

**527/2 Inst. Sch.
AGRICULTURE
PRACTICAL
INSTRUCTIONS
2024**



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

AGRICULTURE PRACTICAL INSTRUCTIONS

527/2 Inst. Sch.

2024

CONFIDENTIAL

This information is given only to facilitate preparation of examination.

Great care should be taken that the information given below does not reach the candidates either directly or indirectly.

INSTRUCTIONS FOR PREPARING SPECIMENS AND APPARATUS:

The teacher responsible for preparing specimens must ensure that candidates are provided with correct specimens and other materials as specified in these instructions. Specimens and solutions which have been assigned codes should be presented to candidates using those **codes only** and not any other identity.

A candidate is to be provided with each of the specimens. Where a specimen is to be used by more than one candidate, the teacher preparing specimens **must** devise a suitable system to enable the candidates to take turns at each specimen.

Each candidate should be provided with:

Specimen **A** – whole bean plant affected by anthracnose

Specimen **B** - Maize stalk bored by the stalk-borer

Specimen **C** – Sweet potato tuber (cut into two) affected by the sweet potato weevil

Specimen **D** – Couch grass (whole mature plant)

- 100 ml measuring cylinder
- 2 filter papers
- 2 beakers
- Water
- Stop clock
- pH chart
- Universal indicator
- 2 filter funnels
- Soil sample **X**
- Soil sample **Y**

Candidate's Name:

Signature:

Random No.						Personal No.		

(Do not write your School/Centre Name or Number anywhere on this booklet.)

527/2
AGRICULTURE
Paper 2
2024
2 hours



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

AGRICULTURE

Paper 2
Practical

2 hours

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **two** compulsory examination items.*

*Write your answers in the space provided using **blue** or **black** ink.*

*Answer **all** items in this paper.*

Item 1.

Fish farming is becoming a popular enterprise in Uganda. The demand for fish is high because it provides high value proteins for both humans and livestock.

A farmer established fish ponds in two different places, one in Gayaza and another in Kayunga. He stocked both ponds with tilapia fry. The water level in the Kayunga pond was adequate while that in the Gayaza pond remained low despite the inflow from the inlet pipe. The Gayaza pond wall was also unstable and the fish in this pond remained small. Soil samples **X** and **Y** were picked from the two ponds for investigation.

Task

Plan and carry out investigations on the two soil samples and based on your findings;

- Identify the soil sample from the Kayunga pond with reason(s).
- Explain to the fish farmer why the level of water in the Gayaza pond remained low.
- In one sentence, advise the farmer.

SAMPLE

Handwriting practice lines (20 horizontal lines).

SAMPLE PAPER

Item 2.

Musa decided to grow three different crops on his one hectare of land which he had divided into plots. The crops included beans, maize, and sweet potatoes. Each crop was grown on a separate plot using the recommended spacing. The crops were established at different intervals, followed by a period of heavy rains. Of recent, Musa has observed that the appearance of his crops has changed. There was also a plant species **D** which was abundant in all plots. Musa wanted to eliminate it, so he slashed it down in all the plots, but after two weeks it had grown again.

Musa picked samples **A**, **B**, **C** and **D** from his plots for investigation.

Task

Carefully observe each of specimens **A**, **B**, **C** and **D** then;

- record and explain your observations on **A, B** and **C**.
- suggest how Musa can overcome the conditions observed in his plots.

SAMPLE P

Handwriting practice lines (ruler markings) across the page.

SAMPLE PAPER

527/2
AGRICULTURE
Paper 2
2024



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

AGRICULTURE

Paper 2
Practical

SCORING GUIDE

527/2 sample expected responses.

1 sample expected responses

Aim of the experiment: To compare the amounts of water retained by soil samples X and Y.

Hypothesis: The Kayunga soil sample retains more water than the Gayaza sample.

Variables: Soil type and amount of water retained.

Materials and equipment: measuring cylinders, two soil samples (X and Y), filter papers/cotton wool, water, funnels, beakers, protective equipment.

Procedure:

1. Put on protective equipment for safety.
2. Label two measuring cylinders X and Y.
3. Plug a funnel using a filter paper/cotton wool and place it on the measuring cylinder labelled X.
4. Measure the required volume of soil sample X and place it in the funnel on cylinder X.
5. Measure the required volume of water and add it to the soil in the funnel on cylinder X while at the same time starting a stop clock. After 10 minutes remove the funnel from the cylinder, stop the clock and read out the volume of water collected in the measuring cylinder. Record your results. Repeat this procedure with soil sample Y.

Data presentation: Draw a table and record in it the volumes of soil used, amounts of water added and collected from each soil sample after 10 minutes.

Soil Sample	Volume of soil used	Volume of water added	Volume of water collected
Sample X			
Sample Y			

Analysis: compare the amounts of water collected/retained by the two soil samples.

Conclusion/Recommendation: soil sample X retained more water than soil sample Y. Therefore, soil sample X is the one from Kayunga since the Kayunga pond had adequate water.

- a. Although the Gayaza pond was receiving water from the inlet pipe, most of the water drained through the unstable walls of the pond and through the pond bottom because the soil type (sandy soil) cannot hold/retain much water because of its wide air spaces.

2 sample expected Responses

a. Specimen A:

Observation: Dark brown to black sunken lesions/spots on stems, leaves and pods

Explanation: Anthracnose; a condition caused by a fungus.

Specimen B:

Observation: Wilting or drying of upper leaves; ragged irregular holes chewed in newly unrolled leaves; tunnels bored in the stalk

Explanation: destruction done by the maize stalk borer

Specimen C:

Observation: dark brown tunnels bored in the tuber

Explanation: damage caused by the sweet potato weevil

b. Control

Specimen A:

- Crop rotation
- Removing and destroying affected plants
- Treating seeds with appropriate fungicides.
- Plant resistant varieties

Specimen **B**:

- Crop rotation
- Apply ash or dry soil into the leaf funnel of young plants
- Destroy the remains of previous crops
- Deep ploughing to bury eggs and other stages of the borer
- Early planting
- Spraying with appropriate pesticide

Specimen **C**:

- Crop rotation
- Timely harvesting
- Using clean planting materials
- Application of systemic pesticides
- Maintaining soil moisture by irrigation

Specimen **D**:

- Deep cultivation to remove rhizomes which are later dried and burnt.
- Applying a systemic herbicide.

527/1
AGRICULTURE
Paper 1
2024
2½ hours



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

AGRICULTURE

Paper 1
Theory

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **six** examination items. It has **two** sections; **A** and **B**.*

*Section **A** has **two** compulsory items.*

*Section **B** has **two** parts; **I** and **II**. Answer **one** item from each part.*

*Answer **four** examination items in all.*

*Any additional item(s) answered will **not** be scored.*

***All** answers **must** be written in the Answer booklet(s) provided.*

SECTION A
SOIL SCIENCE AND VALUE ADDITION

Answer all items in this section.

Item 1.

- (a) Kagugu a farmer in Pabpu sub county in Uganda was advised to start a dairy farm on his one-hectare piece of land. He planted elephant grass and Congo signal grass in plots **A** and **B** respectively at the same time. He expects to receive in-calf dairy heifers in six months' time and both pastures have already reached their flowering stages. Therefore, there is no likelihood of him feeding the current pastures to the heifers which are yet to come. At the same time, he is not interested in selling his pastures in a green state to other farmers. In his first attempt to conserve the pastures, the final product was rotten, black in colour and produced an unpleasant smell.

Task

Write a message to Kagugu advising him on how to conserve his pastures.

- (b) In Pabpu sub-county where Kagugu practices farming, many other farmers have small plots of land that are scattered in many places. They keep little money from what they sell. This little money is kept in pillows, or wooden boxes. Some farmers do not even know how much money they have kept. During planting season, each farmer works alone in his/her farm, and by the time they finish, the first part of the garden they began with has already grown bushy. A market survey indicates that an individual farmer buys a litre of Rocket pesticide at Ugsh40,000, yet a 20 litre jerrycan of the same pesticide costs Ugsh600,000.

Task

Based on the above scenario, what advice would you give to the farmers in Pabpu Sub county?

Item 2.

Having realized that students in a school have preferences for fruits like passion fruits, the Young Farmers Club decided to establish an orchard in the school farm. Some areas of the school farm are steep and rocky with shallow soils while other areas are gently sloping with deep, well drained and fairly fertile soils. In the course of running the project, it was observed that the soils in the nursery were compact, sticky and flooded with water. The pH of the soil in the nursery is lower than the recommended range for fruit growing. The seedlings were thin with shallow roots, bent stems and yellowish leaves.

Task

In your view, suggest the improvements that the Young Farmers Club should do to ensure profitable fruit production on the school farm.

SECTION B

*This section has **two** parts; I and II*

PART I: ANIMAL PRODUCTION

*Answer **one** item from this part.*

Item 3.

Innocent who is an agricultural extension worker visited a farm and in his report he indicated that the roof of a calf pen was blown off. Also, the cows were bonny and their dung contained worms. The adult animals could hardly find what to eat and were grazing on woody natural pastures. The only source of water had snail shells, algae and dung. The lactating cows had cracks on their teats. Hair-like substances were seen in the milk which was filtered using an old cloth. The farm owner uses a basin for mixing the acaricide.

Task

Basing on the report from Innocent, how can the farm owner improve on the productivity of the livestock farm?

Item 4.

Peter is a poultry farmer producing both eggs and meat on a large scale. Recently he got a new farm manager and instructed him to establish a poultry breeding unit using the parent stock he has to produce chicks for sale. However, the farm manager was not getting the expected number of chicks from the hatchery. The farm is located in an area with many other poultry farmers and there is free movement of chicken from one farm to another. Birds from the neighbouring farms were observed with cough, blood-stained faeces, mucus discharge and scratch marks on their bodies.

Operation Wealth Creation has provided tools and equipment to livestock farmers in the community especially for disease and parasite management.

Task

Write guidelines to help the farm manager meet Peter's requirement.

PART II: CROP PRODUCTION

Answer one item from this part.

Item 5.

Mr. Maburu is a farmer who decided to grow cassava on one hectare of land. He obtained all the planting materials from his neighbours' farms. The cassava stems had dark brown streaks which appeared as scratches or wounds. The stems were cut into 20 cm long pieces. After clearing the bush using a slasher, Mr. Maburu used a forked hoe to plant the cuttings at a spacing of 3m x 3m. Some of the cuttings sprouted but others did not. Weeds grew very fast, the cassava leaflets were twisted, and stunted growth was observed in some cassava plants in the garden.

Mr. Maburu managed to weed once and decided to harvest the crop after 6 months using a forked hoe. Most tubers were found rotten at harvest and others damaged during harvesting. As a result, he obtained only two 200 kg of fresh cassava instead of the expected 12600kg per hectare.

Task

Write a message to Maburu advising him on how to obtain the expected yield.

Item 6.

A vegetable farmer decided to grow a hectare of tomatoes. He set up a nursery bed in a free draining area near a water source. After preparing the nursery, he broadcast the seeds, covered them well with soil and watered the bed. The seeds germinated well and seedlings covered the entire soil surface. He maintained all the seedlings up to the time of transplanting. Transplanting began at twelve noon on a sunny day as the farmer had to attend a meeting at 2.00 pm the same day. After a week, some empty spaces were noticed within the crop rows. The plants which survived had many branches and leaves. When the farmer inspected his crop before the plants reached maturity, he observed dark brown patches on the leaves and stems. Dark brown circular spots were also covering large parts of the fruits. At a later stage, holes were also observed on some bigger fruits. At harvest, farm workers picked the fully ripe red fruits, packed and sealed them in plastic bags. The packed fruits were to be delivered to the market in a week's time.

Task

Write a message to the vegetable farmer advising him on how he should carry out tomato production efficiently.

527/1
AGRICULTURE
Paper 1
2024



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

AGRICULTURE

Paper 1
Theory

SCORING GUIDE

527/1 Agriculture theory sample responses

1(a). Sample Expected responses

Plot A (Elephant grass) – silage

Identify the material, tools and equipment (panga, molasses, silage storage, tarpulin, jerrican, basins, watering can, and personal protective equipment PPE)

- ✓ *Put on the personal protective equipment to protect yourself from injury.*
- ✓ *Use a panga to cut/harvest the pasture to ensure efficient harvesting.*
- ✓ *Spread the harvested pasture on a clean floor/tarpaulin to wilt to reduce moisture content that may cause rotting during processing.*
- ✓ *Chop the pasture into small pieces to increase surface area for bacterial action during fermentation.*
- ✓ *Pack tightly/press/compress appropriate material in a silo to create an anaerobic condition for fermentation as you sprinkle molasses to increase fermentation process.*
- ✓ *Seal the material to prevent contamination by other materials and entry of air.*
- ✓ *For a pit silo, dig a trench around to lead away running water that may spoil the silage.*

PLOT B (Congo signal grass) – hay

Identify the material, tools and equipment (panga, tarpaulin, baler, ropes and personal protective equipment PPE)

- ✓ *Put on the personal protective equipment to protect yourself from injury.*
- ✓ *Use a panga to cut/harvest the pasture to ensure efficient harvesting.*
- ✓ *Spread the harvested pasture on a clean floor/tarplin to wilt to prevent rotting and contamination.*
- ✓ *Bale the hay into bundles to prevent wastage.*
- ✓ *Pack the hay bales in a clean and leak proof store to keep hay dry and in good condition for a long time.*

1(b) sample expected responses

- ✓ *Land fragmentation – land consolidation to bring pieces of land under one block for easy management.*
- ✓ *Poor saving culture – forming saving groups to encourage members to save and invest.*

- ✓ *No banking of money – opening savings accounts in financial institutions to keep money safely before investment.*
- ✓ *No record keeping – keeping records to keep track of spending and sales.*
- ✓ *Farmers not working as a group – forming cooperatives/self-help groups so that farmers can join efforts to solve their problems.*
- ✓ *Buying input at a high price – buying in bulk as a group to reduce the unit cost of farm inputs.*

2. Sample Expected responses

- ✓ *Steep slope – terracing to reduce slope gradient and erosion.*
- ✓ *Rocky – planting trees to cause weathering that will produce new soil.*
- ✓ *Shallow soils – deep cultivation/sub-soiling to improve drainage and planting depth.*
- ✓ *Fairly fertile soils – addition of manure or artificial fertilizers to raise fertility to the required level.*
- ✓ *Compact – deep cultivation, addition of manure, marling, liming to loosen soil and improve soil structure.*
- ✓ *Sticky – liming, marling, addition of organic manure to loosen soil and improve its structure.*
- ✓ *Flooded soils – drainage, sub-soiling, addition of organic manure to remove excess moisture and improve soil structure.*

3. Sample expected responses

- ✓ *Blown off roof of calf pen - Renovation / repairing the calf pen (re-roofing) to protect calves from rain and sunshine.*
- ✓ *Worm infestation - Deworming -to kill internal parasites.*
- ✓ *Poor pastures - Planting high quality pastures/improving pastures/ supplementary feeding to improve nutrition of animals.*
- ✓ *Unprotected and dirty water source - Fencing the water source, planting the grass around the water source, de-silting of the water source to ensure clean water source for animals.*
- ✓ *Injured teats - Treating cracked teats with recommended medication (all preventive measures of cracks on teats) e.g. applying milking salve to reduce friction on the teats and to heal teats.*

- ✓ *Dirty/soiled animals - grooming cows before milking, using clean filter to milk, putting on protective gear e.g. cap by a milker man to prevent hair and other dirt from falling into the milk.*
- ✓ *Use of wrong equipment - Select and use appropriate equipment for mixing acaricide e.g. spray pump, knapsack sprayer to ensure efficient treatment of animals.*

4. Sample Expected Responses

- ✓ *Fencing off the poultry farm to prevent spread of diseases from other farms.*
- ✓ *Vaccinating birds to control diseases.*
- ✓ *Deworming birds to control internal parasites.*
- ✓ *Disinfecting the poultry house, tools and equipment to prevent the spread of diseases.*
- ✓ *Providing a footbath to prevent the spread of diseases.*
- ✓ *Ensuring proper ventilation of poultry house to prevent respiratory infections.*
- ✓ *Providing clean feeds and water to ensure birds stay healthy.*
- ✓ *Providing a balanced ration for birds to ensure fast and healthy birds.*
- ✓ *Providing adequate space for birds in the poultry house to reduce overcrowding and ensure the birds move freely.*
- ✓ *Regulating the entry of visitors into the farm to prevent introduction of diseases into the farm.*
- ✓ *Isolating and treating sick birds to prevent the spread of diseases.*
- ✓ *Selecting good/viable/high quality eggs for hatching to ensure *hatching* of healthy chicks.*
- ✓ *Providing optimum temperature for hatching to ensure successful hatching.*
- ✓ *Turning the eggs to ensure successful hatching.*
- ✓ *Providing optimum humidity in the hatchery to ensure successful hatching.*

5. Sample Expected responses

- ✓ *Obtain* clean planting materials to produce healthy plants.
- ✓ Obtain planting materials from reliable sources to ensure they are *healthy*.
- ✓ Plant a *resistant* variety to prevent crop disease infections.
- ✓ Proper *seedbed* preparation to ensure proper sprouting of the cuttings.
- ✓ Use *recommended* spacing to provide crop plants with enough growing space.
- ✓ Gap *filling* to maintain the correct plant population in the field.
- ✓ Weed *the* crop at least twice to reduce competition for nutrients and the spread of diseases.
- ✓ *Harvest* at the correct stage of maturity to ensure high quality and quantity of product.
- ✓ Use a *hand* hoe to carefully remove soil to expose the tuber which is dug out to prevent damage/injury to tubers.
- ✓ *Carefully* lift the tubers from the soil and place gently on the ground or in a container to prevent bruising or damaging them.
- ✓ Use *recommended* length of stem cutting to ensure proper sprouting.

6. Sample Expected responses

- ✓ *Broadcast* too many seeds – place seeds/sprinkle seeds along drills/furrows in the nursery bed to prevent overcrowding of seedlings.
- ✓ *Overcrowding* of seedlings – thin seedlings/prick out to reduce competition for space and nutrients.
- ✓ *Seedlings* not hardened off – reducing watering and shade to
- ✓ gradually expose seedlings to field conditions.
- ✓ Wrong *time* of transplanting – transplant seedlings in the morning or evening to prevent wilting of seedlings.
- ✓ Empty *spaces* within rows – gap fill to ensure correct plant population
- ✓ *Occurrence* of pests and diseases – carry out pest and disease control measures to *prevent* yield reduction.
- ✓ Too many *branches* and leaves on surviving plants - prune plants to allow them grow to the desired shape.
- ✓ Delayed *harvesting* – harvest fruits before they are fully ripe so that they can be kept in good condition for a longer time.
- ✓ Use of *unsuitable* containers/bags to keep fruits during harvesting - use open and well-ventilated containers to keep fruits in good condition.