THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

034 **AGRICULTURE**

Time: 2:30 Hours. **ANSWER** **Year: 2024**

Instructions

1. This paper consists of sections **A**, **B** and **C** with a total of **ten (10)** questions.
2. Answer **all** questions.
3. Section A carries **15** marks, section B carries **70** marks and section C carries **15** marks.
4. Cellular phones and unauthorized materials are **not allowed** in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

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QUESTION NUMBER	**SCORE**	**EXAMINER'S INITIIALS**
1		
2		
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TOTAL		
CHECKER'S INITIALS		

SECTION A

1. Choose the correct answer and write its letter in the box provided.

(i) How can you best define the term agriculture?

A. Science of crop production

B. Science and art of crop production

C. Science and art of crop and livestock production

D. Science of crop and livestock production

Correct answer: C (Science and art of crop and livestock production)

Agriculture is both a science and an art because it involves the application of scientific principles in areas such as crop breeding, soil management, and animal health, while also requiring practical skills and creativity in carrying out daily farming tasks. The inclusion of both crop and livestock production makes this definition complete and accurate since agriculture covers both aspects of production. The other options are incomplete because they either omit livestock production or ignore the art aspect of agriculture.

(ii) How can a farmer add the value of the land?

A. Through fencing

B. By removing trees

C. By hindering accessibility

D. By ditching

Correct answer: A (Through fencing)

Fencing increases the value of land by improving its security, defining boundaries, and preventing encroachment or unauthorized access. It also enhances the land's physical appearance, which can increase its market value. The other options are incorrect because removing trees may lead to soil degradation, hindering accessibility lowers usability, and ditching does not contribute to improving the land's productivity or worth.

(iii) Why is shifting cultivation commonly practiced by peasant farmers?

A. To maintain the water sources

B. It results into soil conservation

C. High returns is achieved

D. It does not need complicated knowledge

Correct answer: D (It does not need complicated knowledge)

Shifting cultivation is a simple farming method that requires little formal education or advanced technology. Peasant farmers often rely on local experience and traditional tools such as hoes and machetes. This simplicity allows them to grow crops without complex scientific methods or machines. The other options are incorrect because shifting cultivation does not conserve soil or water and generally provides low returns due to small-scale production.

(iv) The experiment on soil particles in a farm showed that it had 40% sand, 40% silt and 20% clay. With respect to the results of the experiment, what is likely to be the characteristic of the soil?

A. Fewer air spaces

B. Moderate water holding capacity

C. Low fertility

D. Difficult root penetration

Correct answer: B (Moderate water holding capacity)

Soil that contains 40% sand, 40% silt, and 20% clay is known as loam soil. Loam has a balanced texture that holds water moderately, allowing plants to access both moisture and air for growth. It also supports proper drainage and good root penetration. The other alternatives are incorrect because loam soil does not have fewer air spaces, low fertility, or difficulty in root penetration.

(v) When you are thinking of fast action weed control method, which one would you recommend to be used?

A. Cultural

B. Chemical

C. Mechanical

D. Biological

Correct answer: B (Chemical)

Chemical weed control is the fastest method since herbicides act quickly to destroy unwanted plants by interfering with their physiological processes. Unlike mechanical or biological methods, which take time, chemical control achieves results within a short period. Cultural methods depend on crop management practices like rotation, which take seasons to show effects, and biological control involves living organisms, which is slow to establish.

(vi) The following are the benefits of livestock production except:
A. Source of industrial raw materials
B. Source of farm power
C. Source of employment
D. Source of inorganic manure

Correct answer: D (Source of inorganic manure)

Inorganic manure is produced from chemical compounds and not from animals. Livestock provide organic manure such as dung, urine, and compost, which enrich soil naturally. Therefore, option D is not a benefit of livestock. The other options are true because livestock offer raw materials like hides and wool, provide draught power, and create employment opportunities in production and processing.

(vii) You are consulted to solve a problem of loss of soil fertility that could be caused by soil erosion. What method of maintaining soil fertility would you propose as a remedy?
A. Fallowing
B. Liming
C. Mulching
D. Addition of fertilizer

Correct answer: C (Mulching)

Mulching prevents soil erosion by covering the soil surface with organic materials such as leaves, grass, or crop residues. This cover reduces the impact of raindrops and wind, retains moisture, and adds organic matter as it decomposes. The other options are not direct remedies for erosion; liming corrects soil acidity, fertilizers add nutrients but do not prevent erosion, and fallowing helps rest the soil but doesn't protect it from erosion.

(viii) In a village where people engage in crop and livestock production, the agricultural officer called a meeting and emphasized on the use of animal power over human power. Why does the agricultural officer emphasize so?

A. Animal power has higher work output

B. Animal power can be used for all types of work

C. Animals do not get tired

D. Animals do not need training

Correct answer: A (Animal power has higher work output)

Animal power, such as oxen or donkeys, produces greater force and efficiency than human labor. It allows for quicker ploughing and transportation of heavy loads, increasing productivity on farms. The other options are wrong because animals can get tired, require training, and cannot perform all types of farm work.

(ix) Which method of reducing risk and uncertainty involves production of more than one type of product?

A. Flexibility in production

B. Diversification in production

C. Maintaining liquidity

D. Insurance of products

Correct answer: B (Diversification in production)

Diversification spreads risk by producing multiple crops or livestock types. This ensures that if one product fails or prices drop, the farmer still earns from others. It's a key strategy in risk management. Flexibility refers to adjusting production processes, maintaining liquidity deals with cash flow, and insurance transfers risk but does not involve production.

(x) The teacher assigned students to bring different types of soil and asked them to identify the soil type that has the smallest particles. Which type of soil did they identify?

A. Clay

B. Silt

C. Sand

D. Gravel

Correct answer: A (Clay)

Clay soil has the smallest particles, less than 0.002 mm in diameter. These tiny particles make clay dense and sticky when wet, allowing it to hold more water and nutrients. Silt and sand have larger particles, while gravel has the largest. Hence, clay is identified as the soil with the finest texture.

2. Match the items in List A with the correct responses in List B by writing the letter of the correct answer in the box provided.

List A

(i) Cattle

(ii) Pig

(iii) Goat

(iv) Sheep

(v) Poultry

List B

A. California

B. Saanen

C. Camel thorn

D. Leghorn

E. Large White

F. Merino

G. Friesian

Correct matching:

(i) G – Friesian

(ii) E – Large White

(iii) B – Saanen

(iv) F – Merino

(v) D – Leghorn

3. (a) Briefly explain four types of soil structure according to their structural arrangement of aggregates.

The four main types of soil structure are **granular, blocky, platy, and prismatic**.

Granular structure is made up of small, rounded aggregates that are loosely packed, allowing good aeration and easy root penetration.

Blocky structure consists of irregular-shaped aggregates that fit together roughly; it has moderate water-holding capacity and is common in clay soils.

Platy structure appears in thin, flat plates stacked over one another, which restricts water infiltration and root growth.

Prismatic structure forms vertical columns that may have flat or rounded tops and occurs in soils with high clay content, influencing drainage and water movement.

(b)(i) Describe the relationship between soil texture and soil structure.

The relationship between soil texture and soil structure is that texture determines the proportion of sand, silt, and clay, which in turn influences how soil particles bind together to form aggregates or structure.

For example, clay soils with finer particles tend to form stronger aggregates, while sandy soils form loose structures. Therefore, texture directly affects structure and both influence plant growth.

(ii) Differentiate between soil texture and soil structure.

Soil texture refers to the relative proportion of sand, silt, and clay in the soil, which determines how the soil feels and behaves.

Soil structure, on the other hand, refers to how these particles are arranged into aggregates or clumps. In short, texture is about particle size composition, while structure is about how these particles are organized.

4. (a) Explain how each of the following uncertainties may affect agricultural production.

Price uncertainty affects farmers because unexpected changes in market prices for inputs or outputs can reduce profits and make planning difficult. For example, when fertilizer prices rise suddenly, production costs increase, reducing farmers' earnings.

Yield uncertainty affects production because weather conditions, pests, and diseases can make it difficult to predict harvest quantities. This uncertainty discourages investment and reduces farmers' confidence in expanding production.

Technological uncertainty arises when new technology, such as improved seeds or machinery, is introduced without full understanding of its outcomes. Farmers may hesitate to adopt such innovations due to fear of failure or financial loss.

Institutional uncertainty occurs when government policies or agricultural institutions change unexpectedly, affecting access to loans, subsidies, or land ownership. These shifts disrupt farmers' ability to plan production effectively.

(b) Briefly explain the role of the government in minimizing risks and uncertainties facing farmers. Give four points.

The government plays an important role in minimizing risks and uncertainties by providing weather forecasts that help farmers plan their activities.

It also promotes agricultural research and extension services to educate farmers about improved practices. Additionally, the government regulates markets to stabilize prices and ensures access to affordable inputs through subsidies.

It can also introduce crop insurance programs to protect farmers against losses caused by disasters or market fluctuations.

5. Analyse the procedures of planting the sorghum crop based on the following guidelines.
(a) Land preparation (b) Propagation and spacing (c) Manures and fertilizers (d) Weeding (e) Harvesting

Land preparation involves clearing bushes, removing stumps, and ploughing the land using a hoe, ox-plough, or tractor to achieve a fine tilth suitable for seed sowing. Harrowing helps break soil clods and smooth the surface, ensuring good germination.

Propagation of sorghum is done by seed, usually sown directly in the field. The recommended spacing is 60 cm by 75 cm or 15 cm by 20 cm depending on the variety and soil fertility. Proper spacing ensures adequate sunlight and nutrient access.

Manure and fertilizers improve soil fertility. Farmyard manure is applied before planting to enrich the soil. In areas without manure, phosphate fertilizers like DAP or TSP are applied at planting. Nitrogenous fertilizers such as Urea can be used as top dressing three weeks after germination.

Weeding should be done regularly using a hoe or by hand to remove weeds that compete with the crop for nutrients and moisture. The first weeding is done two to three weeks after germination, followed by another before flowering. Serious weeds like Striga can be controlled by crop rotation or trap crops.

Harvesting is done when the grains are hard and dry. The heads are cut with a sharp knife, sun-dried, threshed, winnowed, and stored in clean, dry containers to prevent pest infestation.

6. (a) Analyse the effects of each of the following insect pests in crop production:
   (i) Nematodes (ii) Sucking pests
   Nematodes damage plant roots, reducing their ability to absorb water and nutrients. This causes wilting, stunted growth, and poor yields. The crops become weak and susceptible to diseases.

   Sucking pests such as aphids and whiteflies suck sap from plants, weakening them and slowing growth. They also transmit viral diseases, further reducing yield and quality.

   (b) How are the following cultural pest control methods used in crop production?
   (i) Timely planting of crops (ii) Timely harvesting of crops (iii) Proper tillage of land (iv) Closed season
   (v) Growing trap crops

Timely planting allows crops to escape peak pest infestations. Crops planted early grow stronger before pests multiply.

Timely harvesting prevents field and storage pests from attacking mature crops. Delayed harvesting gives pests time to damage produce.

Proper tillage exposes soil-borne pests to sunlight and predators like birds, reducing their population before the next planting.

Closed season involves skipping cultivation of certain crops for one or more seasons to break the life cycle of pests and allow for destruction of their eggs and larvae.

Growing trap crops attracts pests away from the main crop, making it easier to destroy them by other means such as chemical control.

7. **(a) Examine five factors which influence effectiveness of pesticides in controlling crop pests.**
   The effectiveness of pesticides depends on correct concentration during mixing; too little is ineffective while too much harms crops.

   Timing of application is crucial because pesticides must be used when pests are most vulnerable.

   Weather conditions also matter since heavy rain can wash off chemicals, reducing their action.

   Pest resistance can also lower effectiveness when pests adapt to certain pesticides.

   Finally, using expired or poor-quality pesticides makes control unsuccessful.

   (b) Briefly explain how integrated pest management method is practiced in controlling crop pests.

Integrated Pest Management (IPM) combines several control methods to manage pests economically and safely.

It uses cultural methods like crop rotation, biological methods like natural predators, mechanical methods like handpicking, and limited chemical use only when necessary.

IPM emphasizes environmental protection and long-term pest control by integrating different approaches rather than relying solely on chemicals.

8. **(a) Outline five advantages that farmers get from growing sorghum and cowpeas in the same field.**

Growing sorghum and cowpeas together improves soil fertility because cowpeas fix atmospheric nitrogen, benefiting sorghum.

It also allows better use of soil nutrients since their roots exploit different soil layers.

Intercropping reduces pest and disease attack because pests specific to one crop are disturbed by the presence of another.

It also helps control soil erosion by covering the ground and reduces the risk of total crop failure by diversifying production. The total yield per area increases due to efficient use of sunlight, water, and nutrients.

(b) Shifting cultivation is a farming system practiced in Tanzania. Highlight five major features that distinguish it from other systems.

Shifting cultivation requires little capital since farmers use simple tools like hoes and machetes.

It is common in sparsely populated rural areas and involves small plots cleared by slashing and burning.

It relies mainly on family labor and traditional knowledge rather than machines.

Crops are grown for a few seasons until fertility drops, after which farmers move to new land, allowing the previous land to recover.

9. **(a) Identify five advantages of using animals as a source of farm power as compared to tractor power.**

Animals are cheaper to maintain than tractors since they only need water and feed rather than costly fuel or lubricants.

They are more suitable for small-scale farms where tractors are uneconomical.

Oxen can work on uneven or soft soils where tractors may get stuck.

Animal equipment and spare parts are inexpensive and easier to repair.

Moreover, animals provide manure in addition to power, adding value to the farm.

(b) Identify five factors to be considered when selecting oxen for training to perform farm activities.

When selecting oxen for training, choose healthy and strong animals capable of withstanding heavy work.

The animals should be of suitable age, around 2–3 years for local cattle and 1.5–2 years for exotic breeds.

Castrated males are preferred because they are calmer and easier to control.

Oxen should have a hump to support the yoke, and they must be of gentle temperament to follow commands without aggression.

10. In six points, explain the importance of livestock.

Livestock provides food such as milk, meat, and eggs which are rich sources of protein and essential nutrients for human health.

Livestock offers raw materials for industries, including hides, wool, and bones used in manufacturing leather, textiles, and other goods.

Livestock serves as a source of income and capital, helping farmers sell animals or their products to meet financial needs and invest in other activities.

The sector creates employment opportunities in farming, processing, transportation, and marketing of animal products.

Livestock manure improves soil fertility by adding organic matter and nutrients, increasing crop yields.

Finally, livestock has social and cultural value, symbolizing wealth and status in many communities, and providing draught power and security in rural areas.