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: 2016**

Instructions

1. This paper consists of sections A, B and C with a total of **thirten (13)** 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) Systematic error in surveying can be caused by
A. misreading the tape or chain
B. wrong holding of tape or chain
C. miscounting tape or chain length
D. poor straightening of tape or chain
E. variation in tension of tapes or chains

Systematic error occurs when the measurements consistently deviate from the true value due to specific causes like tension variation.
Correct Answer: E

(ii) Which of the following groups is influential in convincing farmers to adopt new innovations in farming and livestock husbandry?
A. Researchers
B. Extension workers
C. Local leaders
D. Political leaders
E. Women

Extension workers play a significant role in providing knowledge and practical demonstrations to farmers, influencing their decisions.
Correct Answer: B

(iii) Which one of the following is not applicable to Tilapia as the most favored fish pond in Tanzania?
A. Breed and grow very fast
B. Suffer from fewer parasites
C. Grow best in fresh warm water
D. Easy to feed
E. Easy to harvest and process

Tilapia is favored for its ease of breeding, feeding, and growing in warm water, but it does suffer from parasites occasionally.
Correct Answer: B

(iv) The normal way of harvesting tea in the field is to pick
A. two leaves and a bud
B. four leaves and a bud
C. three leaves and a bud
D. three leaves without a bud
E. one leaf and a bud

Tea is usually harvested by picking two leaves and a bud, which ensures high-quality produce.
Correct Answer: A

(v) Human activity that facilitates gully erosion includes
A. deforestation
B. burning of vegetation
C. overgrazing
D. cultivation along slopes
E. monocropping

Cultivating along slopes disturbs the soil structure, allowing water to create gullies.
Correct Answer: D

(vi) Before planting bean seeds it is advised to apply
A. sulphate of ammonia
B. muriate of potash
C. calcium ammonium nitrate
D. urea
E. triple super phosphate

Triple super phosphate supplies phosphorus, which is essential for root development and germination.
Correct Answer: E

(vii) Which one of the following is not a characteristic for a good udder in a dairy cow?
A. Medium-sized teats
B. Neat stiff udder
C. Big udder
D. Firmly attached udder

A good udder should be firmly attached and proportional. A big udder is not always indicative of quality.
Correct Answer: C

(viii) The order of arrangement of stomach chambers from mouth in ruminant animals is
A. reticulum, rumen, abomasum, omasum
B. rumen, omasum, reticulum, abomasum
C. rumen, reticulum, omasum, abomasum
D. reticulum, abomasum, rumen, omasum
E. omasum, rumen, reticulum, abomasum

The correct order for digestion in ruminants is rumen, reticulum, omasum, and abomasum.
Correct Answer: C

(ix) Determination of the financial position of the farm is a function of
A. profit and loss account
B. balance sheet
C. cash flow analysis book
D. partial budget
E. income and expenditure book

A balance sheet shows the financial position by listing assets, liabilities, and equity at a specific time.
Correct Answer: B

(x) In soil profile, 'B' horizons are mainly characterized by
A. accumulation of materials
B. leaching of materials
C. decomposition of materials
D. consolidation of materials
E. weathering of materials

The B horizon, also called the subsoil, is characterized by the accumulation of minerals like clay, iron, and organic matter from the upper layers.
Correct Answer: A

2. Match the items in List A with the responses in List B.

List A
i. Buys agricultural products and changes their forms before selling them.
ii. Concentrates buyers and sellers at a particular time and place and offers a specialized service in the negotiation of purchase and sales.
iii. Buys the goods in bulk and sells to other merchants in relatively large quantities.
iv. Promotes production and organizes marketing of major crops and livestock.
v. Moves from one place to another buying goods and selling them at the markets in towns.
vi. Represents buyers and/or sellers and brings them together.
vii. Serves either producers to market their products or consumers to have fair prices for the goods.
viii. Acts on behalf of other businessmen by selling goods and services for a fee.
ix. Handles goods and sells them to final consumers in small quantities.
x. Buys goods from one place and sells to another place and makes profit due to difference in prices between two places.

List B
A. Speculator
B. Retailer
C. Cooperative
D. Processor

E. Debtor
F. Arbitrageur
G. Shopper
H. Auctioneer
I. Corporation and authority
J. Commission agent
K. Broker
L. Consumer
M. Creditor
N. Wholesaler
O. Jobber

Answers
i. D
ii. H
iii. N
iv. C
v. O
vi. K
vii. I
viii. J
ix. B
x. F

3. (a) Briefly explain any three important economic problems that hold back development of agriculture in Tanzania.

i. Low access to capital – Farmers lack sufficient funds to invest in modern farming tools, technologies, and inputs, hindering productivity.
ii. Poor market infrastructure – Inadequate roads and transport facilities make it difficult for farmers to access markets and sell their produce.
iii. Limited access to credit – Farmers face challenges obtaining loans due to high-interest rates and lack of collateral.

(b) Outline six measures to be taken by farmers to improve agriculture in Tanzania.

i. Use of modern farming techniques such as irrigation and mechanization to increase efficiency.
ii. Adoption of improved seed varieties to enhance crop yield and resistance to diseases.
iii. Application of fertilizers and pesticides to improve soil fertility and control pests.
iv. Diversification of crops to reduce reliance on single crops and increase income.
v. Formation of cooperatives to access collective bargaining and better market prices.

vi. Participation in agricultural training programs to acquire knowledge on best practices.

4. (a) Differentiate soil texture from soil structure.

Soil texture refers to the relative proportions of sand, silt, and clay particles in the soil. Soil structure refers to the arrangement of soil particles into aggregates or clumps.

(b) Examine four importance of soil texture in crop production.

i. Water retention – Clay soils retain more water, while sandy soils drain quickly.
ii. Aeration – Sandy soils allow better air circulation compared to clay soils.
iii. Nutrient availability – Soils with balanced texture hold nutrients more effectively.
iv. Root penetration – Loamy soils facilitate easy root growth and development.

5. (a) (i) Give the meaning of agricultural extension that explains it as an informal educational process.

Agricultural extension is the process of transferring agricultural knowledge and technologies to farmers to improve their productivity and livelihoods.

(ii) State the objective of agricultural extension.

The objective of agricultural extension is to increase agricultural productivity and improve the living standards of farmers.

(b) Elaborate three principles of agricultural extension work.

i. Participation – Involving farmers in planning and decision-making ensures acceptance and effective implementation of innovations.
ii. Adaptability – Extension programs should be tailored to suit local conditions and farmers' needs.
iii. Sustainability – Promoting practices that are environmentally friendly and economically viable ensures long-term benefits.

6. (a) What is meant by the term 'horticulture' in crop production?
Horticulture is the branch of agriculture that deals with the cultivation of fruits, vegetables, flowers, and ornamental plants.
(b) Account for five methods of vegetative propagation of fruit crops.

i. Grafting – Joining a scion of one plant to the rootstock of another to combine desirable traits.
ii. Budding – Inserting a bud of one plant into the stem of another plant.
iii. Layering – Bending a branch to the ground and covering it with soil to promote root development.
iv. Cuttings – Planting stem, leaf, or root cuttings to grow new plants.

v. Division – Splitting mature plants into sections to propagate them.

7. (a) Define the following terms as used in sheep farming.

(i) Lamb
Lamb refers to a young sheep that is less than one year old, often raised for its tender meat and wool production.

(ii) Ewe
Ewe is an adult female sheep that is capable of reproduction and is used primarily for breeding and milk production.

(b) Briefly explain four advantages of docking in sheep.

i. Improves hygiene – Docking prevents the accumulation of feces and urine around the tail area, reducing the risk of infections like flystrike.
ii. Enhances reproduction – Makes mating easier by reducing interference caused by a long tail.
iii. Increases market value – Docked sheep are often considered more appealing and fetch higher prices in markets.
iv. Prevents injuries – Reduces the risk of tail injuries that may occur during movement or interaction with other sheep.
8. (a) For what purpose are the following fittings used in plumbing?

(i) Elbow – Used to change the direction of a pipe, typically at a 90-degree or 45-degree angle.
(ii) Coupling – Used to connect two pipes of the same or different diameters to form a continuous pipeline.
(iii) Tee – Used to connect three pipes, allowing the flow of water or gas in different directions.
(iv) Union – Used to join two pipes in a way that allows easy disconnection and maintenance.

(b) Briefly describe how you would make the following timber joints.

(i) Butt joint – Cut two pieces of timber squarely and join them end-to-end using nails, screws, or adhesive. It is simple and commonly used for basic structures.
(ii) Dowel joint – Drill holes into both pieces of timber, insert dowels (wooden pegs), and secure them with glue to create a strong connection.
(iii) Lap joint – Overlap two pieces of timber at the ends, cut a recess in each, and fasten them together using nails, screws, or glue. This joint provides strength and stability.

9. (a) Outline three reasons for keeping bees.

i. Honey production – Bees produce honey, a valuable product consumed as food and used in medicine.
ii. Pollination – Bees are critical for pollinating crops, which increases agricultural productivity.
iii. Wax production – Beeswax is used in various industries, including cosmetics, candle making, and pharmaceuticals.

(b) (i) Describe the procedure involved in honey harvesting.

i. Wear protective clothing to avoid bee stings.
ii. Use a smoker to calm the bees and make the hive easier to handle.
iii. Carefully remove the honeycomb frames and brush off any bees.

(ii) Enumerate the three steps in the crushing and straining method of honey processing.

i. Crush the honeycomb to release the honey.
ii. Strain the crushed comb through a fine sieve to separate the honey from wax and impurities.
iii. Collect the strained honey into clean containers for storage.

10. (a) Explain the meaning of the concept 'environmental degradation.'

Environmental degradation refers to the deterioration of the natural environment due to human activities or natural processes, leading to the loss of biodiversity, soil fertility, and ecological balance.

(b) Account for seven human activities that bring about degradation on land.

i. Deforestation – Clearing forests for agriculture or settlements exposes soil to erosion and reduces biodiversity.
ii. Overgrazing – Excessive grazing by livestock depletes vegetation, causing soil compaction and erosion.
iii. Industrial activities – Release of pollutants and waste from industries contaminates soil and water.
iv. Urbanization – Construction of buildings and roads destroys natural habitats and leads to soil sealing.
v. Mining – Excavation of minerals disrupts soil structure and leaves land barren.
vi. Poor agricultural practices – Overuse of chemical fertilizers and monocropping degrade soil quality.
vii. Waste disposal – Dumping of plastics and other non-biodegradable materials pollutes the soil.

11. In agricultural marketing, marketing middlemen perform marketing functions. Examine marketing channels of agricultural goods and explain the marketing functions performed by middlemen.

marketing channels of agricultural goods

i. direct marketing – farmers sell their products directly to consumers without intermediaries, such as in local markets or farm gates.
ii. wholesaler marketing – farmers sell in bulk to wholesalers, who distribute the products to retailers or processors.
iii. retailer marketing – retailers buy agricultural goods from wholesalers or farmers and sell them in small quantities to final consumers.
iv. cooperative marketing – farmers form cooperatives to collectively market and sell their produce, ensuring better prices and bargaining power.

v. export marketing – agricultural goods are processed and sold to international markets, increasing market reach and income.

marketing functions performed by middlemen
i. buying and assembling – middlemen collect products from different farmers and assemble them in larger quantities for resale.
ii. storage – they store agricultural goods until demand increases or transportation is arranged.
iii. transportation – middlemen facilitate the movement of products from farms to markets or processing centers.
iv. grading and standardization – they classify products based on quality, size, and other specifications to ensure fair pricing.
v. pricing and negotiation – they determine competitive prices based on market demand and supply conditions.
vi. processing and packaging – some middlemen add value by processing and packaging products to meet consumer preferences.
vii. risk-bearing – they take responsibility for losses due to spoilage, price fluctuations, or theft during storage and transit.
conclusion, marketing middlemen play a crucial role in ensuring that agricultural products reach consumers efficiently. while they provide essential services, farmers should also explore ways to minimize exploitation by middlemen through cooperative marketing and direct selling strategies.

12. evaluate the benefits of agroforestry to the farmer and account for the three agroforestry practices aiming at sustainable land use.

benefits of agroforestry

i. improves soil fertility – leguminous trees fix nitrogen in the soil, enriching nutrients for crops and reducing the need for synthetic fertilizers.
ii. prevents soil erosion – trees and shrubs reduce water runoff and wind erosion, protecting the soil structure.
iii. enhances biodiversity – agroforestry creates habitats for various species, promoting ecological balance.
iv. provides additional income – farmers can sell timber, fruits, fodder, and medicinal plants, increasing revenue sources.
v. climate regulation – trees absorb carbon dioxide, mitigating climate change effects while providing shade and reducing temperature extremes.
vi. enhances water conservation – tree roots help in water infiltration and retention, reducing drought stress for crops.
vii. reduces dependency on synthetic inputs – natural leaf litter from trees improves soil organic matter, reducing the need for artificial fertilizers.
viii. increases farm productivity – integrated farming practices optimize land use and enhance overall yields.

agroforestry practices for sustainable land use

i. agri-silviculture – growing trees alongside crops to provide shade, improve soil fertility, and prevent erosion.
ii. silvo-pastoral system – integrating trees with pasturelands to provide fodder for livestock while conserving soil and water.
iii. agro-silvo-pastoral system – combining crops, trees, and livestock on the same land to maximize productivity and sustainability.

conclusion , agroforestry benefits both farmers and the environment by improving land productivity and ensuring long-term sustainability. by adopting agroforestry practices, farmers can increase yields, reduce risks, and contribute to environmental conservation.

13. many people in tanzania keep poultry by using the free-range system. give six advantages and five disadvantages of the free-range system and explain five importance of the poultry industry in tanzania.

advantages of free-range system

i. low cost – requires minimal investment in housing and feed since chickens can forage for food.
ii. natural feeding – birds consume insects, grass, and grains, reducing dependency on commercial feeds.
iii. improved health and meat quality – free-range chickens develop stronger immunity and produce better-quality meat compared to confined poultry.
iv. environmental benefits – manure from poultry naturally fertilizes the soil, promoting sustainable farming.
v. better adaptability – birds raised in a free-range system adapt well to changing environmental conditions.
vi. reduced cannibalism and aggression – birds have enough space to move freely, reducing stress and aggressive behaviors.

disadvantages of free-range system

i. predation risk – birds are vulnerable to predators such as hawks, dogs, and wild animals.
ii. lower productivity – egg and meat production may be inconsistent due to exposure to environmental factors.
iii. diseases and parasites – free-range birds are more exposed to disease-causing organisms from the environment.
iv. weather dependency – extreme weather conditions, such as heavy rains or drought, affect the birds' health and productivity.
v. difficult egg collection – birds may lay eggs in hidden locations, making collection challenging.

importance of the poultry industry in tanzania

i. source of income – poultry farming provides revenue for small-scale and commercial farmers through the sale of eggs and meat.
ii. employment creation – the industry creates jobs in farming, processing, and marketing.
iii. nutritional benefits – poultry products provide affordable protein, essential vitamins, and minerals for human health.

iv. contribution to gdp – the poultry industry contributes significantly to the country's agricultural economy.
v. utilization of agricultural by-products – poultry feed can be made from crop residues, reducing waste and promoting sustainable agriculture.

conclusion

despite its challenges, the free-range poultry system remains popular due to its low costs and sustainability. the poultry industry plays a key role in food security, employment, and economic development in tanzania, making it an essential sector for growth and investment.