b) What are the likely outcomes of Derrick's Lifestyle?

- Taking alcohol and marijuana damage Derrick's body organs like brain, lungs
- Poor performance
- Start stealing
- Being arrested as a result of under age when taking alcohol.

(c) What advice can you give him?

- Stop taking alcohol and marijuana
- Concentrate on his studies
- Leave group peer
- Educate / sensitizing him about dangers of taking alcohol and marijuana.

**ITEM 42**

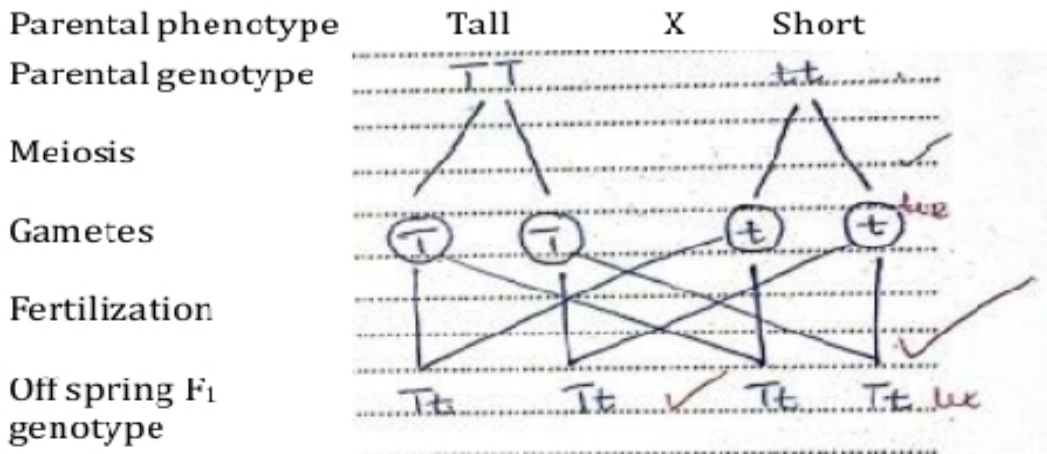
Fifteen years ago, Reign was very small, short and young girl. Last time her aunt visited their home and found out that she had undergone a lot of changes all over her body. She noticed that she had added a lot of weight and was very tall like one of her parents. In her family, the father is very tall while the mother is very short. Now days her mother oftenly ensures that Julianna is at home to protect her from attempts of early childhood pregnancies and other reproductive problems.

Task

(a) Using genetic symbols, show how the two parents have contributed to Reign's new height.

Let T represent allele for tallness

Let t represent allele for shortness



Off spring phenotype: All tall

Reign's new height was tall since the gene for tallness was dominant to shortness.

**(b) State the developmental changes which Reign has undergone at her contributing to her new weight. (5 marks)**

- Reign's increased weight was due to puberty and growth.
- The increased appetite and hormonal changing which stimulated growth and fat d
- Increased weight was also due to mass of the muscle increased.

**(c) Explain to Reign the likely effects associated with early childhood pregnancy other related reproductive problems encountered by youth today. (3 marks)**

Risks of early childhood pregnancy: Increased complication during pregnancy and eg. Premature birth, Low birth weight and death, emotional development.

**SECTION B (Choose 1 item from each part)**  
**PART 1 CHOOSE ONE ITEM**

**ITEM 4**

Many farmers practicing farming in hilly areas in Uganda especially in Bul... facing many challenges in their farmlands due to landslides that occurred in recently increased washing of top soils to low lying areas during rainy season greatly affected productivity in such area and many people have lost their liv

**SUPPORT MATERIAL**



As a soil scientist, explain to these farmers the likely causes of the above problem. Advise them on the possible measures that can be used to overcome the above problem. (15

a) Increased frequency of landslide and top soil erosion in Bulambuli is due to the following factors;

- Deforestation: Cutting down trees and removal of vegetation that help to bind soil particles lead to washing of soil particles down the hill as rain runs off.
- The loss of trees also lead to soil erosion exposing the soil naked and erosion occur easily by rainfall leading to increased runoff hence landslides.
- Using poor methods of farming such as overgrazing and over cultivation along the slopes leading to loosely soil particles hence erosion occurs easily. • The loose soil particles underlying the rocks can easily be washed away by rainfall leadingto landslides.

b) Irresponsible irrigations

Implementation of soil conservation with the following measures

- Terracing which reduces the speed of run off and prevents soil erosion.
- Contour farming; Ploughing across the slopes instead up and down reduces the speed or runoff hence reducing erosion and holds nutrients in the soil. • Deforestation and afforestation to restore vegetation cover which stabilize the soil.
- Afforestry intergration of trees and shrubs into farming system. This also helps to stabilize the soil and reduces runoff and improve soil fertility.

**ITEM 45**

River Mpologoma is covered by thick papyrus vegetation and slow-moving waters. Residents are cutting the papyrus, cultivate along river banks and use mosquito nets for fishing. Recently, many residents are falling sick and they complain of reduced fish in the river.

TASK

(a) Explain how the activities of the residents have caused the challenges they are facing.

Cutting the papyrus leads the following negative effects in river Mpologoma.

- Cutting the papyrus leads to habitat destruction for some aquatic animals which reduces the population due their migration
- Cultivating along the river banks add fertilizers and pesticides causes runoff in the river,

polluting water and this harms aquatic life

- The populated water reduces the fish population and residents fall sick of water borne diseases.

- The use of mosquito nets for fishing is unsustainable leading to overfishing and depletion of fish species in the river.

- The slow-moving water is as a result of depositing rubbish from the garden along the river banks that leads to act as a breeding place for mosquitoes hence causing malaria.

(b) Suggest the possible recommendations to address these challenges. (15 scores)

Restriction of fishing sizable fish to avoid extinction of fish species.

- Practicing sustainable fishing practices to be implemented.

- Practicing seasonal fishing to maintain fish population.

- Reforestation efforts to restore papyrus vegetation hence providing habitat for fish and improves water quality.
- Improving sanitation to access clean water and prevents water borne diseases.

- Practicing sustainable agriculture practices such as organic fertilizers and minimizing

use of pesticide to reduce water pollution.

Fatumah a senior 4 girl was experiencing general body weakness a week towards school inter-house athletic competitions and thus was scared that she may not participate in these competitions. The school nurse didn't find her with any disease and advised her to first eat before engaging in any sports activities especially on the competition day, which she did by taking a meal containing posho and beans.L

After resting for about an hour, she felt stronger and managed to even win her race.

However, after the competition, Fatumah experienced deep breathing and muscle pain causing her to walk with a lot of difficulty.

Task

**Describe the process that led to the success of Sarah and why she experienced deep breathing and difficulties in walking. How did she eventually recover?**

**(15 scores)**

- Initially the weakness was as a result of blood sugar that caused fatigue.
- Consuming a lot of posho and beans replenished her glycogen stores providing the energy needed for athletic competition to improve on performance in the race.
- The deep breathing and muscle pain indicates increased lactic acid in his muscles.
- Increased physical activities depletes oxygen to anaerobic respiration which produces lactic acids causing muscle pain and difficult in movement.
- The deep breathing is due to body's attempt to increase oxygen intake to metabolize lactic acid to restore muscle function.
- Resting helps to clear lactic acid and restore muscle functioning normally hence muscle pain reduced.
- Eating posho and beans supplied nutrition that aided the recovery process.

**5 – 7 ue or more = 15**

**3 – 4 ue = 10**

**2-3 ue = 6**

**1 ue = 3**

**ue = 1**

**ITEM 7**

**John, whose mother has hepatitis B was involved in a motor accident. He hit his head, lost a lot of blood and became unconscious. He rushed to a nearby health center IV where they found that he is of blood group AB and also had injured his kidneys. The doctor advised that John should undergo blood transfusion in addition to other medication. The health Centre did not have blood but John's relative with safe blood were willing to donate blood to save his life. However, they were confused as to who of them could donate blood.**

**Table 1 below shows groups of John's available relatives.**

<b>Relative of John</b>	<b>Blood group</b>
<b>Cousin</b>	<b>A</b>
<b>Mother</b>	<b>B</b>
<b>Sister</b>	<b>AB</b>
<b>Brother</b>	<b>O</b>

**SUPPORT MATERIAL**



Task

(a) Explain how the accident affected the functioning of John's body.

(b) Without referring John to another hospital, suggest with reasons, which relative could donate blood to John.

- The accident caused blood loss leading to unconsciousness, bleeding and damaging organs like kidneys and brain and reduced supply of oxygen in that compromised his health.
- John's sister with blood type AB is the best match because she has the same blood type as John.
- Kidney damage complicates his conditions impairing his ability to filter waste products from blood.
- Individual blood type AB are universal recipients from all blood groups A, B, AB and O but John had to receive blood from his sister or the same blood group to avoid risks complicating.
- Basing on the table John's sister (AB), brother (O) mother (B) and Cousin (A) could not donate blood to him. However, his sister has the same blood type the other can donate but there is a slightly high risk of complication.
- All can donate to John except the mother, cousin and sister can donate to John because they cannot produce antibodies against antigen A and B in the blood.

**Item 48**

Item 1

In Uganda, the beautiful landscapes are home to diverse ecosystems that provide vital natural resources. However, increasing human activity, such as illegal poaching and deforestation for agricultural purposes, has begun to take a toll on these precious environments. The beautiful forests of Bwindi Impenetrable National Park, a UNESCO World Heritage Site, are known for their rich biodiversity, including endangered species like the mountain gorilla. Nonetheless, the pressures of land reclamation for farming and unsustainable logging practices have led to significant ecological disruption.

Task.

Explain the effects of such human activities highlighting the natural resources at risk of being affected and what can be done to reverse the effects. Discuss the benefits of preserving such a

**Item 49**

UNESCO World Heritage Site emphasizing the importance of biodiversity and ecosystem health. In a village in Kalungu District, the town residents were complaining of having no market for fish that they had caught in the river. An investor decided to construct a manufacturing factory on the River Banks to provide market for the fish and also get more products from the fish. Fishermen are now complaining about reduced fish, increased cases of respiratory diseases among others.

TASK.

Explain to the locals the challenges the factory may be imposing to life in the lake, advise them on the ways to minimise the effects of the challenges and Show them the value of conserving such a natural resource. (MERRYLAND HIGH SCHOOL KATABI CAMPUS)

**Item 50**

In Lukaya Town Council, swamps have been cleared for Agriculture, cattle farmlands and sandmining. The town residents are dumping wastes in sewage channels, burning rubbish and polythene and are not concerned of the effects they are causing. The Mayor Mr. Jozin and the town clerk Mrs Joy have sensitized the mass about the dangers of such practices but all in Vain. In a recent radio talk show, Mr. Jozin quoted and said “the Earth has enough resources for our need, but not for our greed. Conserving the environment is a state of harmony between men and Land.”

Task.

(a)

Explain to the town residents the environmental problems likely addressed by the town Mayor and the town Clerk. and how they can be solved. Explain why the village should conserve the natural resources in the swamps (MERRYLAND HIGH SCHOOL KIGUNGU CAMPUS)

**Item 51**

Many residents had cleared and constructed residential and commercial buildings and various factories in Lubigi, a large wetland in Kampala. Due to the many environmental challenges brought about by their actions, the National Environmental Management Authority NEMA, has decided force them out of the area and destroyed all their buildings in order to restore the wetlands a residents are not happy.

Task.

Explain to the residents how their actions have brought about the environmental challenges in Kampala city

. Suggest what could be done to avoid such challenges if they were allowed to sustainably live in the area and why is it important for NEMA, to restore the area to its original question paper

**Item 52**

Jonah planted maize and mixed beans on his plot along a dusty road side. As a way of obtaining good yields, prepared his garden well and planted quality seeds in closely packed columns and rows, applied fertilizers, sprayed to prevent any pests and removed weeds. He planted maize earlier and planted beans later after the maize were already tall. His maize yielded poorly and beans remained stunted with no yields. He is very worried about the outcomes yet he spent a lot of money on the garden.

Task.

- a. Describe the causes of the outcomes.
- b. Advise Jonah on how he can plant the same plants in the same garden in other seasons with minimal losses. (MERRYLAND HIGH SCHOOL KATABI CAMPUS)

**Item 53**

Nancy and Catrine who are farmers in Kamu sub county both planted the same type of beans. Nancy planted her beans near the dusty road while Catrine planted her beans far away from the road. At flowering stage the garden was invaded by numerous bees for some time. After the visit by the bees, the bean pods started forming and finally the beans gave some yields. At the harvest time Nancy's yields were too low while Catrine's harvest were relatively higher this left the two confused as they were unable to understand the cause of the differences in the yields.

Task:

a) Explain

i. the major challenges faced by the bean plants in Nancy's garden.

ii. the internal processes that took place in the bean plants from the time bees visited until when the yields were realized.

b. How did the beans overcome the prevailing conditions to give some yields?

**Item 54**

In the village of Kigungu located in Entebbe, local farmers predominantly cultivate Bananas and Cassava. However, the village recently faced a prolonged dry spell followed by strong winds which brought a significant amount of dust that settled on the leaves and stems of banana and cassava crops. The farmers are worried that if this problem persists, it could lead to severe losses in their harvests.

Task:

- a) Identify the life processes affected in the plants.
- b) Explain
  - i. how the functioning of these plants is affected.
  - ii. solutions that the farmers of Kigungu could implement to overcome the challenges posed by dust on their crops. (MERRYLAND HIGH SCHOOL

**Item 55**

Mr. Matovu is a farmer in Kigungu Village. He borrowed money from PDM and used it to plant his beans on a full acre of land in hopes of making profits and paying back the loan. A few weeks later, the beans had sprouted and formed their first foliage leaves that came out of the ground. A few weeks after sprouting, the leaves developed yellowish patches, and some were being eaten by the caterpillars. Matovu's friend Jonah felt bad for his friend and gave him a pesticide to eradicate the pests that later all died after being sprayed. Unfortunately, the leaves remained yellowish and the bean plants showed retarded growth. And at the end of the season some bean pods were formed and other plants never yielded anything.

Task.

a. Identify

i. the life processes that were affected within the plant.

ii.

Other possible measures Mr. Matovu can put in place to prevent such tragedies from happening again next season.

b. Describe the events that occurred within the seeds from the time they were planted to when the first foliage leaves were formed.

#### Item 55

Ddembe of recent bought a piece of land. He planted maize and ground nuts at the onset of the rainy season. After some time, the plants were showing stunted growth, having yellow small leaves, while some leaves had fallen off prematurely. On investigation, he found out that plants had very short poorly developed roots. On consultation from the agriculturalist, he was given a chemical which he mixed with water and sprayed on the crops. After two weeks, the plants had improved with many broad long leaves, many long roots and started flowering. Ddembe is very happy

Task;

- a) Identify the plant nutrients that were likely to be present in the chemical
- b) i. Explain how the above-named nutrients led to the increase in plant yields.  
ii. How did the plants overcome the challenges during growth?

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- b) i. Explain how the above-named nutrients led to the increase in plant yields.  
ii. How did the plants overcome the challenges during growth? (MERRYLAND HIG

#### Item 56

Mr. Zinart is an athlete who loves jogging and working out everyday in the morning hours.

He recently shifted from his former town X due to having been employed in a different town Y. Town Y is characterised by numerous manufacturing industries that produce numerous

pollutants like toxic fumes, smoke and dust that was minimal in town X.

He used to jog everyday without any complications in town X but unfortunately when he shifted to town Y, he experienced complications such as difficulty in breathing, chest pain and coughing.

Task:

Explain to Mr. Zinart his experiences while living in town X and the new ones encountered in town

Y and advise Mr. Zinart on how to manage the challenges experienced in town Y.

#### Item 57

Jonah experienced a fatal accident where he experienced teeth loss and loss of consciousness.

He was rushed to the near by hospital and on further diagnosis, it was seen that his pancreas was damaged. The doctor advised that Jonah should undergo blood transfusion immediately in addition to other medication. The hospital did not have blood but Jonah's relatives were willing to donate blood so as to save his life. They consulted the Doctor to see who would be able to donate

On analysis, Jonah's cousin aged 20 years and weight of 60Kg was of blood group A, Jonah's mother aged 46 years and with a weight of 70Kg was of Blood group B, Jonah's sister aged 20 years with a weight of 38Kg was of blood group AB and Jonah's Brother was of blood group O aged 9 years with a weight of 29Kg.

Task

- a. Identify the organs of Jonah's body that were affected
- ii. With clear reasons, to the family who can possibly donate blood to Jonah since he was tested being blood group AB
- b. Explain how the damage of the organs affected the normal functioning of his body.

**Item 59**

Galvina was always sick and initially resisted seeking medical attention because she is very stubborn but eventually realized the negative impact her deteriorating health was having on her life. When she was eventually taken to the hospital, reported symptoms of frequent urination, lower abdominal pain, Haematuria (Blood in urine), fatigue, Nausea, Vomiting, swollen feet and ankles. When her Urine was tested, it had a lot of proteins. An examination also revealed difficulty in standing and alcohol on her breath.

TASK.

- a. Identify the organs which were affected by the patient's symptoms
- b. Identify the role this/these organ(s) play(s) in the body.
- c. Describe the events that led to the formation of the urine that was taken to the lab for testing.
- d. Suggest strategies for managing the condition she is suffering

**Item 60**

Gembe, a village in Luwero is composed of the following groups of people; Pregnant women, Crawling babies, footballers and athletes, office workers and old people. The health care providers of the area want to design the right diet for each group of people but they don't know what to include. You have been consulted on what to do.

Task.

- a. Identify the nutrients and their uses that should constitute a greater percentage in the diets of the above groups of people in Gembe village.
- b. Suggest what would happen if the individuals above depended on an imbalanced diet.

**Item 61**

Frank is a teenager who is in S4. He drinks alcohol and uses other related drugs to feel high. On several encounters, his parents have been counselling him to stay away from drugs. One day as he was boiling milk. He rushed to lift the saucepan that had milk as the milk was about to spill. Even after lifting the hot saucepan, without any insulator, he never felt pain. His grandmother got surprised. After putting the saucepan down, Frank experienced pain and rushed to put his hands in water to cool down.

Task.

a.Explain

i.

the challenges Frank is likely to face as a teenager.

ii.Explain the reasons behind his failure to respond to the heat stimulus scenario.

b. What advice can you give to Frank and other teenagers so as to be productive members of society. (ENTEbbe COMPREHENSIVE SENIOR SECONDARY SCHOOL)

Item 62

Arthur smokes cigarettes, Marijuana, cocaine and shisha everyday after work with his friends.

During weekends he consumes a lot of alcohol. He no longer has enough money to pay school fees for his children who are appearing malnourished. He beats his wife every time and the wife is in plans of divorcing him. Arthur recently has developed hypertension and diabetes plus other chest problems affecting his breathing rate. He appears weak and older than his real age.

Task

a. Explain the effect of Arthur's life style on Arthur

Item 62

Kelly is a student in S4 who frequently urinates and feels thirsty. One day while on his way back home, he heard a very loud barking sound from a fierce dog. When he tried to run, his legs felt weak and he couldn't move them. When he forced himself to move he instead fell down. His heart pounded, eyes protruded and his heart beat increased Task

task

Task

a) Explain how Kelly's body coordinated from the time the loud barking sound was heard to the time he wanted to run away.

b)Point out

i.his bodily metabolic disorder and explain its causes

ii.Ways how he can manage his health condition.

**Item 63**

Peter is preparing a meal while enjoying a few drinks with friends. After several hours of socializing and consuming alcohol, he decides to warm some milk for his evening tea. As he reaches for the saucepan on the stove, he accidentally touches the side of the hot pan. He doesn't react in anyway but realises later that he got a burn in the process.

Task:

a)Explain

i.

The key processes and body parts involved in that incidence, including the roles of sensory receptors, nerves, and the spinal cord.

ii.The biological problems that arise from Peter's alcohol consumption c.Describe

i.how the body normally overcomes such challenges through reflex actions ii.

Describe potential strategies or interventions that Peter could take to minimize the

risks associated with alcohol consumption in dangerous

Item 64

Nanyonga, a senior three student normally watches films at the nearby trading centre up to midnight. On her way back home, she saw a fierce looking dog coming towards her

Immediately, she experienced an increase in the rate of heartbeat and breathing. She picked a stick and beat the dog.

Task

a. Describe how her body coordinated from the time she saw the dog up to when her arm muscles helped her to beat the dog.

b. What are the possible

i. Effects of the student's way of life as described in the scenario above?

ii. Ways through which the student can be helped to change her lifestyle?

Item 65

In a certain family, a paternity dispute has arisen between a man, Mr. Kasozi, and a woman, Mrs. Kasozi, over their 2-year-old child. Mr. Kabuye denies being the biological father of the child since they have different blood groups while Mrs. Kasozi claims he is the right father. The child's blood type is O, Mrs. Kasozi's blood type is B while Mr. Kasozi's blood type is A. Recently, the child was diagnosed with a bleeder's disease after an injury, where he even needed a blood transfusion but neither of the parents had such a disorder.

Task.

a) Clearly show to Mr. Kasozi the possibility of being the father of their 2-year-old child basing on

the scientific facts of blood groups.

b)What are the likely effects of the disease discovered in the 2-year-old?

**Item 66**

Musa was a man of Honor, with a very good job, lived in Munyonyo where he had constructed a very big house where he married and stayed with his new bride. Two years ago Musa's wife got pregnant and gave birth to a son with a very low birth weight, the child experiences pain in his joints, that are always swollen. A medical examination revealed a damaged spleen and low blood count. Musa has sold most of his things to treat his child and feels like God has abandoned him.

Musa started living in a grass thatched house in Bwaise with his wife where their son eventually died from leaving them devastated. A year ago, Musa's Wife got pregnant again and experienced a miscarriage. And since then all subsequent pregnancies have been miscarried. Musa is depressed and has sworn to commit suicide. A medical examination revealed a rhesus blood incompatibility causing the miscarriage

Task.

a.Explain.

i.The disorder their person son had.

ii.Using a genetic cross how their son got to have such a disorder.

b.Suggest

i.

An explanation for the possible causes of the miscarriage and why their first pregnancy never got miscarried.

ii. Which advice you can give to Musa so as to deal with the problems his family is facing.  
(MERRYLAND HIGH SCHOOL KIGUNGU CAMPUS)

**Item 67**

In a recent case in Kigungu, a 16 year old Isabella, influenced by her peers, innocently engaged in

sexual acts with several boys and became pregnant with a baby girl. After her baby's birth, it was discovered that the baby has a hereditary disease of excessive bleeding when injured. As news spread, two families were implicated, and Isabella's family sought to identify the baby's biological father to understand potential hereditary risks and ensure proper support.

Task:

a.

i) Using a genetic cross, identify explain how the rightful biological father can be identified.

ii. Describe the processes that lead to the pregnancy.

b. Which advice can you give to Isabella and her peers about the dangers of e

**Item 68**

A woman has a daughter. There are three men whom she claims might have been the father of the child. The judge in the paternity court orders that all three men, the child, and the mother have blood tests. The results are:

Mother, Type A

Daughter, Type O

Man 1, Type AB

Man 2, TypeB

Man 3, TypeO.

The mother claims that this proves that Man 3 must be the little girl's father. The judge isn't satisfied, so he asks for the medical records of the people involved. He discovers that the little girl is colourblind. Men 1 and 2 are also colourblind; Man 3 has normal colour vision, as does the mother.

Task.

Using your knowledge of Genetics, work out the crosses and determine the rightful biological father of the child.

#### Item 69

Milly was 15 years old and in S3, when she was convinced by David to engage in a sexual activity. After one month, she discovered that she was pregnant and decided to go to David for support but David denied being responsible and abandoned her. She later started falling sick more often and on testing she had Hepatitis B and Malaria. She delivered the baby who was mentally retarded, has a short neck, bulging eyes and flat face. The doctor said that the child's mental condition is due to a genetic disorder caused by non disjunction.

Task.

a.Explain

- i.how the child's genetic condition comes about.
- ii.What are the likely challenges that Milly faced before and after delivery

b.Suggest

- i.How Milly can ensure that the child lives a healthy life
- ii.Advice you would give to teenagers outside to prevent

#### Item 70

## PRACTICAL

After weaning her baby, Akumu introduced her to a new diet. Six months later the baby developed a pot belly, bleeding gums, started falling sick frequently. The neighbors suggested that Akumu should add some other foods to the baby's diet to improve the baby's condition.

Food samples in

solutions P

, Q, R and S are some common in Akumu's environment.

Task

Carry out a scientific investigation on all the food samples and then use your results to advise

Akumu on which ones to be added to the baby's diet. (your investigation should include aim,

hypothesis, variables, materials, results of experiment, analysis and recommendation)

## Item 2.

Nakabito a chips seller in Wandegaya market noticed that most people enjoy eating Irish potatoes in sliced fried form. She cuts them into small pieces and allows them to settle in water for some time in preparation for frying them. Nakabito's customers enjoy the chips and even pack some for their children home. In a rush to serve her customers, she bought 2 jerry cans of water to use the next day and soaked the sliced Irish potatoes in them. The next morning the sliced pieces were

fried and served to the customers but noticed that they were different from the normal ones

always served since they were small in size. Nakabito is afraid of marking losses.

Solutions Q and R are samples from the two jerry cans and plant organ M is similar to what

Nakabito uses in her business.

Task

Carry out a scientific investigation on solution Q and R with plant organ M to so as to help

Nakabito save her business.

Item 3

Rice grows well in swampy areas. A farmer bought two different plots of land in the same area to grow rice on large scale. Plot A is on a slightly raised area while plot B is located at the valley. He planted the same quantity of rice seedlings on both areas A and B. The farmer observed that many rice plants from plot A had short roots and a few had long roots while those of plot B all had many short roots. At harvest time the yield from plot B was more than from plot A. The farmer was told that the difference in yield was due to difference in the soils' ability to retain water. The farmer wants to know why the two plots have different yields.

Task

You are provided with soil samples A and B obtained from the two plots. Design and carry out a scientific investigation on soil samples A and B to determine which plot of

Item 4

Pastoralists around Nakaseke district have often complained about unknown organisms on their animals. Many of their animals keep rubbing their bodies on tree trunks in order to get rid of the organisms. When the pastoralists reported to the district veterinary officer, he collected the specimen from the affected cattle corridor and took them for further analysis in the laboratory.

Specimen P (tick) Q (worker termite) R (housefly) and S (beetle) are some of the organisms collected.

Task

- a) With reasons, classify the specimen into two common taxa.
- b) Explain how specimen P is adapted to causing its effect on the animals.

- c) Identify the specimen using a dichotomous key
- d) Draw the specimen that is responsible for the effect on the animals. Label the main body

### Item 5

Mr. Opio and Mr. Okello are neighboring farmers in Kigombya village in Mukono. When flowering time reached, their flowers matured. Mr. Opio observed that more bees visited Mr. Okello's garden than his. Mr. Okello continuously complained of decreased yield in his garden.

You have been provided with specimen K (maize inflorescence) from Mr. Opio's garden and L (hibiscus flower) from Mr. Okello's garden.

#### Task

- a) Identify the specimen provided.
- b) Explain why more bees preferred Mr. Okello's garden
- c) Draw and label the female part of specimen L. provided.

### Item 71

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 72

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.

**Item 76**

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 thmother 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 con

**Item 78**

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.

#### Item 79

In Uganda, the beautiful landscapes are home to diverse ecosystems that provide vital natural resources. However, increasing human activity, such as illegal poaching and deforestation for agricultural purposes, has begun to take a toll on these precious environments. The beautiful forests of Bwindi Impenetrable National Park, a UNESCO World Heritage Site, are known for their rich biodiversity, including endangered species like the mountain gorilla. Nonetheless, the pressures of land reclamation for farming and unsustainable logging practices have led to significant ecological disruption.

Task:

Explain the effects of such human activities highlighting the natural resources at risk of being affected and what can be done to reverse the effects.

Discuss the benefits of preserving such a UNESCO World Heritage

Site emphasizing the importance of biodiversity and ecosystem health.

#### Item 80

In villages of Sembabule, swamps have been cleared for cattle farmlands and sand mining. The resident district commissioner (RDC) organized a community sensitization campaign on

sustainable use of natural resources in swamps. Unfortunately, Raphael a resident of the area arrived late and only heard the concluding remarks, "..... I kindly request

everybody to use our natural resources sustainably."

Task:

Explain to Raphael the environmental problems likely addressed by the RDC and how they can be solved. Explain why the village should conserve the natural resources in the swamps.

#### ITEM 81

Due to increased population pressure in Kabale municipality. Most of the vegetation has been cleared to create space for settlement and agriculture. Trees have also been cut down to be used as fuel and there is an increased use of fertilizer in the plantation especially tea plantations in Rushoroza. Some have decided to do stone quarrying and sand mining as the source of income to supplement food from the garden.

The residents have started noticing that the village wells are drying up and the appearance of water is changing.

The concerned citizens of Kabale municipality have sought help from the officials who have organized sensitization workshop in different villages

Tasks

As a biology learner prepare a short presentation you will deliver during workshop

Explain the challenges the residents caused to the environment.

The im

portance of conserving the environment

#### ITEM 82

People of Kigezi living on the shores of lake Bunyonyi during the dry season practice planting of different crops, mining sand from lake to earn living and others have constructed homes and hotels around the shores to attract the tourists.

Recently they are facing challenges like constant flooding, frequent malaria disease, soil erosion, crop wilting and as a result crop yields have reduced

Task

Explain the challenges faced by the people living around the shores of lake Bunyonyi

Suggest the ways how shores of lake Bunyonyi and some neighbouring features like rivers and wetlands can be conserved

**ITEM 83**

Mr. Kakooza a senior UPDF officer recently was given a leave. This was after his immediate supervisors observed his change in behaviours like increased smoking and decreased performance on parade. More so in the recent training he fell short of breath and started coughing. He is now worried about his decline in performance and the possibility of losing a chance to go to Somalia to keep peace. He is not sure whether all these are caused by smoking

Task

Show how Mr. Kakooza lifestyle is responsible for the challenges experienced in his body, leading to his decline in performance

Suggest how he can change his lifestyle

**ITEM 84**

Mrs. Jenipher has been working at Makanga hospital for over 20 years as a cleaner. Recently her child got a serious accident on his way back home from Kampala.

He was rushed to makanga regional referral hospital to get improved treatment. Unfortunately, the doctor told Mrs Jenepher that the son had got a serious damages and lost a lot of blood so he need blood transfusion. On test the compatibility of jeniphre's blood and the doctor's blood it was found out that both could not donate blood to her son. The only option was to get blood from blood bank in Mbarara regional referral hospital however while on the way the child died.

Blood group of Mrs Jenipher AB

Blood group of the doctor A

Blood group of the son B

Mrs Jenipher is now blaming the doctor and her fellow staff mates that they could not let her save the son not even the doctor himself yet she has been donating blood every three month

Task

Explain to Mrs Jenipher,

Why blood transfusion was not possible both from her and the doctor to the son  
Which blood group could have saved his son (would be compatible on transfusion)  
Why and how heavy blood loss resulted to death of life of hi

**I wish you success all in 2926....**

**God bless you.**

**Compiled by Tr. MUSINGUZI IBRAHIM**

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