THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

ADVANCED CRTIFICATE OF SECONDARY EDUCATION EXAMINATION

134/1 **AGRICULTURE 1**

(For Both School and Private Candidates)

Time: 3 Hours. **ANSWER** **Year: 2022**

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and **two (2)** questions from each of section B and C.
3. Section A carries **40** marks, section B and section C carries 30 marks each.
4. Cellular phones and unauthorized materials are **not allowed** in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. (a) Explain how soil water is involved in the soil profile development.

Soil water is involved in soil profile development by transporting dissolved minerals from upper to lower horizons through the process of leaching, leading to the formation of distinct soil layers. It also facilitates weathering by reacting with minerals chemically and physically breaking down rocks, which contributes to soil horizon differentiation.

(b) Describe briefly two distinguishing features of each of the master horizon in the soil profile.

The O horizon is characterized by a high content of organic matter from decomposed plant and animal residues, and it is usually dark in color.

The A horizon, also called the topsoil, has a mixture of minerals and humus, making it fertile and darker than the lower layers.

The B horizon, or subsoil, is characterized by accumulation of leached materials such as clay, iron, and aluminum oxides, and it is usually denser than the topsoil.

The C horizon consists of partially weathered parent rock material and is less affected by biological activity compared to upper horizons.

The R horizon is the bedrock layer, which is unweathered and serves as the parent material for the soil above.

2. (a) Briefly describe four soil structural grades.

Single-grain structure consists of loose particles that do not stick together, commonly found in sandy soils.

Massive structure occurs when the soil appears as a solid block without visible peds, often seen in clay soils.

Weak structure means peds are barely observable, and the soil breaks easily with little resistance.

Strong structure indicates well-formed and durable peds that resist breaking, promoting good aeration and water movement.

(b) Categorise soil structure types on the basis of the shape and arrangement of peds.

Based on the shape and arrangement of peds, soil structures are categorized into granular, blocky, platy, and prismatic or columnar.

Granular structure consists of small, rounded aggregates common in topsoil.

Blocky structure forms irregular, block-like aggregates in subsoil.

Platy structure shows thin, flat plates stacked horizontally.

Prismatic or columnar structure consists of vertical, elongated peds often found in subsoils with clay.

3. Analyse five factors that influence the nutritional value and quality of farmyard manure.

The type of livestock influences manure quality, as different animals excrete waste with varying nutrient compositions. For example, poultry manure is richer in nitrogen compared to cattle manure.

The type of feed given to animals also determines manure quality. Animals fed on protein-rich and balanced diets produce nutrient-rich manure.

Storage methods influence manure quality, as poorly stored manure loses nitrogen through volatilization or leaching.

The age of manure is also important. Fresh manure contains more readily available nutrients, while older manure loses nutrients over time if not stored properly.

The presence of bedding materials such as straw or sawdust affects manure quality by either diluting nutrient content or adding organic matter that enriches soil.

4. (a) Give two points on what would happen if inorganic fertilizers are stored in an open space and subjected to the sunlight.

If inorganic fertilizers are stored in open space under sunlight, they may lose effectiveness due to volatilization of nitrogen compounds.

They may also absorb moisture, harden, and become difficult to apply, reducing efficiency.

(b) Briefly explain why farmers should consider the following aspects to ensure efficient proper use of fertilizer by giving one example in each case:

(i) Right fertilizer type .

The right fertilizer type should be chosen to match the crop needs, for example, phosphate fertilizers for root crops.

(ii) Right fertilizer rate

The right fertilizer rate should be used to avoid under-fertilization, which reduces yield, or over-fertilization, which causes nutrient wastage and pollution.

(iii) Right time of fertilizer application

The right time of application should be followed to match crop growth stages, for instance applying nitrogen during vegetative growth for cereals.

(iv) Right method of fertilizer application.

The right method of application ensures nutrients are available where needed, for example, band placement near crop roots for efficient uptake.

5. (a) Suggest five conditions suitable for the successful implementation of the plan in which the school is planning to use animals as a source of power instead of the farm tractor due to economic constraints.

One condition is the availability of suitable animals, such as oxen or donkeys, which are strong enough for farm operations.

Another condition is proper training of both animals and handlers to ensure animals respond to commands and work efficiently.

There must be sufficient feed and water resources to maintain the energy levels of the animals.

The land should be relatively small or moderately sized, as animal power is not as efficient as tractors on very large farms.

Affordable and suitable implements such as ploughs or carts designed for animal traction should be available.

(b) Examine five important animal management practices to be adopted in order to obtain a maximum output from the animal farm power.

To obtain maximum output, animals must be provided with a balanced diet rich in energy and protein to sustain their strength.

Regular health checks and vaccinations should be carried out to prevent diseases that could weaken or kill the animals.

Animals must be given adequate rest and not overworked to maintain their productivity over time.

Good housing should be provided to protect animals from harsh weather and ensure comfort.

Proper harnessing and handling techniques should be used to avoid injuries and enhance the efficiency of the animals.

6. (a) Give six points on how the maintenance of the dip is carried out in order to guarantee its efficiency and last longer.

A dip should be cleaned regularly to remove dirt, manure, and debris that accumulate and interfere with the chemical solution.

The dip solution should be replenished and adjusted to the correct concentration to maintain effectiveness against parasites.

Structural parts of the dip such as walls and floors should be repaired promptly to prevent leakage and accidents.

The draining and refilling system should be inspected often to ensure smooth operation during dipping.

Surroundings of the dip should be kept clean to minimize contamination and disease spread among animals.

Protective roofs or covers should be maintained where possible to reduce evaporation and dilution of the chemical by rainwater.

(b) Justify in four points that a farm without a workshop is said to be incomplete.

A farm without a workshop is incomplete because there will be no place to repair and maintain machinery and tools, leading to frequent breakdowns.

Workshops provide storage for tools and equipment, and without them, losses through theft and misplacement are high.

A workshop enables the fabrication of simple farm structures and equipment, which reduces costs.

It also serves as a training center where workers can learn repair and maintenance skills, which improves efficiency on the farm.

7. (a) Give five advantages of the overhead irrigation over the surface irrigation.

Overhead irrigation distributes water more uniformly over the crops compared to surface methods.

It is suitable for a variety of soils, including sandy soils where surface irrigation would cause quick percolation.

It saves water because the amount applied can be controlled more precisely.

It is adaptable to uneven land where surface methods would cause runoff.

It allows simultaneous application of fertilizers and pesticides with irrigation water.

. (b) Briefly explain in five points the prerequisite conditions for using the disc plough over the mouldboard plough.

Disc ploughs are preferred where soils are hard and stony, as discs cut through obstacles better than mouldboards.

They are suitable in areas with sticky clay soils that would clog mouldboard ploughs.

Disc ploughs are effective in land with roots and crop residues since they cut and mix organic matter into the soil.

They can work better on dry soils where mouldboards would not penetrate easily.

They are also suitable for soils prone to erosion, as discs leave a rough surface that reduces water runoff.

8. (a) Briefly explain three ways in which inputs used in production process relate with quantity of yield produced.

Inputs such as fertilizers increase soil nutrients, which in turn raise crop yields.

Labor inputs, when adequate, ensure timely operations like planting and weeding, leading to higher yields.

Mechanization improves efficiency and reduces drudgery, increasing the quantity and quality of yield.

(b) Name the region of the production function in which the following situation operates and give reason: the school is keeping a few poultry in a very large poultry house.

Keeping a few poultry in a very large poultry house falls under region I of the production function. This is because inputs (housing space) are underutilized, and increasing stock would increase output.

(c) Name the region of production function in which the following situation operate and give reason: the school cattle are overgrazed in the school pasture.

Overgrazing cattle in the school pasture falls under region III of the production function. This is because excessive input (too many cattle) reduces output as the pasture is degraded, and productivity per animal declines.

9. Explain five possible problems that would face a farmer when marketing his or her agricultural production and give five general solutions to overcome the problems.

One problem is price fluctuation, where farmers may not get consistent income due to changing market prices. A solution is government price stabilization policies or cooperative marketing.

Another problem is exploitation by middlemen who offer low prices. A solution is forming farmer cooperatives to negotiate better deals.

Perishable nature of produce is a problem, as crops like fruits and vegetables spoil quickly. A solution is providing cold storage and processing facilities.

Poor transport infrastructure makes it hard for farmers to reach markets. A solution is government investment in rural roads and transport.

Lack of market information affects farmers' decision-making. A solution is establishing market information systems through mobile technology and extension services.

10. (a) Propose four measures to be taken by the government to reduce the effect of low world market prices for its cash crops as a result of COVID-19 pandemic that affected trade across borders.

The government can promote value addition to cash crops so that farmers export processed goods at higher prices.

It can diversify export markets to reduce dependence on a few trading partners.

It can provide subsidies or financial support to farmers during low-price periods.

It can encourage domestic consumption and processing industries to absorb surplus production.

(b) Propose four important questions that have to be answered by the farmer before replacing the tomato enterprise with the fish farming enterprise.

Before replacing tomatoes with fish farming, a farmer should ask whether the resources required for fish farming such as ponds and water are available.

The farmer should ask whether there is enough market demand for fish compared to tomatoes.

The farmer should ask whether they have the technical knowledge or access to training in fish farming.

The farmer should ask whether the new enterprise will be more profitable and sustainable than the current one.