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UGANDA ADVANCED CERTIFICATE OF EDUCATION  
NOVEMBER - DECEMBER, 2023

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- (a) - stems ✓  
- leaves ✓  
- buds ✓  
- Roots  
- Flowers

Any 3 scores

(b). Transpiration ✓ leaves are sites for transpiration, so the rate of transpiration would reduce because there will be few/no leaves

Photosynthesis ✓ The fire damaged the leaves which are sites for Photosynthesis preventing manufacture of food. leaves also are sites for entry of carbon dioxide gas which is raw material for Photosynthesis ✓

Any 6 scores

Damage of the roots by fire prevents absorption of water from the soil and consequently its transport to the sites of making food, where water molecules are used as raw materials for Photosynthesis thus Photosynthesis will cease ✓

Gaseous exchange ✓ leaves contain stomata through which gases/respiratory gases are exchanged. Thus there will be a reduced rate of gaseous exchange / No gaseous exchange ✓



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Translocation; ✓  
The fire could have destroyed the xylem and phloem cells in the stem leading to little/no translocation of food from sites of manufacture to sites of utilisation e.g. Roots ✓

Respiration; ✓  
The fire could have killed some of the plant cells so they were unable to respire to avail energy/ATP for carrying out the plant's metabolic/life processes ✓

Growth and development; ✓  
The fire damaged the buds which are the sites for growth of new young plants/leaves, thus rate of growth reduced/ceased ✓ *Award -3 scores for 3 processes identified  
- 3 scores for 3 processes explained*

(c) The plant will form / produce new buds ✓, which then sprout/d produce new young plants/leaves, so this would take longer for leaves that manufacture food to develop fully ✓

Role / value of the affected processes in enabling plant to solve the problem.

*Any 3 ways for clear solution of problem*



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- Photosynthesis makes food which is stored in the stems ~~raising~~ the quality and size of the stems.

- Transpiration allows movement of water up the plant, which is a raw material for Photosynthesis ✓

- Translocation allows movement of food from sites of manufacture to other parts to be stored / used for growth. ✓ Award 3 scores

- Respiration provides energy which is required for growth and development of new buds, leaves and other young plants. ✓

- Growth produces new buds from where leaves develop which are sites for manufacturing food ✓

Award 3 scores for any three processes stated with their respective roles in solving problems

Award zero scores if candidate didn't give any response on this part



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Item 2

(a). Pain receptors in the foot sensed the nail and produce an impulse that was conveyed along the sensory neuron to the spinal cord which passed on the impulse to the relay/intermediate neuron across the synapse, then the impulse moved from the relay neuron across the synapse to motor neuron which passed on the impulses to effector muscle in the foot.

The effector muscles contracted and the foot was withdrawn from the nail.

- Answers;
- 1 score for reception of stimuli
  - 1 conversion of stimuli into impulses
  - 1 score for transmission of impulse to spinal cord
  - 1 score for transmission from spinal cord to effectors in foot
  - 1 score for correct response.



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- (b) - Poor vision / Reduced detail of shapes and objects ✓  
- Loss of memory and judgment ✓  
- Impaired learning / Taking long time to make decisions ✓  
- Increased anxiety ✓  
- Poor relationship with others / Self isolation. ✓  
- Promotes lung infections / may cause bronchitis  
- Weakens immune system

Award Maximum scores = 3  
Accept other plausible responses

- (c) - Medications / go for treatment of affected body organs ✓  
- Avoid chewing manjiamo ✓  
- Many go for rehabilitation ✓  
- Participate in community work as a substitute to chewing manjiamo ✓  
- Avoid friends / Peers / areas where manjiamo is chewed

Maximum score is 3  
Accept other plausible responses



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Item 3.

(a) The disorder is Albinism ✓<sup>a</sup>

Inheritance of disorder from  
Parents to the child;

let A represent the allele for normal  
Skin colour ✓<sup>b</sup>

let a represent allele for albinism  
both Parents would be heterozygous

Parental Phenotypes      Normal woman x Normal man ✓<sup>c</sup>

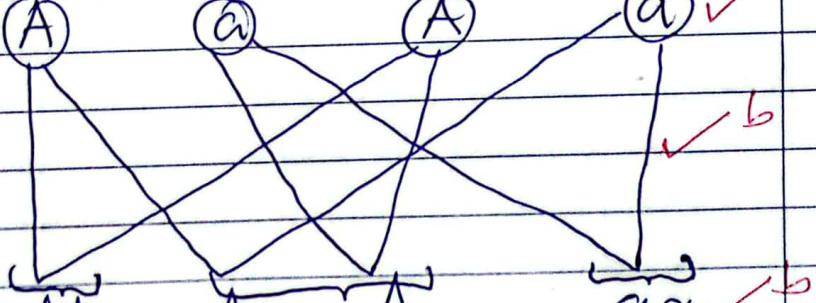
Parental Genotypes

Aa      x      Aa

Meiosis  
Gametes

A      a      A      a

Random  
Fertilisation



Offspring genotypes AA

Aa

Aa

aa ✓<sup>b</sup>

Offspring Phenotypes ✓<sup>c</sup> Normal carrier, albinism

There is 1/4 chance of producing an  
albinos child hence the baby inherited  
the disorder from the parents / gene that  
causes albinism from the parents ✓<sup>c</sup>  
Sonam and husband are worried because



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they have normal skin color / hair.  
normal in appearance yet their  
child has a light colored skin  
They look normal because are  
Carriers for an allele that causes albinism

### Showing Good

- Identifying disorder = 1 score

- Working out a  
genetic cross etc = 3 score

Show inheritance

- Conclusion from = 3 scores  
the cross

(b) - Impaired / poor vision /  
Reduced degree of focus / Reduced  
depth of ~~Perception~~ of images of  
objects ✓

- High Vulnerability of the  
child to skin cancers / Skin damage  
by ultraviolet rays ✓

- Stigmatization of their  
child by society ✓

- Child may develop feel  
of isolation ✓



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- Stigmatization of their child by others / society ✓
- child may experience anxiety attacks ✓
- Their child may not be allowed to participate in several activities ✓
- Unwanted questions from society about appearance of their child ✓ *Any 3 scores*
- Bullying of their child by fellow children ✓
- Failure to exercise human rights for their child ✓

- (C) - Providing Proper eye care / medical consultation from specialists ✓ *Any 3 scores*
- Close monitoring of the child's skin by consulting a medical specialist / dermatologist.
  - Through limiting child's exposure to excessive exposure to sunlight
  - Provision of counselling to their child about the appearance
  - Educating child on how to ignore stigma from society



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- Provision of sunglasses to the child that provide protection against UV rays ✓
- Take child for annual eye and skin examinations to catch any problem that may arise earlier
- Providing child with sun screen protector and clothing against UV light
- Advise child / complete covering of their child with clothes ✓

#### Item 4.

Environmental challenges that arise in areas along lake Victoria.

- Poor disposal of wastes contaminates the water leading to water borne diseases ✓
- Loss of habitats for wild animals eg snakes which can attack the human settlements along the lake ✓



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- Drainage of the swamp along for settlement ✓
- Flooding of the area due to waterlogging which limits uptake of enough oxygen by plant roots causing their death / aquatic plants become covered up leading to no photosynthesis ✓
- Digging up of clay creates deep stagnant pools of water which are risky for humans / wild animals / act as breeding grounds for vectors eg mosquitoes that cause malaria
- Attack of humans by dangerous wild animals that live in swamps due to encroachment of their habitats ✓
- Siltation of water channels in swamps creating water turbidity / reduces visibility of aquatic animals ✓
- Cutting down of smaller trees along the area to obtain poles for construction of structures ✓

a = environmental challenge

b = Affected natural resource

Award 2 scores for living forms

1 score for non-living forms

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Ways of reducing on the effects

- Planting of fast growing trees to reduce on loss of soil from swamps ✓
- Use of alternative construction materials eg metallic poles ✓
- Treatment of domestic waste before disposing into water ✓
- Controlled harvesting of material from swamps eg. Papyrus ✓
- Minimise on digging up of clay from swamps ✓
- Dredging of the swamps ✓  
Max sizes is 3.

Importance of Sustainable use of natural resources in areas surrounding lake Victoria; ✓

- Provides an ideal natural habitat for aquatic animals eg snakes, frogs ✓
- Swamps protect lakes and rivers from silt by filtering water before joining the major streams/water bodies ✓
- Swamps provide a source of food eg fish, clams, mussels ✓



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- Swamps act as water catchment zones ✓
- Swamps provide water for domestic and industrial use ✓
- Avail raw materials eg clay, for pottery and Papyrus for crafts
- Plants in swamps release oxygen used by animals for respiration ✓
- Plants absorb CO<sub>2</sub> from atmosphere and reduce air pollution / global warming/ green house effect ✓

### Item 5:

ways environmental problems came about

- Deforestation leads to loss of natural habitats causing wild animals to attack human settlement in the industries ✓
- Industries may release untreated sewage / wastes into water body and cause water pollution / death of fish / lower quality of water / make water unfit for domestic use



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- Settlement of the workers / employee's of the industry may cause congestion leading to outbreaks of diseases that affect human life.
- Cutting / clearance of the forest by industrial settlers may promote air pollution / global warming due to reduced absorption from the atmosphere by trees.
- There was loss of biodiversity due to loss of trees and habitats for wild animals / death.
- Expansion of industry may shorten the life span of the water body which threatens survival of organisms living there.
- Poor disposal of human wastes into water can cause water borne diseases.
- Cutting down of trees for construction of industrial structures.

a = Explanation of problem (3score)

b = Natural resource affected (3score)

(2 must be living form and 1 non-living form).



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Ways of reducing on the effects  
of the challenges?

- Treatment of industrial wastes before disposal into water ✓<sup>c</sup>
- Planting trees in the area that mature faster ✓<sup>c</sup>
- Advise the government to plan and relocate the industry to another area ✓<sup>c</sup>
- Constructing a boundary around the water body to minimize on mis-use ✓<sup>c</sup>
- Education of the employee's and residents about the dangers of mis-using water bodies ✓<sup>c</sup>
- Controlled disposal of human wastes from industry workers ✓<sup>c</sup>

Award only 3 Max scores



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Reasons for conserving the area where the industry was established:

- Trees reduce air pollution by absorbing CO<sub>2</sub> from the atmosphere ✓
- Trees release oxygen for aerobic respiration by animals ✓
- Water body provides water for domestic and industrial uses ✓
- Water body is a habitat for aquatic animals e.g. fish, snakes, frogs etc. ✓
- Water body contains animals which are a source of food to humans e.g. fish ✓
- Trees maintain soil compact structure and reduce soil erosion ✓
- Trees provide natural habitat for wild animals ✓
- Trees provides building / construction structures for humans e.g. poles ✓

Max scores = 3.



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Item 6 .

life processes in Kironde's body affected by alcohol .

- Gaseous exchange ✓ a
- Ventilation / Breathing / Inhalation and exhalation ✓ a
- Digestion of food ✓ a
- Respiration ✓ a Any 3 scores

Ways alcohol affected life processes in the body to cause general body weakness .

Alcohol caused blockage of pancreatic ducts so little / no pancreatic enzymes were available to digest food so little soluble food was absorbed into blood and transported around the body into respiring tissues / cells .

Alcohol also caused swelling of the lungs affecting their normal functioning leading to reduced breathing rate and reduced gaseous exchange ✓ d



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This cause less oxygen to be transported to respire cells / tissues around the body

The food and oxygen where combined during respiration / food was respired liberating less <sup>b</sup> little energy which was not enough to maintain life processes in the body / body activities. This resulted into general body weakness.

a = Process affected

b = Raw material + Product

c = Process involved

d = Impact on process

e = Impact on body

f = Solution to problem

Ways the medication given to himorde enabled his body regain normal status / recover from general body weakness;

Medication <sup>e</sup> unblocked the pancreatic ducts and beating / reversed swelling / inflammation of the lungs.

This promoted <sup>e</sup> proper digestion of food due to available pancreatic enzymes and gaseous exchange together with breathing were adequate



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The respiration cells received wrong food and oxygen which were used in respiration to produce enough energy.

The adequate amount of energy produced maintain the body's life processes hence Kizza recovered his normal health.

Status - Raw materials and products (b) 3 scores

- Life processes affected (a) 3 scores*
- Affected processes - 3 scores
  - Impact of process affected on body function - 3 scores
  - ways body solves problem 3 scores

### Item 7

Ways life processes in Musa's body enable him run faster to escape bullets in absence of breakfast.

Life Processes involved are

- coordination
- Transport of hormones
- Transport of glucose from liver
- Respiration



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### Explanations for each life process

The ear converted sound waves of a bullet into impulses which were sent to the brain by the auditory nerve ✓<sup>a</sup>

The brain interpreted the impulse and sent out signals to the adrenal glands stimulating them to release adrenaline into blood stream ✓<sup>a</sup>

Adrenaline was transported around the whole body and caused the following;

- Stimulated body cells in muscles to use energy stored in ATP for muscle contraction ✓<sup>b</sup>
- Caused an increase in breathing rate and heart beat to increase the supply of glucose and oxygen to respiration muscle cells to be used in respiration to provide energy ✓<sup>a</sup>

- Caused the liver to convert stored glycogen into glucose when muscles became extremely under intense exercise ✓<sup>b</sup>



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All of these activities promoted availability of energy for muscle contractions, hence Musee was able to run for a very long distance to reach a friend's work place.

Muscle processes = 3 scores Life processes

Movement of body organs = 3 scores Raw material = 1 score

Coordination = 3 scores

Explanation of how the biscuit Musee ate enabled his body regain strength.

The biscuit was digested physically in the mouth into smaller particles and then swallowed.

The carbohydrates in the biscuits were digested by digestive enzymes to produce glucose which was absorbed into blood across the walls of the villi of the ileum.

The absorbed glucose was transported around the body to respiration cells where it was oxidised using oxygen to produce energy enabling Musee



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Regain Strength in his body .

- Mention of the Processes involved = 3 scores
- Explanation of role of processes in solving Problem = 3 scores
- Raw Materials plus products involved = 3 scores
- Mention of body organs / structures = 3 scores.

Total Score = 15 scores

d - organ / structure

e - Process

f - Product + Raw material .