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: 2006**

Instructions

1. This paper consists of sections A, B and C with a total of **thirteen (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. (i) the practice of continuously growing one type of annual crop after the same crop has been harvested is called

a interplanting
b monocropping
c monoculture
d continuous cropping
e intercropping

monocropping is the repeated planting of the same crop in the same field every season, leading to nutrient depletion and pest buildup.
b monocropping

(ii) a product market in which several sellers each sell a certain quantity of produce to consumers is called
a monopsony
b monopoly
c oligopoly
d oligopsony
e black market

an oligopoly occurs when multiple sellers offer similar products but influence the market through pricing and marketing strategies.
c oligopoly

(iii) when the soil solution contains more hydrogen ions than hydroxyl ions, the soil is said to be
a concentrated
b neutral
c alkaline
d saline
e acidic

an acidic soil has a high concentration of hydrogen ions, lowering the ph below 7.
e acidic

(iv) which of the following is a mass method of agricultural extension?
a farm visit
b radio broadcast
c result demonstration
d training and visit
e method demonstration

radio broadcasting reaches a wide audience, making it a mass extension method.
b radio broadcast

(v) it is advisable to avoid grazing incalf dairy cows on a pasture with plenty of green succulent alfalfa (lucerne) to prevent

a overfattening
b blotching
c miscarriage
d bloating
e contamination

alfalfa causes gas buildup in the rumen, leading to bloating, which can be fatal.
d bloating

(vi) in forestry, the process of transplanting seedlings from the seedbed to the field is called

a pricking out
b shading out
c lining out
d lifting out
e plucking out

lining out refers to moving seedlings from the nursery to their final growing position in the field.
c lining out

(vii) the hereditary unit that determines the characteristics of a farm animal is called

a mitochondria
b nucleus
c autosome
d chromosome
e gene

a gene is the fundamental hereditary unit that carries genetic information influencing traits.
e gene

(viii) the diagram in figure 1 illustrates the root system of a carrot plant. which of the following may cause the condition shown?

a sandy soil
b wide spacing
c too much watering
d excessive organic matter
e shallow soil

shallow soil restricts root growth, causing stunted development in deep-rooted crops like carrots.
e shallow soil

(ix) which part of an ox-plough controls the depth of ploughing?
a draft rod
b wheel
c frog
d landside
e mouldboard

the landside helps control ploughing depth by maintaining balance and stability.
d landside

(x) which type of fishpond is suitable for construction in a flat area?
a paddy
b barrage
c contour
d shallow
e deep

paddy ponds are best suited for flat lands as they retain water effectively and allow fish farming alongside rice cultivation.
a paddy

2. match the responses in list b with the words/phrases in list a by writing the correct letter beside the item number.

i) the negative logarithm of the hydrogen ion concentration of the soil solution.
t -log h soil

ii) a variety of eggplants.
l black beauty

iii) a breed of cattle that secretes plenty of milk with low butterfat content.
p friesian

iv) the rewards for good entrepreneurship on a farm.
r profits

v) softwood.
n trees with needle-like leaves

vi) a farm workshop tool suitable for planning convex or concave timber surfaces.
a spokeshave

vii) a chemical substance applied to fishpond water to prevent acidity.
g agricultural lime

viii) a process where a calf's intestines fail to absorb colostrum.
c gut closure

ix) an example of joint agricultural products.
i cotton fibre and cotton seed

x) an example of predators used for biological pest control.
e wasps

3. (a) distinguish between soil texture and soil structure.

soil texture refers to the proportion of different-sized mineral particles (sand, silt, and clay) in the soil. it affects water retention, drainage, and aeration.

soil structure describes how soil particles are arranged into aggregates, influencing root penetration, air circulation, and water movement.

(b) what do you understand by the term illuviation as used in soil science?

illuviation is the process where dissolved or suspended soil materials, such as clay, iron, or organic matter, are transported from one soil horizon to another and deposited, usually in the b horizon, due to water movement.

4. the following diagram (figure 2) represents one of the crops grown in tanzania.

(a) (i) how is this crop propagated?

it is propagated by stem cuttings, which are planted directly into the soil.

(ii) state the botanical name of this crop.

manihot esculenta (cassava).

(b) (i) state two most important pests of the crop.

i) cassava mealybug – damages leaves and reduces yield.
ii) cassava mosaic virus vector (whitefly) – transmits viral diseases.

(ii) name two diseases that infect the crop.

i) cassava mosaic disease – causes yellowing and stunted growth.
ii) cassava bacterial blight – leads to leaf wilting and stem rot.

5. (a) define the term masonry as used in farm workshop technology.

masonry is the construction of structures using materials such as bricks, stones, or concrete blocks, bonded together with mortar.

(b) state the use of each of the following masonry tools.

(i) brick hammer – used to cut or shape bricks and remove old mortar.
(ii) plumb bob – ensures vertical alignment in construction.
(iii) wood float – smoothens and levels plastered surfaces.
(iv) spirit level – checks horizontal and vertical alignment.
(v) square – ensures right angles in masonry work.

6. (a) what do you understand by the term pasture as used in livestock production?

pasture refers to land covered with grasses and legumes, which provide food for grazing animals. it can be natural (wild growth) or improved (planted species).

(b) state seven desirable qualities of good pasture grasses and legumes.

i) high nutritional value – provides essential proteins and energy.
ii) fast regrowth – allows continuous grazing.
iii) drought resistance – survives dry conditions.
iv) palatability – animals readily consume it.
v) disease resistance – minimizes health risks.
vi) good ground cover – prevents soil erosion.
vii) nitrogen-fixing ability – legumes improve soil fertility.

7. (a) What does “risks and uncertainties” mean as used in farming business economics?

Risks refer to situations where the outcomes of farming activities are uncertain but can be estimated with probabilities, such as crop failure due to drought or pest attacks.
Uncertainties are situations where the outcomes cannot be predicted due to the lack of information or unforeseen circumstances, such as sudden changes in government policies or global market conditions.

(b) State six advantages and seven risks that may occur in a farming business.

Advantages of farming business:

1. Employment generation – Provides job opportunities in rural and urban areas.
2. Food production – Ensures food security through crop and livestock production.
3. Income generation – Farmers earn revenue from selling agricultural produce.
4. Utilization of natural resources – Maximizes the use of land, water, and other resources.
5. Economic growth – Agriculture contributes significantly to national GDP.
6. Sustainability – Promotes environmentally friendly practices like organic farming.

Risks in farming business:

- Weather unpredictability – Droughts, floods, or storms can damage crops and reduce yields.
- Pest and disease outbreaks – Cause significant losses in crops and livestock.
- Market price fluctuations – Lead to unstable income for farmers.
- Input shortages – Limited access to fertilizers, seeds, and equipment hinders productivity.
- Financial risks – High loans or interest rates can threaten farm sustainability.
- Labor shortages – Migration and urbanization reduce the availability of farm labor.
- Technological risks – Inappropriate technology adoption can lead to inefficiency.

8. (a) Write four common breeds of pigs which are kept in Tanzania.

- Large White – Known for its fast growth rate and high-quality meat.
- Landrace – Popular for its excellent mothering ability and lean meat.
- Duroc – Hardy breed with good feed conversion efficiency.
- Hampshire – Recognized for its strong growth and adaptability to different environments.

(b) State seven factors that limit the pig industry in Tanzania.

- High feed costs – Reduces profitability for farmers.
- Disease outbreaks – African Swine Fever and other diseases cause high mortality rates.
- Limited access to improved breeds – Farmers rely on low-yielding local breeds.
- Poor infrastructure – Inadequate transportation and market access.
- Cultural barriers – Some communities avoid pork consumption.
- Lack of extension services – Insufficient knowledge of modern pig farming techniques.
- Competition – Imports of pork products affect local market demand.

9. (a) Differentiate between “market” and “marketing.”

Market refers to a physical or virtual place where buyers and sellers interact to exchange goods or services. Marketing involves the activities and processes of promoting, pricing, distributing, and selling goods to consumers.

(b) (i) What is an imperfect market?

An imperfect market is one where the conditions of perfect competition are not met, such as in monopolies or oligopolies, where few sellers dominate the market.

(ii) How will the price of mangoes in the short run be affected if the quantity of mangoes supplied in a market is increased?

When the supply of mangoes increases and demand remains constant, the price will decrease due to excess supply.

10. (a) What is the meaning of the term "interplanting" as used in crop production?

Interplanting is the practice of growing two or more crops simultaneously in the same field, arranged in rows or mixed patterns, to maximize space and resource use.

(b) (i) State seven advantages of interplanting.

- Efficient use of space – Multiple crops are grown in the same area.
- Weed control – Dense planting suppresses weeds.
- Pest control – Some crops repel pests, reducing infestations.
- Improved soil fertility – Legumes fix nitrogen, benefiting companion crops.
- Increased yields – Overall production per unit area increases.
- Risk reduction – Reduces the risk of total crop failure.
- Income diversification – Multiple crops generate different income streams.

(ii) State four disadvantages of interplanting.

- Competition – Crops may compete for nutrients, water, and sunlight.
- Labor-intensive – Managing multiple crops requires more effort.
- Pest spread – Close proximity increases the risk of disease and pest transmission.
- Complex management – Requires careful planning to avoid negative crop interactions.

11. Using the following headings, explain how you would raise a crop of sunflower (Helianthus spp.).

a. Climate and soils – Sunflowers grow best in warm temperatures (20–30°C) and well-drained soils with a pH of 6.0–7.5.
b. Land preparation – Plough and harrow the land to prepare a fine seedbed.
c. Propagation – Propagate by planting seeds directly into the soil.
d. Spacing – Space rows 60 cm apart and plants 30 cm apart.
e. Weeding – Remove weeds regularly to prevent competition for resources.
f. Manures and fertilizers – Apply farmyard manure before planting and nitrogen-based fertilizers during growth.
g. Pest control – Use insecticides to manage aphids and caterpillars.
h. Disease control – Apply fungicides to prevent fungal diseases like rust.
i. Harvesting – Harvest when the back of the flower heads turns yellow.
j. Storage – Store seeds in a cool, dry place to prevent mold.

12. (a) Explain what you understand by the term farm records as used in agriculture.

Farm records are documents that track all activities, inputs, outputs, and finances on a farm. They provide essential data for decision-making and evaluating farm performance.

(b) Distinguish between financial and physical records which have to be kept on the farm.

- Financial records: Document monetary transactions, including income, expenses, and profits. Examples include receipts and profit/loss statements.
- Physical records: Track tangible assets like livestock, machinery, and crops. Examples include inventory and production records.

(c) Prepare the profit and loss account of Mrs. Kisea's farm.

Profit and Loss Account for Mrs. Kisea's Farm

Details	Amount (Shs)
Income	
Milk sales	80,000
Sales of goats	5,000
Sales of cabbages	7,500
Sales of one heifer	94,000
Tea sales	47,000
Total Income	233,500
Expenses	
Purchase of farm tools	10,000
Construction of zero grazing unit	100,000
Depreciation of machinery	8,000
Interest payable	7,500
Purchase of pesticides	3,000
Veterinary bills	4,000
Wages	48,000
Total Expenses	180,500
Opening valuation	120,000
Closing valuation	160,000
Net Profit	93,000

Mrs. Kisea's farm made a net profit of Shs 93,000 during the year 2003. Let me know if further clarifications are needed.