THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

034/1 **AGRICULTURE SCIENCE 1**

(For Both School and Private Candidates)

Time: 3 Hours **ANSWERS** **Year: 2019**

Instructions

1. This paper consists of sections A, B and C with a total of **eleven (11)** questions.

2. Answer **all** questions in sections A and B and **one (1)** question from section C.

3. Sections A and C carry **fifteen (15)** marks each and section B carries **seventy (70)** marks.

4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.

5. Write your **Examination Number** on every page of your answer booklet(s).

1. For each of the items (i) - (x), choose the correct answer among the given alternatives and write its letter beside the item number in the answer booklet provided.

i. Which of the following crops are considered to belong to grass family crops?
(1) Cassava
(2) Sorghum
(3) Beans
(4) Paddy
(5) Sweet potatoes
A (1) and (2)
B (2), (3) and (5)
C (2) and (4)
D (3) and (4)
E (3) and (5)

Grass family crops include sorghum and paddy.
Correct answer: C

ii. What does plumbing process involve?
A Connecting and joining timbers to make furniture.
B Construction of various structures by using blocks or bricks.
C Joining two pieces of metal by melting them together with a filler rod.
D Striking metal to form tools.
E The cutting, threading, and fitting pipes.

Plumbing involves working with pipes for water, gas, or other fluid systems.
Correct answer: E

iii. How does monocropping differ from other systems of cropping?
A One annual crop is grown on the field after another annual crop has been harvested.
B Different types of crops are grown on the same field in successive seasons or years.
C Two or more types of crops are grown on the field at the same time.
D One annual crop is grown on the field season after season or year after year.
E Different types of crops are grown on the field in a specific and systematic pattern.

Monocropping involves planting the same crop year after year on the same land.
Correct answer: D

iv. How is artificial insemination in animals' farms done?
A By collecting sperms from the bulling by artificial means.
B By extracting egg from the female and producing offspring artificially.
C By transplanting embryo to a cow which cannot conceive to produce offspring.
D By depositing sperm at the appropriate part of the female reproductive tract.

E By the fusion of egg and sperms to produce embryo artificially.

Artificial insemination involves depositing sperm in the female reproductive tract.
Correct answer: D

v. Forest crop production involves various post-tending operations. Which management practices in forest production refer to replacement of dead trees in the field?
A Thinning
B Beating up
C Pricking out
D Hardening off
E Pruning

Beating up refers to replacing dead trees or plants in a plantation.
Correct answer: B

vi. What should be done to correct acidic soil so that it becomes suitable for growing agricultural crops and microbial activities?
A Liming
B Salinisation
C Alkalinisation
D Acidification
E Conversion

Applying lime neutralizes acidic soils and makes them suitable for agriculture.
Correct answer: A

vii. Which one is a good quality of the roughage feeds staff given to the farm animals?
A Rich in crude protein.
B High fibre content and high in energy.
C Rich in energy and protein.
D Rich in protein and fibre content.
E High in fibre content and low in energy.

Good roughages are high in fibre content and energy.
Correct answer: B

viii. Which diseases belong to the group of diseases caused by viruses in cattle?
A Rinderpest and Rabies
B Anthrax and coccidiosis
C Black Quarter and Pneumonia
D Trypanosomiasis and East Coast Fever
E Anaplasmosis and Brucellosis

Viral diseases in cattle include Rinderpest and Rabies.
Correct answer: A

ix. The following are the effects of poor waste disposal except
A make the environment dirty.
B provide breeding group for diseases.
C pollute soil and water.
D wastes can harm wild animals.
E reduces the cost of recycle materials.

Reducing the cost of recycle materials is not an effect of poor waste disposal.
Correct answer: E

x. Which one is an example of uncertainty in the farm?
A Theft
B Fire outbreaks
C Accidents
D Health of the farmer and his family
E Price fluctuations

Price fluctuations represent uncertainty in farm income.
Correct answer: E

2. Match the items in List A with the responses in List B by writing the letter of the correct response beside the item number in the answer booklet provided.

List A:
i. An individual gets a vague idea about innovation but lacks enough information on that innovation.
ii. An individual becomes desired in the innovation and looks for more information.
iii. An individual mentally thinks about applying the ideas for his or her own situation.
iv. An individual attempts the innovation on a small scale.
v. An individual decides to use the innovation on a full scale.

List B:
A. Trial
B. Awareness
C. Adoption
D. Compatibility
E. Observability
F. Evaluation
G. Interest

Answers:

i. B
ii. G
iii. F
iv. A
v. C

3. The following table presents different practices observed in agricultural fields:

Field	**Practice**
1	Tomato plants were irregularly watered.
2	Organic manure used on soil growing carrot plants.
3	More than one variety of sweet pepper were grown on the same piece of land at the same time.
4	Nitrogenous fertilizer was applied on soil grown cassava crop plants.
5	Sunflower crop plants grown on a wet weather condition.

Identify the problem that can arise in each case:

i. Irregular watering of tomato plants can lead to blossom end rot and poor yield.
ii. Excessive organic manure may cause excessive vegetative growth at the expense of roots.
iii. Mixing varieties can lead to poor pollination and reduced yields due to competition.
iv. Excess nitrogen in cassava may cause toxicity and hinder proper root formation.
v. Wet conditions can promote fungal diseases in sunflower crops.

4. (a) One farm was analyzed for nutrient content and the result showed that the soil had deficiency in phosphorus. What deficiency symptoms would you expect to observe if maize plants were to be grown on such farm?

i. Stunted growth due to poor energy transfer in cells.
ii. Purple or reddish discoloration on leaves due to lack of phosphorus.
iii. Poor root development leading to reduced nutrient uptake.
iv. Delayed maturity of maize plants.
v. Low yield or poorly developed grains.

(b) Give five roles of calcium in plants.

i. Strengthens cell walls, improving structural stability.
ii. Regulates nutrient transport within the plant.
iii. Activates enzymes required for plant growth.
iv. Plays a vital role in root and shoot development.
v. Aids in cell division and elongation.

5. (a) The school is planning to buy Friesian breed of cattle. Suggest six features required to build a suitable house for the cattle.

i. Well-ventilated to ensure proper air circulation.
ii. Adequate space for movement and resting.
iii. Proper drainage to prevent water stagnation.
iv. Easy access to water and feed troughs.
v. Durable roofing to protect from extreme weather.
vi. Hygienic flooring to reduce disease risks.

(b) A livestock farmer is facing a problem on diseases and parasites control. In four points, advise the farmer on proper control measures to be taken.

i. Regular vaccination to prevent common diseases.
ii. Maintain clean and sanitary living conditions.
iii. Use of veterinary services for proper diagnosis and treatment.
iv. Apply insecticides to control external parasites.

6. (a) An extension officer advised farmers to change their ways of doing farm operations from human power to mechanical assistance. Give six reasons to support the advice given by the extension officer.

i. Reduces labor costs significantly.
ii. Increases efficiency and productivity.
iii. Reduces time spent on farm operations.
iv. Allows large-scale farming with minimal effort.
v. Enhances precision in planting, harvesting, and other tasks.
vi. Improves farmer's competitiveness in the market.

(b) Account for factors that limit the effectiveness of farm mechanization in agricultural production. Use four points.

i. High initial cost of purchasing machinery.
ii. Lack of skilled labor to operate and maintain machines.
iii. Small land sizes unsuitable for large machinery.
iv. Poor infrastructure hindering the transportation of machinery.

7. A farmer planted 2 hectares of maize. In raising the crop, he bought seeds for Tshs. 120,000.00, fertilizer Tshs. 460,000.00, insecticide Tshs. 20,000.00, weeding costs Tshs. 80,000.00, and harvesting costs Tshs. 200,000.00. The total yield was 60 bags of 100 kg each. The maize was bought by the local co-operative society at Tshs. 500 per kg. Calculate the gross margin per hectare.

Total revenue = Yield x Price per kg
= 60 bags x 100 kg/bag x Tshs. 500/kg
= Tshs. 3,000,000.

Total costs = Seeds + Fertilizer + Insecticide + Weeding + Harvesting
= Tshs. 120,000 + 460,000 + 20,000 + 80,000 + 200,000
= Tshs. 860,000.

Gross margin per hectare = (Total revenue - Total costs) / Area
= (Tshs. 3,000,000 - Tshs. 860,000) / 2 hectares
= Tshs. 1,070,000 per hectare.

8. (a) Briefly describe how you would render first aid to an injured student.

i. Clean the wound with antiseptic to prevent infection.
ii. Stop the bleeding by applying pressure with a clean cloth.
iii. Bandage the wound securely but not too tightly.
iv. Seek medical attention if the injury is severe.

(b) Outline any other four accidents that are likely to occur in agricultural science laboratory.

i. Chemical spills leading to burns or poisoning.
ii. Slips and falls due to wet floors.
iii. Cuts from broken glassware or sharp tools.
iv. Electric shocks from faulty equipment.

9. (a) Deforestation has led to land degradation in most arable lands of Tanzania. How will you advise people in your community on the importance of trees in soil and water conservation?

i. Trees reduce soil erosion by anchoring soil with their roots.
ii. They enhance water infiltration, reducing surface runoff.
iii. Forests act as windbreaks, preventing topsoil loss.
iv. Trees improve soil fertility through organic matter.
v. They provide shade, reducing soil temperature.
vi. Forests conserve water bodies by maintaining the water cycle.
vii. Trees act as carbon sinks, mitigating climate change.

(b) Briefly explain three importance of soil and water conservation.

i. Maintains soil fertility for sustainable crop production.
ii. Reduces water loss, ensuring availability for crops.
iii. Prevents environmental degradation and promotes ecosystem balance.

10. Diseases are among the challenges facing livestock keepers at a farm level in Tanzania. As a veterinary expert, advise farmers on how to detect a sick animal. Give six points.

i. Loss of appetite: A sick animal often refuses to eat or drink, indicating underlying health issues.
ii. Abnormal behavior: Changes in normal behavior, such as isolation or aggressiveness, could indicate illness.
iii. Unusual discharge: Look for discharge from the nose, mouth, or eyes, as it may suggest infection or disease.
iv. Changes in body temperature: High or low temperatures compared to normal can signal fever or hypothermia.
v. Poor coat condition: A dull, rough, or matted coat could indicate poor health or parasitic infections.
vi. Difficulty in movement: Limping, staggering, or reluctance to move can be signs of injury or illness.

11. Weeds are the most crucial enemies in crop production. Advise farmers on six cultural weed control measures they can employ to improve production.

i. Crop rotation: Changing crops in successive seasons disrupts weed life cycles and reduces weed infestation.
ii. Mulching: Applying organic or synthetic materials to the soil surface suppresses weed growth by blocking sunlight.
iii. Timely planting: Planting crops at the right time allows them to establish faster than weeds, reducing competition.
iv. Hand weeding: Regular manual removal of weeds prevents them from competing with crops for nutrients and water.
v. Intercropping: Growing multiple crops together can reduce space and resources available for weeds.
vi. Proper tillage: Tillage practices bury weed seeds or expose them to unfavorable conditions, reducing their germination.