ASSHU ANKOLE JOINT MOCK EXAMINATIONS 2025

Uganda Certificate of Education

BIOLOGY PAPER 1

SCORING GUIDE

EXPECTED RESPONSES 553/1

ITEM 1

(a)

- Reproduction | pollination/fertilization
- Transpiration
- Photosynthesis
- Respiration | Gaseous Exchange
- Translocation | Transport of manufactured materials.

(b)

- Rolling of leaves reduced the surface area for light absorption by the chlorophyll in the chloroplasts which reduced the rate of photosynthesis ;
- Rolling of leaves also reduced on the number of stomata exposed thus reduced rate of transpiration hence reduced absorption of water the soil leading to drying of leaves.
- The thick hairs reduced the rate of transpiration by creating moist ,still air layer near the leaf surface thus reduced absorption of water and mineral salts from the soil leading to reduced photosynthetic rate ;
- The covering of inflorescence reduced the rate of reproduction ~~pollination/fertilization since~~ since the pollinators could not access flower ; pollination/fertilization couldn't successfully take place
- Drying of leaves / reduction in number of leaves reduced the surface area for trapping sunlight by the chloroplasts for photosynthesis ;
- Drying of leaves reduced translocation; since xylem & phloem/vascular bundles were destroyed.

Rubric

3⁺Ue=6

2Ue=5

1Ue=4

Ul(listing)=1

(c)

Transpiration ;

- Thick hairs reduced water loss by creating moist ,still air layer near the leaf surface thus the plant had moisture to carry out plant processes ; (any process mentioned)
- Folding of leaves reduced the leaf surface area exposed for water loss thus keeping the plant with moisture for survival ;

- The covering of inflorescence by leaves reduced on the rate of reproduction as a result food made by the surviving leaves was used for other processes like respiration to support survival ; Ae
- Reduction in the number of leaves reduced the surface area for water loss through transpiration hence retaining water for other processes ; Ae
- Spreading out of the inflorescence at night to allow pollination to take place leading to fruit formation Ae

Rubric
3+Ae=6
2Ae=5
1 Ae=4
Al(listing)=2

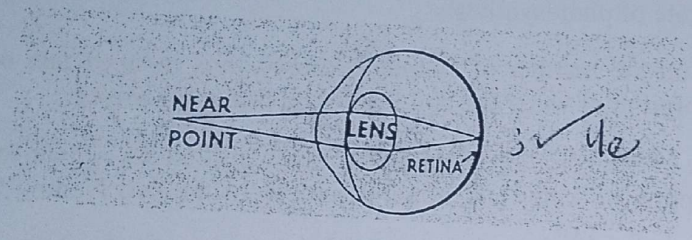
Ue=6
Ae=6 12

ITEM 2

a) James is suffering from long sightedness a condition where a person can see distant object clearly but nearby objects appear blurry ; Ue

Illustration

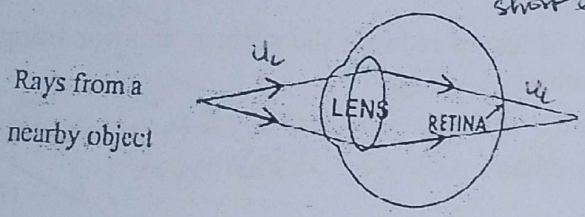
Normal eye for near object



; Ue

Long sighted eye

short eyeball/Low lens curvature



; Ue

Accept word statements

In a normal eye, light rays from a near object (like a book) are bent by the cornea and lens so they focus directly on the retina (the light-sensitive layer at the back of the eye), allowing clear vision. ; Ue

However, in a long-sighted eye:

The eyeball is too short or the lens is not curved enough, ; Ue

This causes light rays from nearby objects to focus behind the retina instead of directly on it. ; Ue

As a result, near objects appear blurry, and the person strains their eyes to try and see clearly, leading to eye strain or discomfort while reading. (Appears in the scenario).

Rubric

2⁺Ue=5

1Ue=4

Ul(listing)=1

b

- Take insulin or prescribed diabetes medication to control the sugar levels in blood..
- Maintain a balanced diet low in sugars to blood sugar levels stable and prevent complications from diabetes
- Exercise regularly, exercise helps the body to use glucose which lowers blood sugar levels and improves blood circulation and overall health.
- Drink plenty of water to stay hydrated which also helps to replace the lost fluids and reduces the feeling of constant thirst
- Attend regular medical check-ups to detect early signs of complications and keep the condition under control.

Rubric

3⁺Ae=6

2Ae=5

1 Ae=4

Al(listing)=2

ITEM 3

(a) Let N be allele for normal

Let n be allele for sickle cell

Parental phenotype Normal man X normal woman

Parental genotype Nn X Nn

Meiosis

Gametes N n N n

Fertilization

Off spring genotype NN Nn Nn nn

Off spring phenotype normal childrine sickler

♀ / ♂	N	n
N	NN	Nn
n	Nn	nn

Phenotype (offspring) 3 normal: 1 sickler
Thus there is 25% of producing a sickler ✓ ue

Marking points

Defining letters, parental genotypes, gametes, random fertilisation, offspring genotype, offspring phenotype, phenotypic ratio/conclusions/relating the cross to the scenario

Rubric

3^{+}Ue=6
2Ue=5
1Ue=4

Ul (listing)=2

(b)

- Seek counseling and join support groups for emotional support. ✓Al ✓Ae
- Enroll in ART (antiretroviral therapy) to reduce on the viral load ✓Al ✓Ae
- Attend postnatal care for guidance on how to care about herself and the child. Al ✓Ae
- Regular medical care for the child to manage the condition and detect early possible compilations. Al Jane | Blood transfusion ✓Ae
- Reintegrate into education or vocational training so that she can keep engaged and manage stress. At ✓Ae
- Seek support from NGOs or community organizations for free medication. At ✓Ae
- Feeding on a balanced diet to boost the immunity At ✓Ae
- Vaccinations, regular hand washing to prevent infections in the child Al ✓Ae

Rubric

6^{+}Ae=6

5Ae=5

4Ae=4

Al (listing)=2

Ue = 6

Ae = 6

12

SECTION B

ITEM 4

a. Illegal Sand Mining weakens the riverbanks, causing frequent flooding that can destroy homes, and aquatic breeding areas for fish, frogs, and other aquatic life thus reducing food sources for birds thus their(birds) disappearance. Ul Ue Ue

It also disturbs nesting grounds for riverbank animals like birds and reptiles. Ue ✓

Commercial Agriculture by the River banks, Farmers use chemical fertilizers and pesticides that get washed into the river. These chemicals cause overgrowth of aquatic plants (like algae) which blocks sunlight and reduces oxygen levels in the water. This leads to the death or migration of fish, frogs, and water insects. Ul Ue ✓ue

Birds that fed on these animals, like kingfishers and herons, also disappear due to lack of food.

→ Devegetation (Cutting Down Trees and Plants): Removing vegetation causes soil erosion, with soil and dirt washing into the river, making the water muddy and polluted. Aquatic animals like fish and snails suffer because the cloudy water blocks light and clogs their gills.

Without trees, birds lose nesting sites, and insects lose shelter.

→ Humans are also affected as the river water becomes unsafe for use (e.g., drinking, washing, or fishing).

Rubric

3⁺Ue=5

2Ue=4

1Ue=3

b. To protect animal life from flooding, Natural vegetation helps absorb excess rainwater, reducing flooding that can destroy animal habitats and drown small animals like rodents, insects, and burrowing creatures.

To conserve bird species, Birds that depended on the river for water, nesting, and food (like fish and insects) disappeared due to habitat destruction. Sustainable use helps keep these food sources and safe spaces available.

To preserve aquatic life, Polluted water from agriculture and sand mining can poison fish, kill aquatic insects, and disturb the balance of aquatic ecosystems (e.g., frogs, snails, and microorganisms).

To control harmful plant overgrowth, Excess nutrients from farm runoff lead to algal blooms, which reduce oxygen levels in water, suffocating fish and other aquatic animals.

To protect soil organisms and plants, Devegetation leads to soil erosion, which washes away topsoil that is home to earthworms, beetles, fungi, and beneficial bacteria essential for plant growth.

Protecting the environment ensures life-supporting systems remain intact for future generations of plants and animals.

To support human life, Humans depend on clean water, food (fish, crops), and income from activities like fishing and farming. Environmental degradation puts these life-sustaining resources at risk.

Nb. all benefits that aren't beneficial to living things are coded Al

Rubric

2⁺Ae=6

1Ae or Al=5

Al=2

Ue=5

Ae=6

11

Activity's out come Ue affect Ue

ITEM 5

(a) **Clearing the forest** (deforestation) destroyed the habitats of birds, insects, mammals, and plant species, causing them to migrate or die. Ue

Reduced tree cover, which protects soil and purifies air, leading to soil erosion and loss of natural forest resources like fruits, herbs, and timber.

Growing only maize (monoculture) reduced plant diversity, which also affects insect and animal diversity that depends on varied plants for food and shelter. Ue

Monoculture depleted specific soil nutrients, making the land less productive over time /multiplication of some pests since their life cycles were never broken

Use of herbicides and pesticides killed useful insects like bees (important for pollination), and ladybirds (natural pest controllers). Ue

Poisoned soil organisms, like earthworms and bacteria, which help keep the soil healthy.

Polluted rivers or streams, endangering aquatic life such as fish, frogs, and water plants.

Use of artificial fertilizers disrupted the balance of nutrients in the soil /altered soil PH, harming microbial life and making the soil less fertile. Ue

Runoff into water sources caused algal blooms, which suffocate fish and reduce oxygen levels in water.

Frequent tillage (cultivation of steep slops) disturbed soil organisms and also destroyed soil structure thus made it easy for rain to wash away fertile topsoil. Ue / reduced fertility and aeration.

This erosion also clogs rivers, harming aquatic ecosystems.

Frequent irrigation led to leaching of soluble nutrients hence low yields Ue / Loss of soil fertility

Rubric

4+Ue=5

2-3Ue=4

1Ue=3

Ul=1

(b) Plant trees or practice agro-forestry, Helps restore animal and bird habitats, prevents erosion, and supplies natural resources like firewood and fruits. Ae Ae

Use crop rotation or intercropping, Encourages diversity of plants and soil organisms, breaks pest cycles, and keeps the soil fertile naturally. Ae Ae

Apply organic fertilizers, Supports healthy soil bacteria, fungi, and worms, while avoiding pollution of water sources. Ae

Control pests naturally, Protects beneficial insects like bees and avoids killing harmless animals through toxic chemicals.

Practice conservation tillage, Protects soil life and maintains soil structure, reducing erosion and improving water retention.

Build terraces or farm along contours, Prevents runoff and protects aquatic ecosystems from sediment and chemical pollution.

Reduce herbicide use, saves surrounding plant species, allowing butterflies, insects, and birds to thrive.

Use drip or controlled irrigation, prevents damage to soil structure.

Protect nearby water bodies and wetlands, Ensures the survival of fish, frogs, birds, and plants that depend on clean water.

Learn and involve the community in sustainable practices, Sharing knowledge promotes wider protection of biodiversity and natural resources.

Rubric

2⁺Ae=6

1Ae or Al=5

Al = 2

ITEM 6

a

- posho was digested in the mouth by salivary amylase to maltose.
- In the small intestines enzymes maltase digested maltose to glucose
- Glucose was absorbed into blood across the villi of the ileum .
- During the second match, glucose was broken down through respiration to provide energy.
- The protein in the meal was digested in the stomach by pepsin and in the deudenum by trypsin to peptides
- The peptides were hydrolysed to amino acids to amino acids in the ileum and absorbed into blood stream across the villi

Rubric

3⁺Ue=6

2Ue=4

1Ue=3

Ul=2

b

- Breathing increased to supply oxygen for respiration. Ae
- Sweating regulated body temperature by cooling the body. Ae
- Rapid heartbeat increased nutrient delivery. for respiration Ae / energy production.

Rubric

3Ae=6

2Ae =5

1Ae=3

Al=1

Ue = 6
Ae = 6

12

ITEM 7

(A)

(I)

- Blood group A has A antigens and anti-B antibodies/ Accept small letter b to b antibiotics represent antibodies. Ue
- Blood group O has no antigens but has both anti-A and anti-B antibodies. Ue
- Transfusing group A blood into a group O person would trigger an immune reaction/production of antibodies. Ue
- Antibody would react with antigen A leading to agglutination/sticking together of blood cells Ue
- Blood vessels are blocked preventing the supply of essential substances hence death Ue

(i)

- Inhalation of cigarette smoke damaged lungs leading to breathing problems. Ue
- Poor diet caused vitamin C , iron and calcium deficiencies leading to bleeding gums, anaemia, weak bones Ue
- Long exposure to pollutants increased risk of chronic illnesses. Ue / lung cancer / chest pain.

Rubric

4+Ue=6

2-3Ue=4

1Ue=3

Ul=2

(from i and ii)

b)

- Improve diet: include iron, calcium, and vitamins to boost his immunity Ae against infections.

- Stop exposure to smoke and seek a safer work environment to reduce on the lung damage.
- Use respiratory aids or treatment as needed.
- Seek medical help for regular monitoring and treatment.
- Engage in mild physical activity to improve on breathing and blood circulation.

Rubric

3^{+}Ae=6

2Ae =5

1Ae=3

Al=1