THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

735 **AGRICULTURE TEACHING METHODS**

Time: 3 Hour. **ANSWERS** **Year: 2003**

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 common tools used in school garden preparation.

The hoe is commonly used for tilling soil, uprooting weeds, and making planting holes. It is versatile and easy for students to handle.

The rake helps in leveling the soil and removing debris or stones from the garden surface, creating a smooth seedbed.

The watering can is essential for irrigating seedlings and young plants, especially where water supply systems are limited.

The wheelbarrow is used to transport manure, compost, tools, and harvested produce within the school farm, saving time and energy.

2. Mention four ways of conserving water in school farms.

Mulching with dry leaves or grass reduces evaporation by covering the soil, helping retain moisture around plant roots.

Using watering cans or drip irrigation ensures targeted water application, reducing wastage from runoff or unnecessary spraying.

Water harvesting systems such as gutters and tanks collect rainwater for use during dry spells, maintaining constant supply.

Irrigating early in the morning or late in the evening minimizes water loss through evaporation caused by direct sunlight.

3. Give four examples of plant nutrients and their roles.

Nitrogen promotes vigorous vegetative growth and leaf development, especially in leafy vegetables like spinach.

Phosphorus supports strong root formation and is essential during the early stages of plant growth and seed development.

Potassium improves disease resistance and enhances fruit development, increasing the quality and quantity of yields.

Calcium strengthens plant cell walls and is crucial in the formation of new tissues and root tips.

4. Identify four common weeds found in vegetable gardens.

Blackjack (Bidens pilosa) is a fast-spreading weed that competes with crops for nutrients and space.

Pigweed (Amaranthus spp) grows rapidly and shades out vegetables, reducing light availability.

Nutgrass (Cyperus rotundus) is a persistent weed with underground tubers that are hard to eliminate.

Couch grass (Cynodon dactylon) spreads through stolons and forms dense mats that choke crop plants.

5. State four reasons for applying mulch in crop fields.

Mulch conserves soil moisture by reducing evaporation, especially important during dry seasons.

It suppresses weed growth by blocking sunlight, minimizing competition with crops for nutrients and water.

Mulch regulates soil temperature by insulating the soil against extreme heat or cold, creating favorable growth conditions.

As it decomposes, organic mulch adds nutrients to the soil, improving soil fertility and structure.

6. Mention four benefits of keeping records in crop production.

Records help track input usage such as seeds, fertilizers, and pesticides, allowing better planning and budgeting.

They assist in evaluating crop performance by comparing yields from different seasons or methods.

Accurate records support transparency and accountability, especially when the farm generates income for the school.

They help in teaching students practical skills in farm management and decision-making based on real data.

7. Describe five methods of preventing soil erosion on school farms.

Planting grass strips along the contour of a slope slows water runoff and traps soil, preventing erosion.

Constructing terraces reduces the speed of water flow and allows more water to infiltrate, protecting the soil structure.

Mulching exposed soil surfaces shields it from direct impact of raindrops, reducing splash erosion.

Planting cover crops such as legumes holds soil particles in place with their roots and provides ground cover.

Building drainage channels controls the movement of excess water and directs it away from erosion-prone areas.

8. Explain five characteristics of well-cured compost manure.

It has a dark brown to black color, indicating complete decomposition of organic materials like leaves and manure.

The texture is crumbly and loose, making it easy to mix into soil without clumping.

A pleasant earthy smell suggests aerobic decomposition, while foul odor would mean poor curing or anaerobic decay.

It is cool to touch, meaning microbial activity has slowed down, unlike fresh compost which generates heat.

The original materials are no longer recognizable, showing thorough breakdown and nutrient readiness for plant use.

9. Discuss five good practices in poultry rearing in schools.

Maintaining clean and dry poultry houses prevents disease buildup and ensures a healthy environment for birds.

Providing balanced feed regularly ensures good growth, strong immunity, and high productivity in layers or broilers.

Vaccinating birds against common diseases like Newcastle protects flock health and reduces mortality.

Ensuring access to clean drinking water helps digestion and supports metabolic functions in poultry.

Proper spacing and ventilation prevent overcrowding, reduce heat stress, and minimize spread of diseases.

10. Outline five challenges faced by agriculture teachers in implementing school projects.

Limited funding restricts access to quality inputs like seeds, fertilizers, tools, and animals needed for effective projects.

Lack of land or poor soil conditions in school compounds make it difficult to establish demonstration farms or gardens.

Short school terms or exam interruptions reduce the time available for following full crop or animal cycles.

Inadequate support from school administration may limit resources, attention, or priority given to agricultural activities.

Students sometimes show low interest in agriculture, affecting participation and success of hands-on learning.

11. Explain five reasons for practicing crop rotation in school gardens.

Crop rotation helps to prevent the buildup of pests and diseases that affect specific crops. When the same crop is grown repeatedly in one area, pests and diseases that feed on it can accumulate. Rotating crops breaks this cycle and reduces infestation.

It improves soil fertility by alternating crops with different nutrient demands. For instance, legumes fix nitrogen in the soil, which benefits subsequent crops that require more nitrogen.

Crop rotation helps to reduce soil exhaustion. Growing the same crop repeatedly depletes certain nutrients, but rotation spreads the nutrient demand across different crops.

It improves soil structure and texture because different crops have different root systems. Some, like deeprooted crops, help to break up compacted soil and improve aeration.

The practice increases overall farm productivity and yield over time, as it maintains a healthy soil ecosystem and reduces losses due to pests and diseases.

12. Describe five functions of agricultural cooperatives in rural development.

Agricultural cooperatives provide access to inputs such as seeds, fertilizers, and pesticides at reduced prices, making farming more affordable for rural members.

They help in marketing farm produce by collecting and selling in bulk, which attracts better prices and reduces exploitation by middlemen.

Cooperatives offer training and education to members on better farming methods, financial management, and market trends, enhancing productivity.

They facilitate access to credit services by acting as guarantors for members or providing loans directly, enabling investment in farm expansion.

Cooperatives promote unity and collaboration among farmers, empowering them to advocate for their interests and participate in local decision-making.

13. Prepare a summary of a lesson on "Soil Types and Properties." Include: (a) Types of soil (b) Characteristics of each (c) Student activities (d) Importance of the topic (e) Conclusion

The lesson begins by identifying the main types of soil: sandy, clay, and loam. Sandy soil has large particles and drains quickly. Clay soil is sticky, holds water well, and is rich in nutrients but drains poorly. Loam is a balanced mixture of sand, silt, and clay, and is considered ideal for farming.
Each soil type is discussed with its texture, water-holding capacity, fertility, and workability. Students learn how these factors affect plant growth.

Student activities include feeling soil samples, performing water infiltration tests, and identifying soil types based on appearance and texture.

The topic is important because it helps students select appropriate crops for each soil type and determine the necessary soil improvements.

In conclusion, understanding soil types and their properties is essential for planning successful agricultural practices and improving yields in both school and community farms.

14. Students are involved in a dairy cattle project. Write a full report including: (a) Objectives (b) Activities done (c) Observations (d) Benefits of the project (e) Challenges faced

The main objective of the project was to provide students with practical skills in dairy cattle management, including feeding, milking, and health care.

Activities involved daily feeding of the cattle with fodder and supplements, cleaning the shed, recording milk yields, and observing signs of health or illness. Students also participated in routine veterinary checkups and learned about dairy equipment.

Students observed that well-fed and clean cattle produced more milk, and that diseases reduced milk yield significantly. They also noticed that cows required regular care and consistency in feeding.

The project benefited students by improving their skills and interest in animal husbandry, generating income from milk sales, and enhancing their understanding of record keeping and teamwork.

Challenges faced included high feed costs, occasional disease outbreaks, and limited time during examination periods, which affected daily routines.

15. Write an essay explaining five factors to consider in selecting a site for crop production and five environmental risks that may affect the site.

Soil fertility is a major factor, as nutrient-rich soils support better crop growth. A soil test should be conducted to determine nutrient levels before deciding on a site.

Water availability is essential for irrigation and healthy crop development. The site should be close to a water source or have good rainfall.

Sunlight exposure is critical because most crops need full sunlight for photosynthesis. A site with minimal shade is ideal.

Drainage must be adequate to prevent waterlogging, which can damage roots and reduce crop yield.

Accessibility to roads and markets is important for transporting inputs and selling produce efficiently.

Environmental risks include drought, which limits water availability and stresses plants, reducing yield.

Flooding can destroy crops, wash away topsoil, and damage infrastructure like beds and drainage systems.

Pests such as locusts or rodents can invade fields and cause significant losses if not managed in time.

Soil erosion, especially on slopes, depletes topsoil and nutrients, making land less productive.

Climate change, through unpredictable weather patterns, can lead to unseasonal rains or heat, affecting planting and harvesting schedules.

16. Describe five ways to improve teaching and learning of agriculture in secondary schools and five obstacles that hinder effective delivery of the subject.

Incorporating more practical lessons alongside theory improves students' understanding by allowing them to apply knowledge in real-life situations like school gardens or animal units.

Provision of teaching and learning materials such as textbooks, charts, tools, and equipment helps to explain complex agricultural concepts more clearly.

In-service training for agriculture teachers ensures they stay updated with new technologies, teaching methods, and changes in the curriculum.

Establishing demonstration plots or mini farms in schools creates a hands-on learning environment where students can observe crop and animal production firsthand.

Linking schools with nearby farms or agricultural institutions for field visits allows students to learn from real-world farming operations and modern techniques.

Obstacles include shortage of teaching materials, which makes it difficult to explain technical topics or involve students in practical work.

Limited funding reduces the ability to buy farm inputs, tools, and animals necessary for school agricultural activities.

Lack of land within school premises restricts practical agriculture, especially in urban schools or overcrowded institutions.

Inadequate teacher training and support leaves some agriculture teachers struggling with outdated methods or low confidence in managing practicals.

Low motivation among students, especially when they see agriculture as a subject for those who fail other options, weakens participation and interest.

17. Explain five qualities of a good agricultural demonstration and describe five ways to ensure learner participation during agricultural practicals.

A good agricultural demonstration is simple and clear. It should be easy for learners to follow, using local examples and appropriate language.

It is well-prepared in advance, with all materials, tools, and steps ready to avoid confusion or time wasting during the activity.

It focuses on a single objective to ensure learners understand one skill or concept well instead of getting overwhelmed with too much information.

The demonstration should be participatory, allowing learners to ask questions, handle tools, or try steps under supervision.

It must be accurate and based on scientifically proven practices to avoid passing on misleading or outdated information.

To ensure learner participation, the teacher should assign roles so that each student has a task to perform or observe closely during the practical.

Use of small groups promotes interaction and engagement, allowing each learner to contribute actively instead of being passive.

Encouraging students to ask and answer questions during the practical keeps them mentally engaged and helps reinforce understanding.

Allowing students to evaluate and reflect on the demonstration afterward promotes critical thinking and learning from experience.

Providing feedback and praise during the activity motivates students and builds confidence in their agricultural skills.

18. You are guiding students to develop a mini-farm plan. Describe five components of a good farm layout and five reasons why planning is essential in school farm management.

A good farm layout includes crop plots arranged based on size, water needs, and compatibility. Related crops should be grouped together to simplify care and management.

An animal unit must be positioned where drainage is good and waste can be managed properly, with access to feed and water.

Pathways and walkways should be included for easy movement of people, tools, and products around the farm without damaging crops.

Storage and tool sheds should be centrally located to allow convenient access and security of farming equipment.

Water sources like tanks or wells should be placed where irrigation can be distributed easily to different parts of the farm.

Planning ensures efficient use of limited space, maximizing productivity even in small school compounds.

It helps in allocating time and labor by identifying when and where activities like planting or harvesting will take place.

Planning minimizes resource wastage by specifying input quantities and scheduling operations carefully.

It supports budgeting and decision-making by identifying needs and estimating costs before the farming season begins.

Planning enhances learning outcomes by providing a structured environment for students to observe and participate in agricultural processes throughout the year.