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: 2018**

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. A list of all that a farmer owns and the cash value of each item is called
A. asset
B. inventory
C. liability
D. stock
E. valuation

inventory refers to a detailed list of assets, tools, and materials owned by a farmer along with their values.
correct answer: b

ii. Which one of the following tools is used for removing out nails?
A. Screwdriver
B. Chisel
C. Brace
D. Ball pein hammer
E. Pincers

pincers are designed to grip and pull out nails efficiently.
correct answer: e

iii. The crop disease that is caused by viruses is known as
A. blight
B. canker
C. mosaic
D. rust
E. mildew

mosaic is a viral disease that affects plants, causing leaf discoloration and reduced crop yield.
correct answer: c

iv. Which type of fertilizer helps in the development of the root system?
A. Sulphate of ammonia
B. Urea
C. Muriate of potash
D. Triple superphosphate
E. Calcium ammonium nitrate

triple superphosphate is rich in phosphorus, which is essential for root development.
correct answer: d

v. Which one of the following is the most effective way of learning in agricultural extension by rural people?
A. Learning by doing
B. Learning by listening
C. Learning by innovating
D. Learning by watching
E. Learning by reading

learning by doing (practical experience) is the most effective way for farmers to adopt new techniques.
correct answer: a

vi. The management practice in sheep that allows mating to take place with little difficulty is known as
A. castration
B. shearing
C. dehorning
D. docking
E. debeaking

docking involves removing part of the tail to prevent interference during mating.
correct answer: d

vii. The form of agroforestry in which crops and trees or shrubs are grown on the same piece of land is referred to as
A. silvopastoral
B. agrosilvopastoral
C. agrisilvicultural
D. apiforestry
E. entomoforestry

agrisilvicultural combines crop production with trees and shrubs on the same land.
correct answer: c

viii. The economic problem that hinders agricultural development in Tanzania is
A. scarcity of inputs
B. simple and inefficient tools
C. poor marketing facilities
D. limited research facilities
E. poor health in part of the farmers

poor marketing facilities hinder farmers from accessing profitable markets for their products.
correct answer: c

ix. Which practice causes soil to lose its fertility?
A. Alley cropping

B. Mixed cropping
C. Intercropping
D. Multistory cropping
E. Monocropping

monocropping depletes soil nutrients as the same crop is planted repeatedly.
correct answer: e

x. Which practice can best control maize streak virus disease?
A. Burning crop residues
B. Early harvesting
C. Early sowing
D. Uprooting of diseased plants
E. Application of nitrogen fertilizers

uprooting and destroying diseased plants prevents the spread of the virus.
correct answer: d

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

List A
i. The disease characterized by the animal giving out excessive saliva and difficulty breathing.
ii. The disease characterized by swollen lymph nodes.
iii. The disease characterized by the discharge of blood-stained urine.
iv. The disease characterized by the animal giving out a lot of tears from the eyes.
v. The disease characterized by reddish and swollen udder.
vi. The disease characterized by the animal bleeding non-clotting blood from the natural openings.
vii. The disease characterized by the animal discharging mucus from the mouth, becoming weak, lying down being unable to rise again.
viii. The disease characterized by sudden abortion shown by blood-stained tail and rump of an animal.
ix. The disease characterized by swellings in areas of heavy muscles which when pressed gives out a peculiar cracking sound.
x. The disease characterized by the animal showing nervous symptoms, moving in a circle and twitching of eyelids, falling down its legs keep paddling in the air.

List B
A. Mastitis
B. Brucellosis
C. Anthrax
D. Black quarter
E. Tuberculosis

F. Foot and Mouth Disease
G. Rabies
H. Rinderpest
I. East Coast Fever
J. Heart Water
K. Anaplasmosis
L. Trypanosomiasis
M. Babesiosis
N. Scours
O. Pneumonia

Answers
i. g
ii. e
iii. m
iv. h
v. a
vi. c
vii. f
viii. b
ix. d
x. j
3. (a) State the meaning of biological weed control and give three methods in which biological weed control is applied.

biological weed control is the use of natural enemies such as insects, fungi, or animals to suppress weed growth.

methods of biological weed control:
i. introduction of insects that feed on specific weeds, such as using weevils to control water hyacinth
ii. releasing fungal pathogens that infect and kill weeds
iii. grazing animals, such as goats, to consume unwanted weeds

(b) Classify herbicides on the basis of time of application and briefly explain their time of application.

herbicides are classified based on their application timing as:
i. pre-emergence herbicides – applied before weeds germinate to prevent their growth
ii. post-emergence herbicides – applied after weeds have grown to kill them directly
iii. pre-plant herbicides – applied before planting to clear the field of unwanted vegetation

4. (a) Outline six advantages of silage making.

i. provides nutritious feed for livestock during dry seasons
ii. reduces wastage of fodder compared to hay
iii. maintains feed palatability for animals
iv. allows storage for long periods without significant spoilage
v. minimizes feed shortages during unfavorable weather conditions
vi. improves digestion in ruminant animals

(b) (i) What do you understand by the term 'ration' as it is used in animal feeding?

ration refers to the total amount of feed given to an animal within a specific period to meet its dietary needs.

(ii) Account for any five factors to be considered in formulating rations.

i. nutritional requirements – the ration should meet the animal's energy, protein, vitamin, and mineral needs
ii. age of the animal – younger animals require different rations than mature animals
iii. purpose of rearing – dairy cows need different rations compared to beef cattle
iv. availability of feed ingredients – locally available feeds should be prioritized to reduce costs
v. palatability – the feed should be appealing to encourage animal consumption

5. (a) (i) What is meant by factor of production?

factor of production refers to the resources used in the production of goods and services. these include land, labor, capital, and entrepreneurship.

(ii) analyze three characteristics of land as a factor of production.

i. immobility – land is a fixed resource that cannot be moved from one location to another.
ii. heterogeneity – land differs in fertility, texture, and productivity depending on location.
iii. indestructibility – land cannot be completely destroyed, but its productivity can be degraded due to misuse.

(b) examine four roles of entrepreneurship as a factor of production.

i. resource allocation – entrepreneurs decide how to combine land, labor, and capital efficiently.
ii. innovation – they introduce new ideas, techniques, and products to improve productivity.
iii. risk-bearing – entrepreneurs take financial and operational risks to establish and expand businesses.
iv. employment creation – through business ventures, they provide jobs and contribute to economic development.

6. (a) (i) What is a soil profile?

a soil profile is a vertical section of soil layers from the surface to the parent material, showing different horizons.

(ii) briefly describe the ‘o’ horizons in a soil profile.

the ‘o’ horizon, also known as the organic layer, consists of decomposed plant and animal matter. it is rich in nutrients and plays a vital role in soil fertility.

(b) briefly explain three importance of soil profile in crop production.

i. determines soil fertility – different horizons contain varying amounts of nutrients essential for plant growth.
ii. influences water retention – helps in understanding how well soil retains moisture for crops.
iii. guides soil management – informs decisions on soil conservation, irrigation, and fertilization methods.

7. (a) describe the characteristics of each of the following categories of innovation adopters.

(i) late majority – they adopt innovations after most people have already accepted them and are cautious about change.
(ii) early majority – they adopt innovations before the average person but require evidence of success before doing so.
(iii) laggards – they are resistant to change and adopt innovations only when they become a necessity.
(iv) innovators – they are the first to adopt new technologies and are willing to take risks.

(b) (i) distinguish between adoption of an innovation and diffusion of an innovation.

adoption of an innovation refers to the process where an individual or organization starts using a new idea or technology. diffusion of an innovation is the spread of that innovation within a society or community.

(ii) assess the significance of ‘evaluation’ and ‘trial’ in the process of adoption of an innovation.

evaluation allows farmers to assess the potential benefits and risks of adopting an innovation. trial enables them to test the innovation on a small scale before fully committing to its use.

8. (a) (i) What is surveying?

surveying is the process of measuring land to determine distances, angles, and elevations for mapping and construction purposes.

(ii) state four purposes of surveying.

i. determining land boundaries for ownership and management.
ii. planning infrastructure projects such as roads and irrigation systems.
iii. assessing topography for agricultural and construction purposes.
iv. mapping land features for environmental conservation and resource management.

(b) elaborate the functions of six instruments used in chaining method of linear measurements in surveying.

i. chain – used to measure horizontal distances.
ii. arrows – placed at measured points to mark positions.
iii. ranging rods – help align straight measurements over long distances.
iv. pegs – mark permanent positions in the survey area.
v. plumb bob – ensures vertical alignment when measuring elevations.
vi. measuring tape – provides accurate short-distance measurements.

9. (a) (i) What is the meaning of wood preservation?

wood preservation is the treatment of wood with chemicals or physical processes to protect it from decay, pests, and environmental damage.

(ii) briefly describe the cold dipping method of applying preservatives and name two types of wood for which the method is mostly used.

cold dipping involves immersing wood in a preservative solution at normal temperatures for a specific duration to allow absorption. it is mostly used for softwoods such as pine and cedar.

(b) point out two advantages and four disadvantages of creosote oil as a wood preservative.

advantages:
i. provides long-term protection against insects and fungi.
ii. highly resistant to water damage.

disadvantages:
i. strong odor makes it unsuitable for indoor applications.
ii. toxic to humans and animals if not handled properly.
iii. stains wood, making it difficult to paint or finish.
iv. requires specialized disposal due to environmental concerns.

10. (a) Why is soil erosion one of the most serious problems in agriculture? Give three reasons.

i. loss of soil fertility – removes topsoil containing essential nutrients for plant growth.
ii. reduced water retention – eroded soil loses its ability to retain moisture, leading to drought stress.
iii. land degradation – makes land unsuitable for farming, reducing agricultural productivity.

(b) briefly explain three forms in which water erosion occurs.

i. sheet erosion – removal of a thin layer of soil over a large area due to rainfall.
ii. rill erosion – formation of small channels on the surface as water runs off.
iii. gully erosion – deep and wide channels are formed, making the land unsuitable for farming.

11. weeds and pests are great enemies in crop production. examine the use of chemical method in controlling weeds and pests by citing on its eight advantages, five disadvantages, and the seven safety precautions in use of agrochemicals.

advantages of chemical control:
i. fast action in eliminating pests and weeds.
ii. effective in covering large areas with minimal labor.
iii. can be applied in different weather conditions.
iv. controls multiple pest species at once.
v. prevents rapid pest reproduction.
vi. ensures higher crop yields.
vii. reduces reliance on manual weeding.
viii. some chemicals have long-lasting effects.

disadvantages of chemical control:
i. potential harm to beneficial insects and biodiversity.
ii. development of resistance in pests and weeds.
iii. environmental pollution from chemical residues.
iv. health hazards to farmers and consumers.
v. high cost of purchasing and applying agrochemicals.

safety precautions in agrochemical use:
i. wear protective clothing such as gloves and masks.
ii. follow dosage recommendations strictly.
iii. store chemicals in labeled, secure containers.
iv. avoid spraying during windy conditions.
v. wash hands and equipment after handling chemicals.
vi. keep chemicals away from food and water sources.
vii. dispose of empty containers properly.

12. explain eight benefits that farmers can get by forming cooperatives for marketing their products and examine six problems facing agricultural marketing cooperatives in tanzania.

benefits of cooperatives:
i. better bargaining power in the market.
ii. access to loans and financial assistance.
iii. reduced cost of agricultural inputs.

iv. improved storage and transportation facilities.
v. training and extension services.
vi. fair prices for farm produce.
vii. reduced exploitation by middlemen.
viii. collective investment opportunities.

problems facing cooperatives:
i. poor management and corruption.
ii. inadequate capital for expansion.
iii. lack of modern storage facilities.
iv. poor communication among members.
v. competition from private traders.
vi. delays in payment to farmers.

13. (a) describe five procedures involved in preparing the cows for milking and milking process using hand milking system.

i. ensure the milking area is clean and hygienic.
ii. wash and dry the udder before milking.
iii. allow the calf to stimulate milk letdown.
iv. milk the cow using a rhythmic hand motion.
v. store milk in clean containers immediately after milking.

(b) give seven essentials of clean milk production.

i. clean milking environment.
ii. healthy cows free from diseases.
iii. proper udder hygiene.
iv. sterilized milking equipment.
v. quick cooling and storage.
vi. good handling practices.
vii. regular testing for milk quality.