**THE UNITED REPUBLIC OF TANZANIA**

**NATIONAL EXAMINATION COUNCIL OF TANZANIA**

**ADVANCED CRTIFICATE OF SECONDARY EDUCATION EXAMINATION**

**134/1** **AGRICULTURE 1**

**(**For Both School and Private Candidates)

**Time: 3 Hours.** **ANSWER** **Year: 2021**

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**Instructions**

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and **two (2)** questions from each of section B and C.
3. Section A carries **40** marks, section B and section C carries 30 marks each.
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).

1. Account for five disadvantages of using human power in the farm and five factors affecting human working capacity.

One disadvantage of using human power is low efficiency. Human labor cannot match the speed and output of machines, making it unsuitable for large-scale farming operations.

Another disadvantage is time consumption. Tasks such as land preparation or weeding take longer when done manually, which can delay planting and harvesting.

A third disadvantage is high labor demand. Many workers are needed to accomplish tasks that machines could handle faster, leading to higher costs in terms of wages and supervision.

Human power is also affected by environmental conditions. Extreme heat, rain, or cold reduces the ability of workers to perform, causing inconsistencies in farm work.

Finally, reliance on human power causes seasonality issues. During peak farming seasons, labor shortages are common, which disrupts farming activities and reduces productivity.

Factors that affect human working capacity include age. Younger people are generally stronger and more energetic, while older workers tire more quickly.

Another factor is nutrition. Well-nourished workers have more energy and endurance, while poorly fed workers fatigue easily.

Health is also an important factor. Sick or weak individuals cannot perform tasks efficiently compared to healthy workers.

Skills and training influence working capacity. Workers who are trained complete tasks faster and more accurately than untrained ones.

Lastly, motivation and working conditions matter. Workers with fair wages, good tools, and safe environments are more productive than those working under poor conditions.

2. (a) Briefly explain the functions of the five plumbing tools to be used for connecting pipes in a network of irrigation system. (b) Advise the farmer on how to construct a suitable structure to confine the animal for dehorning.

A pipe wrench is used for gripping and turning threaded pipes and fittings, ensuring that connections are tight and leak-free.

A pipe cutter is used to cut pipes into desired lengths with smooth and accurate edges, preventing irregular joints.

A pipe reamer is used to remove burrs from the inside of pipes after cutting, ensuring water flows smoothly without obstruction.

A plumber's tape, commonly called Teflon tape, is wrapped around pipe threads before joining to prevent leaks.

A pipe threader is used to cut threads on the ends of pipes, making it possible to connect pipes with fittings securely.

A suitable dehorning structure should be strong, made of durable materials like timber or metal to withstand the strength of the animal.

It should have a crush or chute that holds the animal firmly, preventing excessive movement during the dehorning operation.

The structure should provide enough space for workers to move around and handle the animal safely.

It should be located in a clean, well-drained, and ventilated area to maintain hygiene and reduce stress on the animal.

Finally, the design should ensure that the animal is confined comfortably, without causing injury or excessive discomfort during the process.

3. (a) Point out six problems of using machines in agriculture that are associated with farmers. (b) Give four conditions which favour the use of sprinkler irrigation over surface irrigation.

One problem is the high initial cost of buying machines, which many small-scale farmers cannot afford.

Another problem is lack of technical knowledge. Many farmers lack skills in operating and maintaining agricultural machinery.

A third problem is scarcity of spare parts and fuel, which makes machines difficult to operate consistently.

Machines may also be underutilized in small farms, where land is not large enough to justify their use.

Soil compaction is another problem, as heavy machines press the soil particles together, reducing aeration and fertility.

Finally, theft and lack of secure storage facilities pose challenges, since machines are valuable and easily targeted.

Sprinkler irrigation is favored in sandy soils, where surface irrigation would result in rapid water loss due to infiltration.

It is suitable in areas with limited water supply, since sprinklers use water more efficiently.

Sprinklers are effective on uneven or sloppy land where surface irrigation would cause runoff and erosion.

They are also useful for crops that require uniform application of water over the leaves, such as vegetables and pasture grasses.

4. Suggest five farming practices that can be used by the farmer to improve soil structure for crop production.

The application of organic matter such as compost and manure improves soil aggregation, increasing porosity and aeration.

Practicing crop rotation helps maintain fertility, reduces pest build-up, and prevents soil exhaustion, thereby improving structure.

Mulching conserves soil moisture, prevents compaction, and protects the soil surface from erosion and direct sunlight.

Minimum tillage reduces the disturbance of soil, maintaining its natural structure and preventing compaction.

Planting cover crops protects the soil from erosion, adds organic matter, and maintains soil fertility and structure.

5. Examine one characteristic and two management implications of the following soil colours: (a) black (b) white (c) red (d) brown (e) grey.

Black soils are characterized by high organic matter content. Their management requires proper drainage to avoid waterlogging, and they are naturally fertile, requiring less fertilizer input.

White soils are characterized by the presence of salts or lime. Their management requires leaching to remove excess salts, and the choice of salt-tolerant crops to avoid poor yields.

Red soils are characterized by high amounts of iron oxides. Their management requires the addition of organic matter to improve fertility, and fertilizer application to correct nutrient deficiencies.

Brown soils are characterized by moderate organic matter and fertility. Their management requires balanced fertilization to sustain crop production, and good conservation practices to prevent erosion.

Grey soils are characterized by poor drainage and waterlogging. Their management requires installation of proper drainage systems, and the planting of water-tolerant crops to avoid crop failure.

6. Analyse five ways in which the level of nutrients can decline in the soil.

One way nutrients decline is through leaching. When water percolates through the soil, soluble nutrients such as nitrates are washed deep beyond the reach of plant roots, reducing fertility.

Another way is soil erosion. Wind and water remove the topsoil, which contains most of the organic matter and nutrients, leaving the land less fertile.

Nutrient decline can also occur through continuous cropping without replenishment. Harvesting crops removes nutrients, and without adding manure or fertilizer, the soil becomes exhausted.

Volatilization is another way, where nutrients such as nitrogen are lost to the atmosphere as gases, especially when fertilizers are misapplied.

Finally, nutrient decline occurs through fixation. Some nutrients, like phosphorus, become chemically bound in forms that are unavailable to plants, reducing soil fertility over time.

7. Justify the statement that functions and deficiency symptoms of mineral elements in plants are directly related, using magnesium and calcium as examples.

Magnesium is a central component of chlorophyll, which is vital for photosynthesis. Its function is to enable plants to capture sunlight and produce energy. When deficient, plants show chlorosis (yellowing) of leaves due to failure in chlorophyll production, directly relating the function to the symptom.

Calcium strengthens cell walls and aids in cell division and root development. Its function is essential for structural support and growth. When deficient, plants show weak stems, poor root growth, and blossom end rot in fruits. This symptom reflects its direct function in structural development.

8. (a) Explain how the biological nature of agricultural production influences change in the prices of agricultural goods by giving two points.

Agricultural production is seasonal, meaning supply fluctuates depending on planting and harvesting times, which affects prices. When supply is high during harvest, prices fall, while scarcity in off-season raises prices.

Agricultural production is also perishable, as crops and animal products cannot be stored indefinitely. This short shelf life causes farmers to sell quickly, sometimes at lower prices, which influences market fluctuations.

(b) Give three positive effects and three negative effects of controlling the prices of agricultural goods.

Price control has positive effects such as protecting consumers from excessively high prices, ensuring affordability of food products.

It also provides farmers with stable income by setting minimum prices.

Another positive effect is stabilizing the market, preventing extreme fluctuations.

However, price control can have negative effects such as

discouraging farmers if prices are set too low, reducing production incentives.

It may lead to black markets where products are sold illegally at higher prices.

It can also strain government budgets, as subsidies may be required to maintain controlled prices.

9. (a) Account for the four importance of foreign reserve as it is used in international trade.

Foreign reserves are important because they are used to pay for imports, allowing countries to purchase goods and services not available locally.

They stabilize exchange rates by balancing currency demand and supply.

They provide confidence to investors and trading partners that a country can meet its international obligations.

They also act as a buffer during economic crises, allowing the government to intervene in the economy.

(b) Give reasons on why the following factors are considered when drawing a farm plan:

(i) environmental factor

Environmental factors are considered in farm planning because climate, soil type, and water availability determine which crops and livestock can thrive.

(ii) farmer's objectives and preference.

Farmer's objectives and preferences matter because they guide what enterprises are chosen, depending on income goals or family needs.

(iii) availability and costs of input .

Availability and cost of inputs influence planning since a farm must be designed based on affordable and accessible resources.

(iv) security

Security is considered to protect the farm from theft, wild animals, and other risks that may cause losses.

10. Examine five ways that can be used by the management to improve labour productivity in the farm.

One way is providing training to workers so they acquire skills and knowledge, enabling them to work more efficiently.

Another way is offering fair wages and incentives, which motivate workers to increase their effort and commitment.

Provision of modern tools and equipment also improves productivity, as workers can accomplish tasks faster and with less fatigue.

Improving working conditions, such as providing protective gear, shade, and rest breaks, ensures workers remain healthy and energetic.

Lastly, good supervision and organization of work helps to reduce time wastage and ensures workers stay focused on their tasks, leading to higher productivity.