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: 1995**

Instructions

1. This paper consists of section A, and B with total of 13 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. (a) (i) Differentiate between Magnetic North, True North and Grid North.

Magnetic North is the direction that a magnetic compass points towards, which aligns with the Earth's magnetic field. It constantly changes due to variations in the Earth's core.

True North is the direction pointing towards the geographic North Pole, which is a fixed point on the Earth's surface. It does not change over time.

Grid North is the direction of the vertical grid lines on a map projection, typically used in topographic mapping. It may slightly differ from True North due to the map projection system used.

(ii) By comparing a 1:25,000 and 1:50,000 map scale show the usefulness of scales in map reading and interpretation.

A 1:25,000 scale map provides more detail than a 1:50,000 scale map because it represents a smaller area with greater accuracy.

- A 1:25,000 map is useful for urban planning, navigation, and military operations where high detail is required.
- A 1:50,000 map covers a larger area with less detail, making it suitable for regional planning and travel.
- The choice of scale depends on the purpose of the map; detailed activities require a larger scale, while broader overviews require a smaller scale.

(b) Study the map extract of part of Tanzania – KILWA KIVINJE (Sheet 256/2) provided and answer the following questions.

(i) Calculate the area covered by cashew nut plantations.

To determine the area of cashew nut plantations:
- Identify the cashew nut plantation symbols on the map.
- Use the grid square method to estimate the total area.
- Multiply the number of squares by the area represented by each square based on the scale.

(ii) Comment on the drainage pattern of the area.

The drainage pattern is determined by the arrangement of rivers and streams in the area.
- If rivers form a branching pattern, it is dendritic drainage, which occurs in areas with uniform rock structures.
- If streams flow parallel to each other, it is trellis drainage, which forms in folded terrain.
- Radial drainage occurs where rivers flow outward from a central highland, such as a mountain.
- The presence of swamps or marshes indicates poor drainage in certain areas.

(iii) With evidence from the map show how the vegetation is related to climate.

Vegetation distribution is influenced by climate conditions such as rainfall and temperature.
- Dense forests or mangroves near the coast suggest high rainfall and humid conditions.
- Grasslands or savanna areas indicate moderate rainfall and seasonal variations.
- Sparse vegetation or desert-like conditions suggest arid or semi-arid climates.
- The presence of agricultural plantations suggests a climate suitable for farming.

(iv) Calculate the length of the all-weather road between Grid references 292497 and 287570.
To calculate the road length:
- Measure the distance between the two grid references using a ruler or string.
- Convert the measured distance into real-world units using the map scale.
- If the road has curves, use a flexible material to measure accurately.
(v) Account for the distribution of population in the area shown.

Population distribution is influenced by several factors:
- Coastal areas and riverbanks have higher population densities due to access to water and trade.
- Flat and fertile areas support agriculture, leading to higher settlement densities.
- Mountainous or rugged terrain discourages settlement due to difficult living conditions.
- Roads and infrastructure encourage settlements along transportation routes.

(vi) What type of landscape does the map depict?

The landscape type can be classified based on topography and features observed on the map:
- If contour lines are closely spaced, the area is mountainous or hilly.
- If contour lines are widely spaced, it indicates plains or lowlands.
- Presence of rivers, valleys, and ridges suggest a structurally controlled landscape.

(vii) Name the area where outcrop rock is predominant.

Outcrop rock areas are identified by symbols representing exposed bedrock or rocky terrain. These areas are usually found in highland regions, escarpments, or near riverbanks where erosion has exposed underlying rock.

(viii) With evidence from the map name economic activities which can be carried out in the area.

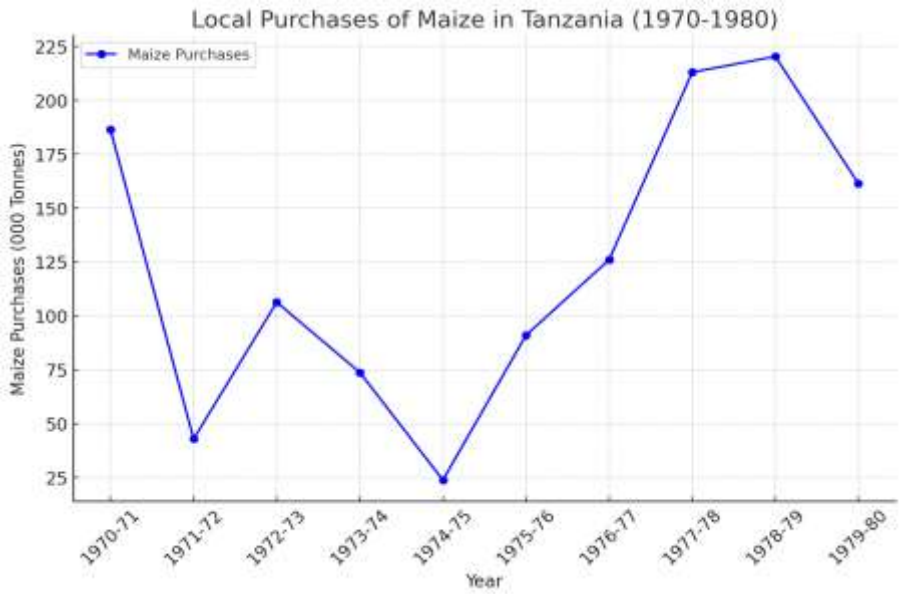
Possible economic activities include:
- Agriculture, indicated by cashew nut plantations and cultivated land.
- Fishing, due to the presence of rivers, lakes, or coastal regions.
- Trade, supported by market centers and transport networks.
- Forestry, if there are large forested areas.
- Tourism, if the map shows historical sites, parks, or coastal attractions.

2. Study table 1 provided below and then answer the questions that follow.

TABLE 1: TANZANIA – LOCAL PURCHASES OF MAIZE DURING 1970 – 1980

YEAR	PURCHASE (000 TONNES)
1970 - 71	186.4
1971 - 72	43.0
1972 - 73	106.4
1973 - 74	73.8
1974 - 75	23.9
1975 - 76	91.1
1976 - 77	126.1
1977 - 78	213.1
1978 - 79	220.4
1979 - 80	161.5

(i) Show the purchase of maize from 1970 – 1980 by a divergent line graph.



(ii) Give a statement on the trend of the purchases.

- The maize purchases show significant fluctuations over the years.
- There is a sharp decline in 1971 – 72 and 1974 – 75, possibly due to droughts or poor harvests.
- Purchases increased steadily from 1975 onwards, reaching the highest levels in 1978 – 79.
- The trend suggests variability in agricultural production, influenced by weather conditions, policies, and demand.

(iii) What are the advantages and disadvantages of this method?

Advantages of line graphs:
- Clearly show trends over time.
- Easy to compare changes in maize purchases across years.
- Useful for identifying periods of growth and decline.

Disadvantages of line graphs:
- Cannot explain the reasons behind changes.
- Large fluctuations may make interpretation difficult.
- Small variations may be exaggerated depending on scale used.

3. Describe how Isopleth maps are constructed. Name the disadvantages of Isopleth maps.

Isopleth maps are created by:
- Collecting data at various points, such as temperature or rainfall readings.
- Drawing lines to connect points of equal value, creating isopleths or contour-like representations.
- Interpolating values between known points to refine the map.

Disadvantages of Isopleth maps:
- Require accurate data collection for meaningful representation.
- Cannot be used for discrete data, only continuous variables like temperature or elevation.
- Small-scale variations may not be represented accurately.

4. Describe the equipment used in Plane table survey. How does Plane Table survey differ from Compass survey?

Equipment used in Plane Table survey includes:
- Plane table: A flat board mounted on a tripod for field mapping.
- Alidade: A sighting device used to take angles and bearings.
- Compass: Determines the north direction for orientation.
- Spirit level: Ensures the table is properly leveled.
- Measuring tape: Used for direct distance measurements.

Differences between Plane Table survey and Compass survey:
- Plane table survey allows direct plotting of features in the field, while compass survey requires separate calculations.
- Plane table survey is more visual and interactive, while compass survey relies on bearing measurements.
- Compass survey is affected by magnetic variations, while plane table survey depends more on sighting accuracy.

5. Show the interplay of climate, topography and parent material in soil development.

Soil development is influenced by climate, topography, and parent material, which interact to determine the soil's characteristics and fertility.

- Climate affects soil formation through temperature and precipitation. High rainfall leads to leaching of minerals, creating acidic soils, while low rainfall results in salt accumulation and arid soils. Temperature influences the rate of weathering, where warmer climates accelerate chemical weathering and colder climates promote physical weathering.
- Topography determines drainage and erosion. Steep slopes experience rapid erosion, leading to thin, less fertile soils, while flat areas allow for deep soil formation. Poorly drained depressions can accumulate organic material, forming fertile soils.
- Parent material is the original rock or sediment from which soil forms. Granite produces sandy soils, while basalt leads to fertile clay-rich soils. The mineral composition of parent material influences soil texture, structure, and nutrient availability.

6. Account for the structural development of springs.

Springs form when groundwater emerges naturally from the Earth's surface due to geological conditions. Their structural development depends on rock formations, pressure, and water table levels.

- Permeable and impermeable rock layers control groundwater movement. When water percolates through porous rocks and reaches an impermeable layer, it is forced to the surface, forming a spring.
- Faults and fractures in rocks create pathways for underground water to flow towards the surface. Springs commonly occur along fault lines where rock displacement provides an escape route for water.
- Pressure differences lead to artesian springs, where water is trapped between impermeable layers and rises to the surface under pressure.
- Karst landscapes develop springs due to the dissolution of limestone, forming underground caves and channels that direct water to the surface.

7. Define the following terms:
(a) Canyon
A canyon is a deep, narrow valley with steep sides, typically formed by river erosion over millions of years. It develops in regions with resistant rock layers, where vertical erosion by rivers cuts deep into the landscape. Famous examples include the Grand Canyon in the USA and Fish River Canyon in Namibia.

(b) Estuarine coast
An estuarine coast is a coastal region where a river meets the sea, creating a mix of freshwater and saltwater. These coasts are characterized by tidal mudflats, sandbars, and estuaries, which support diverse ecosystems. Estuarine coasts are important for fisheries, shipping, and biodiversity, such as the Rufiji Delta in Tanzania.

(c) Superimposed drainage

Superimposed drainage occurs when a river maintains its original course despite encountering resistant rock structures. The river cuts through geological barriers, creating deep gorges or valleys that seem to ignore the underlying rock structure. This happens when a river develops on a higher sedimentary surface and later erodes down into older resistant formations.

(d) Antecedent drainage
Antecedent drainage refers to a river that existed before the uplift of land and continues to flow along its original course despite geological changes. The river erodes through rising landforms, forming deep gorges and canyons. Examples include the Indus River cutting through the Himalayas and the Colorado River in the Grand Canyon.
8. With examples from Africa show the importance of river regime studies.

River regime studies analyze variations in river discharge over time, helping in water management, agriculture, and flood control.

- In the Nile River, understanding seasonal flow variations is crucial for irrigation in Egypt and Sudan, ensuring water availability during dry seasons.
- The Congo River has a stable flow due to its equatorial location, making it vital for hydroelectric power generation in countries like the Democratic Republic of Congo.
- Seasonal rivers such as the Limpopo experience dry and wet season variations, requiring regulation to prevent droughts and flooding.
- Studying river regimes in semi-arid regions like the Orange River helps in designing sustainable water storage and distribution systems.

9. Examine the significance of temperature change in mechanical weathering.

Mechanical weathering is the physical breakdown of rocks without chemical changes, and temperature fluctuations play a major role in this process.

- Frost action occurs when water seeps into rock cracks, freezes, and expands, exerting pressure that breaks the rock apart. This is common in cold regions with seasonal freeze-thaw cycles.
- Thermal expansion causes rocks to crack due to repeated heating and cooling. In deserts, high daytime temperatures cause rock surfaces to expand, while rapid cooling at night leads to contraction, resulting in exfoliation.
- Granular disintegration happens when different minerals in a rock expand and contract at different rates, weakening the structure and causing it to break apart.
- Temperature-driven mechanical weathering accelerates the breakdown of rocks, contributing to soil formation and landscape changes over time.

10. Explain the process of faulting and its effect on the surrounding landscape.

Faulting is the fracturing of the Earth's crust due to tectonic forces, leading to displacement of rock layers. It occurs when stress exceeds the strength of rocks, causing sudden movements along fault lines.

- Normal faults occur when tension forces pull rocks apart, causing one block to drop relative to another. This forms features like rift valleys, such as the East African Rift Valley.
- Reverse faults result from compressional forces, pushing one block over another, creating fold mountains like the Atlas Mountains.
- Strike-slip faults occur when rocks move horizontally along a fault line, such as the San Andreas Fault in California.
- Faulting leads to earthquakes, changes in river courses, formation of escarpments, and creation of natural springs along fault lines.

Give the life history of a temperate depression and describe the weather conditions associated with the passage of this depression.

11. A temperate depression is a low-pressure system that develops in mid-latitudes, bringing unstable weather conditions. Its life cycle includes:

- Formation occurs when warm tropical air meets cold polar air, creating a front with rising warm air.
- Maturity sees the development of well-defined warm and cold fronts, leading to cloud formation and precipitation.
- Occlusion happens when the cold front overtakes the warm front, lifting warm air entirely above the surface and causing intense rainfall.
- Dissipation occurs when the energy of the depression weakens, and pressure stabilizes.

Weather conditions associated with temperate depressions include:
- Heavy rainfall and thunderstorms along the warm front.
- Cloud cover and drizzle in the warm sector.
- Intense downpours and strong winds at the cold front.
- Clear skies and cool temperatures after the depression passes.

12. Account for the differences between Equatorial and Monsoon forests.

Equatorial forests and monsoon forests differ in their climate, vegetation, and seasonal characteristics.

- Equatorial forests, such as the Amazon and Congo rainforests, have a hot and humid climate with high rainfall throughout the year. Vegetation is dense, evergreen, and includes tall trees like mahogany and ebony.
- Monsoon forests, found in South and Southeast Asia, experience distinct wet and dry seasons. Trees shed leaves in the dry season to conserve water. Vegetation includes teak, sal, and bamboo, which are adapted to seasonal changes.

- Equatorial forests have continuous biological activity due to stable conditions, while monsoon forests undergo seasonal growth and dormancy.
- Soil fertility is higher in monsoon forests due to seasonal leaf shedding, while equatorial forests have nutrient-poor soils due to rapid decomposition and leaching.

These differences influence the biodiversity, human activities, and conservation strategies in each forest type.