

JJ CHRIS EVENTS ARUA CBC FINALISTS SEMINAR 2024

Element of Construct One

Item One

40 years ago, Banda was a natural swamp with numerous papyrus plants, reptile species and several birds. Over time, people started constructing homes within the wetland until it became a township. However, residents still face a number of challenges both during wet and dry seasons and all these are attributed to the fact that the natural swamp is no longer in existence.

Task:

Explain the problems in Banda, suggest how the residents can overcome them, and show them the value of conserving the natural environment.

Item two

A chemical factory was established on a large river bank, with a view that it needs constant supply of water for its machinery and activities. Overtime, the river developed a lot of algal blooms, and the fisher men complained of dwindling numbers of fish species previously caught in large numbers. It was also noted that during the establishment of the factory, a lot of soil was heaped along the river bank, and so a lot of deposition goes on into the river. Environmentalists have warned the government about pending dangers especially during rainy seasons.

Task

Explain to the relevant authorities the origin of the problems in Murchison Falls National park, show how they can be worked upon and sensitize them on the relevancy of the natural interactions that go on in such communities.

Item three

In order to promote tourism in Murchison fall National, the Uganda Wild life Authority decided to increase on the number of lions, and these were transferred from Queen Elizabeth National park to the area. The Lion population in Murchison falls National Park grew bigger, and coincidentally, the numbers of antelopes decreased drastically. With time, the park increasingly became bushy and the game wardens decided to use fire to control the bushes. During periods of burning, thick smoke covered the atmosphere for the greater part of the day.

The National wild life body is now concerned over the challenges in the national park.

Task

Explain to the relevant authorities the origin of the problems in Murchison Falls National park, show how they can be worked upon and sensitize them on the relevancy of the natural interactions that go on in such communities.

Item four

Mr. Mukasa cleared a forest along the slopes of a hill that had fertile soils to extend his farm 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. Yields are poorer at the hill top than in the valley. Also, residents of this village use the valley of Mr. Mukasa's farm for dumping plastic waste bottles and used polythene bags which has caused more challenges especially in the streams found in the valley. **Task**

Explain the likely effects of the actions of Mr. Mukasa and the residents of his village and suggest possible ways these effects can be overcome. What is the importance of conservation of valleys?

Element of Construct Two.

Item five

Herbalists in Buikwe District use Mabira forest as a source of their herbal medicines. They debark trees, harvest leaves and dig out tree roots in order to extract various herbal medicines for several ailments. Consequently, the medicinal plant species in the forest are decreasing greatly.

- Identify the several plant structures affected by the activities of the Herbalists
- How do the actions of the Herbalists affect the normal functioning of medicinal trees in the forest?
- Explain how the medicinal plant trees are able to survive despite the actions of the herbalists.

Item six

Two farmers A and B planted equal acreage of maize in the same season. Farmer A's garden is near an extremely dusty and busy murram road, while farmer B's garden is very far away from the road. The maize in both gardens showed different growth rates, despite being under similar weather conditions and soil profile. The garden for farmer B was invaded by caterpillars at flowering stage, however, the maize managed to give yields before that of farmer A.

- Point out the major processes and organs affected by the prevailing conditions in the gardens of the two farmers
- Explain how the conditions in the garden of farmer A were responsible for the delayed yields
- How did the maize in the garden of farmer B finally manage to give yields despite all challenges?

Item seven

Mr. Mubiru prepared his garden well and planted

beans which were looking healthy for the first three weeks. Suddenly, a dry spell set in and most beans had their leaves turning yellow, and some wilted. At flowering stage though, 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.

- Identify the major challenges faced by the bean plants in Mr. Mubiru's garden
- Explain the internal processes that took place in the bean plants from the time bees visited until when the yields were realized.
- How did the beans overcome the prevailing conditions to give some yields?

Element of Construct Three.

Item eight

During his first hospital visit in January, Oloya, a five-year-old boy was found to be having wasted muscles, not physically active, had wounds on his legs and was generally weak. Special foods majorly comprising of Lato milk, millet porridge and fruits were recommended by the Nutritionist for Oloya. His condition has since then improved and data from the hospital records about his weight is as shown in **Table 1**

Table 1: shows changes in John's body weight since his first visit to the hospital

Month	Weight (kg)
January	10.9

March	11.8
May	13.5
July	14.8
September	15.7

The normal weight range of boys is shown in **Table 2**

Table 2: shows normal weight range of boys between 2 to 7 years

Age (years)	Weight (kg)
2	8.9 – 15.1
3	11.9 – 17.9
4	13.4 – 20.4
5	15.2 – 24.4
6	16.9 – 26.5
7	18.6 – 31.5

Task:

Clearly point out Oloya's health challenges and explain how his body utilized the special foods to enable him improve his health.

Item nine

After a morning heavy carbohydrate meal, Nagenda, a male athlete started to warm up in preparation for the competition in long races. He competed favorably, but towards the end, he developed muscle cramps and was breathing heavily. Nonetheless he endured and finally won the race. After finishing, his heavy breathing continued, while the muscle cramp progressively receded. He even managed to walk back home from where he took another meal.

Task

Explain how Nagenda's body utilized the morning meal to enable him win the competition, analyze the challenges his body encountered during the race and how it overcame them to enable him walk back home.

Item ten

Having been in a company of chain smokers for two years, Daniel, an teenager developed dry cough and serious chest pain and got hospitalized after coughing blood. The medical report suggested that Daniel was a smoker, which he utterly denied, and so the doctor put him on serious medication. In the course of the treatment, it was also discovered that Daniels' blood could no longer load enough oxygen, a reason why he was always very weak.

Task

Mention Daniel's Health problem and clearly explain how his body contracted it. Advise Daniel on how he can recover from the problem discovered later in the course of the treatment.

Element of Construct Four.

Item eleven

A sixty-year-old woman instructed her grandson to watch over a saucepan of milk on fire until it boils. At boiling, the old woman rushed to lift the saucepan, but in the event, she immediately released it, slipped off and fractured her leg in additions to burns and scalds sustained. When rushed to the hospital, the orthopedic doctor diagnosed her with Osteoporosis.

- Expound on the events that took place in her body from the time she touched the saucepan until she released it.
- What symptoms did the orthopedic doctor base on to diagnose the woman as such?
- Advise the old woman on how she can manage and improve her health condition as stated by the doctor.

Item twelve

Adrian, a S.4 teenager in one of the urban schools frequently urinates and feels thirsty. 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 his heart beat increase. He stood out to go and hide, but his legs were too weak to support him, so he fell down and his friends laughed at him.

Tasks

- Explain how Adrian's body coordinated from the time the loud sound was produced by the tear gas canister until he fell down while trying to run and hide.
- Point out his bodily metabolic disorder and explain its causes
- Show Adrian how he can manage his health condition.

Item thirteen

Moses is a tall boy, who is bright in class. He however as a result of his friends started taking alcohol and and marijuana which prompted him to always escape from school. One day as the class Teacher was organising the class, Moses refused to sit at the back, stating that he cannot see clearly on the chalk board when at the back of the class, so he insisted on sitting on the first row of the class.

- Explain Moses' problem to the teacher that is making him insist on sitting on the first row of the class, clearly pointing out its cause.
- State the likely effects of Moses' lifestyle
- Advise Moses on how he can improve his lifestyle and be a good child.

Element of Construct Five.

Item fourteen

Jane is a secondary school girl, studying in a day school near her home. As a result of bad peer groups, she started drinking alcohol and dodging school. When the school authority tried to trace why Jane was dodging school, they found out that she had a boyfriend in the nearby village, where she would stay, without reaching school.

A few months later, Jane started feeling sickly and vomiting. When her parents carried out an HClJ urine test, it turned out positive and they were very bitter with her.

She was forced to marry her young boy friend by her parents; however she continued with her habits and did not attend antenatal care. **Task**

- Explain the events that resulted into the changes in Jane's body from the time she met her boyfriend up to when she started feeling sickly and vomiting
- What are the likely consequences of Jane's lifestyle?
- Advise Jane on how she can improve her living conditions

Item fifteen

Mary and Peter had been married for 10 years and have produced five Girls. Peter is very bitter and blames his wife for denying him boys, so he started engaging in extra-marital affairs. After some time, Peter developed an ailment, went to a healthy facility, which after some tests were carried out, it was discovered that he was HIV positive.

Task

- Convince Peter, that he is also responsible for the kind of children they have in their marriage.
- Identify the likely symptoms possessed by Peter, Mary's husband as a result of his health status
- How can Peter manage life with his health status?

Item sixteen

Jane is a thirteen-year-old P.6 pupil was discovered to be pregnant at school during the routine pregnancy checks. She was sent out of school and her parents decided to keep her at home until she delivers. In the course of the pregnancy, she faced many challenges and did not go for antenatal care. She finally delivered her girl child, though with a lot of difficulty. After about one year, her child presented frequent fevers, had sharp pains in the body and was generally weak. The medical personnel informed Jane that her child had a genetic condition that was responsible for her health. Jane and her boyfriend did not believe the personnel's information since for them they had never had such a problem.

Task

- Help Jane and her boyfriend to believe the medical personnel's information.
- Point out the likely consequences of Jane's decisions and actions responsible for her current state. How can Jane better her life despite prevailing conditions?

Practical item (553/2/3)

Science process skills

Item 1

A bread manufacturing company uses enzyme Z to break down starch into sugars, which is a crucial step in the production process as it determines the taste of the bread. Recently, there have been inconsistencies in the taste of the bread, leading to a loss of customers.

It was discovered that workers collect water for bread making from two different sources. Bread made with water from one source is sweet, while bread made with water from the other source is tasteless. You are provided with enzyme Z, starch solution, and water samples A and B from the two water sources. Carry out scientific investigations to determine which water sample produces sweet bread and why the other sample does not. Your findings will help the company address the taste inconsistencies.

Note: After mixing the enzyme, starch, and water, the workers keep the mixture at 40°C to ensure the enzyme works effectively.

Item 2

Ground nuts require well drained soils with good aeration in order to produce the best yields. Namusisi owns two pieces of land L and M and is planning to grow groundnuts on one. Soil samples L and M were collected from the two plots of land respectively.

Carry out scientific investigations to advise Namusisi on which piece of land she can grow the groundnuts to get the best yields.

Structure and function of living things

Item 1

In a suburb of Kampala, residents use farmyard manure to fertilize their backyard gardens that grow vegetables like tomatoes and green pepper. However, an outbreak of cholera has been reported. A health team has been dispersed to investigate and identify the causing agent. During their assessment, they observed two organisms A and B prevalent in the in large numbers. When the residents were informed, their decision is to kill all spray and kill both species of insects.

You are provided with S and T which are the two insects collected from the suburb.

- with reasons, help the residents identify the insect which is responsible for the outbreak.
- Keenly observe specimen S and use its features to convince the residents that it is important them.
- Cut off one leg of specimen T and make a labelled drawing of the leg.

Item 2

Mr. Otim purchased a piece of land and noticed it had only a few plants of species X. He also saw that the neighboring land had species Y, but only in one corner. When Mr. Otim returned a month later, he found that plant X had spread all over his land, while plant Y had grown in number but remained limited to a few specific spots. Mr. Otim suspects that someone may have planted species Y across his land.

You are provided with X and Y which were picked from the two plant species respectively.

- Identify specimens X and Y, providing reasons for your identification.
- Explain to Mr. Otim the situation he found on his land after one month.
- Carefully observe specimen Y, then draw and label it.

Item three

Sarah grows plant seedlings in a nursery bed for sell. She waters them regularly. The dry season came and water became scarce. Mercy bought two jerrycans of water from a supplier whose source she does not know. On watering her seedlings, she noticed that 20 minutes later, half of the plants had their leaves bending down, the stems were very weak while the other plants were very upright and stems strong. Mercy is wondering what could have caused her plants to behave like this.

Specimen G provided has similar tissues as those in the stems of the young plants. You have also been provided with solutions A and B which are samples of water from the two jerrycans Mercy used for watering.

Task.

Design and carryout a scientific investigation on the solutions A and B whose results you will use to guide Mercy.

Item four.

Sarah prefers to buy oily junk foods from the school canteen which she depends on for all her meals of the day and eats atleast an orange a day. One month later, Sarah is observed to walk very slowly at all times, she can not participate in P.E activities, her arm and leg muscles became smaller. She visited the school nurse claiming to be having malaria and that she wants to go home. The nurse examined her and advised her to start eating school foods to improve her condition. Joan does not believe the nurse and insists on going home.

You have been provided with solutions D and E which are extracts from school foods and canteen foods respectively.

(Solution D is a school food extract and solution E is a canteen food extract)

Task.

Design and carryout scientific investigations(s) on the two samples and use the results to convince Joan to take the nurse's advice.

Item five.

Mark, a young farmer weeds his maize garden regularly, however he noticed that there are some two plants that keeps appearing in his garden just a few weeks after weeding. He also observed that the neighbour's goats usually move from the nearby bush and pass through his garden. Mark is wondering why these plants keep appearing in his garden. **Task.**

You are provided with specimen K and L which are parts of the plants that keep growing in Mark's garden.

- a) Using observable features, identify the plant parts K and L.
- b) Explain to Mark how the plants keep appearing in his garden.
- c) Draw and label specimen K.

Item six.

Jacob uses a bull to dig his large garden which is on a slope. One day he noticed that his cow could not stand and was unable to pull the ox-plough. His neighbour suggested that the ox-plough could have broken some bones in the back of the cow and in the legs. The cow later became very ill and was slaughtered, some bones were collected from it.

Specimens R, Q and T are bones collected from the cow.

Tasks

- (a) Using observable features, identify the specimens R, Q and T.
- (b) Describe the features on specimen Q that enable it to keep the cow upright?
- (c) Draw and label the specimen that was obtained from the neck region of the cow.

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