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: 2002**

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. Study the map extract of part of KENYA – NYAKWERE provided and answer the following questions.

(a) The compass bearings taken from a fishing boat to Samgoro hill and Pump house GR 045647 were 145° and 122° respectively.

(i) By using grid reference write the position of the fishing boat.

To determine the position of the fishing boat using grid reference, two bearings are required. The intersection of these two bearings from Samgoro Hill and Pump House will provide the exact location of the boat.
- The bearings indicate directions from these points towards the boat.
- By plotting the given bearings on the map, the meeting point of the two lines represents the position of the fishing boat in grid reference format.

(ii) Find the true bearing of the Samgoro hill from Pump house.

The true bearing from the Pump House to Samgoro Hill is calculated by adding or subtracting 180° from the given bearing, depending on direction.
- Given bearing from the boat to Samgoro Hill is 145°.
- The bearing from the Pump House to Samgoro Hill follows the direction rule:
  True bearing = 145° + 180° (if opposite direction)
  True bearing = 325°

Thus, the true bearing of Samgoro Hill from the Pump House is 325°.

(b) A racing cyclist covers a distance of 45 km between town A and B in 30 minutes. If the distance measures 3 cm on the map,

(i) calculate the speed of the cyclist

Speed = Distance / Time

Distance = 45 km
Time = 30 minutes = 0.5 hours

Speed = 45 km / 0.5 hours
Speed = 90 km/h

(ii) for how long will cyclist cover 120 km from A to C?

Time = Distance / Speed

Time = 120 km / 90 km/h

Time = 1.33 hours or 1 hour 20 minutes

(iii) draw a graphic scale to read 120 km

A graphic scale is a visual representation of distance on the map.
- If 3 cm represents 45 km, then 1 cm represents 15 km.
- To represent 120 km, the required scale length will be:

Length = 120 km / 15 km per cm
Length = 8 cm

A graphic scale of 8 cm will accurately represent 120 km.

(c) Describe the relief of the mapped area.

The relief of the mapped area can be analyzed based on contour lines, spot heights, and physical features:
- The presence of contour lines shows variations in elevation, with closely spaced lines indicating steep slopes and widely spaced lines indicating gentle slopes.
- The presence of hills and mountains is indicated by circular contours with increasing elevation towards the center.
- Rivers and valleys can be identified by V-shaped contour patterns, where the river flows along lower elevations.
- Some parts of the map may have plateaus and flat lands, where contour lines are nearly absent or widely spaced.
- The presence of escarpments and ridges suggests abrupt changes in elevation.

(d) Calculate the gradient between Fotobiro hill and the point at grid reference 040640.

Gradient is calculated using the formula:

Gradient = Vertical Height Difference / Horizontal Distance

1. Identify the height of Fotobiro Hill from the map.
2. Identify the height of the point at grid reference 040640.
3. Find the height difference between these two points.
4. Measure the horizontal distance between the two locations using the scale.
5. Divide the height difference by the horizontal distance to determine the gradient.

(e) Describe any two demerits of hill shading as a method of representing relief on the map.

Hill shading is a method of representing relief using light and dark shading, but it has the following demerits:

- Lack of precise elevation data. Hill shading does not provide numerical elevation values, making it difficult to determine exact heights of landforms.
- Misinterpretation of slopes. Shadows may create an illusion of depth and shape, leading to incorrect perception of terrain features.
- Dependence on light direction. The effectiveness of hill shading depends on the assumed light source, which may vary in different interpretations.
- Difficulty in distinguishing flat and gently sloping areas. Shading does not clearly differentiate between gentle slopes and completely flat lands.

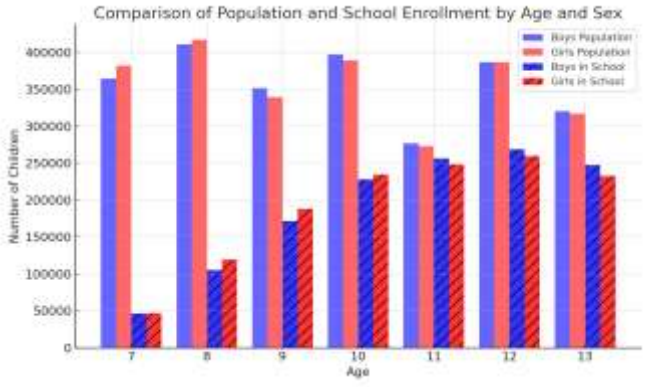
(f) With evidence from the map explain the main economic activities carried out in the area.

Economic activities in the area can be determined by analyzing map symbols and features:

- Agriculture. The presence of cultivated land, irrigation schemes, and settlements near fertile areas suggests farming as a key economic activity.
- Fishing. The proximity to water bodies such as lakes and rivers indicates fishing as a major livelihood.
- Trade and commerce. Towns and road networks suggest markets and trading centers where goods and services are exchanged.
- Transportation. The presence of roads, railway lines, and airstrips indicates employment in the transport sector.
- Forestry. Forested areas on the map suggest timber harvesting and related activities.
- Mining. If symbols indicating mineral deposits or quarrying activities exist, mining can be considered an economic activity.

2. Study the following data for 1992 census carefully.

(a) Present the data by age/sex in a compound divergent bar graph.



(b) Comment on the distribution nature of children in schools and those in population.

- The population of children is higher in the younger age groups, with a gradual decline as age increases.
- School enrollment increases with age but does not match the total population of children in each age group.
- There is a gap between the number of children in the population and those attending school, indicating that some children do not have access to education.
- The number of boys and girls in both population and school enrollment is relatively balanced, though minor variations exist.
- The largest difference between population and school enrollment is at younger ages, suggesting that not all young children enroll in school at the expected age.

3. Compare and contrast the features in chain traversing and the intersection method in plane table surveying.

- Chain traversing involves measuring distances along a series of connected lines, using a chain or tape measure to establish the shape of an area.
- The intersection method in plane table surveying determines the location of a point by sighting it from two known positions and plotting the intersection of the lines.

Comparison:
- Both methods are used for mapping land features and establishing control points.
- Both require accurate measurement and recording to ensure precision.

Contrast:
- Chain traversing relies on linear measurements, while the intersection method depends on angular observations.
- Chain traversing is more suitable for boundary surveys, while intersection is used for locating inaccessible points.

4. Give brief account of the following data collection techniques as used in field research.

(a) Questionnaires

A questionnaire is a set of structured questions designed to collect information from respondents. It can be administered through printed forms, online surveys, or interviews.
- Advantages include the ability to reach a large number of people, standardization of responses, and ease of data analysis.
- Disadvantages include potential biases in responses, limited depth of information, and non-response issues.

(b) Interview

An interview is a method where the researcher directly asks respondents questions to gather detailed information.

- Advantages include the ability to clarify questions, obtain in-depth responses, and adapt to the respondent's understanding.
- Disadvantages include time consumption, interviewer bias, and difficulty in analyzing qualitative responses.

(c) Focus Group Discussion (FGD)

A focus group discussion involves gathering a small group of people to discuss a specific topic guided by a moderator.
- Advantages include rich qualitative data, multiple perspectives, and interaction among participants.
- Disadvantages include dominance by vocal participants, difficulty in managing large groups, and challenges in quantifying responses.

These techniques are essential for gathering accurate and reliable information in field research.

5. Study carefully the photograph of Dar Es Salaam City and then answer the questions that follow.

(a) What type of photograph is this?

This is an oblique aerial photograph. It is taken from an elevated angle, showing both the skyline and the ground surface. The perspective allows for the observation of city infrastructure, roads, buildings, and coastal features, making it useful for urban planning and geographical analysis.

(b) State the possible factors which contributed to the siting of the town shown in the photograph.

Several factors contributed to the establishment and growth of Dar Es Salaam:
- Coastal location. The city is situated along the Indian Ocean, facilitating trade, fishing, and maritime activities.
- Natural harbor. The deep-water harbor supports port activities, attracting international trade and commerce.
- Transportation hub. The city is well connected by roads, railways, and air transport, making it a major economic center.
- Historical significance. The city has colonial and post-independence developments that have shaped its urban growth.
- Economic opportunities. Industrialization, banking, and commercial activities attract people to the city.
- Availability of land. The city was originally established in an area with enough space for expansion and infrastructure development.

(c) Name the hinterland areas which depend on the feature shown in the middle ground of the photograph.

The hinterland areas that depend on the port include:
- The central and northern regions of Tanzania, which rely on the port for imports and exports.

- Neighboring landlocked countries such as Rwanda, Burundi, Uganda, Zambia, and the Democratic Republic of Congo, which use Dar Es Salaam Port for access to international trade.
- Agricultural regions in Tanzania, such as Morogoro and Mbeya, that transport cash crops through the port.

(d) What are the major commodities that pass through the feature shown in the middle ground of the photograph to and from the hinterland?

The port of Dar Es Salaam handles various commodities, including:
- Imports such as machinery, fuel, consumer goods, and industrial raw materials.
- Exports such as agricultural products (coffee, tea, cotton, cashew nuts, and tobacco).
- Minerals such as gold, copper, and gemstones from Tanzania and neighboring countries.
- Petroleum and fuel transported inland for industrial and domestic use.
- Manufactured goods from local industries transported to inland markets.

6.(a) Discuss the causes of movements of tectonic plates along their margins.

Tectonic plates move due to several forces acting within the Earth's lithosphere and mantle. The main causes include:
- Convection currents. Heat from the Earth's interior causes molten rock in the mantle to circulate, pushing and pulling plates along.
- Slab pull. At subduction zones, the denser oceanic plate sinks into the mantle, pulling the rest of the plate along.
- Ridge push. At mid-ocean ridges, newly formed lithosphere pushes older lithosphere away, driving plate movement.
- Gravitational forces. Differences in elevation between ocean basins and continents influence plate movement.

These movements lead to the formation of earthquakes, volcanoes, and mountain ranges.

(b) What evidences support plate movement?

Several pieces of evidence support the theory of plate tectonics:
- Continental drift. Fossil and geological similarities between continents suggest they were once connected.
- Seafloor spreading. The discovery of younger rocks at mid-ocean ridges and older rocks near continental margins indicates the continuous formation of new oceanic crust.
- Earthquake and volcanic activity. Most earthquakes and volcanoes occur along plate boundaries, showing movement and interaction of plates.
- Magnetic striping. The symmetrical pattern of magnetic reversals on the ocean floor confirms seafloor spreading and plate movement.

7. Give a general classification of air masses.

Air masses are classified based on their source regions and characteristics:
- Continental air masses (c): Originate over land, dry in nature.
- Maritime air masses (m): Form over oceans, moist and humid.
- Tropical air masses (T): Develop in warm regions, bringing high temperatures.
- Polar air masses (P): Form in cold regions, leading to cooler conditions.
- Arctic/Antarctic air masses (A): Originate in polar areas, extremely cold and dry.

Air masses influence global weather patterns and climate changes.

8. Briefly discuss the conditions that produce hot springs and geysers.

Hot springs and geysers form due to geothermal activity beneath the Earth's surface. The necessary conditions include:
- Presence of underground water that can be heated by geothermal energy.
- High temperatures from magma chambers or volcanic activity heating the water.
- Underground pressure that forces heated water to rise to the surface through cracks or faults.
- Permeable rock layers allowing water to seep underground and get heated.

Geysers require additional conditions where heated water builds up pressure and erupts forcefully at intervals.

9. Give an account of the world distribution of coral reefs and atolls and explain the problems posed by their origins.

Coral reefs and atolls are primarily found in warm, shallow tropical waters, including:
- The Great Barrier Reef in Australia.
- The Caribbean Sea and the Gulf of Mexico.
- The Indian Ocean, particularly around the Maldives and Seychelles.
- The Pacific Ocean, including regions around Indonesia, the Philippines, and Hawaii.

Problems posed by their origins include:
- Sensitivity to climate change, leading to coral bleaching.
- Rising sea levels threatening atolls and low-lying island nations.
- Overfishing and pollution affecting marine biodiversity.
- Destruction due to coastal developments and human activities.

10. By using vivid examples, examine causes and effects of earthquakes.

Causes of earthquakes:
- Tectonic plate movements at fault lines, such as the San Andreas Fault in California.
- Volcanic eruptions causing ground shaking, as seen in Indonesia.

- Human activities like mining, dam construction, and nuclear testing inducing artificial earthquakes.

Effects of earthquakes:
- Structural damage and collapse of buildings and infrastructure.
- Tsunamis generated by undersea earthquakes, such as the 2004 Indian Ocean tsunami.
- Landslides triggered by ground shaking, especially in mountainous areas.
- Loss of lives and displacement of communities.

11. Give an account of fluvial landforms formed by deposition.

Fluvial landforms created by river deposition include:
- Deltas, where rivers meet standing water and deposit sediments, such as the Nile Delta.
- Floodplains, formed by repeated flooding and sediment accumulation.
- Meander loops, where rivers deposit sediments on the inner bends.
- Oxbow lakes, created when meanders are cut off from the main river channel.

These landforms contribute to fertile soils and rich ecosystems.

12. Define intrazonal soil and describe its chief characteristic features.

Intrazonal soils are soils that develop under strong local influences, regardless of climate or vegetation.

Characteristics include:
- Formed in areas with unique parent materials such as marshes, saline flats, or volcanic deposits.
- Retain moisture due to poor drainage, making them ideal for wetland vegetation.
- Rich in minerals but sometimes unsuitable for agriculture due to salinity or acidity.

Examples include peat soils, saline soils, and volcanic ash soils.

13.

(a) Why is the earth not exactly a spheroid?

The Earth is not a perfect sphere but an oblate spheroid due to:
- Centrifugal force from its rotation causing equatorial bulging.
- Slight flattening at the poles due to gravitational forces.
- Variations in surface elevation, including mountains and ocean basins.

(b) Provide evidence of the earth’s sphericity.

Evidence includes:
- Satellite images showing Earth's curved surface.
- The way ships disappear over the horizon gradually.

- The circular shadow of the Earth seen during lunar eclipses.
- The variation in star constellations visible from different latitudes.

These observations confirm that Earth is spherical but slightly flattened at the poles.