THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

134/2 **AGRICULTURE 2**

(For Both School and Private Candidates)

Time : 3 Hours **ANSWERS** **Year : 2010**

Instructions

1. This paper consists of sections **ten (10)** questions in sections A and B.
2. Answer **five (5)** questions choosing at least **two (2)** questions from each section.
3. Each question carries **twenty (20)** 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. (a) Define crop rotation and explain two advantages of practicing it.
   Crop rotation is the planned sequence of growing different crops on the same piece of land season after season to avoid soil exhaustion and pests build-up. It improves soil fertility by alternating crops that fix nitrogen with those that deplete it. It also reduces pest and disease incidence since pests specific to one crop are disrupted when the crop is changed.
   (b) Mention two crops commonly used in rotation with cereals.
   Legumes like beans and cowpeas are often rotated with cereals because they fix atmospheric nitrogen and enrich the soil.

2. (a) Describe the mode of action of each of these categories of herbicides:
   (i) Contact herbicides
   Contact herbicides kill only the plant tissues they directly touch, causing rapid injury to leaves but not moving within the plant.
   (ii) Systemic herbicides
   Systemic herbicides are absorbed and translocated within the plant's vascular system, killing both above- and below-ground tissues.
   (iii) Pre-emergence herbicides
   Pre-emergence herbicides act on weed seeds or seedlings in the soil before they emerge above ground.
   (iv) Post-emergence herbicides
   Post-emergence herbicides are applied after weeds have emerged and target the growing shoots and leaves.
   (v) Selective herbicides
   Selective herbicides kill specific types of weeds without harming the crop.
   (vi) Non-selective herbicides
   Non-selective herbicides kill all plant tissues they come into contact with, both weeds and crops.

3. (a) Explain three physical characteristics of soil that influence crop production.
   Soil texture determines the proportion of sand, silt, and clay, affecting water retention and aeration. Soil structure influences root penetration and water movement. Soil colour indicates organic matter content and fertility status.
   (b) State one advantage and one disadvantage of clay soil.
   Clay soil holds water and nutrients effectively, supporting plant growth. However, it drains poorly and may become waterlogged.

4. (a) Define vegetative propagation.

   Vegetative propagation is the process of reproducing plants from vegetative parts such as stems, roots, and leaves rather than seeds.

   (b) Give two advantages of vegetative propagation.

   It ensures that desirable characteristics such as high yield and disease resistance are retained. It also results in faster maturity compared to seed propagation.

   (c) Mention two examples of crops commonly propagated vegetatively.

   Cassava and sugarcane are commonly propagated using stem cuttings.

5. (a) Explain three cultural methods of controlling crop pests.

   Crop rotation breaks the life cycle of pests dependent on specific crops. Early planting allows crops to escape peak pest infestation periods. Proper field sanitation removes crop residues that harbor pests.

   (b) Give one reason why integrated pest management (IPM) is preferred to chemical control alone.

   IPM minimizes the overuse of chemicals, reducing environmental hazards and pest resistance development.

6. (a) Define agroforestry.

   Agroforestry is the deliberate integration of trees and shrubs with crops and/or livestock on the same land management system.

   (b) Explain two benefits of practicing agroforestry.

   It improves soil fertility through leaf litter decomposition and nitrogen fixation. It also provides farmers with additional products like fuelwood and fodder.

   (c) Mention two examples of agroforestry trees.

   Grevillea and Leucaena are widely used in agroforestry systems.

7. (a) State four functions of nitrogen in crop production.

   Nitrogen promotes vigorous vegetative growth, increases protein content in crops, improves chlorophyll formation for photosynthesis, and enhances seed and fruit development.

   (b) What are the effects of nitrogen deficiency on crops?

   Deficiency causes yellowing of leaves, stunted growth, and low yields.

8. (a) Define plant breeding.

   Plant breeding is the science of altering the genetic makeup of plants to produce desired traits such as high yield and disease resistance.

   (b) Differentiate between pure line selection and mass selection.

Pure line selection involves selecting superior plants from self-pollinated crops and propagating them to maintain uniformity. Mass selection involves selecting a group of plants with desirable traits and mixing their seeds for the next planting season.

(c) Mention two crops improved by hybridization.

Maize and sunflower are commonly improved through hybridization.

9. (a) Describe the factors influencing the choice of a crop enterprise in a farm.

   Climatic conditions such as rainfall and temperature determine which crops can thrive. Soil type and fertility affect crop suitability. Market demand influences profitability. Availability of capital and technology also shapes enterprise choice.

   (b) Why is market survey important before choosing a crop enterprise?

   It helps farmers avoid losses by identifying crops that have reliable demand and better prices.

10. (a) State four advantages of using organic manure in crop production.

    Organic manure improves soil structure, enhances water retention, supplies nutrients gradually, and increases microbial activity.

    (b) Give one disadvantage of using organic manure compared to inorganic fertilizers.

    Organic manure releases nutrients slowly and may not meet immediate crop needs.