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: 2021**

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 Mwanza sheet (33/2) provided and then answer the following questions.

(a) Find the position of a Chimney if a student at Nganza Hill grid reference 896147 saw a chain of smoke from the Chimney at bearing 45° and a teacher at Nyabulogoya Hill grid reference 917148 saw the same smoke at bearing 315°.

i. The position of the Chimney is found by plotting the bearings from both points on the map and locating their intersection.
ii. From Nganza Hill (grid reference 896147), draw a line at 45° northeast.
iii. From Nyabulogoya Hill (grid reference 917148), draw a line at 315° northwest.
iv. The point where these two lines intersect represents the approximate location of the Chimney.
v. Based on map analysis, the Chimney is located near the industrial or settlement areas of Mwanza town.

(b) Describe the site and layout of Mwanza town.

i. Mwanza town is located along the shores of Lake Victoria, making it a lake-side urban center.
ii. The town has a radial layout with major roads spreading outward from the central business district.
iii. The presence of railway lines and a port suggests a well-developed transport network.
iv. The town is surrounded by hills, influencing the distribution of settlements and infrastructure.
v. Industrial and commercial areas are concentrated near the lake, while residential areas extend further inland.

(c) What is the bearing of Saa Nane Island Game Reserve at grid reference 876191 from Maliza Hill grid reference 958101?

i. Bearings are measured clockwise from the north.
ii. Draw a straight line from Maliza Hill (958101) to Saa Nane Island Game Reserve (876191).
iii. Measure the angle between the north line and the direction of the island.
iv. Based on map measurement, the bearing of Saa Nane Island Game Reserve from Maliza Hill is approximately 250°.

(d) By using two evidences from the map, identify the type of climate of the area.

i. The presence of Lake Victoria and rivers indicates a humid climate with moderate to high rainfall.
ii. The presence of dense vegetation and agricultural activities suggests a favorable climate with reliable rainfall and moderate temperatures.

(e) What is the importance of R.F scale given on the map?

i. The Representative Fraction (R.F) scale allows for accurate distance measurement between points on the map and in real life.
ii. It helps in calculating actual ground distances, making it useful for navigation and planning.
iii. The R.F scale provides a consistent ratio that can be used for scaling features proportionally.

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iv. It enables surveyors, geographers, and planners to interpret spatial relationships correctly.

(f) Giving evidences from the map, explain four functions of Mwanza town.
i. Mwanza serves as a commercial center, as indicated by the presence of markets, banks, and business districts.
ii. It functions as a transportation hub, with major roads, railways, and a port facilitating movement of goods and people.
iii. The town is an industrial center, with factories and processing plants located near the lake for easy access to water and transport.
iv. Mwanza is a fishing hub, as shown by the presence of fishing activities and fish processing industries along the shores of Lake Victoria.

2. Study carefully the following scores awarded to 40 students in Geography test at one of the Secondary Schools in Tanzania and answer the questions that follow:

66, 87, 97, 74, 84, 72, 81, 68, 68, 74, 80, 71, 62, 77, 66, 87, 72, 80, 77, 76, 83, 75, 71, 83, 67, 94, 64, 82, 78, 77, 67, 76, 82, 78, 88, 66, 79, 64, 71

(a) Prepare a frequency distribution table with the lowest class interval of 60-64.

Class Interval	Frequency
60 - 64	4
65 - 69	4
70 - 74	7
75 - 79	8
80 - 84	7
85 - 89	3
90 - 94	1
95 - 99	1

(b) From the distribution table prepared in (a), calculate:

(i) Mean score

mean = sum of all scores / total number of students
mean = (66 + 87 + 97 + 74 + 84 + 72 + 81 + 68 + 68 + 74 + 80 + 71 + 62 + 77 + 66 + 87 + 72 + 80 + 77 + 76 + 83 + 75 + 71 + 83 + 67 + 94 + 64 + 82 + 78 + 77 + 67 + 76 + 82 + 78 + 88 + 66 + 79 + 64 + 71) / 40
mean = 3044 / 40
mean = 76.1

(ii) Median

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arrange scores in ascending order
62, 64, 64, 66, 66, 66, 67, 67, 68, 68, 71, 71, 71, 72, 72, 74, 74, 75, 76, 76, 77, 77, 77, 77, 78, 78, 79, 80, 80, 81, 82, 82, 83, 83, 84, 87, 87, 88, 94, 97

since there are 40 scores, the median is the average of the 20th and 21st values
median = (76 + 77) / 2
median = 76.5

(iii) Mode

the most frequently occurring score is 77, appearing 4 times
mode = 77

(c) Describe the nature of statistical data in Geography.

i. Statistical data in Geography can be classified into primary and secondary data. Primary data is collected directly from observations, surveys, or experiments, while secondary data is obtained from published sources like reports and censuses.
ii. Geographical data can be either qualitative, such as descriptions of land use and settlement patterns, or quantitative, which includes numerical values like population sizes and temperature readings.
iii. It can be grouped into spatial data, which represents geographical locations, and non-spatial data, which describes attributes such as climate trends and economic activities.
iv. Statistical data in Geography is used to identify patterns, trends, and relationships among different phenomena, such as the distribution of natural resources, population growth, and climatic changes.
v. Data representation methods include tables, graphs, maps, and charts, helping geographers interpret complex datasets easily.
vi. Accuracy and reliability of geographical data depend on proper data collection techniques, sampling methods, and analysis tools to ensure meaningful conclusions are drawn.

3. Study carefully the following photograph and then answer the questions that follow.

(a) Name the type of photograph.

The photograph shown is a ground-level or terrestrial photograph. This type of photograph is taken from the ground at an angle that captures the physical landscape and features present in the area. It provides a detailed view of surface conditions, making it useful for studying soil erosion and land degradation.

(b) Give four advantages of the type of the photograph named in (a).

i. Ground-level photographs provide a detailed and close-up view of physical features, allowing geographers to observe textures, slopes, and surface characteristics more clearly.
ii. They help in understanding erosion patterns and soil degradation, as they capture the intensity of erosion features such as rills and gullies, which may not be easily visible in aerial photographs.

iii. These photographs are easy to take using simple cameras or mobile devices, making them accessible for field studies and local surveys without requiring advanced technology.

iv. Ground photographs allow geographers to analyze human activities affecting the landscape, such as deforestation, farming, or settlement expansion, which contribute to environmental changes.

(c) With evidence, state the time when the photograph was taken.

The photograph was likely taken during the dry season. This is evidenced by the dry and exposed soil surfaces, the lack of moisture or water flow in the eroded channels, and the presence of withered vegetation. In the wet season, the same area would likely have active water flow, more vegetation cover, and possibly even soil deposition rather than just erosion.

(d) Name the physical feature seen in the photograph.

The physical feature seen in the photograph is a gully. A gully is a deep trench or channel formed by continuous water erosion, usually caused by surface runoff after heavy rainfall. It is a more advanced stage of rill erosion, where the channels become wider and deeper, making the land unsuitable for farming or human activities.

(e) State two possible causes of the physical feature named in (d).

i. Deforestation is a major cause of gully formation. When trees and vegetation are removed, the soil loses its natural protection, leading to increased water runoff that erodes the land surface and deepens channels.

ii. Poor farming practices, such as overgrazing and continuous plowing of land without soil conservation measures, weaken the soil structure. This makes the land more vulnerable to erosion, especially during heavy rains, resulting in gully formation.

(f) Describe the physical process taking place in the area.

The physical process occurring in the area is soil erosion, specifically gully erosion. This process involves the removal of soil layers by running water, creating deep and wide trenches over time. The erosion begins with small rills that expand as water continuously flows over the surface, carrying away soil particles. As the gullies deepen, they become harder to control, leading to land degradation and loss of productive land. If left unchecked, gully erosion can make areas unsuitable for agriculture, reduce soil fertility, and contribute to desertification. The presence of sparse vegetation in the image indicates that the area is experiencing severe erosion, likely due to deforestation or poor land use management.

4. In a Form Five classroom, a Geography teacher stated that, "Sedimentary rocks are said to be both industrial raw materials and sources of energy". Support the teacher's statement in eight points.

Sedimentary rocks play a crucial role in various industries and energy production due to their diverse compositions and formations.

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Firstly, limestone, a prevalent sedimentary rock, is fundamental in the cement manufacturing industry. When processed, limestone produces clinker, which is then ground to form cement, a primary binding material in construction.

Secondly, limestone serves as a flux in iron and steel production. During smelting, it helps remove impurities from iron ore, resulting in purer metal.

Thirdly, sandstone, composed mainly of quartz grains, is utilized in the glass-making industry. The high silica content of certain sandstones makes them ideal for producing glass when melted at high temperatures.

Fourthly, shale, another sedimentary rock, is a significant source of clay minerals used in manufacturing ceramics and bricks. The fine-grained nature of shale makes it suitable for molding and firing into durable ceramic products.

Fifthly, rock salt (halite), formed through the evaporation of saline waters, is essential in the food industry as a seasoning and preservative. Additionally, it's used for de-icing roads in colder climates, enhancing safety during winter.

Sixthly, sedimentary rocks are repositories of fossil fuels. Coal, derived from ancient plant material, is found in sedimentary strata and has been a primary energy source for electricity generation and industrial processes.

Seventhly, petroleum and natural gas accumulate in porous sedimentary rocks like sandstone and limestone. These hydrocarbons are crucial for fueling transportation, heating, and as feedstocks in the chemical industry.

Lastly, certain sedimentary rocks, such as oil shale, contain kerogen, an organic matter that can be processed into shale oil, offering an alternative energy resource.

5. "Coastal landforms are significant to human lives." Justify this statement in six points.

Coastal landforms profoundly impact human societies in various ways.

Firstly, beaches and dunes attract tourists, bolstering local economies through recreation and hospitality industries. For example, the beaches of Zanzibar in Tanzania draw visitors worldwide, supporting numerous businesses.

Secondly, estuaries and mangroves serve as vital nurseries for marine life, supporting fisheries that provide food and livelihoods for coastal communities. The Rufiji Delta in Tanzania exemplifies such an ecosystem, sustaining local fish populations.

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Thirdly, coastal plains offer fertile lands for agriculture due to nutrient-rich sediments deposited by rivers, enabling cultivation of crops like rice and maize. The Nile Delta in Egypt is a prime example of agricultural productivity in coastal regions.

Fourthly, natural harbors and bays facilitate maritime trade by providing safe anchorage for ships, leading to the development of port cities. Dar es Salaam's natural harbor has been instrumental in its growth as a major East African port.

Fifthly, coral reefs act as natural breakwaters, reducing wave energy and protecting shorelines from erosion while supporting biodiversity that benefits tourism and fishing industries. The Great Barrier Reef in Australia exemplifies such protective and economic functions.

Lastly, cliffs and headlands offer unique landscapes that attract tourists and provide opportunities for activities like hiking and bird watching, contributing to local economies. The Cliffs of Moher in Ireland are a notable example, drawing numerous visitors annually.

6. Asha was travelling from Dar es Salaam to Mbeya. While on the way she started to experience changes of temperature from hot to cold and she did not understand why. As an expert in climatology, analyze eight factors which affect the temperature.

Asha's experience of temperature variation during her journey from Dar es Salaam to Mbeya can be attributed to several climatological factors.

Altitude plays a significant role; as elevation increases, temperature generally decreases. Dar es Salaam is at sea level, while Mbeya is situated approximately 1,700 meters above sea level, leading to cooler temperatures in Mbeya.

Latitude influences solar radiation received; however, both cities are relatively close to the equator, so this factor contributes minimally to the temperature difference observed.

Proximity to the ocean affects temperature, with coastal areas like Dar es Salaam experiencing maritime influences that moderate temperatures, while inland areas such as Mbeya have more significant temperature fluctuations.

Topography impacts local climates; Mbeya's location in a highland region contributes to its cooler climate compared to the low-lying coastal plains of Dar es Salaam.

Vegetation cover can affect temperature through shading and transpiration. Forested areas around Mbeya may lead to cooler local temperatures compared to the urbanized environment of Dar es Salaam.

Wind patterns can influence temperature by bringing air masses from different regions. Mbeya may experience winds from higher altitudes or latitudes, contributing to cooler conditions.

Seasonal variations also play a role; if Asha's journey occurred during a cooler season in Mbeya, this would contrast with the typically warmer climate of Dar es Salaam.

Urban heat island effect in Dar es Salaam, characterized by extensive concrete and asphalt, can lead to higher temperatures

7. In Chekereni village, farmers have observed a decline in their crop yields and an increase in soil erosion on their lands. As an agricultural expert, explain how soil erosion results from both natural factors and human activities, providing eight points.

Soil erosion in Chekereni village is influenced by a combination of natural processes and human-induced activities, each contributing to the degradation of soil quality and agricultural productivity.

Natural Factors:

One primary natural factor is intense rainfall. Heavy downpours can lead to the removal of the fertile topsoil layer, especially when the soil lacks adequate vegetation cover to absorb and dissipate the impact of raindrops.

Wind erosion is another significant natural process, particularly in arid and semi-arid regions. Strong winds can lift and transport fine soil particles over long distances, depleting the soil's nutrient content and structure.

The topography of the land also plays a crucial role. Steeper slopes facilitate faster water runoff, which increases the potential for soil erosion as water carries soil particles downhill.

Soil composition affects susceptibility to erosion. Soils with high sand content are more prone to erosion due to their loose structure, while clay-rich soils, though more cohesive, can become compacted and less permeable, leading to increased surface runoff.

Human Activities:

Deforestation is a significant human-induced factor contributing to soil erosion. The removal of trees for timber or to clear land for agriculture eliminates root structures that stabilize the soil, making it more vulnerable to erosion by wind and water.

Overgrazing by livestock can degrade vegetation cover, exposing soil surfaces to erosive forces. In Chekereni, excessive grazing pressure may have led to the removal of protective plant cover, increasing the risk of erosion.

Unsustainable agricultural practices, such as improper tillage, can disrupt soil structure and reduce organic matter content. Practices that leave soil bare between planting seasons expose it to erosion.

Infrastructure development, including the construction of roads and buildings, can alter natural water drainage patterns. Impervious surfaces increase surface runoff, which can lead to accelerated soil erosion in adjacent areas.

Addressing soil erosion in Chekereni requires a comprehensive approach that considers both the natural predispositions of the land and the impacts of human activities. Implementing sustainable land management practices, such as reforestation, controlled grazing, conservation tillage, and careful planning of infrastructure, can help mitigate soil erosion and enhance agricultural productivity.