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 : 2012**

Instructions

1. This paper consists of sections **three (3)** questions.
2. Answer **two (2)** questions.
3. Question one (1) carries **twenty (20)** marks and questions **two (2)** and **three (3)** carries **fifteen (15)** marks each.
4. Non-programable calculators may be used.
5. Cellular phones are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with specimens: K1, K2, K3, L1, L2, L3, L4, L5, M1, M2, M3, M4, and M5.

(a) (i) Identify specimens K1, K2, and K3

K1 is a clutch disc, K2 is a gear wheel, and K3 is a universal joint. These are essential parts of the tractor transmission system, responsible for power transmission.

(ii) Give two types of specimen K1 and their roles in tractor functioning

There are single-plate clutches and multi-plate clutches. The single-plate clutch is mainly used in light tractors to transmit torque smoothly from the engine to the gearbox. The multi-plate clutch has several friction plates and is used in heavy-duty tractors to transmit higher torque where a single plate would not be sufficient.

(iii) State three warning signs that show specimen K1 is worn out

One sign is slipping, where the engine races but the tractor moves slowly due to loss of friction. Another is difficulty in gear engagement, caused by improper clutch disengagement. The third sign is vibration or jerky movements when releasing the clutch pedal, often caused by worn-out linings or oil contamination.

(iv) Identify the unit in which specimen K3 belongs and explain its mode of operation

The universal joint belongs to the propeller shaft unit. It operates by transmitting torque between shafts at varying angles, allowing smooth rotary motion even when the tractor axle moves up or down on uneven terrain.

(b) (i) Identify specimens L3, L4, and L5

L3 is a ring spanner, L4 is an open-end spanner, and L5 is an adjustable spanner. These tools are commonly used in farm machinery maintenance.

(ii) State the uses of specimens L1, L2, and L5

L1, a hammer, is used for driving nails and adjusting metal parts. L2, a screwdriver, is used to tighten or loosen screws. L5, the adjustable spanner, is used to grip and turn nuts and bolts of various sizes since its jaw can be adjusted.

(iii) Distinguish between the functions of specimens L3 and L4

A ring spanner (L3) grips a nut or bolt all around, providing a strong hold for heavy tightening. An open-end spanner (L4) grips only two opposite sides, making it easier to use in confined spaces but less firm for heavy torque.

(c) (i) Identify specimens M1, M2, M3, and M4

M1 is a straight pipe, M2 is an elbow joint, M3 is a T-joint, and M4 is a socket. These are used in irrigation and plumbing systems.

(ii) Show their arrangement and state the fitting used to connect specimen M5

The arrangement involves connecting straight pipes (M1) with sockets (M4), changing direction with elbows (M2), and branching water flow with T-joints (M3). Specimen M5, a union joint, is used to connect two pipes while allowing disconnection for repairs.

2. You are provided with specimens: N1, N2, O1, O2, and O3.

(a) (i) Identify specimens N1 and N2

N1 is Urea fertilizer, while N2 is DAP (Diammonium Phosphate) fertilizer.

(ii) List four morphological features of specimen N2

DAP appears as hard granules that are slightly grayish. It has no distinct odor and dissolves slowly in soil water. It also has a high phosphorus content combined with nitrogen.

(iii) State the use of specimens N1 and N2

Urea supplies nitrogen to enhance vegetative growth in crops. DAP supplies both phosphorus and nitrogen, which stimulate root development and early plant establishment.

(iv) Indicate the growth stage when specimen N2 should be applied

DAP is best applied at planting or early seedling stages so that phosphorus can stimulate root growth.

(b) (i) State the botanical name of specimen O1

Specimen O1 is cassava, botanically known as Manihot esculenta.

(ii) Identify the disease in specimen O1 and give its causal organism

The disease is cassava mosaic, caused by the cassava mosaic virus.

(iii) Name the disease on specimen O2

O2 shows leaf rust disease.

(iv) Give two ways in which the disease on specimen O2 is transmitted

Leaf rust is spread by airborne spores carried by wind and through infected plant residues left in the field.

(v) Give the scientific name of specimen O3

Specimen O3 is the larger grain borer, Prostephanus truncatus.

(vi) Mention three crops that are commonly infested by specimen O3

It commonly infests maize, cassava chips, and sorghum grains.

(vii) Suggest whether specimen O3 is a field or storage pest and justify with two reasons

It is a storage pest. It causes severe grain damage during storage, boring into maize cobs and cassava. Also, it multiplies rapidly in stored conditions where food reserves are concentrated.

3. You are provided with specimens: P1, P2, P3, and P4.

(a) (i) Identify specimens P1, P2, P3, and P4 using scientific names

P1 is Napier grass (Pennisetum purpureum), P2 is Lucerne (Medicago sativa), P3 is a tick (Boophilus annulatus), and P4 is a tsetse fly (Glossina palpalis).

(ii) State how specimens P1 and P2 may be best preserved

They can be preserved as hay by cutting, drying, and storing them in a dry place. They can also be made into silage by chopping and storing them in airtight pits to ferment.

(iii) Give three reasons for conserving specimens P1 and P2

They are conserved to provide feed during dry seasons when pasture is scarce. Conservation prevents feed shortages that can lower milk and meat production. It also reduces feed costs by minimizing the purchase of expensive concentrates.

(b) (i) Explain briefly how specimen P4 infests livestock

Tsetse flies infest livestock by biting and sucking blood. During feeding, they transmit trypanosomes that cause sleeping sickness or nagana in animals.

(ii) Mention two animals commonly attacked by specimen P4

Cattle and goats are commonly attacked.

(iii) Explain the relationship between specimens P3 and P4

Both ticks and tsetse flies are parasites of livestock. They rely on the blood of animals for survival, and this parasitic relationship harms the host while benefiting the parasite.

(iv) Outline three measures for controlling specimen P4

Spraying animals with insecticides helps reduce infestations. Clearing bushes and vegetation near farms destroys tsetse fly habitats. Using fly traps and keeping animals in fly-proof shelters during peak hours also helps reduce attacks.