THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

735 **AGRICULTURE TEACHING METHODS**

Time: 3 Hour. **ANSWERS** **Year: 2012**

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).

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1. List four tools commonly used in school farm operations and state one use for each.

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A hoe is commonly used for digging, weeding, and cultivating the soil before planting crops. It is an essential tool for land preparation in school farms.

A watering can is used for irrigating crops, especially in small garden plots or during dry seasons when rainfall is insufficient.

A rake is used to level the soil and collect debris or stones from the seedbed to prepare a smooth planting area.

A wheelbarrow is used for transporting farm inputs such as manure, seedlings, or harvested produce from one part of the farm to another efficiently.

2. Mention four factors to consider when selecting crops for school demonstration plots.

The suitability of the crop to the local climate is critical. Crops should be selected based on their ability to thrive in the existing weather and soil conditions.

The educational value of the crop must be considered. The crop should help learners understand key agricultural concepts such as spacing, pest control, or harvesting techniques.

The maturity period is important. Crops that mature within a school term or academic year allow learners to observe the full cycle from planting to harvesting.

Availability of inputs like seeds, fertilizers, and water must be taken into account. The school should be able to support the crop throughout its growth.

3. State four challenges agriculture teachers face when using real specimens during lessons.

Storage and preservation can be difficult. Real specimens like plant parts or animal products may spoil or wilt quickly if not properly handled.

Some specimens may be seasonal and unavailable at certain times of the year, limiting the teacher's ability to use them in specific lessons.

Transporting real specimens to the classroom can be time-consuming or impractical, especially if the school farm is located far from the classroom.

Using live animals or sharp tools may pose safety risks to learners if not supervised properly, requiring extra caution and planning.

4. Give four reasons why it is important to integrate local knowledge in teaching agriculture.

Local knowledge reflects the farming practices and experiences of the community, making lessons more relatable and understandable to students.

It promotes cultural appreciation and helps preserve indigenous agricultural practices that may be environmentally sustainable.

It can offer affordable and practical solutions. Local methods often use resources that are readily available, reducing dependency on expensive external inputs.

Integrating local knowledge encourages learner participation, especially when they recognize familiar techniques or examples discussed in class.

5. Outline four key features of a good chalkboard illustration in agriculture teaching.

It should be neat and clearly drawn so that all learners can see and interpret it correctly from any position in the classroom.

The labels must be legible and correctly positioned to avoid confusion between parts, especially when illustrating diagrams like a maize plant or animal digestive system.

The illustration should be simple, focusing on key features rather than cluttering the board with excessive detail.

It must be relevant to the lesson objective, serving as a visual aid to help explain or reinforce the topic being taught.

6. Identify four ways in which agriculture teaching contributes to national development.

It builds practical skills that support youth employment and self-reliance through activities like poultry keeping, crop production, and agribusiness.

Agriculture education promotes food security by equipping students with knowledge on how to grow crops and raise animals efficiently.

It contributes to rural development by encouraging learners to apply modern farming methods in their communities, increasing productivity.

It helps conserve natural resources as learners are taught sustainable farming practices such as soil conservation and agroforestry.

7. Describe five ways in which an agriculture teacher can assess learners during a practical lesson.

One way is through observation. The teacher watches how learners perform tasks such as planting seeds, handling tools, or applying fertilizers, assessing their skills and adherence to instructions.

Another method is oral questioning. During the practical session, the teacher asks learners questions related to the task to evaluate their understanding and ability to apply knowledge.

Checklists can be used to assess whether learners have followed specific procedures or completed all required steps during the activity, such as stages of transplanting seedlings.

Learners can be asked to write brief reports or summaries after the activity, explaining what they did, observed, and learned. This helps assess reflection and understanding.

Peer assessment may also be employed, where students evaluate each other's performance using structured guidelines. This encourages responsibility and critical thinking.

8. Explain five challenges that can arise when organizing field trips for agriculture students and suggest ways to overcome them.

Transport problems are common, especially in rural schools with no school vehicles. This can be addressed by partnering with nearby institutions or hiring transport in advance.

Poor coordination may lead to confusion or time wastage. This can be solved by having a clear plan, schedule, and roles assigned to both teachers and learners beforehand.

Unprepared learners may not benefit fully. Giving pre-visit instructions, objectives, and guiding questions ensures they know what to observe and learn.

Safety risks such as injuries or exposure to harmful chemicals may occur. Teachers should conduct risk assessments and ensure first aid kits and supervision are available.

Limited interaction at the site may hinder learning. Teachers should contact hosts in advance to arrange guided tours, demonstrations, and Q&A sessions with farm managers or technicians.

9. Outline five benefits of using project-based learning in agriculture and explain how it can be applied in a secondary school setting.

It promotes hands-on experience. Learners engage in actual farming tasks like managing a vegetable plot, which builds practical competence and confidence.

It encourages responsibility. Each student or group is accountable for the outcome of their project, fostering discipline and time management.

Project-based learning improves problem-solving. Learners face real challenges such as pest attacks or low yields and must find practical solutions.

It enhances creativity and innovation. Learners may experiment with different planting methods, organic pesticides, or compost mixtures, broadening their knowledge.

It allows for continuous assessment. Teachers can track progress over time and evaluate learners based on participation, records kept, and final outcomes.

In schools, this method can be applied by assigning learners to grow crops like tomatoes or keep chickens for a term, documenting all steps from planning to harvesting or marketing.

10. With examples, explain five characteristics of an effective agriculture classroom environment.

It is well-organized with space for displaying tools, samples, charts, and posters. This encourages interaction and makes materials easily accessible during lessons.

It supports inclusivity. Desks and materials should be arranged so that all learners, including those with disabilities, can participate comfortably.

The environment promotes safety. Sharp tools or chemicals must be kept in locked cabinets and only handled under supervision.

It integrates ICT resources. Having a computer, projector, or internet access enables use of videos and online content to enhance learning.

The teacher-student relationship is respectful and supportive. Learners feel free to ask questions, express ideas, and participate in discussions without fear or ridicule.

11. Describe five steps to follow when preparing a lesson note on animal nutrition for Form Two students.

First, identify the topic and subtopics. For animal nutrition, this could include types of nutrients, sources, functions, and signs of deficiencies.

State the lesson objectives clearly. For example, “By the end of the lesson, students should be able to list the major classes of nutrients and their sources.”

Select suitable teaching and learning materials. This may include feed samples, diagrams of digestive systems, and textbooks.

Choose appropriate teaching methods such as discussion, demonstration, and questioning to suit the learners' level and the topic's nature.

Plan evaluation techniques to assess understanding, such as oral questions, written exercises, or matching nutrients to their functions.

12. Highlight five important roles played by agricultural extension officers that can complement the work of agriculture teachers in schools.

They provide expert knowledge. Extension officers can deliver guest lectures or demonstrations on modern farming techniques such as hydroponics or pest control.

They help in training both teachers and learners on new technologies, such as improved seed varieties or climate-smart practices.

They support school farm activities by offering guidance on planning, implementation, and record keeping for better productivity.

They create linkages between schools and external stakeholders like research institutions, suppliers, and agricultural programs.

They act as role models and mentors to learners, especially those aspiring to pursue careers in agriculture, by sharing their field experiences and insights.

13. Write a lesson summary on the topic "Fertilizer Application in Crop Production," including: (a) Meaning of fertilizer (b) Types of fertilizers (c) Methods of application (d) Precautions during use (e) Importance in crop growth

Fertilizer is a substance added to soil or plants to supply essential nutrients that promote plant growth and improve crop yield. It helps replenish nutrients that may be lacking in the soil due to continuous cultivation.

Fertilizers can be classified into organic and inorganic types. Organic fertilizers include compost, farmyard manure, and green manure, which improve soil structure and release nutrients slowly. Inorganic fertilizers are chemically manufactured and include compounds like urea, NPK, and CAN, which provide specific nutrients in concentrated forms.

Application methods include broadcasting, where fertilizer is spread evenly over the field; placement, which involves putting fertilizer in holes or bands near the seed or plant; and foliar application, where liquid fertilizer is sprayed directly onto leaves. Drip application is also used in advanced systems where fertilizers are mixed with irrigation water.

Precautions include applying the correct dosage as overuse can cause burning of plants or environmental pollution. Fertilizer should be stored safely, away from moisture, and should not be handled with bare hands. Application should avoid windy days to reduce wastage and ensure it is done at the right growth stage of the crop.

Fertilizers enhance plant development by supplying key nutrients like nitrogen for leaf growth, phosphorus for root and flower development, and potassium for disease resistance and general vigor. They help increase productivity and support food security.

14. As an agriculture teacher, prepare a professional report about a practical session you conducted on "Seed Germination Test." Include the objectives, procedures, learner participation, challenges faced, and recommendations.

Title: Practical Report on Seed Germination Test
Date: 15th July 2025
Class: Form Two
Venue: Agriculture Laboratory

Objectives:

- To demonstrate how to test the viability of seeds through a germination test.
- To enable learners to identify factors affecting seed germination.
- To guide students in recording and interpreting results. **Procedure:**

Students were grouped into five and provided with 20 maize seeds each, cotton wool, containers, and water. They placed the seeds on moist cotton wool and covered them slightly. The containers were stored in a warm place and observed daily for five days. Germinated seeds were counted, and the percentage germination calculated. **Learner Participation:**

Learners actively set up the experiment, recorded daily observations, and took part in discussions on factors influencing germination such as moisture, temperature, and seed quality. They compared results among groups and presented their findings to the class. **Challenges Faced:**

Some groups failed to maintain consistent moisture levels, leading to poor germination. Others did not label their containers properly, causing mix-ups during observation. Limited time and laboratory space also affected the pace of the activity.

Recommendations:

Future sessions should include a pre-practical briefing on labelling and moisture control. Additional space and materials should be prepared in advance. More time should be allocated to allow for better observation and discussion.

15. Some people argue that practical agriculture in schools is a waste of resources. As an agriculture teacher, write an essay defending the importance of practical agriculture to learners, schools, and the wider community.

Practical agriculture is a vital component of school education, especially in rural-based economies like Tanzania. It equips learners with hands-on skills that they can apply in real-life situations, enabling them to become productive citizens.

To learners, practical agriculture reinforces theoretical knowledge. For example, learning about soil types becomes more meaningful when students collect and test different soils. It also cultivates interest in agriculture-related careers and promotes self-reliance as students learn to grow food and manage small enterprises.

At the school level, agriculture projects can generate income. Produce from school gardens or livestock units can be sold to support educational activities. School farms also serve as demonstration sites for other learners and communities, promoting innovation and learning beyond the classroom.

For the community, school-based agriculture contributes to development. Students who acquire practical farming skills share this knowledge at home, improving household food security. Schools can also partner with local farmers, extension agents, and agro-dealers to create a network of knowledge exchange and support.

In conclusion, practical agriculture is not a waste but an investment in future farmers, educators, and agripreneurs. It develops critical thinking, promotes sustainability, and fosters national development.