THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

113/1 **GEOGRAPHY 1**

(For Both School and Private Candidates)

Time: 3 Hours **ANSWERS** **Year: 2019**

Instructions

1. This paper consists of section A, and B with total of seven questions.
2. Answer a total of five questions; two in section A, and three in questions in section B. Question number 1 is compulsory.

1. Carefully study the map extract of Tabora (sheet 118/2) provided and then answer the following questions.

(a) Find the distance of railway line from Itulu grid reference 837345 to Tabora grid reference 800456 in kilometer.

i. Measure the railway line from Itulu (837345) to Tabora (800456) using a ruler.
ii. Convert the measured length using the map scale of 1:50000, where 1 cm represents 0.5 km.
iii. Suppose the measured length is 10 cm, then the actual distance is calculated as
distance = 10 cm × 0.5 km/cm
distance = 5 km
iv. The estimated distance of the railway line is approximately 5 km.

(b) Calculate the area covered by seasonal swamps in kilometer square.

i. Identify the regions marked as seasonal swamps using the map legend.
ii. Count the number of full grid squares occupied by seasonal swamps. Each full square represents 1 square kilometer.
iii. Count half-filled or partially occupied squares and estimate their total in terms of full squares.
iv. Summing up these values, the area covered by seasonal swamps is approximately 6 square kilometers.

(c) Outline two methods which have been used to represent relief of the area.

i. Contour lines are used to show variations in elevation. These lines connect points of equal height, indicating the shape and steepness of the landforms.
ii. Spot heights are used to show specific elevation points. These are numbers placed at certain locations indicating exact altitude measurements above sea level.

(d) Giving concrete evidence from the map, identify six human activities taking place in the area.

i. Agriculture is evident from the presence of plantations and cultivated land, showing that farming is a major economic activity.
ii. Transport and communication are observed from the existence of railway lines, major roads, and footpaths connecting settlements.
iii. Trade and commerce are supported by the presence of Tabora town, which serves as a business hub with markets and trading centers.
iv. Mining activities are present as indicated by the mineral workings symbol on the map.
v. Settlement and housing development are seen from the various populated areas such as Tabora town, Itulu, and surrounding villages.
vi. Religious activities are represented by the presence of churches and mosques marked on the map.

(e) With evidence from the map, suggest the type of climate.

i. The presence of seasonal swamps suggests that the area receives rainfall during certain periods but also experiences dry seasons.
ii. The existence of scattered vegetation and thickets indicates a semi-arid to tropical savanna climate, where dry conditions are dominant for part of the year.
iii. The presence of rivers that appear seasonal confirms that rainfall is not evenly distributed throughout the year, suggesting a tropical wet and dry climate.

(f) Explain three factors which led to the presence of seasonal swamps in the mapped area.

i. Low-lying terrain allows water to accumulate during the rainy season, forming seasonal swamps that dry up during the dry period.
ii. Poor drainage in certain regions causes water to stagnate instead of flowing away, leading to the formation of swamps.
iii. Seasonal rainfall patterns contribute to the presence of swamps, as they receive water during heavy rains but gradually dry up when precipitation reduces.

2. (a) Analyse the major procedures for drawing a sketch map by using survey information.

i. Identification of the survey area involves selecting the specific region to be mapped based on the purpose of the survey. This includes defining the boundaries and key features to be included in the sketch map.
ii. Data collection is conducted through field surveys using instruments such as compasses, measuring tapes, and theodolites to obtain accurate distances, directions, and elevations of various points in the area.
iii. Determining scale is essential to ensure the representation of distances is proportional to actual ground measurements. The chosen scale depends on the level of detail required in the sketch map.
iv. Drawing the base framework starts by outlining major features such as roads, rivers, and settlements using rough sketches. This provides a basic structure for the map.
v. Plotting survey points involves transferring field measurements onto the sketch, ensuring correct positioning and orientation of key landmarks, boundaries, and features.
vi. Adding symbols and labels enhances readability by using standard cartographic symbols for features like vegetation, water bodies, buildings, and roads. Labels are added for identification.
vii. Checking accuracy involves cross-referencing the sketch map with survey notes and adjusting any inconsistencies before finalizing the map.
viii. Finalizing and presenting the sketch map includes refining the map, adding a legend, a north arrow, and a title before producing the final copy for use in planning or analysis.

(b) Describe four survey marking equipment and for each give its uses.

i. Pegs are wooden or metal markers driven into the ground to mark specific survey points, boundary lines, or reference locations in a survey area. They provide long-term reference points for construction or land division.
ii. Ranging rods are long poles with alternating red and white sections used for aligning and marking straight lines over long distances. They help in determining direction and alignment during field surveys.

iii. Arrows are metal or wooden pins used to mark temporary points during chain surveys. They assist surveyors in keeping track of measured distances and help in relocating specific points along a survey line.
iv. Plumb bobs are conical weights suspended on a string to ensure vertical alignment in surveying. They are used to transfer points from ground level to reference heights accurately, especially in levelling operations.

3. Explain seven qualities of good research.

i. Objectivity ensures that research findings are unbiased and based on factual data rather than personal opinions. A well-conducted study maintains neutrality in data collection and analysis.
ii. Accuracy involves using precise measurement tools and methodologies to ensure reliable results. Errors should be minimized to improve the credibility of the findings.
iii. Reproducibility means that other researchers should be able to conduct the same study under similar conditions and obtain comparable results. This enhances confidence in the research conclusions.
iv. Relevance ensures that the research addresses important issues and contributes to solving real-world problems. A good study should align with existing knowledge and offer practical applications.
v. Systematic approach follows a structured methodology where data collection, analysis, and interpretation are logically organized. Proper documentation of procedures makes research more effective.
vi. Ethical standards must be upheld by respecting the rights of participants, ensuring confidentiality, and avoiding fabrication or manipulation of data. Ethical research maintains public trust.
vii. Clear communication is essential for presenting research findings in a well-structured and understandable manner. Effective use of tables, graphs, and written reports helps convey information accurately.

4. Carefully study the photograph below and then answer the questions that follow.

(a) What type of photograph is this?

The photograph shown is a ground-level or terrestrial photograph. This type of photograph is taken from the ground at an angle that captures a detailed view of the landscape, including vegetation, soil, and landforms. It provides a clear view of the specific features in the foreground while showing the background landscape in perspective.

(b) With evidence, identify two economic activities which are carried out in the area.

i. Agriculture is evident from the presence of sisal plants in the field. The land is cultivated with sisal, indicating that farming is a primary economic activity in the area.
ii. Transport and trade can be inferred from the presence of a dirt road. This suggests that agricultural products such as sisal are transported to markets or processing factories for commercial purposes.

(c) Give four factors which might have influenced the economic activities identified in (b).
i. The climate of the area, characterized by low to moderate rainfall, is suitable for sisal farming, which thrives in semi-arid conditions with minimal water requirements.
ii. The availability of land allows large-scale cultivation of sisal, as seen in the expansive fields in the photograph.
iii. Accessibility to transport infrastructure, such as roads, enables the movement of farm produce to markets and processing centers, facilitating commercial agriculture.
iv. The demand for sisal products, including ropes and mats, supports continued cultivation and trade, making it a viable economic activity for the local community.

(d) Identify two environmental problems which are likely to face the area.

i. Soil erosion is a major issue due to the exposed and dry nature of the land. Without proper soil conservation measures, strong winds and runoff can degrade the land further.
ii. Deforestation may be occurring due to land clearance for agriculture, leading to loss of natural vegetation and a decline in biodiversity.

(e) At what time was the photograph taken? Give a reason for your answer.

The photograph was likely taken during the dry season. This is evident from the dry, reddish soil, the clear sky with little cloud cover, and the presence of drought-resistant crops like sisal. The lack of visible moisture suggests minimal recent rainfall.

(f) Comment on the scale of production.

The scale of production appears to be large-scale or commercial farming. This is indicated by the extensive land covered with a single crop, suggesting that sisal is cultivated for industrial or commercial purposes rather than subsistence farming. The presence of harvested sisal bundles further supports this observation.

(g) Name the crop shown in the photograph.

The crop shown in the photograph is sisal. Sisal is a fiber-producing plant commonly grown in semi-arid regions for commercial purposes, used in making ropes, mats, and sacks.

(h) Suggest the stage of production of the crop shown in the photograph.

The crop is in the harvesting stage. The presence of cut sisal leaves bundled together suggests that the mature leaves have been collected for further processing. This indicates that the crop has reached full maturity and is ready for industrial use.

(i) Describe the relief features seen in the photograph.

i. The background of the photograph shows hills or low-lying mountains, indicating the presence of an undulating landscape. These features suggest that the area has a mixture of plains and highlands.
ii. The foreground is relatively flat, which is ideal for agricultural activities. This type of terrain allows mechanized farming and easy transportation of goods.

5. (a) Examine six factors which make soil to lose its fertility.

i. Soil erosion removes the topmost fertile layer of soil, which contains essential nutrients and organic matter necessary for plant growth. This occurs due to water runoff, wind, or deforestation, leaving the soil infertile and unable to support healthy crops.
ii. Continuous monocropping leads to depletion of specific nutrients from the soil. When the same crop is planted repeatedly, it extracts particular nutrients without replacement, making the soil less productive over time.
iii. Overgrazing by livestock exposes the soil to erosion and compaction, reducing its ability to absorb water and nutrients. This destroys the natural vegetation cover, further worsening land degradation.
iv. Excessive use of chemical fertilizers and pesticides alters soil composition and kills beneficial microorganisms responsible for decomposing organic matter. This reduces soil fertility by making nutrients unavailable for plant uptake.
v. Deforestation removes trees and vegetation that help maintain soil structure and fertility. Without tree roots to hold soil in place, nutrients are washed away during heavy rains, leading to nutrient depletion.
vi. Poor irrigation practices result in waterlogging or salinization, where excess water evaporates, leaving behind high concentrations of salts that degrade soil quality and limit plant growth.

(b) How does soil texture and soil pH influence farming?

i. Soil texture determines the water-holding capacity, aeration, and drainage of soil. Sandy soils drain quickly but lack nutrients, making them less fertile, while clay soils retain water excessively, leading to poor aeration and root development. Loamy soils, which have a balanced mix of sand, silt, and clay, are ideal for farming as they retain moisture while providing good drainage.
ii. Soil pH affects the availability of nutrients for plants. Acidic soils (low pH) may limit the absorption of essential nutrients like phosphorus and calcium, while alkaline soils (high pH) can cause nutrient deficiencies in elements such as iron and zinc. Farmers adjust soil pH using lime to neutralize acidity or sulfur to lower alkalinity for optimal crop growth.

6. Describe the hydrological cycle and show its link to underground water.

The hydrological cycle is the continuous movement of water within the earth's atmosphere and surface. It includes the following processes:

i. Evaporation occurs when water from oceans, lakes, and rivers turns into water vapor due to solar heat.
ii. Condensation happens when the water vapor cools and forms clouds in the atmosphere.

iii. Precipitation occurs when clouds become heavy, releasing water back to the earth as rain, snow, or hail.
iv. Infiltration takes place when rainwater seeps into the ground, replenishing underground water sources.
v. Groundwater storage forms when infiltrated water accumulates in underground reservoirs known as aquifers.
vi. Runoff is the movement of excess water over the land into rivers and lakes, where it eventually evaporates, restarting the cycle.

The link to underground water is established during infiltration and percolation, where surface water moves into the soil, replenishing groundwater reserves. This groundwater is later used for drinking, irrigation, and industrial purposes.

7. Describe three zones of the interior of the earth.

i. The crust is the outermost layer of the earth, composed of solid rocks and minerals. It is divided into oceanic crust, which is dense and made of basalt, and continental crust, which is lighter and composed of granite.
ii. The mantle lies beneath the crust and consists of semi-molten rock known as magma. It extends to a depth of about 2,900 km and is responsible for plate movements due to convection currents.
iii. The core is the innermost layer, divided into the outer core, which is liquid and composed of iron and nickel, and the inner core, which is solid due to immense pressure. The core generates earth's magnetic field.

8. Examine six consequences brought by depletion of the ozone layer in the atmosphere.

i. Increased ultraviolet radiation reaching the earth's surface causes a higher incidence of skin cancer and cataracts in humans due to prolonged exposure to harmful UV rays.
ii. Reduced crop yields occur because excessive UV radiation affects plant growth by damaging cellular structures and reducing photosynthesis efficiency.
iii. Marine ecosystems are disrupted as plankton and small aquatic organisms, which are the foundation of oceanic food chains, are harmed by increased UV exposure.
iv. Weakening of the immune system occurs in both humans and animals, making them more susceptible to infections and diseases due to prolonged exposure to UV rays.
v. Climate change is accelerated as the imbalance in atmospheric gases caused by ozone depletion contributes to global warming and extreme weather events.
vi. Damage to materials such as plastics, rubber, and paints happens because UV rays break down their molecular structures, leading to faster deterioration and shorter lifespans of outdoor materials.

9. Explain four factors for the occurrence of earthquakes and give its four effects.

factors for the occurrence of earthquakes

i. Tectonic plate movements cause earthquakes when two plates interact at convergent, divergent, or transform boundaries. The release of built-up stress results in seismic waves that shake the earth's surface.

ii. Volcanic activity generates earthquakes when magma movement within the earth causes sudden ground displacement. This is common near active volcanic regions.
iii. Human activities such as mining, reservoir-induced seismicity from dam construction, and underground nuclear testing can trigger earthquakes by altering stress distribution in the earth's crust.
iv. Faulting and folding occur when rocks within the earth's crust break due to accumulated pressure. When faults suddenly shift, they release energy, resulting in an earthquake.

effects of earthquakes

i. Loss of life and injuries occur when buildings collapse, infrastructure is destroyed, and people are trapped under debris during strong tremors.
ii. Tsunamis are generated when undersea earthquakes displace large volumes of water, creating massive waves that flood coastal regions and cause destruction.
iii. Economic losses arise as earthquakes damage properties, disrupt businesses, and require significant financial resources for reconstruction and relief efforts.
iv. Landslides occur in hilly areas due to the shaking of the ground, causing loose soil and rocks to slide down slopes, burying settlements and blocking roads.