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 : 2012**

Instructions

1. This paper consists three questions.
2. Answer **two** 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).

1. You are provided with specimens A_1, A_2, A_3, A_4, A_5, A_6, A_7 and A_8. Observe each of the specimens carefully and answer the questions that follow:

(a) (i) Name two possible products of specimen A_1 when processed and give one use of each product.
Two possible products of specimen A_1, groundnut, are groundnut oil and groundnut cake. Groundnut oil is used for cooking, while groundnut cake is used as livestock feed.

(ii) Name the primary store pest for specimen A_1 and briefly explain the adaptation of the pest.
The primary store pest of groundnut is the groundnut bruchid. It is adapted by laying eggs on pods, and the larvae bore into the seeds where they feed, reducing quality.

(b) (i) Comment on the resistance of specimen A_2 to storage insect attack and give reason for your answer.
Specimen A_2, cowpea, has low resistance to storage insect attack because its thin seed coat allows easy penetration by bruchids.

(ii) Groundnut rosette virus is a serious disease affecting plants of specimen A_1. Explain briefly two effects and two control measures of the disease.
The effects include stunted growth of plants and malformed pods with low yield. Control measures include planting resistant varieties and controlling the aphid vectors that transmit the virus.

(iii) Write down the scientific name of plant that produces specimen A_2.
The scientific name of the plant producing specimen A_2 is Vigna unguiculata.

(iv) Explain briefly how pests attacking the plant in (b)(iii) above can be controlled.
The pests can be controlled by using insecticides, practicing early harvesting, and storing the produce in airtight containers to kill bruchids.

(c) Refer to specimens A_3 and A_4.
(i) Name two major pests of the plant from where the specimen A_3 was taken.
Two major pests are maize stem borer and armyworm.

(ii) How would you control the pests named in (c)(i) above?
The pests can be controlled by using resistant maize varieties, applying biological control such as parasitoid wasps, and spraying with recommended insecticides.

(iii) What is the use of specimen A_4?
Specimen A_4, maize flour, is used for human consumption in preparing food such as ugali or porridge.

(d) Briefly explain how you would establish plants of specimen A_5 in the field.
Specimen A_5, rice, can be established by either direct seeding in puddled fields or by transplanting seedlings from a nursery into the main field after three weeks.

(e) (i) Identify specimen A_6 by its common name and account for the origin of its name.
Specimen A_6 is pigweed. It got its name because it commonly grows as a weed and is used as feed for pigs.

(ii) Briefly explain how specimen A_6 is able to compete with the crop plants.
Pigweed competes effectively because it grows fast, produces many seeds, and tolerates harsh conditions, thereby depriving crops of nutrients, light, and water.

2. You are provided with specimens B_1, B_2, B_3, B_4 and B_5. Observe them carefully and answer the questions that follow:

(a) (i) Name specimens B_1 and B_2.
Specimen B_1 is pasture grass. Specimen B_2 is a silage sample.

(ii) Briefly explain the use of each of the specimens B_1 and B_2.
Specimen B_1 is used as grazing material for livestock. Specimen B_2 is used as preserved feed to be given to livestock during dry seasons.

(iii) State two advantages of the practice done using specimen B_2 in animal husbandry.
Silage making ensures feed availability in dry periods and maintains higher nutritive value compared to dry fodder.

(iv) Outline six symptoms of the condition tested by using specimen B_3.
Specimen B_3, a mastitis test kit, tests for mastitis. Symptoms include swelling of the udder, pain when touched, reduced milk yield, watery milk, clots in milk, and fever in the animal.

(v) Describe briefly the mechanism of functioning of specimen B_3.
The mastitis test kit works by mixing milk with a reagent that reacts with somatic cells, forming a gel-like substance when cell counts are high, indicating infection.

(b) (i) Identify specimen B_4.
Specimen B_4 is a tick.

(ii) State three harmful effects of specimen B_4 to farm animals.
Ticks suck blood, leading to anemia. They transmit tick-borne diseases such as East Coast fever. They also cause wounds that reduce hide quality.

(iii) You have been appointed as a Ranch Manager at Dakawa Ranch where animals are highly infested with specimen B_4. Explain briefly four measures which you will take to control the specimen in the ranch.
I would introduce regular dipping or spraying with acaricides. I would rotate pastures to break the tick life cycle. I would clear bushes and tall grass that harbor ticks. I would also apply biological control by introducing tick predators.

(iv) Briefly explain the disease that is transmitted to farm animals by specimen B_4 using the following guidelines:

- Name of disease: East Coast fever.
- Causative agent: Theileria parva.
- Two groups of animals affected: Cattle and buffaloes.
- Four symptoms: High fever, swollen lymph nodes, labored breathing, and loss of appetite.

3. You are provided with specimens C_1, C_2, C_3, C_4, C_5, C_6 and C_7. Observe each of the specimens carefully and then answer the questions that follow:

(a) (i) Identify each of specimens C_1, C_2, C_3, C_4, C_5 and C_6.
Specimen C_1 is compost manure.
Specimen C_2 is farmyard manure.
Specimen C_3 is green manure.
Specimen C_4 is nitrogen fertilizer.
Specimen C_5 is phosphate fertilizer.
Specimen C_6 is potash fertilizer.

(ii) Explain briefly the use of each of the specimens C_1, C_2, C_3, C_4, C_5 and C_6.
Compost manure improves soil organic matter and fertility. Farmyard manure provides nutrients and improves soil structure. Green manure enriches soil with nitrogen after decomposition. Nitrogen fertilizer boosts vegetative growth. Phosphate fertilizer promotes root and flower development. Potash fertilizer enhances fruit quality and disease resistance.

(b) Differentiate between groups of materials represented by specimens C_6 and C_7.
Specimen C_6 represents inorganic fertilizers, which are manufactured chemicals. Specimen C_7 represents organic manures, which are derived from plant or animal remains.

(i) Enumerate four properties of specimen C_1.
It is bulky in nature. It has low nutrient concentration. It improves soil water retention. It enhances soil microbial activity.

(ii) State four roles of specimen C_4 in the soil.
It increases leaf growth, promotes chlorophyll formation, increases protein content, and accelerates crop maturity.

(iii) Briefly explain why specimens C_4 needs to be applied at a high rate.
Nitrogen fertilizers are highly soluble and leach easily from the soil, hence must be applied in higher amounts to meet crop needs.

(iv) Suggest the best time and reason for applying specimen C_5 in a field of maize.
It should be applied at planting because it promotes root development, which is crucial for early crop establishment.

(v) Explain why specimen C_6 should be applied in small amounts and at a considerable distance away from the growing plant.
Potash fertilizer in high amounts causes burning of plant roots, hence must be applied in small doses away from young roots.

(vi) Suggest three proper methods for specimen C_7 application in the field when planting is done.
It can be applied by broadcasting, by banding in rows, or by spot application in planting holes.

(vii) Explain briefly why specimen C_5 should be placed in a narrow space away from the plant roots.
Phosphate fertilizers are immobile in the soil, hence must be placed near but not in direct contact with roots to avoid burning and to allow effective absorption.