



KAMPALA WAKISO GIANT SCHOOLS' ASSOCIATION (KWGSA)

National Joint Mock Examination 2025

Uganda Certificate of Education

BIOLOGY THEORY

Paper 1

DRAFT MARKING GUIDE

SECTION A

1. Tinah is a prominent farmer in Buwenge district. In one season, she planted beans on large scale but after germinating, her crops experienced dry period and the leaves became folded, hairy, yellowish and slow growth. After one month, rain started and the crops grew up well and produced high yields at the end of the season.

Task

- (a) Identify the processes in the crop which were affected by the dry period.

- Photosynthesis
- Transpiration
- Translocation.
- Gaseous exchange
- Growth
- Water absorption

Any 3 processes 02 scores

1 – 2 processes 01 score

No correct process 00 score

- (b) Explain how the processes affected the productivity of the plants.

- Photosynthesis; folded leaves reduced the surface area for absorption of sunlight used in photosynthesis hence reduced productivity. Yellowish of the leaves reduced concentration of chlorophyll hence reduced sunlight absorption leading to the reduced photosynthesis and productivity.
- Gaseous exchange; folding of leaves reduced the number of stomata that allow entry of carbon dioxide which is a raw material for photosynthesis hence reduced productivity.
- Transpiration; folding of the leaves reduced the number of stomata which affects exit; the movement of water up the plant leaves where it is required for photosynthesis and thus low productivity.
- Water absorption; dry season reduced soil water content and this led to low water absorption by the root hair cells which is a raw material for photosynthesis hence reduced productivity.
- Respiration; due to low rate of photosynthesis caused by folding of leaves; less substrates were available for respiration.

Accept any other correct explained process

- (c) How were the crops able to produce high yields at the end of the season
- They unfolded their leaves which enabled them to carryout photosynthesis to manufacture enough food materials for storage in the seeds hence giving high crop yields.
 - They developed enough roots which enabled them to absorb enough water and mineral salts from the soil.
 - They unfolded their leaves which enabled them to lose excess water and wastes and also to absorb enough mineral salts and water from the soil.
 - They developed enough flowers which were pollinated and fertilized such that they can produce many fruits.
 - Plants developed more root hairs when it rained and increased its rate of water absorption which is a raw material for photosynthesis.
 - Plants developed more leaves when it rained that contained more chlorophyll that trapped sunlight for photosynthesis.
 - Hairy leaves trapped a film of moisture around leaves reducing transpiration hence conserving water used for photosynthesis and thus high yields.

2. Mr. Tom, smoking cigarettes lives in Iganga village where they distill alcohol called Kaseke, Liralira, waragi for sale to different parts of Uganda. James wakes up daily in the morning to go for drinking but one day, he was feeling much hungry and found his wife cooking meat which made him to pick a piece of meat from the sauce pan which has been removed from the fire by his wife. On touching the piece of hot meat, he immediately withdrew his hand, unfortunately soup splashed on his body and got burnt.

Task

- (i) Identify the body organs and structures which were affected by James' lifestyle.
- Lungs
 - Liver
 - Kidney
 - Heart
 - Muscles
 - Pancreas
 - Brain
 - Stomach
 - Skin

3+ Organs 01 score

1 – organs 01 score

No correct organ 00 score

- (ii) Explain how the body reacted to save James from further effects.

Skin contains heat / thermo receptors / pain receptors that detected the heat stimuli from the hot piece of meat and converted it into a nervous impulse. Sensory neuron transmitted the impulse to the spinal cord, there are synaptic connections made between the sensory neuron and relay neuron to transmit the impulse. The impulse is interpreted in the spinal cord. The impulses are then handed over to the motor neuron across the synapse. Motor neuron transmitted the impulses to the effector muscles in James' hand / arm to contract releasing piece of hot meat.

Correctly explained processes 04 scores

- (iii) How can his lifestyle affect his wellbeing and how can they be managed for the better.

Effect of James' lifestyle

- Alcohol damages the brain leading to memory loss.
- Alcohol damages the liver that, regulates blood sugars; that make plasma proteins etc
- Alcohol damages the stomach leading to ulcers, cancer etc.
- Alcohol leads to self-neglect; family neglect; domestic violence etc.

Accept any correct explanation with the function of the liver

Management

- Going for counseling and guidance services.
- Engaging in productive projects / activities to avoid being idle.
- Withdrawing from smoking and taking alcohol.
- Withdrawing / stop engaging in bad peer groups / Bad Company.
- Avoid going to places where can be attempted to smoke and take alcohol.
- Proper utilization of leisure time through participating in physical activities , church choirs e.t.c

*Any 2 Correct points 01 Score
4 correct points 02 scores*

3. Kasirye and Konso are officially 20 years ago with 6 girl children only but after Tom demanding for the boy child from his wife for so long, he decided to engage himself in reckless sexual behavior with other wives but still got girl children

outside the wedlock. Unfortunately their first daughter Mary has reached puberty and she is experiencing a number of challenges which affect her stay at school.

Task

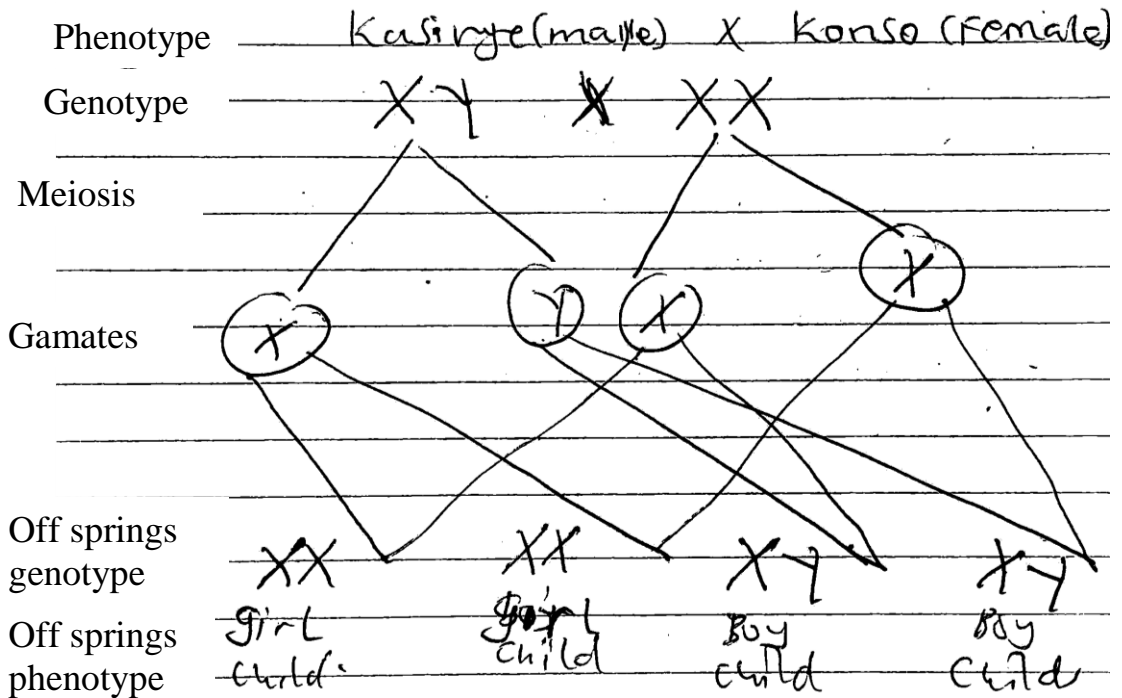
- (a) Genetically, show Kasirye, why he should stop his demands to the wife for a boy child.

Kasirye should stop his demands for a boy child because he is the one responsible for determining the sex of the child, since he has both X and Y chromosomes; during fertilization, when he sends a sperm with X chromosome, to those with that of Konso's arm, a girl child is formed, and when he sends a sperm cell with Y chromosomes, to fuse with that of the female's ovary, a boy child is produced.

Alternatively

Let XX represent the genotype of Konso

Let XY represent the genotype of Kasirye



- (b) What are the likely changes in Mary's body which are making her to be challenged in her life.

- Enlargement of her breasts which attract boys to disturb her for love.
- Enlargement of hips which also attracts boys and strangers to disturb her.
- Smoothing of the skin and softening of the voice which attracted the strangers and boys to disturb her.
- On set of menstration periods which make her un comfortable when at school by feeling shy.

3 points 03 scores
@point 01 score

- (c) How can Kasirye manage the challenges brought about by his behavior to survive for long?
- Feeding on a balanced diet to boost his immunity
 - Going for counselling and guidance such that he can be rehabilitated.
 - Having protected sex with the woman using condom.
 - By abstaining from sex such that he can not contract with other diseases.
 - Going for medical check up regularly to check on his health status.
 - By administering drugs like ARVs regularly as recommended by doctors to suppress the viral load.

3 points 03 scores
@point 01 score

SECTION B PART I

Answer one question from this part

4. As a result of increasing population, the demand for land increased which attracted the government to get an investor to set up a sand mining project in a swampy land so as to meet the demands of the public but this action caused a lot of challenges in the area which left the residents worried on what would happen later in future.

Task

- (a) Explain the various challenges which resulted from this action of the investor and show how these challenges can be settled to remove the worry from the residents.

Challenges

- Destruction of habitats for wild animals which make them to migrate to other places.
- Loss of bio-diversity due to destruction of habitats
- Destruction of breeding for organisms which reduce their number hence causing loss of bio diversity and extinction of some organisms.
- Destruction of hunting grounds for food materials hence causing famine in the environment.
- Floods due to blocking of the water channels which cause outbreak of water borne diseases, loss of life and properties.
- Water pollution due to discharge of domestic wastes in the water bodies like plastics and sewage.
- Drought in the area due to destruction of vegetation which form rainfall.
- Attacks from wild animals due to destruction of their habitats.

09 scores

@point well explained 01 score

Solutions to the challenges.

- By recycling the domestic wastes like plastics than disposing them to the environment.
- By digging channels to allow water to flow properly to control floods.
- By relocating the people in the area to other places without swamps.
- By carrying out controlled mining of sand in the area.
- By carrying out afforestation and re-afforestation in the area to control erosion of soils.
- By planting grasses around the site to control erosion of soils.

03 scores

@point well explained 01 score

(b) Reasons for conserving swamps

- It acts as a habitat for wild animals.
- It conserves bio diversity by providing breeding grounds for organism.
- It acts as a humanity grounds for food materials
- It controls floods in the area.
- It is important in the formation rainfall through evaporation.
- It filtrates water.
- It provides materials for art work like clay and papyrus.
- It controls soil erosion by covering the soil

03 scores

@point well explained 01 score

5. Mr. Kabona cleared a forest along the slopes of a hill that had fertile soil to extend his farm for growing maize. After several years of planting maize on hill. The maize plant started growing slowly, with yellow leaves which greatly reduced the yield. The yields are poorer at the hill top than in the valley. His fellow residents of the village use the valley of Mr. Kabona's farm for dumping plastic waste bottles and use polythene bags which caused more challenges especially in the streams found in the valley.

Task

- (a) Explain the likely challenges that resulted from the actions of Mr. Kabona and his fellow residents of the village and suggest the possible ways of overcoming those challenges.

Challenges

- Landslides due to digging of the slopes.
- Loss of bio-diversity due to destruction of the habitat.
- Destruction of habitats which cause displacement of the organisms.
- Destruction of breeding grounds for organisms which cause loss of bio diversity.
- Destruction of hunting grounds for food materials which cause famine in the area.
- Water pollution due to discharge of plastic wastes.
- Air pollution due to burning of the plastic wastes.

09 scores

@point well explained 01 score

Ways of controlling

- By recycling the plastics wastes than burning and disposing them to the environment.
- By practicing contour ploughing along the slopes of the hill.
- By carrying out terracing along the slopes.
- By mulching the slope soils.

03 scores

@point well explained 01 score

(b) Show them the value of conserving valleys in the environment.

- Valleys provide water for domestic use
- They contain vegetation used in the formation of rainfall.
- They are used as habitats for wild animals.
- They act as breeding grounds for wild animals hence conserving bio diversity.
- They act as hunting grounds for food materials hence controlling famine.
- They provide materials for construction such as stones.

03 scores

@point well explained 01 score

PART II

6. After a morning, heavy carbohydrate meal, Dinnah a male athlete started warming up for the competition of a long race. He completed favourably, but towards the end he developed muscle cramps and breathing heavily together with much sweat and high rate of heart beat. Never the less, he endured and finally won the race.

After finishing the race, heavy breathing and heart beat continued while muscle cramps progressively reduced which enabled him to walk back home from where he took another meal.

Task

- (a) Explain how Dinnah's body utilized the morning meal to enable him to win the race.

07 scores

Well explained coherent process 01 score

Carbohydrate meal was ingested in the mouth where it was mechanically broken down by the teeth into small particles which were acted upon by salivary amylase to maltose.

From the mouth, food moved down the esophagus to the stomach by peristalsis. In the stomach, there is no digestion of carbohydrates.

From the stomach, food moved to the duodenum where pancreatic amylase broke down the remaining starch to maltose.

In the ileum, intestinal juice / succus entericus contains enzyme maltase which converted maltose to glucose which was absorbed into the blood stream by the respiring body tissues where it was oxidized during respiration to provide energy to Dinnah which enabled her to win the race.

- (b) Analyze the challenges he encountered during the race and how he overcame them to enable him to walk back home.

Muscle cramps developed due to over stretching of the muscle, dehydration of body tissues, and accumulation of lactic acid in the muscles.

Heavy breathing occurred in order to supply enough oxygen to the body tissues to carryout respiration to provide energy for the activity.

High rate of heat occurred in order to supply / pump enough blood containing oxygen and nutrients to the body tissues to be used for respiration to provide energy for the activity.

After the activity, heavy breathing continued in order to supply enough oxygen to the body tissues so as to pay the oxygen debt which occurred during anaerobic respiration and also to oxidize the accumulated lactic acid to water and carbon dioxide.

04 scores

@Well explained challenge 01 score

Recovery process to enable her to move back home

- Deep breathing after the race to enable her to take in enough oxygen to oxidize the accumulated lactic acid to water and carbon dioxide.
- Carrying out post – race stretching of the muscle to promote blood flow to aid in the removal of lactic acid.

- Carrying out adequate rehydration and having a rest to allow the muscles to repair and rebuild after serious physical exercise.
- Consuming a balanced post – exercise meal rich in proteins and carbohydrates to replenish / replace energy lost, support muscle recovery and reduce muscle soreness.

04 scores

@ Well explained recovery process 01 score

7. Annah’s husband is addicted to cigarette smoking. He smokes inside a poorly ventilated house where they stay with his wife who is pregnant. His teeth have plaque and cavities and he has a bad breathe from his mouth which makes Annah uncomfortable. Annah gave birth recently to a baby but the baby and herself have experienced very many health complications. When Annah visited the hospital, she was informed that their health complications were brought about by the husband’s lifestyle. Her child needed a transfusion of blood but she could not assist her child with a blood donation which made her very annoyed.

Task

- (a) Explain why Annah was unable to assist her child with blood at the hospital.

05 scores

Well explained reason 01 score

Annah’s blood was incompatible with that of her child, where specific antigens, in Annah’s blood react with specific antibodies in the child’s blood hence causing clotting / agglutination of blood in the child’s blood which may cause death of the child.

- (b) How did the husbands’ action affect Annah and her baby and suggest what could be done to improve on the husband’s mouth condition.
- It increases the risk of lung cancer, throat cancer and pancreatic cancer.
 - It increases the risks of infections like pneumonia and influenza to Annah and her baby.
 - It increases the risks of healthy conditions and reduces the quality and length of life
 - It reduces the productive fertility of Annah
 - It reduces the functioning of the lungs due to the coating effect of the alveoli hence increasing respiratory diseases to Anna and her baby.
 - It causes conflicts and financial stress in the family.

Ways of improving on the mouth condition

- Brushing teeth after meal
- Dental frothing.
- Rinsing the mouth after a meal.

END