THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

034/2 **AGRICULTURE 2**

Time : 2:15 Hours **ANSWERS** **Year : 2018**

Instructions

1. This paper consists two questions.
2. Answer **all** questions.
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

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1. You are provided with specimens A, B, C, D, E, F, G, H and I. Observe them carefully and answer the questions that follow:

(a) (i) Identify each of specimens A, B, F, H and I by their botanical names.
Specimen A is Zea mays, which is maize.
Specimen B is Cucurbita pepo, which is pumpkin.
Specimen F is Ipomoea batatas, which is sweet potato.
Specimen H is Phaseolus vulgaris, which is common bean.
Specimen I is Musa paradisiaca, which is banana.

(ii) Why is it not advised to plant more than one variety of specimens A at the same place at a time?
It is not advised because cross-pollination between different maize varieties reduces the genetic purity of the crop and may result in poor-quality harvest.

(iii) Distinguish three types of specimen B by its flowers.
One type of pumpkin has large yellow male and female flowers borne separately on the same plant. Another type has bright orange flowers which are larger in size and more attractive. A third type has smaller pale yellow flowers that are less conspicuous but still separate male and female flowers.

(iv) State the male: female plant ratio for specimen B to be observed in farming.
The recommended ratio is one male plant for every ten female plants to ensure sufficient pollination for fruit development.

(v) Why is it not recommended to apply nitrogen fertilizer for growing specimen F?
It is not recommended because nitrogen promotes excessive vegetative growth at the expense of tuber formation, reducing sweet potato yield.

(vi) Name six commonly grown specimen H varieties in Tanzania.
Six common varieties are Selian 97, Jesca, Uyole 03, Kabanima, Kilombero, and Njano Uyole.

(vii) Give four common names of most frequently occurring pests of specimen H.
Common bean pests include bean stem maggot, aphids, pod borers, and bean weevils.

(viii) Briefly explain the three types of vegetative propagating materials for specimen I.
One type is sword suckers, which are vigorous shoots that produce healthy banana plants. Another type is

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water suckers, which are weak shoots that should be avoided as they give poor yields. The third type is tissue-cultured plantlets, which are laboratory-prepared seedlings that are disease-free and uniform.

(b) (i) Identify each of specimens C, D and E by their botanical name.
Specimen C is Oryza sativa, which is rice.
Specimen D is Saccharum officinarum, which is sugarcane.
Specimen E is Gossypium hirsutum, which is cotton.

(ii) What are the five benefits of specimen D to a farmer?
Sugarcane provides farmers with income through sale of cane for sugar production. It can be chewed directly as food, providing quick energy. Its by-product molasses is used for making animal feed and alcohol. Bagasse from sugarcane is used for fuel and making paper. Sugarcane also provides raw material for local brewing industries.

(c) (i) How many suckers are recommended to be left in a stool of specimen G?
Three suckers are recommended to be left to ensure better growth and higher banana yield.

(ii) Give two names of suckers recommended to be left in a stool of specimen G.
The two suckers recommended are the maiden sucker and the sword sucker, since they are vigorous and produce healthy plants.

2. You are provided with specimens J, K, L, M, N, O and P. Observe them carefully and answer the following questions:

(a) (i) Briefly describe the composition and functions of shell in specimen J.
The shell of specimen J, which is an egg, is composed mainly of calcium carbonate. Its function is to provide mechanical protection to the developing embryo and to prevent entry of harmful microorganisms.

(ii) In which part of reproduction system of a bird where shell part of specimen J is added?
The shell is formed in the uterus of the bird's reproductive system.

(iii) State five composition of newly laid specimen J.
A newly laid egg contains albumen (egg white), yolk, shell, shell membrane, and chalazae.

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(b) (i) Suggest two materials and five equipment apart from specimen K which are to be used during harvesting of specimen L.
Two materials are harvesting baskets and sacks for collection. Five equipment are sickles, pangas, hoes, wheelbarrows, and knives.

(ii) Briefly describe the procedure for harvesting specimen L by using hands.
First, hold the base of the cob firmly with one hand. Second, bend and twist the cob downwards sharply until it breaks from the stalk. Third, collect the harvested cob in a basket or sack. Fourth, repeat the process until the field is harvested. Fifth, transport the cobs to a safe storage place. Sixth, dry them under sunlight to reduce moisture content.

(c) State six harmful effects of specimen M to farm animals.
Specimen M, ticks, cause blood loss leading to anemia. They transmit diseases such as East Coast Fever. They cause skin irritation and wounds. They reduce productivity of animals in terms of milk and meat. They lower fertility rates due to poor health. They also reduce the quality of hides and skins.

(d) (i) Examine the procedures for using specimen N in animal management practices.
Specimen N, a syringe, is used by first sterilizing the needle. The medicine or vaccine is then drawn into the syringe. The animal is restrained properly before injection. The injection is administered either intramuscularly or subcutaneously depending on the drug. Finally, the syringe is cleaned or disposed safely after use.

(ii) Name other three methods which are used for the same purpose as specimen N.
The three other methods are drenching, bolus administration, and spraying or dipping.

(e) (i) Give the name of specimen O.
Specimen O is a shovel.

(ii) How specimen O is used for its function?
The shovel is used for scooping and moving soil, manure, or animal feeds in farming.

(iii) Identify specimen P by its botanical name.
Specimen P is Medicago sativa, which is alfalfa.

(iv) Propose two other materials as specimen P that are suitable for planting in pasture by giving their common names.

Two other materials are Napier grass and Desmodium.

3. You are provided with specimens Q, R, S, T, U, V, W, X, Y and Z. Observe them carefully and answer the questions that follow:

(a) (i) Identify the specimens Q, R, S, T and U.

Specimen Q is a hammer.

Specimen R is a chisel.

Specimen S is a trowel.

Specimen T is a saw.

Specimen U is an anvil.

(ii) Briefly explain the function of each of the specimens Q, R, S, T and U.

The hammer (Q) is used for driving nails into wood and breaking objects. The chisel (R) is used for cutting and shaping wood or metal. The trowel (S) is used for spreading mortar during construction. The saw (T) is used for cutting wood and other materials. The anvil (U) is used as a surface for shaping metals during blacksmith work.

(iii) In which process in workshop technology does specimen U is used?

Specimen U, an anvil, is used in metal forging.

(iv) What is the function of mortar with which specimen S is used for?

The mortar is used for joining building blocks such as bricks or stones together.

(b) (i) Identify the specimen V.

Specimen V is wood shavings.

(ii) Name other three types of materials that are used for the same purpose as specimen V.

Three other materials are sawdust, dry grass, and rice husks.

(iii) State the use of specimen V.

Specimen V is used as bedding material in animal houses to provide warmth and absorb moisture.

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(iv) Why is specimen V not recommended in sheep houses?
It is not recommended because wood shavings may cause respiratory problems in sheep when inhaled.

(c) (i) Identify specimens W and X by their scientific name.
Specimen W is Vigna unguiculata, which is cowpea.
Specimen X is Arachis hypogaea, which is groundnut.

(ii) Where does specimen W absorb its nutrients in the soil profile?
Specimen W absorbs its nutrients mainly in the topsoil or surface layer of the soil profile.

(iii) Briefly explain what will happen if specimen W is not used with a shallow root system crop in the farm.
If cowpea is not intercropped with shallow root crops, there will be inefficient use of soil nutrients since it covers only part of the soil layers, leading to reduced productivity.

(iv) What is the role of specimen X in improving soil fertility and productivity?
Groundnut improves soil fertility through nitrogen fixation in root nodules, which enriches the soil with nitrogen.

(v) Elaborate two types of biological nitrogen fixation for specimen X.
One type is symbiotic nitrogen fixation where bacteria in root nodules fix atmospheric nitrogen. Another type is free-living nitrogen fixation where soil microbes fix nitrogen independently in the soil.

(d) (i) Briefly explain two considerations you will take in storage and handling of specimen Y.
First, specimen Y (seed) must be stored in a cool and dry place to prevent spoilage. Second, it should be stored in airtight containers to avoid attack by pests and moisture absorption.

(ii) Account for effects of solubility of specimen Z in farming.
If specimen Z, a fertilizer, is highly soluble, it provides nutrients quickly to plants but may also cause leaching losses. If it is less soluble, nutrients are released slowly, ensuring long-term supply but delaying immediate crop needs.

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