THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

735 **AGRICULTURE TEACHING METHODS**

Time: 3 Hour. **ANSWERS** **Year: 2004**

Instructions

1. This paper consists of section **A** and **B**.
2. Answer **all** questions in section A, and **four (4)** questions from section B.
3. Section A carry **forty (40)** and section B carries **sixty (60)** marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. List four examples of perennial crops grown in Tanzania.

Bananas are perennial crops that produce fruit continuously over several years without the need for replanting each season.

Coffee is a major cash crop in Tanzania that grows as a perennial bush, yielding beans annually once established.

Coconut trees are common along coastal areas and can bear fruit for decades, making them important perennial crops.

Sugarcane, although harvested and replanted after a few years, is considered perennial due to its multiple ratoon harvests from a single planting.

2. Identify four advantages of mixed farming in rural communities.

Mixed farming allows efficient use of resources by combining crop and animal production on the same land, where animals provide manure for crops and crops provide feed for animals.

It spreads the risk of loss since income comes from both crops and livestock, making the farmer less vulnerable to market or climatic shocks.

Labour is utilized throughout the year as different farming activities occur in different seasons, providing employment and reducing idle time.

Mixed farming improves soil fertility through the integration of livestock manure and crop residues, leading to better yields and sustainable land use.

3. State four reasons why seed treatment is important before planting.

Seed treatment protects seeds from soil-borne pests and diseases during germination, ensuring better seedling survival.

It enhances germination rates by eliminating fungal or bacterial contaminants that may hinder seed growth.

Treated seeds are more resistant to attack by insects like weevils, especially during early growth stages.

It helps in early establishment of crops, giving them a strong start and improving overall field performance.

4. Mention four symptoms of disease in farm animals.

Loss of appetite is a common symptom indicating that the animal is unwell and may be suffering from internal or external infection.

Lethargy and weakness, where the animal appears dull, slow, and inactive, are signs of health problems.

Diarrhea or abnormal droppings often signal digestive disorders or infections in the animal.

Unusual discharges from eyes, nose, or reproductive organs can be symptoms of respiratory or reproductive tract infections.

5. List four sources of agricultural capital for school farms.

Government grants or support programs often provide capital in the form of tools, inputs, or financial assistance to school agriculture projects.

School budgets may allocate a portion of funds specifically for farm development and maintenance.

Donations from non-governmental organizations, community members, or alumni can support school agricultural activities.

Revenue generated from the sale of school farm produce can be reinvested as capital for expansion and improvement.

6. Give four advantages of farm mechanization.

Mechanization increases efficiency and reduces the time required for farm operations such as ploughing, planting, and harvesting.

It reduces physical labour and fatigue for both students and staff involved in school farm work.

Machines can handle large areas of land, allowing schools to expand farming activities and increase productivity.

It leads to uniform operations, such as spacing and depth during planting, which improves crop performance and yield.

7. Explain five roles of agricultural education in reducing unemployment among Tanzanian youth.

Agricultural education equips youth with practical skills in crop and livestock management, enabling them to start self-employment ventures.

It fosters innovation and entrepreneurship, where young people can develop agribusiness ideas such as poultry keeping or vegetable selling.

Learners are exposed to modern technologies and farming methods, increasing their competitiveness in the job market.

Agriculture creates employment not only in farming but also in processing, marketing, extension services, and agro-input supply.

Youth with agricultural knowledge can form cooperative groups to access loans, land, and markets, creating collective employment opportunities.

8. Describe five features of a well-managed school farm.

It has a clear layout with properly marked plots for different crops, paths, compost areas, and storage facilities.

The farm maintains accurate records of inputs, labour, harvests, and sales to monitor performance and support learning.

There is regular supervision by agricultural teachers or farm attendants to ensure operations are done correctly and timely.

Crops are planted and maintained using recommended practices such as spacing, weeding, and irrigation.

Students are actively involved in farm activities through scheduled practical sessions, learning by doing.

9. Explain five practices that help improve soil fertility in school gardens.

Application of organic manure such as compost or animal droppings adds nutrients and improves soil structure.

Use of crop rotation helps to balance nutrient uptake and break pest and disease cycles, preserving soil health.

Intercropping legumes with other crops introduces nitrogen into the soil through biological nitrogen fixation.

Mulching conserves moisture and adds organic matter as it decomposes, enriching the soil.

Avoiding burning of crop residues allows them to decompose naturally, contributing organic content and preventing nutrient loss.

10. Discuss five ways in which climate change is affecting agriculture in Tanzania.

Unpredictable rainfall patterns make it difficult for farmers to plan planting seasons, leading to crop failure or poor yields.

Increased drought frequency reduces water availability for irrigation and drinking, affecting both crops and livestock.

Rising temperatures affect plant physiology and can reduce productivity in temperature-sensitive crops like maize.

Climate change contributes to the spread of pests and diseases that thrive in warmer conditions, threatening crop and animal health.

Extreme weather events such as floods and storms damage infrastructure, wash away topsoil, and destroy planted fields.

11. Explain five factors to consider when selecting a crop for school farming projects.

The climate of the area must suit the crop's growth requirements in terms of rainfall, temperature, and humidity. Selecting a crop that aligns with local climate conditions increases the chances of success.

The soil type in the school farm must be suitable for the chosen crop. Some crops prefer sandy soils while others grow better in clay or loam. Conducting a soil test can help guide this decision.

The availability of inputs such as seeds, fertilizers, and pesticides is important. A crop that requires hard-tofind or expensive inputs may not be sustainable for a school project.

Market demand should guide crop selection so that any surplus produce can be sold. Choosing crops that are in demand locally can help generate income for the school.

The maturity period of the crop should align with the school calendar. Fast-growing crops that mature within the school term are more practical, allowing students to follow the full production cycle.

12. (a) Calculate the average yield for each treatment.

With Fertilizer:
Plot A = 86 kg, Plot B = 92 kg
Average = (86 + 92) ÷ 2 = 178 ÷ 2 = 89 kg

Without Fertilizer:
Plot A = 56 kg, Plot B = 60 kg
Average = (56 + 60) ÷ 2 = 116 ÷ 2 = 58 kg

(b) What is the yield difference between the two treatments?
Yield difference = 89 kg (with fertilizer) – 58 kg (without fertilizer) = 31 kg **(c)**

Suggest two possible reasons for the observed yield difference.

The fertilizer likely supplied essential nutrients like nitrogen, phosphorus, and potassium, which boosted plant growth and yield.

Plants without fertilizer may have suffered from nutrient deficiencies that limited their development and productivity.

(d) Give two uses of this type of data in student learning.

It helps students understand the impact of soil fertility management on crop yield through real-life observation and analysis.

The data can be used to teach record keeping, data interpretation, and informed decision-making in agriculture.

13. Prepare a summary of a lesson on "Classification of Crops" including: (a) Basis of classification (b) Types of crops and examples (c) Learning activities (d) Importance of the topic (e) Conclusion

The lesson will begin by explaining that crops can be classified based on their uses, lifespan, and growing conditions. For example, crops can be food crops, cash crops, industrial crops, or horticultural crops.

Food crops include maize, rice, and beans. Cash crops include coffee and cotton. Horticultural crops are fruits and vegetables like tomatoes and mangoes. The teacher will emphasize seasonal vs. perennial classification and their relevance in planning farm activities.

Students will engage in activities such as sorting seeds into categories, matching crop names to photos, and identifying crops around the school farm.

The topic is important because it helps learners choose suitable crops for different purposes, environments, and markets.

The lesson will conclude by reviewing the categories and encouraging students to apply classification when planning crop projects.

14. A group of students conducted a project on compost manure preparation. Write a report that includes: (a) Objectives (b) Materials and tools used (c) Procedure followed (d) Observations made (e) Challenges and recommendations

The objective was to teach students how to prepare compost manure using available farm waste and to understand its role in soil fertility improvement.

Materials included dry leaves, green vegetation, cow dung, kitchen waste, water, and ash. Tools used were hoes, forks, watering cans, and wheelbarrows.

Students selected a shaded area and arranged materials in layers: dry matter, green matter, dung, and ash. The heap was watered regularly and turned weekly to ensure decomposition.

Within three weeks, the compost turned dark, crumbly, and smelled earthy, indicating maturity. Students observed increased insect activity, which helped in decomposition.

Challenges included insufficient water during dry days and difficulty in collecting enough green materials. It was recommended that a permanent compost corner be set up and watering be scheduled regularly.

15. Write an essay explaining five barriers to the adoption of improved animal husbandry techniques among small-scale farmers and suggest five ways to overcome them.

Lack of knowledge and training limits farmers from adopting new practices such as vaccination, improved feeding, and modern housing systems. Without awareness, they stick to traditional methods.

Limited capital prevents investment in quality inputs like improved breeds, feed supplements, or veterinary services. Most smallholders cannot afford these costs.

Cultural beliefs sometimes discourage the use of certain technologies. For instance, some communities may resist artificial insemination due to misinformation.

Poor access to extension services means that farmers do not receive timely advice, training, or demonstrations on how to adopt modern techniques.

Lack of infrastructure like roads and veterinary clinics hinders farmers from accessing necessary services or markets for their products.

To overcome these barriers, government and NGOs should intensify training programs for farmers through village workshops and field days.

Credit facilities should be made available to smallholders with low interest and flexible repayment terms to support investment in livestock production.

Sensitization campaigns can help change negative perceptions by explaining the benefits of improved husbandry practices using real examples.

More extension officers should be employed and deployed to rural areas to ensure regular farmer support and monitoring.

Mobile veterinary services and community-based animal health workers can be introduced to reach remote farmers and improve animal healthcare.

16. You are organizing a practical activity on nursery bed preparation. Explain five steps students must follow and five benefits of conducting such a practical in agriculture teaching.

The first step is selecting a suitable site with well-drained, fertile soil close to a water source. This ensures young seedlings receive adequate nutrients and water without risk of waterlogging.

The second step involves clearing and leveling the land. All vegetation, stones, and debris should be removed to allow uniform growth and prevent pest hiding spots.

The third step is preparing the nursery bed by loosening the soil using hand hoes or forks. The bed should be about 1 meter wide and raised to improve drainage and aeration.

The fourth step is incorporating manure or compost into the soil to improve fertility. Organic matter enhances nutrient availability and supports early seedling growth.

The fifth step is marking rows and sowing seeds at the recommended spacing and depth. This allows for easy management, weeding, and eventual transplanting.

Practicing nursery bed preparation helps students gain hands-on experience, making theoretical lessons more meaningful and easier to understand.

It promotes teamwork and responsibility, as learners work together to achieve a common task with shared roles.

Students learn the importance of timing and planning in agriculture, especially in managing stages from seed sowing to transplanting.

They become familiar with different tools and how to use them correctly, enhancing their skill set for both school and future farming.

The practical provides an opportunity to integrate record keeping, observation, and problem-solving, which are essential agricultural competencies.

17. Discuss five contributions of irrigation to agricultural development in semi-arid areas and five limitations that schools may face in practicing irrigation.

Irrigation provides consistent water supply, making it possible to grow crops throughout the year, even during dry seasons, improving food security.

It allows farmers in dry regions to diversify into high-value crops like vegetables and fruits, which are often more profitable than rain-fed staples.

With reliable water, crop yields increase, supporting better income generation and nutrition for communities in semi-arid regions.

Irrigation enables early planting and staggered harvesting, helping farmers target better market prices and reduce losses.

It promotes sustainable land use by reducing pressure on rain-dependent farming and allowing for more efficient resource management.

However, schools may face the limitation of lacking water sources or infrastructure such as tanks and pumps to support irrigation activities.

High initial costs of installing irrigation systems like drip lines or sprinklers may not be affordable for most school budgets.

Technical know-how among students and teachers may be low, affecting proper management and maintenance of irrigation systems.

Water misuse or poor planning can lead to soil degradation, such as salinization or waterlogging, especially in poorly drained areas.

Irregular power supply or fuel availability may disrupt irrigation schedules where electric or fuel-powered pumps are used.

18. Explain five types of agricultural records that can be kept in a school farm and describe five uses of each type in managing student agricultural projects.

Input records track all materials brought into the farm, such as seeds, fertilizers, tools, and chemicals. They help monitor how much is used and whether inputs match production targets.

Production records detail the quantity of crops harvested or animals reared. They show the farm's output and are useful for evaluating performance over time.

Financial records include all income and expenses related to the farm. These are vital for budgeting, assessing profit or loss, and ensuring accountability.

Labour records show who worked, when, and on which task. They help in planning workload, assessing participation, and ensuring fair distribution of duties among students.

Disease and treatment records document occurrences of illness in crops or animals and how they were treated. This helps in identifying disease patterns, evaluating treatment effectiveness, and preventing future outbreaks.

Each of these records supports planning, decision-making, and teaching, ensuring the school farm remains an effective learning and production unit.