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: 2016**

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 HANANG Sheet 84/4 provided then answer the following questions.

(a) Calculate the area covered by Lake Balangida in square kilometers.

i. Identify the lake boundary on the map.
ii. Count the number of full grid squares occupied by the lake. Each full grid represents 1 square kilometer.
iii. Estimate the partially occupied squares and sum them to form whole squares.
iv. The estimated area covered by Lake Balangida is approximately 6 square kilometers.

(b) What type of landscapes does the map depict?

i. The map depicts both highland and lowland landscapes, as seen from the presence of contour lines indicating hills and valleys.
ii. There are volcanic features, such as craters and hills, which suggest previous volcanic activity in the region.
iii. The presence of a salt lake (Lake Balangida) and soda deposits indicates a semi-arid landscape with limited surface drainage.
iv. The area features scattered vegetation and grasslands, signifying a dry savanna environment.

(c) Identify the type of drainage pattern of the mapped area.

i. The drainage pattern in the area is mainly a dendritic pattern, where rivers and streams branch out in a tree-like structure.
ii. Some sections of the map indicate an internal drainage system, as water collects in Lake Balangida rather than flowing outwards.
iii. There are seasonal streams and watercourses that flow only during rainy seasons, contributing to intermittent drainage.

(d) What are the three major indicators of climate in the area? Give evidence.

i. Presence of a salt and soda lake suggests high evaporation rates, indicating a semi-arid climate.
ii. Sparse vegetation cover, consisting mainly of shrubs and scattered trees, implies low rainfall and dry conditions.
iii. Seasonal rivers and intermittent streams show that precipitation is low and occurs only during certain times of the year.

(e) With evidence from the map, outline types of soil found in the area.

i. Sandy soils dominate the lowland areas, particularly near the lake shores, as indicated by loose surface deposits.
ii. Volcanic soils are found in highland regions, where past volcanic activity has contributed to soil formation.
iii. Clay soils occur in depressions and near watercourses, retaining moisture for longer periods.

(f) Explain four land uses in the mapped area.

i. Pastoralism is a key activity, as the presence of open grasslands supports livestock keeping.
ii. Salt extraction is evident near Lake Balangida, where salt and soda deposits are found.
iii. Small-scale farming is practiced in some fertile areas with access to water, particularly along riverbanks.
iv. Settlement and habitation occur in scattered locations, particularly near transport routes and water sources.

(g) A farmer was at grid reference 680160. He saw fire in the North East (4.2 kilometers).

(i) Find the grid reference position of the fire.

i. The farmer is at grid reference 680160.
ii. North East direction means moving diagonally up and right on the grid.
iii. Converting 4.2 km into map scale (assuming scale is 1:50,000), the distance is approximately 8.4 cm on the map.
iv. Moving 4.2 km diagonally from 680160, the approximate grid reference of the fire is around 684164.

(ii) Name the physical obstacles which the farmer will face if he walks in a straight line to the position of the fire.

i. Rocky outcrops and hills may obstruct direct movement, requiring the farmer to navigate around them.
ii. Seasonal streams and depressions could be barriers, especially if they have retained water.
iii. Dense vegetation in some parts may slow down movement and require detours.
iv. Loose sandy soils near the lake can make walking difficult, particularly in dry and windy conditions.

2. (a) Describe six shortcomings of using questionnaires in research data collection.

i. Low response rate can affect the reliability of the data, as some respondents may fail to return the questionnaires or provide incomplete responses.
ii. Misinterpretation of questions can occur since respondents may misunderstand the questions, leading to inaccurate or irrelevant answers.
iii. Lack of flexibility limits the ability of researchers to clarify or probe further responses, unlike in interviews where follow-up questions can be asked.
iv. Respondents may provide dishonest answers, either due to social desirability bias or lack of interest in the study.
v. Limited detail in responses is a challenge, as questionnaires often contain structured or closed-ended questions that do not allow for in-depth explanations.
vi. Some respondents may lack literacy skills, making it difficult for them to understand and fill out the questionnaire correctly, leading to poor data quality.

(b) Analyse advantages and disadvantages of the case study design.

advantages

i. Provides detailed and in-depth information about a specific event, group, or situation, allowing for a comprehensive understanding.
ii. Allows researchers to explore complex issues in real-life contexts, making it useful in qualitative research.
iii. Enables the use of multiple data collection methods such as interviews, observations, and documents, enhancing data validity.
iv. Helps generate new hypotheses and theories that can be tested in future studies.
v. Case studies can reveal patterns and relationships that may not be evident in broader studies.

disadvantages

i. Findings from a case study may not be generalized to a larger population, limiting its applicability beyond the specific case studied.
ii. Data collection and analysis can be time-consuming and resource-intensive, making case studies impractical for large-scale research.
iii. Subjectivity and researcher bias may influence the interpretation of results, as case studies often rely on qualitative data.
iv. Limited ability to establish cause-and-effect relationships due to the focus on specific contexts rather than broader trends.

3. (a) Explain five qualities and three limitations of prismatic compass survey.

qualities

i. Simple and portable, making it easy to carry and use in field surveys.
ii. Provides quick and direct readings of bearings, allowing for efficient data collection.
iii. Can be used in various terrains, including forests, hills, and open fields, where other methods may be difficult to apply.
iv. Works effectively even in areas with limited visibility, as it does not require long sightlines.
v. Can measure both forward and back bearings, ensuring accurate direction readings.

limitations

i. Affected by local attraction from magnetic materials, which can cause errors in readings.
ii. Less accurate compared to modern digital instruments like GPS, especially for precise surveying needs.
iii. Requires careful handling and leveling to avoid errors caused by tilting or misalignment of the instrument.

(b) Classify obstacles encountered in chain survey.
i. Overcoming physical obstacles such as rivers, hills, and dense vegetation that may block measurement paths.

ii. Avoiding human-made obstructions like buildings, roads, and fences that interfere with chaining and ranging.
iii. Addressing visibility limitations due to fog, mist, or dense forests that hinder sighting between survey points.
iv. Managing errors caused by uneven terrain, which may affect accuracy when taking linear measurements over slopes or depressions.
4. Study carefully the following photograph and answer the questions that follow.

(a) Name the type of photograph.

i. The photograph is a ground-level or terrestrial photograph. It is taken from a position on the ground and provides a clear view of the landscape, vegetation, and wildlife in the foreground and background.

(b) Explain three basic techniques for interpreting the type of the photograph named in (a) above.

i. Identification involves recognizing features such as trees, animals, and landforms to understand the subject of the photograph.
ii. Classification groups similar features together, such as differentiating between vegetation types, animal species, or landforms.
iii. Comparison involves analyzing the relationship between elements in the photograph, such as the interaction between animals and their environment.

(c) Identify the major economic activity that might take place in the area.

i. The major economic activity in the area is wildlife tourism, which includes game viewing, safaris, and ecotourism. The presence of wild animals such as zebras and buffaloes indicates that the area is likely a national park or a game reserve.

(d) Describe four factors that favor the development of the major economic activity in (c) above.

i. Rich biodiversity attracts tourists, as the area has a variety of wildlife species that are of interest to visitors.
ii. Availability of protected areas such as national parks and game reserves ensures the conservation of wildlife, promoting sustainable tourism.
iii. Favorable climate with open savanna landscapes and seasonal water sources supports diverse wildlife populations, making the area ideal for safaris.
iv. Government policies and investment in tourism infrastructure, such as lodges, roads, and ranger services, enhance accessibility and visitor experience.

(e) Briefly describe the natural causes of loss of biodiversity in the area.

i. Climate change affects biodiversity by altering rainfall patterns, leading to habitat loss and water scarcity for animals.

ii. Natural disasters such as droughts and wildfires reduce vegetation cover, impacting food sources for herbivores and disrupting ecosystems.
iii. Predation and competition among species can lead to the decline or extinction of certain animal populations, affecting biodiversity balance.
iv. Diseases and epidemics spread among wildlife populations, reducing species numbers and affecting ecosystem stability.

(f) With evidence from the photograph, describe parts of the given photograph.

i. The foreground contains large herbivores such as buffaloes and zebras, which are grazing in the open savanna.
ii. The middle ground features trees with sparse canopies, indicating a semi-arid or savanna environment.
iii. The background consists of more trees and open land, suggesting the presence of an extended wildlife conservation area.

(g) Name three possible places in Tanzania where the photograph might have been taken.

i. Serengeti National Park, known for its diverse wildlife and the Great Migration of herbivores.
ii. Ngorongoro Conservation Area, which hosts a large number of wild animals in a protected ecosystem.
iii. Tarangire National Park, famous for its herds of elephants, baobab trees, and seasonal water sources attracting wildlife.

5. Explain eight factors responsible for the occurrence of river regime.

i. Climate influences river flow, with wet seasons increasing discharge and dry seasons reducing water levels.
ii. Seasonal rainfall patterns affect river regimes, with monsoonal regions experiencing peak flows during rainy periods.
iii. Temperature variations impact river flow, as snowmelt in cold regions contributes to increased discharge in warmer months.
iv. Vegetation cover regulates runoff by absorbing and releasing water gradually into rivers.
v. Soil type affects infiltration, with sandy soils allowing more absorption and clay soils increasing surface runoff.
vi. Human activities such as deforestation and dam construction alter natural river flow patterns.
vii. River gradient determines the speed of water flow, with steeper slopes leading to higher velocities and increased erosion.
viii. Geological structure influences water retention, as porous rocks enhance groundwater recharge and reduce surface runoff.

6. Analyse the causes of the plate's movements of the lithosphere.

i. Convection currents in the mantle generate heat-driven movements, pushing plates apart or pulling them together.

ii. Slab pull occurs when denser oceanic plates sink into the mantle, pulling the rest of the plate along.
iii. Ridge push happens at mid-ocean ridges, where newly formed crust pushes older crust away, causing movement.
iv. Mantle plumes create hot spots that cause localized plate movements and volcanic activity.
v. Gravitational forces influence the sinking and subduction of plates into deeper mantle layers.
vi. Earth's rotation and tidal forces contribute to minor shifts in plate movement over long periods.

7. Describe five meteorological and edaphic effects on global vegetation variations.

meteorological effects

i. Temperature influences plant growth, with cold climates supporting coniferous forests and warm climates favoring tropical rainforests.
ii. Rainfall determines vegetation density, with high precipitation areas hosting dense forests and arid regions supporting sparse vegetation.
iii. Wind affects plant structure, with strong winds shaping trees in coastal and mountainous areas.

edaphic effects

i. Soil fertility impacts vegetation growth, with nutrient-rich soils supporting dense plant cover and infertile soils limiting growth.
ii. Soil moisture availability determines plant survival, as drought-prone areas support xerophytic plants adapted to dry conditions.

8. Examine eight adaptive features of plants to desert hostile environments.

i. Deep root systems enable plants to access underground water sources.
ii. Thick waxy cuticles reduce water loss by minimizing transpiration.
iii. Small or needle-like leaves lower the surface area exposed to heat and evaporation.
iv. Succulent tissues store water for extended periods.
v. Dormancy allows plants to survive unfavorable conditions and resume growth when water is available.
vi. Reflective leaf surfaces help deflect excess sunlight and reduce heat absorption.
vii. Rapid germination ensures seeds sprout quickly after rainfall to complete their life cycle.
viii. CAM photosynthesis allows plants to open stomata at night, reducing water loss during the day.

9. Describe volcanoes according to their mode of formation.

i. Shield volcanoes form from fluid lava flows that spread over large areas, creating broad, gently sloping landforms. Mauna Loa in Hawaii is an example.
ii. Composite volcanoes develop from alternating layers of lava and ash, leading to steep-sided mountains like Mount Fuji in Japan.
iii. Cinder cone volcanoes consist of volcanic debris that accumulates around a vent, forming small, steep-sided cones such as Paricutin in Mexico.

iv. Dome volcanoes result from viscous lava that piles up near the vent, forming dome-shaped structures like Mount St. Helens' lava domes.
v. Caldera volcanoes form when a magma chamber collapses after an eruption, creating a large depression, as seen in Yellowstone Caldera in the USA.