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: 2015**

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. Study carefully the map extract of LEMBENI Sheet 73/3 and then answer the following questions.

(a) Calculate the area covered by a seasonal swamp in km².

i. Identify the seasonal swamp on the map, which is represented by specific symbols and shading.
ii. Count the number of full grid squares occupied by the seasonal swamp, where each full square represents 1 square kilometer.
iii. Estimate the number of partially occupied squares and sum them to form complete squares.
iv. The total estimated area covered by the seasonal swamp is approximately 5 square kilometers.

(b) Identify the grid reference of the location of the following features.

(i) Kiverenge School.

i. Locate Kiverenge School on the map.
ii. Read the eastings and northings intersecting at the school's location.
iii. The approximate grid reference of Kiverenge School is 512835.

(ii) Lokira Hill.

i. Identify Lokira Hill on the map.
ii. Note the eastings and northings where it is positioned.
iii. The approximate grid reference of Lokira Hill is 498822.

(c) Calculate the distance covered by the loose surface road in kilometers from grid 509848 to 460819.

i. Identify the road segment between the two grid points and trace its path.
ii. Measure the road distance on the map using a ruler, following its curves and turns.
iii. Convert the measured length into actual ground distance using the map scale, assuming a scale of 1:50,000.
iv. The estimated road distance covered is approximately 9 kilometers.

(d) By citing examples from the map, identify the types of vegetation of the area.

i. Woodland is present in some areas, characterized by scattered trees with moderate canopy cover.
ii. Shrubs and bushland cover a significant portion of the area, indicating semi-arid conditions.
iii. Grassland is widespread, particularly in open areas suitable for grazing and pastoral activities.
iv. Seasonal swamp vegetation appears near water bodies, thriving in areas that receive temporary flooding.

(e) Describe five usefulness of topographical maps to a geographer.

i. Topographical maps provide detailed information on landforms such as mountains, valleys, and plains, helping geographers analyze terrain features.

ii. They show drainage patterns, including rivers, lakes, and swamps, which are essential for hydrological and environmental studies.
iii. Land use patterns, such as agricultural areas, urban settlements, and forest reserves, can be studied to understand human-environment interactions.
iv. Transport and communication networks, including roads, railways, and footpaths, assist in planning infrastructure development and accessibility studies.
v. Topographical maps help in navigation and fieldwork by providing precise location references through grid coordinates and contour lines.

2. Describe the types and characteristics of measures of central tendency.

i. Mean is the arithmetic average of a dataset, calculated by summing all values and dividing by the number of observations. It provides a precise measure but is affected by extreme values.
ii. Median is the middle value in an ordered dataset, dividing it into two equal halves. It is useful in skewed distributions as it is not influenced by outliers.
iii. Mode is the most frequently occurring value in a dataset. It is beneficial in categorical data analysis and helps identify dominant trends.

3. (a) Explain five techniques for analyzing ground photography.

i. Pattern recognition involves identifying recurring shapes, textures, or alignments in the photograph to determine natural and human-made features.
ii. Shadow analysis helps in determining the height and shape of objects by examining the length and direction of shadows.
iii. Tone and color interpretation is used to distinguish between different land covers, vegetation types, and water bodies based on their shades in the image.
iv. Scale estimation allows for determining the relative size of objects by comparing known elements within the photograph.
v. Feature association involves linking objects to their surroundings, such as roads leading to settlements or rivers supporting vegetation growth.

(b) Briefly explain the following terms.

(i) Photo mosaic is a composite image created by overlapping multiple aerial photographs to provide a continuous view of a larger area. It is used in cartography and land surveys.
(ii) Stereoscope is an optical device that enables the viewing of overlapping aerial photographs in three dimensions, enhancing depth perception for terrain analysis.
(iii) Camera station refers to the exact location where a camera is positioned when capturing an image, influencing perspective and scale in photography.
(iv) Principal point is the geometric center of an aerial photograph where light rays converge, serving as a reference for map corrections and photogrammetry.

4. (a) Identify four problems associated with a poorly formulated hypothesis.

i. Lack of clear direction leads to confusion in data collection, making it difficult to focus on relevant information.
ii. Weak research objectives result in vague findings that do not contribute to meaningful conclusions.
iii. Difficulties in testing arise when a hypothesis is too broad or lacks measurable variables, making validation impossible.
iv. Misinterpretation of results occurs due to an unclear or ambiguous hypothesis, leading to incorrect conclusions and unreliable recommendations.

(b) Describe six uses of research.

i. Research helps in problem-solving by identifying solutions to economic, social, and environmental challenges.
ii. It enhances knowledge by expanding understanding of scientific, historical, and technological advancements.
iii. Policy formulation relies on research findings to guide decision-making in governance, health, and education sectors.
iv. Economic planning benefits from research by assessing market trends, production efficiency, and consumer behavior.
v. Environmental conservation uses research to monitor climate change, biodiversity loss, and pollution control strategies.
vi. Technological innovation is driven by research in engineering, medicine, and information technology, leading to advancements in various industries.

(c) Why is it crucial for a researcher to identify a site before the actual research? Give three reasons.

i. Site selection ensures accessibility and feasibility, allowing researchers to determine logistics, resources, and potential challenges.
ii. It helps in defining the study scope by ensuring that the chosen location aligns with research objectives and provides relevant data.
iii. Ethical considerations require prior assessment to ensure minimal disruption to communities, ecosystems, and historical sites during research activities.

5. Describe five environmental problems facing the coastal areas and four measures to be taken so as to overcome them.

i. Coastal erosion is a major problem caused by strong waves, storms, and rising sea levels, leading to loss of land and destruction of property.
ii. Pollution from industrial discharge, oil spills, and plastic waste degrades marine ecosystems and threatens aquatic life.
iii. Overfishing reduces fish populations, disrupts the food chain, and affects the livelihoods of local fishing communities.

iv. Habitat destruction due to coastal development, tourism activities, and mangrove deforestation leads to loss of biodiversity.
v. Climate change contributes to rising sea levels, increased storm intensity, and unpredictable weather patterns that impact coastal settlements.

measures
i. Coastal vegetation restoration, including mangrove replanting, helps to stabilize shorelines and protect against erosion.
ii. Implementing strict pollution control regulations prevents industrial and domestic waste from contaminating coastal waters.
iii. Sustainable fishing practices, such as regulated catch limits and marine conservation zones, help protect fish stocks and ecosystems.
iv. Constructing sea walls and artificial reefs reduces the impact of strong waves and prevents further land loss in coastal regions.

6. Explain eight human activities that degrade wetlands.

i. Agricultural expansion leads to wetland drainage for farming, reducing water retention and biodiversity.
ii. Urbanization results in land reclamation, where wetlands are converted into residential and industrial areas.
iii. Deforestation near wetlands alters water flow, leading to increased sedimentation and loss of wetland functions.
iv. Pollution from chemicals, fertilizers, and industrial waste contaminates wetland water, affecting plant and animal life.
v. Overgrazing by livestock in wetland areas damages vegetation, reducing soil stability and increasing erosion.
vi. Unregulated fishing and hunting disrupt wetland ecosystems, leading to imbalances in species populations.
vii. Mining activities, especially sand and peat extraction, cause habitat destruction and alter water flow in wetlands.
viii. Construction of dams and drainage systems interferes with the natural water cycle, reducing wetland areas and altering hydrological balance.

7. (a) Describe the following terms.

(i) Soil (PH) refers to the measure of acidity or alkalinity of soil, expressed on a scale from 0 to 14, where lower values indicate acidic soil, and higher values indicate alkaline soil.
(ii) Soil temperature is the measure of heat content in the soil, which influences biological activity, seed germination, and microbial processes.
(iii) Cation exchange in soil is the process where positively charged ions (cations) such as calcium, magnesium, and potassium are exchanged between soil particles and plant roots, affecting soil fertility.
(iv) Soil catena is a sequence of soils that occur along a slope, displaying variations in moisture, texture, and composition due to differences in drainage and erosion.

(b) Explain the importance of each item in (a) above.

i. Soil pH influences nutrient availability and microbial activity, affecting plant growth and soil fertility.
ii. Soil temperature regulates seed germination, microbial decomposition, and nutrient cycling, influencing crop productivity.
iii. Cation exchange capacity determines the soil's ability to retain and supply essential nutrients for plant growth.
iv. Soil catena helps in understanding soil formation, erosion patterns, and water movement, guiding land use planning and conservation practices.

8. With examples, examine eight values of rocks to humankind.

i. Construction materials such as granite and limestone are used in building roads, bridges, and houses.
ii. Energy production relies on fossil fuels like coal and petroleum, which originate from sedimentary rocks.
iii. Agriculture benefits from phosphate rocks, which are processed into fertilizers to improve soil fertility.
iv. Precious stones like diamonds, rubies, and sapphires are used in jewelry and industrial cutting tools.
v. Rock formations such as caves and mountains attract tourists, contributing to economic growth in many regions.
vi. Rocks store groundwater in aquifers, providing a crucial source of fresh water for domestic and industrial use.
vii. Industrial processes utilize minerals from rocks, such as bauxite for aluminum production and quartz for glass manufacturing.
viii. Some rocks have cultural and historical significance, serving as landmarks, religious sites, and archaeological heritage locations.

9. Describe the composition of the atmosphere and its functions to the universe.

i. The atmosphere is composed of nitrogen (78 percent), oxygen (21 percent), argon (0.93 percent), carbon dioxide (0.04 percent), and trace gases like neon and helium.
ii. It contains water vapor, which influences weather patterns, cloud formation, and precipitation cycles.
iii. The ozone layer within the atmosphere absorbs harmful ultraviolet radiation, protecting living organisms from excessive sun exposure.
iv. The atmosphere regulates temperature by trapping heat through the greenhouse effect, preventing extreme temperature variations.
v. It facilitates wind and air circulation, distributing heat and moisture across different regions, influencing climate and weather patterns.
vi. The atmosphere provides essential gases for respiration and photosynthesis, sustaining life on Earth.
vii. It acts as a shield against meteors and cosmic radiation, preventing harmful space debris from reaching the Earth's surface.
viii. Atmospheric pressure maintains the stability of ecosystems and allows for the existence of liquid water, essential for sustaining life.