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PRINCIPLES AND  
PRACTICES OF  
AGRICULTURE  
Paper 1  
AUGUST 2024  
2 ½ Hours



## ***UNNASE MOCK EXAMINATIONS 2024***

**UGANDA CERTIFICATE OF EDUCATION  
PRINCIPLES AND PRACTICES OF AGRICULTURE**

**PAPER 1**

**TIME: 2 HOURS 30 MINUTES**

### **INSTRUCTIONS TO CANDIDATES:**

- This paper has three sections **A**, **B** and **C**.
- It consists of **six** items.
- Section **A** is compulsory.
- Answer one item from section **B** and one from section **C**.

**SECTION A: (COMPULSORY)****SOIL SCIENCE AND VALUE ADDITION****ITEM 1:**

Lule bought an acre of land for crop growing purpose. He hired a soil scientist who conducted tests to confirm the suitability of soil for crop growing. His findings are summarised in the table below.

Soil parameter	pH	Organic matter	Soil water	Drainage capacity	Living organisms
Results	6.8	85%	68%	60%	Abundant

He concluded that the soil is suitable for crop growing.

Lule started crop growing. He has since used the soil close to ten years to grow maize and there is no season he has not grown the crop. He clears the land by setting the bushes on fire and after which he hires a tractor to plough the land every season. He has applied sulphate of ammonia to boost his crop growth every season. The soil surface is compact and whenever it rains water remains stagnant in the garden some of the maize crops have developed purple colouration on their leaves. Of recent, some two people have come out to claim ownership of the same land Lule uses. Lule enjoyed high yields in the first season but since then he has suffered great losses due to decline in yields in the subsequent seasons. He again hired a soil scientist and his findings are summarised in the table below.

Soil parameter	pH	Organic matter	Soil water	Drainage capacity	Living organisms
Results	2.0	36%	38%	40%	less

**TASK:**

Lule has hired you as an expert in soil science, advise him on what he should do to improve his yields.

**ITEM 2:**

Piene grows a new variety of simsim which has a good taste and highly nutritious. After harvesting, he put the seeds on a dry firm ground to dry under the sun. The dried simsim seeds were then scooped from the ground and packed in large polythenes. The polythenes were then transferred in store which had cracks on its walls. The following day the polythenes of simsim were packed on open Lorries and transported to market centres. Piene then started packing the simsim in small packaging to ease selling. Despite the variety being good, Piene receives few people



who come to buy his simsim, those who buy it appreciate its good taste but also complain that it's gritty. They can't also tell the quantities and date of expiry of the simsim they buy. The small organization where Piene and other farmers keep their money closed suddenly and the operators disappeared with Piene's savings he then obtained small loans from different money lenders to enable him widen his business and took some of the money in betting with hope that he will get double the money he has staked. He plans to setup a simple processing plant for his simsim but he lacks the resources to do so.

**TASK:**

As a graduate of agriculture, advise Piene on how he can overcome his challenges in order to benefit from his business.

**SECTION B:**

**LIVESTOCK PRODUCTION**

**ITEM 3:**

Musa is a fish farmer in Kyando village, he constructed his pond and embarked on the journey of rearing fish he is seen every three days topping up the water in the pond as he prepares to introduce fingerlings in the pond. He received fingerlings from a nearby fish farmer and transported them to his farm using sealed jerry cans to keep them from escaping. He then poured the fingerlings in the pond. He has two attendants who feed fish on different days and at different times. The soil on the dykes falls in the pond water each time an attendant walks on it. He applies farmyard manure every week to fertilize the pond. A green mat of plants covers the pond. The attendants kill two snakes every after two days around the pond area. When Musa visited the pond he found some fish that had died with their mouths open other fish that were sampled had white patches on gills and some had discoloured skins. The average fish weight was taken after a month and it was 500 grams the average weight was taken again after 3 months and it was 600grams. Musa is frustrated with his investment.

**TASK:**

As a trained animal scientist who has been hired by Musa, write a set of recommendations you can give to Musa to enable him benefit from his investment

**ITEM 4:**

Ruhweza rears cattle, poultry and goats all at the same farm. He has suffered losses due to frequent repairs of the fence at the section where cattle are kept. The kids born at the farm are very healthy and fed well but the males grow slowly. 8 calves are kept in each calf pen and the urine in the calf pens remains stagnant. Birds are fed only on maize bran. Eggs from poultry houses are collected on a weekly basis. In the brooder, chicks are seen overcrowding in corners. One of the workers at the dairy section is nursing wounds he sustained from the cow during milking, the cattle have developed appetite for non-edible materials. After mating

with the bulls at the farm, the cows produce off springs with a slow growth rate. The goats and cattle have small wounds on their skins and hides.

**TASK:**

You have been consulted by Mr Ruhweza, assist him on how he can improve production at his farm.

**SECTION C:**

**CROP PRODUCTION**

**ITEM 5:**

Milly established a nursery bed of tomatoes in an area where she had previously grown egg plants, she cleared the area and made nursery beds that measure 4meters wide, she carried out deep ploughing and she immediately scattered the seeds in the nursery beds. She moves for about 15 minutes to fetch water she uses to irrigate the seedlings 6 times a day. On germination, seedlings were congested and she maintained them since she was going to plant in a large area. Some seedlings started toppling over since they had rotten stem bases. She uprooted the mature seedlings and wrapped them in a sack and transported them to the main garden where she had made holes at a spacing of 120cm by 120cm. The leaves of some tomatoes had dry patches, the mature tomatoes that where harvested had a lot of soil and some had started rotting. The yields she got where low than what she had expected.

**TASK:**

Write information you will give to Milly to assist her improve the yields in her garden.

**ITEM 6:**

Benjamin decided to grow bananas. He prepared the garden during the wet season, he obtained banana suckers from James's garden and he planted them in his garden as they were. Some maize plants he never planted were seen growing amongst his banana plants, each mature banana plant had 6 suckers growing at the base of the stem, all plants had many leaves on them. Benjamin used a rusty panga to cut off the banana fibres and he used a lot of energy during the exercise. Some of the banana plants had bent stems. During harvesting, he cut the stem 50cms off the ground. The base of the stem of the harvested banana had dark tunnels running through it. He continuously suffered losses due to constantly low yields.

**TASK:**

Benjamin has hired you to be his farm manager, write your work plan you will use to improve yields at his farm.

**END**



### ITEM1

- Over using soil for long – Bush fallowing to allow soil rest to regain fertility, tostarve pests etc.
- Mon cropping (growing maize every season for 10 years) – Crop rotation tobreak life cycle of pests.
- Bush burning – slashing to clear bushes and maintain soil structure.
- Over using a tractor every season – minimum tillage/ use simple tools to maintain soil structure.
- Over using sulphate of ammonia (artificial fertilizers). Apply organic manure tobuffer soil PH.
- Compact soil. – carry out deep ploughing to improve soil structure.
- Stagnant water / poor drainage – carry out drainage by making channels to remove excess water and improve soil structure.
- Purple coloration on maize leaves – apply phosphatic containing fertilizers to increase phosphorous levels in the soil.
- Two people claiming land ownership (land wrangles) – register land to get a title to reduce land conflicts/to ensure security of tenure.
- Low pH – liming to neutralize soil acidity / to raise soil Ph.
- Low organic matter levels; - Apply organic residues to decompose and increase organic matter levels inthe soil.
- Low soil water levels;- much soil to conserve moisture / irrigate to increase moisture levels in soil.
- Low living organism levels – Add manure to provide food and increase living organism content of soil

#### Scores

10 and above –	4
8 – 9 –	3
4 – 7 –	2
0 – 3 –	1

For challenges

10 and above –	4
8 – 9 –	3
4 – 7 –	2
0 – 3 –	1

For solutions

10 and above –	4
8 – 9 –	3
4 – 7 –	2
0 – 3 –	1

For justifications

## ITEM 2

- Put simsim seeds on dry firm ground – Dry the simsim using clean mats / turplins to reduce contamination with dust.
- Scoops seeds and packs them – Winnow/clean the seeds to remove dust particles and ensure they are clean.
- Packing seeds in polyethene – pack seeds in clean sacks to ensure proper air circulation.
- Stores have cracks on walls – seal the cracks on the walls to control storage pests from hiding within.
- Transporting simsim on open lorries;- use closed tracks to transport simsim to reduce any contact with water in case it rains
- Few people buy simisim. – Advertise the simsim to create market awareness and get many buyers.
- Gritty taste. Sort the simsim to remove stones and other foreign materials.
- Buyers can't tell the quantity and date of expiry, carry out standardization of the products to ensure quality control.
- Keeps money with small organizations, keep money with banks / officially recognized financial institutions to promote safety of savings.
- Small loans from money lenders- obtain loans from registered financial institutions such as banks to reduce risks of exorbitant interest rates.
- Taking money to betting – Use the obtained loan for its appropriate purpose to reduce wastage of loans.
- No resources to set up a processing plant; - form a farmers' group / cooperative to enable pooling together of resources to set up a processing plant.

### Scores

10 and above –	4
8 – 9 –	3
4 – 7 –	2
0 – 3 –	1

For challenges

10 and above –	4
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0 – 3 –	1

For solutions

10 and above –	4
8 – 9 –	3
4 – 7 –	2
0 – 3 –	1

For justifications



### ITEM 3

- Topping up water in a pond every after 3 days;- Build up the pond in clay soil so as to retain water for long periods of time.
- Received fingerings from nearby farm;- obtain fingerings from a trusted fish seed source to reduce spreading of fish diseases
- Transported fingerings in sealed jerrycans- transport fingerings using oxygenated bag/containers to reduce fish mortality.
- Poured fingerings in a pond;- gently lower the containers in the pond to allow fish freely swim into the water to control death by temperature shocks.
- Fish are fed at different times;- Maintain the feeding routine to reduce stressing fish.
- Soil on dykes falls in water; plant grass on dykes to stabilize its walls / build dykes using clay soil to ensure they are strong and stable.
- Applying farm yard manure every week; reduce manure application rates to reduce depletion of oxygen in a pond.
- Green mat on a pond; - Remove excess algae to reduce oxygen competition with fish.
- Two snakes killed every 2 days; - Slash bushes around the fish pond to keep away snakes.
- Dead fish with mouth open;- change turbid water to ensure fresh oxygenated water supply (any measure that improves oxygen supply is correct).
- White patches on gills and discolored skin;- Isolate diseased fish to control spread of diseases (any measure that controls diseases in fish is correct).
- Low weight gain of fish;- Proper feeding of fish with balanced feeds to accelerate fish growth.

#### Scores

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

For challenges

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

For solutions

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

For justifications

#### ITEM 4

- Losses due to frequent repairs of fence at the cattle section; - Dehorn the cattle to make them docile / use treated posts to reduce insect damage.
- Male kids grow slowly; - castrate male calves to promote faster growth of kinds.
- 8 calves kept in calf pens; - keep each calf in an individual pen to control spread of diseases due to overcrowding.
- Urine remains stagnant in calf pens;- Construct calf pens with a slanting floor to promote proper drainage of the calf pens.
- Birds fed only on maize brand;- Feed birds on properly balanced feeds to control nutritional disorders.
- Eggs are collected on weekly basis;- Regular collection of eggs to reduce damages and increase yields.
- Chicks over crowd in brooder corners- Regulate brooder temperature by lowering it to reduce overcrowding of chicks in the corners.
- Worker nursing wounds sustained during milking;- restrain the cow during milking to reduce accidents.
- Cattle developed appetite for non-edible feeds;- Provide feeds rich in phosphorous to control pica.
- Cows mate with bulls and produce slow growing calves;- Carryout artificial insemination / cross breeding to improve breeds on a farm.
- Goats and cattle have small wounds on their skins and hides;- spray/dip the animals using suitable acaricide/insecticide to control external parasites.

#### Scores

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

For challenges

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

JUSTIFICATIONS

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

FOR SOLUTIONS



## ITEM 5

- Establish tomato nursery beds where egg plants were previously grown;- do not plant crops of the same family following each other to control spread of pests and diseases/set up the nursery bed in a new area to control spread of pests and diseases/sterilize the nursery bed to kill any pest and pathogen from the previous crop.
- Nursery beds measure 4m wide, establish nursery beds measuring 1 m wide for easy management.
- Deep ploughing and planting immediately, break the soil clods to make the nursery bed fine for easy emergence of seeds.
- Scattering seeds on a nursery bed, plant seeds in furrows to reduce overcrowding of seedlings.
- She moves 15 minutes to fetch water, establish the nursery bed near a water source. For easy management / to reduce inconveniences.
- Waters plants 6 times a day; reduce the watering times to 2 times a day to control fungal diseases/damping off/rotting of seedlings.
- Congested seedling; - carry out thinning / pricking out to reduce competition among seedlings.
- Toppling over of seedlings with rotten stem bases;- do not over water the nursery bed /reduce watering frequency to control damping off diseases.
- Uprooting mature seedlings; - Transplant using a garden trowel to control damage to the tap root of seedlings.
- Wrapped seedlings in sacks during transportation;- Put seedlings on a wheel barrow to reduce damage of seeds during transportation.
- Spacing of 120 cm x 120 cm, use recommended spacing of 90cm x 45cm to control pests / weeds / diseases.
- Dry patches on tomato leaves, spray using fungicide to control fungal diseases.
- Mature harvested fruits have soil and rotten carry out staking to maintain quality of fruits.

### Scores

10 and above -	4
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0 - 3 -	1

### Challenges

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

### Solutions

### JUSTIFICATIONS

### ITEM 6:

- Prepare the garden during wet season;- Prepare the garden early in the dry season to save planting time.
- Gets suckers from Jame's garden;- obtain suckers from a trusted source to control pests/diseases.
- Planted bananas as they were;- Peer the bananas to promote proper establishment by reducing transpiration rates and banana weevils.
- Maize plants grow among bananas;- carry out weeding to reduce competition for nutrients.
- 6 suckers grow on each plant- Carry out desuckering to minimize competition for growth requirements.
- Many leaves are found on plants;- prune to remove excess leaves and increase bunch size.
- Rusty panga is used; - properly store the panga / garden tools in a cool dry place to ensure they work efficiently.
- Uses a lot of energy during the exercise of cutting banana fibers;- sharpen the panga to ensure smooth efficient and quick operations.
- Banana have bent stems; -carry out staking to properly support the mature plants.
- He cuts stems 50 cm off the ground; - cut the banana Pseudo stem high above the ground about 100 cm off the ground to reduce damages / bruising the bunch.
- Dark tunnels in the stem of harvested plants- hot treatment of banana suckers to control banana weevils/plant using clean suckers to control banana weevils.

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Challenges

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0 - 3 -	1

justifications

10 and above -	4
8 - 9 -	3
4 - 7 -	2
0 - 3 -	1

solutions