

P515/1

Principles and
Practices of

Agriculture

Theory paper 1

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Uganda Advanced Certificate Of Education

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Principles and practices of Agriculture

Theory paper 1

Duration:3hours

INSTRUCTIONS

- This paper has three sections A,B and C
- Section A is compulsory
- Attempt one item from section B and one item from section C
- Four items should be answered in all
- Use clear explanation
- The paper has **six(6)** examinable items

SECTION A: Value addition and Agricultural biology

ITEM 1

Mr. Okello is a known poultry farmer in Wakiso district. He owns around 1000 layers of birds with workers who are strong and energetic. Each day he collects 1000. During collections workers roughly handle eggs while putting them in dirty baskets due to pressure and rushing to meet time. The eggs then transferred and stored in high humid and too dusty rooms with high temperatures. After realising that raw eggs make low profits, he decided to make pickled eggs to meet higher financial goals. However, pickled eggs had bad taste and texture and customers rejected the products. Due to complaints by the customers and notable illnesses, the legal market access was also denied by Uganda national bureau of standards and other local authorities. Mr. Okello could pack the pickled eggs in plastic jars and containers with no brand identity. As a result of low customer awareness of the existence of his pickled eggs, Okello tried to design advertising material but the material could not meet the standards and had no clear picture of expenses and wasted all the money, leaving nothing for daily needs in his farm. Okello is confused on what to do next.

TASK

- A) Guide Okello on how to properly make the value added product he tried to make from eggs.
- B) Explain the measures Mr. Okello should take to improve and benefit from his business.

ITEM 2

Ainebyona from Western Uganda practises mixed farming; keeping animals and growing crops. The farmer always grazes the herd in swampy areas where her animals drink water. Of recent, one of best milk yielding cow got sick and she responded quickly by calling a veterinary doctor. The doctor diagnosed the cow and gave her a report as shown below in the table.

Table showing a report from the veterinary doctor

Cellular organelle diagnosed	Condition of the cell/organelle
Cell membrane structure	fragmented, highly porous and leaky bilayer

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Rough endoplasmic reticulum	Severe de-granulation (loss of ribosomes), dilated and collapsed tubules
Golgi apparatus	Flattened cisternae, dispersed and structurally degraded

The doctor concluded that the liver tissue was attacked by flukes that the cow might have got from dirty water during grazing in swampy areas. Some other two cows dropped in milk production per day due to illness that led to reticular dysfunction. After milking, she stores the milk open without covering in the same room with garlic and onions. The customers who bought her milk started complaining of the smell of the garlic and onions in the milk and they have rejected it. Ainebyona is frustrated with the condition she is experiencing.

TASK

A. Explain how;

- i) The condition of the cell organelle in the doctors report and other two cows in the scenario affected the overall cellular/body functions and milk production per day respectively.
- ii) The smell of the garlic and onion reached the milk that led to rejection.

B. Provide practical measures of how Ainebyona can manage the challenges in the scenario to reduce frustration

SECTION B:Animal production

ITEM 3

Kavuma a rabbit farmer in Mukono started his business of rearing rabbits after receiving the parish development model money. He constructed the cages with rusty and corroded wire mesh. After stocking, rabbits were unable to stretch out fully, hopping and standing upright on their hind legs while inside the cages and yet they are all healthy and not sick. After kindling, kits are constantly crying, wandering out of the nest box early, and looking wrinkled because the doe is dry yet he always formulates feed for his rabbits. On observation, all his rabbits have genetic disorder of physical deformities and every kit born possesses the same condition. Kavuma gets the doe and puts it in the buck's cage for mating and mature bucks got deep bites marks and torn ears. Most of the rabbits had soiled hindquarters, severe pot-bellies and rapid wasting and algae choked waterers were also seen in the cages. In Kavuma's farm, used needles, empty plastic syringes and medicine vials are scattered around the farmyard creating a severe puncture hazard for children, workers and other animals and he is constantly out of money despite selling rabbits. During slaughter, the carcass had fecal matter from the stomach and intestines. The carcass was also dark, discoloured with rabbit fur on the wet meat that led to rejection by high end buyers, butcheries and supermarkets and he also removed liver and kidneys from the carcass. He faced regulatory penalties for chemical residues in the carcasses after random testing by public health inspectors and the business is failing .

TASK

- a) Explain the causes of the challenges on Kavuma's farm
- b) Advise Kavuma on how to benefit from his business

ITEM 4

Agricultural district Officer of Jinja district visited Mr. Mukisa's dairy goat farm for supervision. On reaching the farm, the goat's structure had flat earthen floor with lack of specialised spaces and goats always fight and dominant goats block others from feeding. At initial stage, Mr. Mukisa invested heavily in expensive, pure bred dairy goats where locals only buy cheap goat meat and have zero culture of drinking goat milk. During feed formulation, there was inability to balance energy and fiber with too many easily fermentable concentrates in the ration and

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forage were incorrectly chopped and yet goats were highly selective during feeding. He did not know how to handle a hoof trimming knife, with poor strategic deworming and rotational grazing but does random dosing of the goats. When goats are kidding and there is difficulty in giving birth, he assists a doe and cleans aborted fetus with bare hands and also treats a panicked and painful goat without proper restraining. To maintain health on his farm, Mr. Mukisa sprays the goats against the wind and mixes the chemicals with barehand and does not use rigid puncture-proof container for used needles and expired glass medicine vials, so just dumps them around the farmyard. During milking, the farmer mixes the breeding buck and the milking doe with no pre-milking strip testing and post milking teat dipping in does because of the urgent orders he gets such that supplies them quickly. But when the goat disturbs him during milking, he beats and shouts at the goat and milks even the sick goat that he just treated few hours to meet the required amount of milk needed by the urgent customers.

TASK

- a) Explain the effect of the practice challenges Mr. Mukisa's farm.
- b) Explain the measures Mr. Mukisa should take to profitably benefit from his business.

SECTION C: Crop production

ITEM 5

Fred acquired customary land that gently slopes to the water streams and planted the Hass avocado. He planted the healthy grafted seedlings and roots were seen bent upward to fit into a small hole and some topple over during brief windy periods. The sloping side of the garden had channels carving through rows and dark soils are found on the lower side of the land and stream ponds developed thick with pH of 2. The avocado leaves turn pale green, yellow, wilt and drop prematurely with no disease and pest infestation. (The available information indicates that Hass avocado grows well in well-drained, sandy or alluvial loam with neutral pH but the analysis indicated the soil pH of 2). The down stream ponds on the lower side of his land developed thick green mats of algal blooms which suffocated the fish and ruined domestic water quality that created conflicts with neighbours. Fred decided to put fresh, wet and un composted cow manure directly around the base of the avocado to boost fertility and health of the trees. After fruiting, the developed fruits had rough, scarred and brown skin while the inside was fine. The mature branches of adjacent trees were interlocking, completely blocking sunlight from the lower limbs and yet he prunes them. The farmer observes massive, vigorous growth of vertical water shoots and dense green leaves but the orchard yielded absolutely zero avocados for consecutive seasons. As the trees mature, neighbours cut them down and steal the fruits claiming the trees are on communal paths and other on their private plots and he bogged down of war in unending local council and police disputes.

TASK

- a) Explain the causes of the challenges in Fred's avocado farm.
- b) Advise Fred on what to do to properly benefit from his project.

ITEM 6

Ouma is a rice farmer in Namayingo district who grows lowland rice. In nursery bed stage, he sows seeds too densely to have enough population that can finish his large main field. He improperly puddle the soil (plowing and harrowing wet soil) in the main garden. He transplants the seedling from the nursery after 60 days (the optimal age to transplant seedlings for modern varieties is 15-21 days). Since the

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lowland borders are too fertile, he ploughs and expands the borders upto neighbours plots and clears all the vital upstream catchment areas and vegetation to chase away rats that attack his rice. The lowland rice is also planted in one of the sand soil with loose, coarse soils in some portion of his land (lowland rice grows well in deep fertile clay soil). He puddles the soil when flooded with uneven field leveling having dry mounds due to rushing to plant quickly. Ouma gets seeds from the neighbours and plants in the nursery bed. However, after transplanting, despite heavy applications of fertilizers, perfect water management, pest and disease control he realised low yield. He uses unfermented liquid organic fertilizer containing high concentration of raw ammonia onto young rice leaves and sometimes into shallow water since lacks money to purchase artificial fertilizer. When he got money from a friend, he bought knapsack sprayers and uses them for spraying. The knapsack sprayers were clogged and was using one of the clogged to spray nitrogen fertilizer. He also sprays pests without respirators and gumboots while walking through standing water. After spraying, he washes the knapsack sprayers in the stream of water and some fish were seen dead. He harvests over ripe and brittle rice with brittle rice grains after leaving it for too long in the field. During threshing, Ouma beats the rice too violently against hardstones and after dries it directly on bare soil.

TASK

- a) Explain the effect of the farm practices at his farm on the yield of the rice.
- b) With reasons, suggest the measures Ouma should take to improve on production on his farm.

END