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Principles and practices
Of Agriculture
P515/1
Jul/Aug, 2026
2hours:30mimutes

KAMTEC EXAMINATIONS BOARD

Uganda Advanced Certificate of Education
PRINCIPLES AND PRACTICES OF AGRICULTURE
Paper 1
(THEORY)
2Hours :30minutes

INSTRUCTIONS TO CANDIDATES:

*The paper consists of Sections **A*** and ***B***

***Section A is compulsory**.*

*Respond to **two** items from section **B***

*Choose at **least one item** from each of the parts **I** and **II**.*

Each Item should be attempted on a fresh page.

Turn over

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SECTION A

Item 1

Kojo manages a maize garden and poultry enterprises at his school farm as part of his agriculture project though he sells the products to the school. He rears 200 improved Kuroiler hens and collects an average of 140 eggs daily. He markets his eggs by supplying them to the school canteen, the school kitchen, and nearby day scholars. However, Kojo has been struggling to remember his sales transactions in order to track the sale. Last week, he sold 5 trays of eggs to the school canteen at UGX 15,000 per tray and a sac of row maize cobs to the chief cook to be boiled for students, something he does on a weekly basis. The chief cook however denied receipt of the 100kilogram sac of row maize yet Kojo was not paid for that maize. He also faces several setbacks in his egg marketing enterprise. Eggs frequently crack during transportation from the poultry house to the canteen in old plastic sacs. During holidays, demand drops sharply and many eggs go unsold, forcing him to lower prices. Other egg suppliers from the nearby market sell at lower prices because they buy in bulk from large farms. Some customers have also complained about inconsistent egg sizes, with some eggs being pliable, some trays containing a mix of small and large eggs. Kojo has also noticed that his eggs spoil faster during hot seasons, and sometimes buyers fail to identify his brand of eggs from other suppliers. Due to all the above challenges, Kojo's profits from both enterprises have reduced significantly.

Task

a) *Prepare a document that Kojo can issue to the chief cook in order to be paid.*
b) *Explain the ways through which Kojo can improve his farm projects.*

Item 2

Mugisha owns a 5-acre mixed farm. Encouraged by rising market prices for dairy products and maize, decided to simultaneously expand his cattle herd and establish a large-scale maize enterprise. He purchased ten **Friesian crossbred** heifers and sourced maize seed labeled *"certified hybrid"* from an informal roadside seller. He cleared the land by burning vegetation. He planted maize seeds directly into unprepared, compacted soil, using a spacing of 2 metres between plants and 3 metres between rows. His plot was just adjacent to the neighbour's plot. He applied the same type and quantity of **DAP** fertilizer as his neighbor but unlike the neighbor's maize, his still showed purple coloration. Their soil analysis revealed the results below.

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Table 1

	Soil analysis results from adjacent plot	
farmer	**Nutrients available**	**Quantity in parts per million (ppm)**
Mugisha's neighbor	aluminum iron phosphorus	22 18.1 90
Mugisha	aluminum iron phosphorus	110 200 10

The heifers, meanwhile, were confined in a newly-built structure with tall solid walls, flat bear concrete floor. When the heifers arrived; they were immediately mixed with the two existing goats on the farm. Vaccination programme was initiated after observing sick animals. Mugisha noticed yellowing of maize leaves from the 4th week. He applied a nitrogen-rich top-dressing at double the recommended rate, reasoning that more fertilizer would accelerate growth. Weeding was done only once, and irrigation was applied in large amounts every other day regardless of soil moisture levels. The heifers began to showed rough coats, reduced appetite, nasal discharge, and declining body condition.

He castrated two bull calves under non-sterile conditions and also realized one bull with only one testacle in its scrotum. Two of his milking heifers kicked when the milk man touched their hot udders. And the remaining animals produced far below the expected daily milk yield due to a noisy environment. Mugisha attempted to sell the milk from a heifer that had recently been treated with antibiotics, the milk tested positive for antibiotic residues at the collection centre and was rejected, resulting in a financial loss and reputational damage.

75cm between rows and 30cm between plants,

a) *Explain the causes of low production at Mugisha's farm*
b) *Suggest with reasons, the ways of improving production at his far*

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SECTONB

Part I

(*Attempt **one** item in this part).*

Item 3

Mulongo established a cattle farm on a 100 m x 100 m farm land on which he rears 15 heads of cattle. The kraal is fenced with a hedge planted with Calliandra shrubs intercropped with Kei apple He has one sire which he confines in its own pen due to its aggressive behavior. He constructed a plunge dip of average dimensions of 4.0metres long, 2.0 metres wide and 1.5 metres deep. He routinely dips all animals irrespective of their condition and age. He dips once every three months. He uses supona acaricide and normally dips when the dip wash volume is at the 10800 L mark. The prescription ratio for supona acaricide is

1:500. The entrance race of his dip has one foot bath of 5cm deep and the collecting yard has water troughs with no water. He also controls ticks by double fencing the pasture area but also plants super Napier grass in the buffer zone of his double fence to boost the yield and biomass of his pastures. The information below was picked from the chart which Mulongo's veterinary doctor pinned for him to always refer to whenever he wants to dip his animal.

Dip essential	*observed*	*optimum*
Foot bath depth	*5cm*	*25cm*

Supona acaricide dipping frequency is at least two times a week

The farm productivity has consistently reduced and parasite infestation at the farm is still a challenge and Mulongo feels like dropping the venture.

Task:

a) *Explain the causes of the persistent poor productivity of Mulongo's farm.*
b) *Suggest possible measures he should take to revive the productivity of his farm.*

Item 4

The Bukooli Women's Dairy Group in Iganga District received a government grant and used it to purchase ten Holstein Friesian heifers, which were introduced onto a communally-managed paddock of natural grass that had not been rested or top-dressed in over three years. The animals were tethered individually on sisal ropes during the day and confined at night in a roofed enclosure whose drainage channel was permanently blocked. The group purchased one secondhand milking machine which was shared among all ten cows and rinsed with water only between milkings. Calves were separated from their mothers immediately after birth with no colostrum allowance, and male calves were sold to traders within the first week. The group noticed that after six months of lactation, daily milk yield per cow had dropped from an initial average of eight litres to barely three litres, and the milk frequently failed the alcohol test at the collection centre, resulting in rejection.

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Several cows showed swollen, hot, and painful rear quarters, and one cow had been limping for four weeks after the paddock fence broke and she slipped into a waterlogged ditch.

Three cows that had previously calved were showing no visible heat signs eight months after parturition, even though a Zebu bull was present in the same paddock. The group's treasurer reported that milk income for the last quarter was insufficient to cover the cost of the acaricide and mineral lick purchased that month.

Task

a) *Explain the underlying causes of the declining performance observed in the Bukooli Women's Dairy Group.*

b) *Propose management improvement programmes that will enable the group achieve sustainable dairy production and profitability.*

PART II
(***Attempt one item in this part).***

Item 5

Amoding is a Senior Six student at a boarding school in Luwero District. As part of her Agriculture project, she was given a half-hectare plot of land adjacent to the school farm to establish a maize enterprise from planting to marketing. The school provided her with the plot after she submitted a written proposal and a business model canvas, which was approved by the agriculture teacher in mid-February, just as the long rains were expected. She was excited and quickly prepared the seed bed without conducting any soil tests or applying any soil amendments. She sourced her planting materials from a nearby market trader selecting seeds that were loosely packed in a polythene bag without any label. She planted the seeds at random spacing, and later noticed that some areas of her plot were very overcrowded while other areas had large gaps with no plants at all. Within the first three weeks, she observed that the leaves of many of her young plants had turned yellowish and growth appeared stunted. As the crop grew, noticed unusual spots and lesions appearing on the leaves of a large number of plants, and a few plants were found lying flat on the ground with their stems appearing to have rotted at the base. Thinking the problem would be resolve on its own, she delayed taking any action. During the weeding season, observed that her plot was heavily infested with oxalis plants. When the crop finally approached maturity, noticed that some cobs had not formed properly, with incomplete grain filling at the tip. After shelling the maize, she noticed a greyish-green powder on some of the grain and a musty smell coming from portions of the harvest. She packaged her maize in plain sacks with no labels and attempted to sell directly to a local market trader who offered her a very low price, noting that the grain was of poor quality and of uncertain origin.

Task

a) *Explain Amoding's low maize production outcomes.*

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b) *Propose how she would improve her farm performance.*

Item 6

Bukedea district and the surrounding areas have proved to be favorable for ground nut production due to its optimum climatic and soil factors. Okwi picked interest in the ground nut enterprise the activity he has now done for five years. Recently he hired a virgin gently sloping piece of land for the ground nut project which he cleared by burning bushes and made an intercrop of maize and ground nuts. The land he uses belongs to an absentee land lord. There were always unclearly visible channels on the soil surface every after rains. The ground nuts were spaced at 70 cm between rows and 18 cm between plants since he had cleared a big space. He planted the ground nuts at a depth of 10cm and some did not germinate. He observed stunting of ground nuts with reduced leaf size. He uprooted one of the ground nut plants and realized no sign of nut growth despite the application of enough DAP fertilizer at planting time. Also some maize plants showed purple coloration on their leaves. He was forced to do a quick soil sampling which revealed a chemical analysis of pH and nutrient content in parts per million (ppm) as below.

Soil pH	Available amounts (ppm)	Exchangeable amounts (ppm)
8.5	Calcium (above 1000)	Above 500
	Magnesium (above 150)	Above 100
	Phosphorus (above 100)	20

He also observed a strange plant among the growing ground nuts that resembled the ground nuts and on using a dibber to uproot it, he observed a nut like structure on the plant below the ground. Seeing the lowering yields of maize and ground nuts, Okwi's neighbor advised him to apply agricultural lime to his soils which he did but still obtained very low yields from both crops.

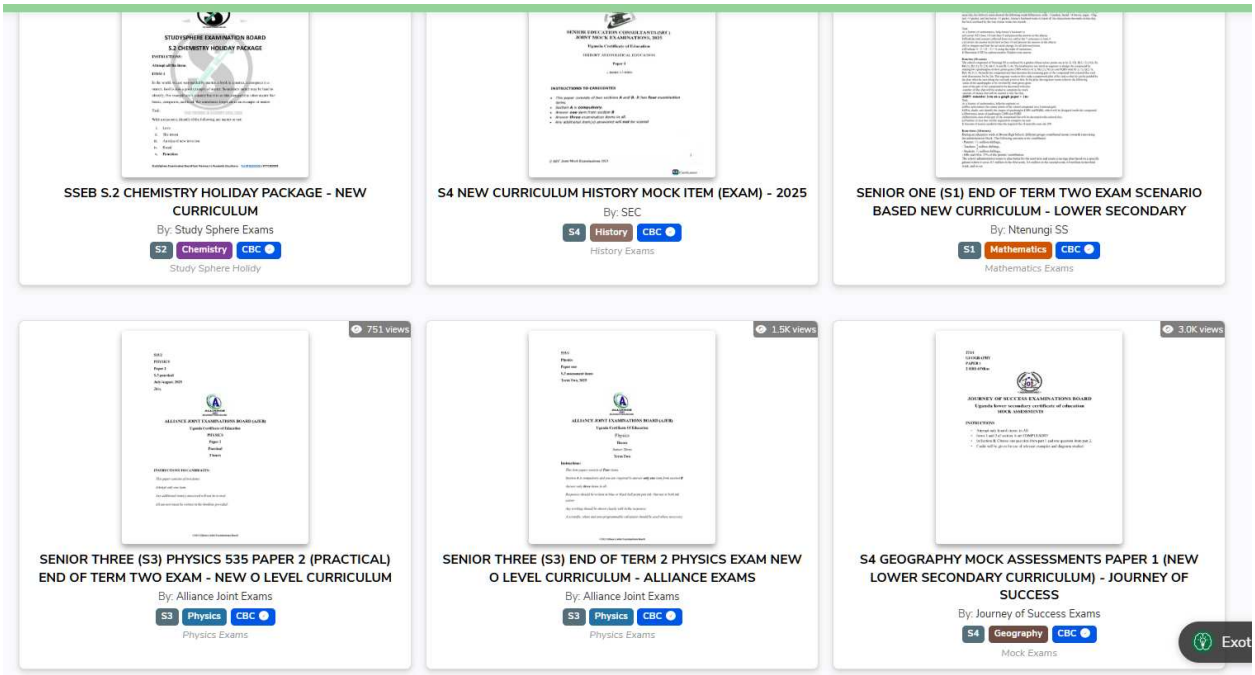
For good ground nut yields, a spacing of 45cm between rows and 12.0cm between plants is ideal in soils of pH 6.5 and are planted at a depth of 6 cm.

(a) *Explain the causes of Okwi's low crop yields.*
(b) *Advise him on the measures to take to achieve high yields.*

END

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