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: 2012**

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 UYOLE Sheet 245/3 then answer the questions that follow.

a. What is the length of the road from grid 680070 to grid 596164

The length of the road is measured using a ruler and then converted using the given map scale. If the map scale is 1:50,000, the distance on the map is multiplied by 50,000 to get the real-world distance. If the road is curved, a thread can be used to trace its path, then the thread's length is measured and converted.

b. Measure the area of Poroto Ridge Forest Reserve in km²

The area is estimated using a grid square method. Each full square covered by the forest reserve represents a known area based on the map scale. Partial squares are counted as fractions and summed up to estimate the total area in km².

c. With vivid evidence from the map, suggest the main economic activities of the area

i. Agriculture – The presence of large cultivated fields and rural settlements indicates crop farming and livestock keeping.
ii. Forestry – The existence of Poroto Ridge Forest Reserve suggests forestry activities such as logging and conservation.
iii. Transportation and trade – The road network and railway line show movement of goods and people, implying trade and commerce.
iv. Mining – If quarry sites or mineral extraction points are marked, mining activities are present.
v. Fishing – If lakes, rivers, or fish ponds are indicated, fishing contributes to the economy.

d. Describe the settlement pattern found in the area

i. Linear settlements – Settlements are aligned along roads and rivers, indicating accessibility-based development.
ii. Nucleated settlements – Some areas may have clustered settlements around trading centers, showing centralized economic activities.
iii. Scattered settlements – In rural areas, houses may be dispersed due to farming activities and land availability.

e. Identify the features found in the following grid readings

i. 690110 – The feature at this grid reference could be a hill, river, school, or another landmark based on the map legend.
ii. 579145 – This location may contain a village, road junction, or forested area.
iii. 674063 – A river, plantation, or built-up area could be found here.
iv. 553123 – The feature might be a valley, contour lines indicating elevation, or a swamp.

f. With evidence from the map, analyze the geological structure of the area

i. Presence of contour lines – Closely spaced contour lines indicate mountainous or hilly terrain, while widely spaced contours suggest gentle slopes.

ii. Rivers and drainage patterns – The dendritic pattern suggests uniform rock structure, while trellis or rectangular drainage indicates faulting.

iii. Presence of ridges and valleys – These features indicate tectonic activities like faulting and folding.

iv. Rock formations – If cliffs or escarpments are present, they suggest resistant rock layers.

v. Soil and vegetation distribution – Areas with dense forests indicate fertile volcanic or alluvial soils, while barren areas suggest rocky terrain.

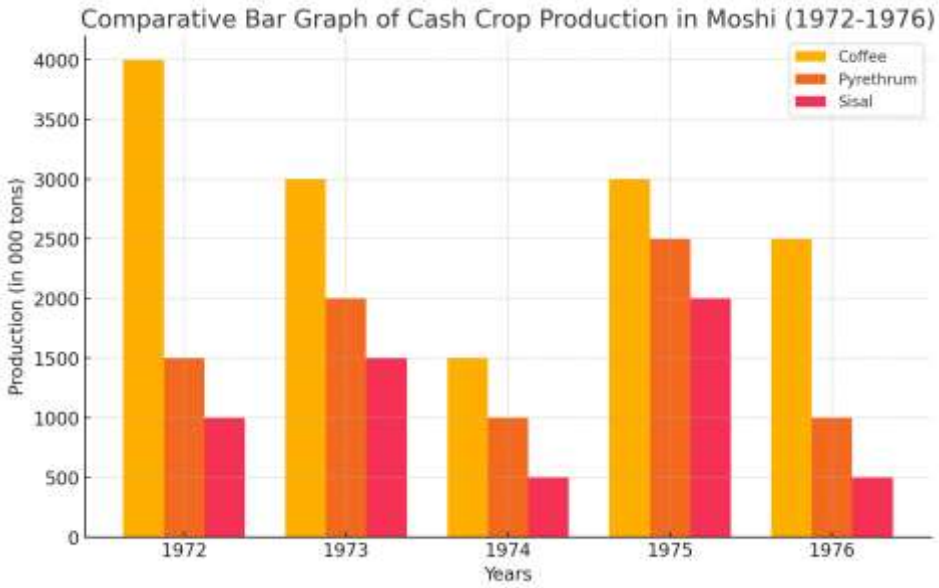
2. Study carefully the following hypothetical data and answer the questions that follow.

Cash crop production in Moshi district from 1972 to 1976 (in '000 tones)

CROP/YEAR	1972	1973	1974	1975	1976
Coffee	4000	3000	1500	3000	2500
Pyrethrum	1500	2000	1000	2500	1000
Sisal	1000	1500	500	2000	500

a. Draw a comparative bar graph to represent the data given.

A comparative bar graph is drawn by plotting the years on the x-axis and the crop production (in thousand tons) on the y-axis. Each year has three bars representing coffee, pyrethrum, and sisal. The bars are placed side by side to compare the values of different crops in each year.



b. Describe the merits and demerits of comparative bar graphs.

Merits:
i. Easy comparison – It allows direct comparison between different crops for each year.
ii. Simple to interpret – The differences in height of the bars make trends visible.
iii. Shows multiple variables – It enables the display of multiple datasets in one graph.
iv. Useful for trend analysis – The changes over time can be clearly observed.

Demerits:
i. Limited data capacity – It becomes cluttered if too many categories are included.
ii. Difficult to read when values are similar – Bars may overlap, making small differences hard to notice.
iii. Does not show precise trends – Unlike line graphs, bar graphs do not illustrate continuous trends.

3. a. Differentiate the Prismatic Compass Survey and Chain Survey.

i. Prismatic Compass Survey – It is a method of surveying that uses a prismatic compass to measure bearings and distances of objects from a given station. It is mainly used in areas where direct measurements are difficult, such as forests and hilly terrain.

ii. Chain Survey – This is a type of land surveying that involves measuring distances using a chain or tape. It is most suitable for small, open, and level areas where direct measurement is possible.

Key Differences:
- Prismatic compass survey measures angles using bearings, while chain survey measures linear distances.
- Prismatic compass survey is used in areas with obstructions, while chain survey requires open land.
- Chain survey is more accurate for measuring short distances, while prismatic compass survey helps in navigating terrain.

b. What is Leveling? Explain four importance of leveling in fieldwork.

Leveling is the process of determining height differences between points on the earth's surface using instruments such as a dumpy level, tilting level, or automatic level.

Importance of leveling in fieldwork:
i. Helps in construction – It is used in road construction, dam construction, and building foundations.
ii. Used in agriculture – It assists in designing proper irrigation channels.
iii. Determines land slopes – Helps in drainage and flood prevention by identifying land inclinations.
iv. Provides data for mapping – It is essential for contour mapping and determining elevation differences.

4. Study carefully the photograph given below and answer the questions that follow.

a. Name the type of the photograph.

This is a ground-level photograph.

b. Describe four characteristics of the type of the photograph named in part (a) above.

i. Taken from a low angle – The photograph is captured from a ground-level perspective.
ii. Shows a limited area – Unlike aerial photographs, it only covers a small portion of the landscape.
iii. Objects appear natural – The photograph presents objects in their actual appearance and proportion.
iv. Has a defined foreground, middle ground, and background – Features are distinguishable by distance.

c. Identify the natural features seen in the photograph.

i. Sand/beach – The presence of sandy ground.
ii. Water body – Possibly an ocean or lake in the background.
iii. Vegetation – There may be scattered trees or coastal plants.

d. At what time was the photograph taken? Give two reasons.

The photograph was taken during the daytime.

Reasons:
i. Presence of shadows – The sun casts visible shadows on objects.
ii. Bright lighting – The photograph has clear visibility, suggesting sunlight illumination.

e. With reasons, suggest the major economic activities taking place in the area.

i. Tourism – The presence of beach huts indicates a recreational area for visitors.
ii. Fishing – The proximity to a water body suggests that fishing may be a primary activity.
iii. Transportation – Boats or ferries could be used for moving people and goods.
iv. Trade – Beach areas often have small-scale businesses catering to tourists.

5. Explain the various processes involved in soil formation

I. Weathering
Soil formation begins with the breakdown of parent rock materials through physical, chemical, and biological weathering. Physical weathering includes processes such as temperature changes, frost action, and wind erosion, which break rocks into smaller particles. Chemical weathering involves reactions with water, oxygen, and acids to decompose minerals, while biological weathering occurs through the action of plant roots and microorganisms that release acids and enzymes.

II. Organic Matter Accumulation

As plants and animals die, their remains decompose, enriching the soil with organic matter. This process improves soil structure, increases fertility, and enhances moisture retention, which is essential for plant growth.

III. Leaching
Water movement through soil washes away soluble minerals and nutrients from the upper layers to lower horizons. This process influences soil fertility and leads to the development of distinct soil layers known as soil horizons.

IV. Translocation
Movement of soil materials within the profile due to water and gravity results in the redistribution of nutrients and minerals. Clay, iron, and organic compounds may be moved from one layer to another, affecting soil composition and texture.

V. Humification
Organic matter is converted into humus, a dark, stable component of soil rich in nutrients. Humus enhances soil fertility, improves aeration, and retains moisture, which supports plant growth.

VI. Soil Compaction and Cementation
As particles settle over time, pressure and chemical reactions bind them together. This process helps in the development of soil structure and stability, making the soil resistant to erosion.

6. With specific examples, enumerate nine importances of rivers in Africa

I. Water Supply
Rivers provide fresh water for domestic, industrial, and agricultural use. For example, the Nile River supplies water to millions of people in Egypt and Sudan.

II. Hydroelectric Power Generation
Major rivers such as the Congo and Zambezi Rivers support the generation of hydroelectric power, which is essential for economic development and industrialization.

III. Transportation and Trade
Rivers serve as natural transport routes, facilitating the movement of goods and people. The Niger River is crucial for trade in West Africa.

IV. Irrigation for Agriculture
Rivers provide water for irrigation, ensuring food production in arid and semi-arid regions. The Nile River supports agriculture in Egypt through extensive irrigation systems.

V. Fishing Industry
Many communities depend on rivers for fish as a source of food and income. The Senegal River supports large-scale fishing industries in West Africa.

VI. Tourism and Recreation
Rivers attract tourists for activities such as boat riding, rafting, and wildlife viewing. The Victoria Falls on the Zambezi River is a major tourist attraction in Zambia and Zimbabwe.

VII. Biodiversity and Ecosystems
Rivers support diverse flora and fauna, serving as habitats for aquatic life and wildlife. The Okavango River sustains the Okavango Delta, one of the richest ecosystems in Africa.

VIII. Industrial Use
Many industries rely on river water for cooling, processing, and waste disposal. The Limpopo River provides water to industries in South Africa and Mozambique.

IX. Cultural and Religious Significance
Many African cultures view rivers as sacred and use them for rituals and spiritual ceremonies. The Nile River has deep historical and religious significance for various civilizations.

7. Discuss the environmental impacts of greenhouse effect and global warming

I. Rising Global Temperatures
Increased greenhouse gases trap more heat in the atmosphere, leading to higher temperatures. This causes heatwaves and alters weather patterns, affecting agriculture and human health.

II. Melting of Ice Caps and Glaciers
Global warming accelerates ice melting in polar and mountainous regions, raising sea levels. This threatens coastal cities such as Lagos and Alexandria with flooding and erosion.

III. Changes in Rainfall Patterns
Some regions experience increased rainfall and floods, while others suffer prolonged droughts. The Sahel region of Africa has faced severe droughts due to changing climate patterns.

IV. Loss of Biodiversity
As temperatures rise and habitats change, many species struggle to adapt, leading to extinction risks. Coral reefs, such as those in the Indian Ocean, are affected by rising sea temperatures.

V. Desertification
Higher temperatures increase soil evaporation, reducing soil moisture and causing land degradation. The Sahara Desert is expanding southward, affecting agriculture in the Sahel region.

VI. Increased Frequency of Natural Disasters
Storms, cyclones, and wildfires have become more frequent and intense due to climate change. In 2019, Cyclone Idai caused massive destruction in Mozambique, Malawi, and Zimbabwe.

VII. Ocean Acidification

Higher carbon dioxide levels make oceans more acidic, affecting marine life, especially shellfish and coral reefs. This disrupts the fishing industry in coastal regions.

VIII. Health Impacts
Rising temperatures contribute to the spread of diseases such as malaria and dengue fever, as mosquitoes thrive in warmer conditions.

8. Justify the sphericity of the planet earth with vivid evidences

I. Satellite Images
Photos taken from space show that the Earth is a sphere, with a curved surface visible in every direction.

II. Horizon Appearance
When observing a ship at sea, the lower parts disappear first before the top, indicating a curved surface.

III. The Shadow of the Earth on the Moon
During a lunar eclipse, the Earth casts a round shadow on the Moon, proving its spherical shape.

IV. Circumnavigation
Travelers can move around the Earth and return to the starting point without falling off, confirming its roundness.

V. Variation in the Visibility of Stars
Certain stars are visible only from specific locations, indicating that the Earth's curved surface obstructs views.

VI. The Shape of Other Planets
Observations of other planets, which are all spherical, suggest that the Earth follows the same natural law.

VII. Gravitational Consistency
Gravity pulls objects toward the center of mass, resulting in a spherical shape due to equal distribution of force.

VIII. Time Zone Differences
As the Earth rotates, different regions experience daylight and night at different times, proving its roundness.

9. Classify igneous rocks according to the place of occurrence and the chemical composition

I. According to the Place of Occurrence

A. Intrusive Igneous Rocks
These rocks form beneath the Earth's surface when magma cools slowly, resulting in large crystals. Examples include granite and diorite.

B. Extrusive Igneous Rocks
These rocks form on the Earth's surface from lava that cools quickly, producing fine-grained structures. Examples include basalt and pumice.

II. According to Chemical Composition

A. Acidic Igneous Rocks
These rocks have a high silica content and are rich in quartz and feldspar, making them lighter in color. Examples include granite and rhyolite.

B. Basic Igneous Rocks
These rocks contain less silica and more iron and magnesium, making them darker and denser. Examples include basalt and gabbro.

C. Intermediate Igneous Rocks
These rocks have a balanced composition of silica, iron, and magnesium. Examples include andesite and diorite.

D. Ultrabasic Igneous Rocks
These rocks contain very low silica but high amounts of iron and magnesium. Examples include peridotite and dunite.