KAMSSA 2022
GOEGRAPHY 1 A LEVEL
COMPULSORY MAP WORK QUESTION:

1. Study the **1:50,000 (UGANDA) KABALE** Map extract, part of Sheet 86/4, Series Y732, Edition 4. U.S.D and answer the questions that follow.

a) (i) Identify the man- made feature found at grid reference 306541. (01mark).

- **Ground Trigonometrical Station**

(ii) State the grid reference of the Antiquity at Bukoora. (01mark)

- **303573**

(b) Calculate the;

(i) Area covered by Lake Bunyonyi. (03marks)

(i) No. of full squares = 00
No. of half squares = 84

$$\text{Area} = \text{Number of full squares} + \left(\frac{Number\ of\ half\ squares}{2}\right)$$

$$00 + \left(\frac{84}{2}\right)$$

$00 + 42$

$= 42$squares

But, 1 grid square $= 1km^2$

$42squares = 42 \times 1km^2$

Area = $\underline{42km^2}$ Correct answer including units.

(Acceptable range $40km^2 - 44\ km^2$)

(ii) State the Hemisphere in which Kabale is located. (01mark)

- **Southern Hemisphere (1^0 20'S)**

(c) Reduce the area shown on the map extract by 50%. Draw its sketch map and on it mark and label:

(i) Two major drainage features
(ii) Three relief features
(iii) Rusoorooza plantation
(iv) forested area
(v) Country boundary (08marks)

(d) Describe the relationship between relief and transport in the area shown on the map. (5marks)

- The steep slopes in the south and west have footpaths
- The gentle slopes in the north east encouraged the construction of a loose surface road.
- Most of the hilly areas in the west and south have limited transport routes.
- The basin occupied by Lake Bunyonyi is crossed by a Canoe ferry.

(e) With examples from the map extract, explain the economic activities carried out in the area shown on the map extract (06marks).

- plantation farming due to the presence of a plantation at Rusoorooza.
- Transport due to the presence of loose surface road in the North East and a canoe ferry.

- Fishing due to the presence of lake Bunyonyi.
- Industrialisation due to the presence of soap and floor factory at Kikungiri in the Northeast.
- Tourism due to the presence of various tourist attractions like hotsprings at Ruhanga, Kaabagirwa.
- Forestry due to the presence of a forest at Rwanyena in the south.

2. COMPULSORY PHOTOGRAPHIC INTERPRETATION QUESTION

(a) Draw a landscape sketch of the area shown in the photograph and on it mark and name;

(a) Draw alandscape sketch of the area shown on the photograph and on it mark and name;

(i) Braided channel.

(ii) Broad valley.

(iii) Gentle slope.

(iv) Vegetation types. (09marks)

(b) Describe the process responsible for the formation of the braided channel shown on the photograph. (6marks)

Braided Channel.

- A braided channel is an extremely wide and shallow channel in which a river divides and subdivides into a series of interconnecting minor channels separated by sand banks and islands of alluvium

- Braiding is most common in heavily loaded streams flowing between banks of easily eroded material.
- It develops with the deposition of sand and gravel on the river bed.
- These gradually increase in size and form islands which cause the river to divide into minor channels. --- Braided channels are commonly found on the lower course of rivers Nzoia, Vola, Sondu and Nyando in Kenya. Kilombero and Rufigi rivers in Tanzania.
- .

(c) Giving Evidence from the photograph, identify the economic activities that are carried out in the area

- Pastoralism /animal rearing/livestock rearing due to the presence of abundant pasture.
- Apiculture / bee keeping due to the presence of the tree vegetation.
- Lumbering/ timber harvesting due to the presence of trees.
- Arable farming/crop growing due to abundant land and water for irrigation.
- Wildlife conservation due to the sparse population.
- Sand mining due to the presence of sand in the lowlands.

(05marks)

(d) (i) Outline the problems faced by people living in the area shown in the photograph (04marks)

- The area discourages water transport/ navigation due to a lot of siltation.
- The area harbour diseases and vectors like snails and mosquitoes which are threat to human beings
- The areas also associated with water borne diseases due to water logged conditions.
- The flat nature of the area encourages flooding that leads to destruction of property and loss of lives.

- Land transport is difficult in this region due to the existence marshy areas which make construction of transport lines difficult and expensive.

- Limited social services due to remoteness

- Dangerous aquatic animals which are a threat to human beings.

(ii)Identify any one area from East Africa where the photograph could have been taken. (01mark)

- Braided channels are commonly found on the lower course of rivers Nzoia, Vola, Sondu and Nyando in Kenya.
- Kilombero and Rufigi rivers in Tanzania.

SECTION B:

3. (a)Distinguish between compressional forces and Tensional forces (6marks)
(b) Examine the influence of faulting on the development of relief land forms in East Africa. (19marks).
4. To what extent has the rock structure influenced occurrence of landslides in East Africa? (25 marks)
5. (a)Account for the occurrence of Sea level changes in the coastal areas of East Africa. (10marks)
(b) Examine the landforms resulting from sea level changes in east Africa. (15marks)

SECTION C:

6. (a) Distinguish between convectional rainfall and Orographic Rain fall (10marks)
(b) Account for the variations in rainfall distribution in East Africa (15marks)

7. Examine the factors for the distribution of Natural forest vegetation in East Africa. (25 marks)
8. Describe the factors that influence the processes of soil formation in East Africa. (25 marks)

SECTION B:

3. (a)Distinguish between compressional forces and Tensional forces (6marks)
(b) Examine the influence of faulting on the development of relief land forms in East Africa. (19marks)

(a) Distinguish between tensional and compressional forces.

- Tension forces are forces that pull apart a block of land.
- They occur due to divergence of the convective currents.
- They are associated with normal faults and lead to sinking of the earth's crust.

- They have been experienced on the Eastern arm of the East African rift valley.

Illustration:

While;

- Compression forces push the block of land.
- They occur due to convergence of the convective currents.
- They are associated with reversed faults and lead to uplift of the block of land.
- They have been experienced on western arm of the East African rift valley.

Illustration.

(b) Examine the influence of faulting on the development of relief landform in East Africa.

Candidates are expected to:

- State the process associated with the forces.
- Define it and give the origins.
- Give the resultant landforms.

Core:

- Faulting is the fracturing of the hard rocks of the earth's crust due to strain and stress resulting into the subsequent displacement and dislocation of the rock strata relative to one another.
  - It originates from the interior of the earth due to radioactivity and geophysical reactions.
  - Heat is generated that causes melting or nearly melting of the mantle rocks hence development of convection currents.
  - These exert pressure on the upper mantle leading to fracturing of the rocks.

The following landforms are associated faulting:

❖ **Block mountain**.

- It is an upland bordered by one or more faults.
- Radioactivity, geographical, geochemical reactions led to convergent convective currents hence compression forces were generated.
- They acted on the rock strata leading to the development of reversed faults.
- The central block was uplifted leaving the side blocks stable hence block mountain formation.
- Eg's include: Usambara, Ulugulu, Rwenzori mountains.

Illustrations.

❖ **Rift Valley.**

- A rift valley is elongated trough/depression bordered by parallel infancing fault scarps.
- There was radioactivity and geographical reactions.
- This resulted into the convergent convective currents that resulted into compression forces.
- They acted on the rock strata

- and pushed it from different direction hence reversed fault lines.
- The side blocks were upthrusted leaving the middle at a relatively lower level to form a rift valley with sharp edges.
- These were later modified by denudation forces.
- Eg's are cited on the western arm of the Rift Valley.

Illustrations.

❖ Escarpment /fault scarps

- An escarpment is a steep sided land sided / slopewhere land falls from a higher level to a lower level.
- Compression forces act on the block of land creating fault lines along which displacement takes place.
- Land is either upthrusted or experiences a down throw to form an escarpment.
- Eg's include: Butiaba and Kicwamba in Uganda.

Illustration.

Graben

- A graben is a hollow/depression at the floor of the rift valley formed by secondary faulting.
- Minor compression forces act on the rift valley floor and create a further depression.
- This depression is called a graben.
- Eg's include L. Edward, L. George and L. Albert.

Illustration.

Tilt block

- There are landforms in form of ridges and depressions formed by faulting and tilting of land along fault scarps followed by displacements.
- -Examples of tilt scarps are along the Rift valley where they form deep bedding planes and western Kenya in Abadare region.
- Illustrations.

Fault guided valley

- This is a valley as the name suggests that develops in a fault line and follows the direction of a fault line.

It is steep sided and has a flat floor. As faulting takes place, the rocks crossed by the fault line are crushed and shuttered.

- The shuttered rocks are then eroded there by resulting into the creating of along valley along which a river may flow e.g. Aswa valley in northern Uganda, Kerio river valley, Ewaso-Ngilo river valley in Kenya, R. Ruhuhu valley in Tanzania.

- Illustrations.

4. To what extent has the rock structure influenced the occurrence of landslides in East Africa?

Approach

Candidates are expected to;

- Define landslides
- Identify and describe the different forms of landslides
- Show the role of rock structure
- Evaluate the question by bringing out the role of other factors
- Conclude with a judgment

Land slides are sudden, rapid and very fast movement of weathered rock materials and soil debris along steep slopes under the influence of gravity.

Areas affected by land slides include Bududa, Bulamburi, Bulucheke, Kasese, Bundibugyo, Kabale, Kisoro, Kenya highlands, Kipengere highlands etc.

The major landslides include;

- Mudflows: are intermittent movement of semi-liquid mud mixed with gravel and other rock boulders at moderate or steep slopes at a fast rate.
- Talus creep: where angular rock particles screes of all sizes move over moderate or steep slopes at a fast speed
- Rock slumping: where large masses of a rock and debris move over steep slopes, road cuttings at a fast rate.
- Rock slides: is the rapid movement of large masses of detached rock particles/debris rolling down slope at a fast rate along a slippery or over steeped slope.
- Rock falls: refer to a free fall of individual rock and boulders over very steep slopes.

- Avalanche: is a sudden downfall of rock materials mixed or embedded in ice, flowing over steep slopes in glaciated highlands.

To a greater extent, rock structure has influenced land slides in the following ways:-

-Permeable weathered, saturated rocks overlying impermeable layers lubricated by water accelerate rock slides, slumps.
-Well jointed large rock masses accelerate rock falls in highlands.
-Alternating layers of hard and soft rocks accelerate rock falls.
-Existence of lubricated and saturated massive layers of semi-liquid materials or mud promote mud flows.
-Existence of angular rocks (disjointed) promotes talus creep.
-Jointed rocks in glaciated mountains accelerate avalanches and talus creep.

(4 x 2 = 08 marks)

(However), there are other factors that influence occurrence of landslides;

- **Climate where**

-Prolonged rainfall, snow melting (super – wetting) saturate and lubricate the rocks slides etc
-Drying and wetting conditions in semi arid areas accelerate mud flows
-Freezing and thawing in glaciated mountains accelerate talus creep, rock falls and avalanches.

- **Nature of the soil**

-Existence of heavy saturated clay soils accelerate mudflows and rock slump.
-Undercutting of the base of the river cliff causes rock falls
-Over loading or accumulation of rock debris in large masses causes rock slides and mud flows.

- **Tectonic forces like / movements**

-Earthquakes and tremors cause vibrations leading to rockslides, rock falls and talus creep.
-Volcanicity i.e. basic lava flowing down slope mixed with weathered rocks cause mud flow.
-Living organisms especially borrowing animals weaken the soil structure to cause rock slumps and slides. The trampling effect of large animals like elephants cause rock falls in jointed rocks.
-Moving vehicles like bull dozers causes rock falls due to vibrations.
-Mining and quarrying activities using explosives cause rock slumps and rock falls.
-Deforestation along mountain slopes cause rock slump and slides.
-Over cultivation on steep slopes due to up and down hill cultivation lead to mud flows during heavy rainfall seasons.
-Building and construction activities along steep slopes promote rock slump and rock slides.
-Over grazing on the steep slopes due to large herds of cattle encourage rock slides and rock slumps.

*(10 x 1 = 10 marks)*Note: Explanation must be related to specific land slides, not mere saying:

causing land slides. C factor + resultant + type

5. (a)Account for the occurrence of Sea level changes in the coastal areas of East Africa. (10marks)
(b) Examine the landforms resulting from sea level changes in east Africa. (15marks)
Approach

Define sea level change and state the types of sea level changes

In part (b) Identify and describe the formation of both submerged and emerged coastal Landforms in highland and low land areas

Draw diagrams and give examples where applicable from East Africa

Sea level changes refer to the rise and fall of the sea level in relation to the land along the coastal areas. **Alternatively, sea level changes can be defined as** the vertical movement of land relative to the sea along the coastal regions.
When sea level changes occur worldwide is called **eustatic or major change** and when it occurs on minor or local scale is called **isostatic change**.

Types of sea level changes
Sea level changes are either positive or negative. Positive eustatism/ change occurs when the sea level rises in relation to the land and produces submerged coasts and their related landforms. Negative eustatism/ change occurs when the sea level falls in relation to the land and produces emerged coasts and their related landforms.
Causes of Sea level Changes include;

- Sea level changes are caused by climate, glaciation and deglaciation, Change in ocean temperatures,Occurrence of earth movements, deposition of sediments and global warming.

- Climatic changes. Pluviation period characterized by heavy rain fall such as El-Nino and monsoon leadto the rise in sea level while desiccation/ prolonged drought period leads to a fall in sea level.

- Glaciation and deglaciation. Glaciation during the last ice age caused a fall in sea level because hugequantities of water froze into ice on high mountains and ice-sheets in Polar Regions. Deglaciation during the inter-glacial period characterized by warmer conditions, melted thick ice sheets fromcontinental landmasses, forming rivers; which drained huge volumes of water into the sea; leading toa rise in the sea level.

- Change in ocean temperatures. When world temperatures increase for example due to volcanicity onthe ocean floor, water in oceans expands and the volume of water increases causing a rise in sea level.
- On the other hand when temperature falls for example during winter, water in oceans contracts andthe volume falls; leading to a fall in sea level relative to the land.

- Influence of global warming**.** The steady rise in the average temperature over the surface of the earthis affecting climate by melting ice on continental landmasses, bringing erratic rains and flooding hencethe rise in sea level.
- On the other hand, global warming is accelerating evaporation and aridity leading to the fall in sealevel.

- Occurrence of earth movements/ tectonic movements at the coast. Earth movements are forces thatoriginate from the interior of the earth due to plate tectonism for example faulting, warping and volcanism.

- Earth movements are responsible for sea level changes in the following ways;

- Warping movements-up- warping / up lifting of coastal areas and down warping of ocean basins
- leads to a fall in sea-level while up-warping of ocean basins and down-warping of coastal areas leads to a rise in sea level.

- Occurrence of Volcanicity on ocean floor. Volcanoes formed where tectonic plates meet at convergentboundary/ subduction zones, displace water in oceans up-wards causing a rise in sea level.

- Plate tectonism. The divergence of oceanic plates at mid-ocean ridges leads to expansion/ widening of ocean floor and a fall in sea level.
- Other hand, convergence of tectonic plates leads to contraction/ narrowing of ocean floor and a rise in sea level.

- Faulting in coastal areas leads to down thrust of some parts causing a fall in the sea level.
- Isostatic readjustments. When huge quantities of materials are added on to continental landmassesfor example ice sheets during the quaternary era, increase the weight of continents forcing them to sink down slowly, displacing water upwards hence a rise in sea level.

- Deglaciation of huge ice sheets and erosion on the continental landmasses reduces the weight of
- continents and cause isostatic uplift of landmass which ultimately leads to a fall in sea level.

- Deposition of sediments on the ocean floor such as alluvium by rivers, construction works in water, cultivation along the coast e.t.c reduces the size of the ocean basin, displaces water upwards leading to the rise in sea level.

(b) Examine the landforms resulting from sea level changes in east Africa.(15marks)

When the sea level rise in a highland coast, the coast is submerged and the following landforms are created;

Rias. A ria is a funnel shaped drowned river valley at the sea. Before submergence, the river flows into the ocean through a valley. When the sea level rise, the river valley is flooded or submerged at the seato form a ria.

Rias are wider and deeper seawards and narrower and shallower landwards which gives them a funnel shape.

Rias are formed on coastlands where hills and river valleys meet the sea approximately at right angle for example Kilindini harbor on which Mombasa port is established, Mtwara, Tanga, Dar es Salaam, Lamu e.t.c along the East African coast. Rias also found on southern shores of Lake Victoria.

Dalmatian coast/ longitudinal coastline. This is a coast with a chain of off islands running parallel to it. A Dalmatian coast is Formed in areas where elongated hills / ridges and valleys lie parallel to the coast before submergence.

When the sea level rises, valleys are flooded or submerged to form sounds while the un submerged hilltops form a chain of islands running parallel to the coast line. The submerged valleys/ sounds separate islands from the main land to form a dalmatian coast. For example, Smith sound on the southern shores of Lake Victoria at Mwanza, Bamburi hills south of Bukoba on Lake Victoria, Dalmatian coast of Pemba and Zanzibar islands of Tanzania e.t.c.

Fiords are drowned u-shaped glacial troughs with steep walls seawards in highland coasts. Fiords are
Formed when sea level rises and floods glacial troughs/ valleys formed initially by glaciers over deepening the valleys below sea level. Fiords have steep sides and deeper seawards. For example the coast of Norway, British Columbia, southern Chile e.t.c

Peninsulas. A peninsular is an elongated piece of land projecting seawards. They are formed in areas where highlands lie at right angles to the coast. When the sea level rises, valleys are flooded submerged leaving elongated pieces of land projecting seawards. For example Entebbe peninsular and Mweya peninsular.

Submerged lowland coasts. When a lowland coast is submerged the following landforms are produced:
Estuaries- are submerged river valleys in lowland coasts with a v-shaped cross profile pointing landwards. They are Formed when sea level rise along a lowland coast causing the sea to penetrate inland to a considerable distance along river valleys. They are wider and deeper landwards. Forexample river Rufiji in Tanzania, river kibanga at Mombasa, estuaries of Thames e.t.c

Creeks -are narrow inlets at the coast formed by submergence/ drowning of small streams in lowlandcoast due to rise in sea level. For example Chake- chake, Mtwapa, Makupa e.t.c along Mombasa on Kenyan coast.
Mud flats, lagoons and marshes. Mud flats are plat forms made of deposits of fine silt and alluviumdeposited by rivers or waves. Continuous deposition of these sediments builds sand spits and bars.
When the sea level rise, seawater is enclosed behind spits and bars to form a lagoon usually colonized by marshes and mangrove swamps. These features are Found at Mombasa, Dar es Salaam e.t.c.
Landforms created by the fall in the sea-level/ Emerged landforms
When the sea level falls the formally submerged landforms are exposed to form emerged landforms in
highland and lowland coasts:
Emerged landforms in **highland coasts**
Raised cliffs. A raised cliff is a steep rock face along the sea coast that is no longer in contact with the sea. Before submergence, waves attacked coastal rock and through processes of abrasion, hydraulic action and solution, a notch formed, enlarged and deepened. With time, land above the notch lost support and collapsed to form a cliff.
When sea level falls, new cliffs are created and the old cliffs that are no longer in contact with the sea are left behind high above the present water level hence the name-raised. Raised cliffs are Found at Mombasa.

Raised terraces are former wave cut plat forms which are no longer in contact with the sea created by materials eroded from the cliff. When sea level falls, new wave cut plat forms are created and the old terraces which are no longer in contact with the sea and left high above the current sea level hence the name raised terraces.

Raised beaches. These are beaches which are no longer in contact with the sea left high above the current sea level.

Before submergence, sand and shingle materials are deposited by constructive waves to form a gently sloping platform called beach at the coast.

When sea level falls, the beach loses contact with the sea and left behind high above the current sealevel as a dry land hence the term-raised beach. For example Dar es salaam, Mombasa, Tanga e.t.c

Raised caves, geos and blowholes. Continuous wave erosion against jointed coastal rock through abrasion, hydraulic action and solution create large holes in the cliff face called caves. When the roof of the cave collapses, it forms a narrow inlet called a geo and a blowhole when waves erode the roof of a cave to the surface.

When sea level falls, all these features reappear behind high above the current water level.

The fall in the sea level in lowland coast creates coastal plains and Fiards.

coastal plains formed when the continental shelf is exposed after a fall in the sea level. The coast line of Coastal plains have no bays and head lands.

Fiards-are are drowned u-shaped glacial troughs/ valleys formed along lowland coasts. They have abroader u-shaped profile than the fiord. For example the coast of south East Sweden, coast of Nova

SECTION C:

6.(a) Distinguish between convectional rainfall and Orographic Rain fall (10marks)
(b) Account for the variations in rainfall distribution in East Africa (15marks

Rainfall

It is defined as coalesced water droplets that fall under the influence of gravity. It occurs as a result of condensation of water vapour in the atmosphere. The water droplets become heavy to

to be held up in the atmosphere and hence, they later on fall down to the ground under the influence of gravity.

Types of Rainfall:

- **Convectional Rainfall**

  -It is a type of rainfall which occurs as a result of evaporation induced by heat.

  -Evaporation releases water vapour into the atmosphere which condenses to form clouds and later rainfall.

  -It is common in the equatorial areas which experience intense heating almost throughout the year while in the mid latitudes, it is received during summer.

  - The heat from the sun causes evaporation from the land and water surfaces as well as evapo-transpiration from vegetation

  -. The water vapour rises until when it reaches the condensation level where it cools and condenses into water droplets or clouds which result into rainfall.

Characteristics of Convectional rainfall:

- It is experienced in areas with intense heating
- It is associated with prolonged rains covering a wide area
- It is mainly received in the afternoons
- Lightning and thunderstorms are so common
- It involves heavy showers
- It occurs during summer in the mid latitudes

- **Orographic Rainfall**

-It is also known as relief rainfall.

-This is a type of rainfall experienced in the highland areas.

-It occurs when moist air is forced to rise upwards by a relief barrier such as a mountain (highland) or hill.

-The onshore moist air rises until when it reaches the condensation level to form clouds which consequently release rainfall on the wind ward side.

-Air rises up the mountain cooling at an adiabatic lapse at the condensation point at an average rate of 1oc per 100metres to form cumulo nimbus clouds.

-As the clouds become dense, water droplets are released as rainfall on the wind ward slopes. --- Air descends on the lee ward side when it is cool and dry hence resulting into little or no rainfall. This region is called the rain shadow.

-This type of rainfall is common in the mountainous areas / highlands of Kilimanjaro, Rwenzori, Elgon, Muhavura and Mt Kenya

Characteristics of Relief rainfall:

- It is often heavy on the wind ward side of the highlands
- It occurs as a result of the ascent of moisture laden air over a highland
- It involves prolonged periods of rain or precipitation
- It occurs in proximity to highlands Occasional thunderstorms and hail are common

b) Account for the variations in rainfall distribution in E. Africa(15mks)

Rainfall distribution refers to the pattern in which rainfall is spread over a given area in a specific period of time.

-Rainfall in E.Africa varies mainly in terms of amount and seasonality. Heavy rainfall of over 1000mm per annum is experienced in areas around the Lake Victoria basin, coastal areas and the highland areas of Mt Kenya, Elgon and around the Kigezi highlands among others.

-Moderate rainfall ranging between 760-1000mm per annum is experienced in South western Tanzania, Central and Northern Uganda]as well as Southern Kenya

-Low rainfall of less than 760mm per annum is received in areas like Karamoja region, Ankole Masaka corridor, Turkana land, Masai land and the Albert flats
The variations in the amount of rainfall received in E.Africa are influenced by the following factors:

Aparent movement of the Sun (I.C.T.Z)

In June – July when the sun is overhead in the north, intense heating occurs creating a low pressure belt and the convergence of moist winds which result into heavy rainfall in the north. The same condition is experienced in the south in December – January.
- The north and south therefore experience a single rainfall maximum due to the movement of the sun. Because the sun is overhead at the equator twice in a year, a double rainfall maxima is experienced in the equatorial areas such around the Lake Victoria basin

Prevailing winds

-They have a rainfall effect on the areas over which they blow because they transfer weather characteristics to the areas where they move.
-The South east trade winds emerge from the Indian ocean when they are moist so they are responsible for the heavy rainfall experienced along the E.African coast as well as the northern shores of lake Victoria while the North east trade winds from the Arabian desert are responsible for the low and un reliable rainfall in North eastern Uganda and North western Kenya.

vegetation cover

-Areas with thick vegetation cover like tropical rain forests experience heavy rainfall due to the high rates of evapo-transpiration e.g around Mabira, Budongo and the coastal areas with mangrove forests.
-On the other hand, semi arid areas with scattered vegetation cover experience low and un reliable rainfall e.g Karamoja region and Turkana land

Influence of water bodies such lakes and the Indian ocean recharge the atmosphere with water vapour through evaporation as well as through land and sea breezes. Therefore, areas near water bodies experience heavy convectional rainfall e.g the lake Victoria basin and the coastal areas while areas far away from water bodies experience low and un reliable rainfall e.g In North eastern Uganda .

Relief

Highland areas in E.Africa experience heavy rainfall on the wind ward slopes since they act as barriers towards the movement of the moist winds hence forcing them to rise upwards towards the condensation level thereby forming orographic rainfall. On the other hand, lowland areas like Albert flats experience low rainfall due to the absence of relief barriers to trap them.

Altitude

High altitude areas like mountainous regions experience heavy rainfall due to cool temperatures which induce condensation of moisture bearing winds while areas of low altitude experience low to moderate rainfall due to the limited cooling effect for instance Mt Elgon areas receive heavy rainfall than the rift valley region

Latitudinal location

Areas located at or near the equator experience heavy rainfall which is evenly distributed throughout the year with a double rainfall maxima in March and September because the sun is overhead at the equator twice in a year while areas far away from the equator experience moderate to low rainfall with a single rainfall maximum because the sun is overhead at the tropic of cancer in the north and tropic of Capricorn in the south once in a year

Ocean currents

Warm ocean currents like the warm Mozambique currents increase the temperature of the ocean water and cause an increase in the rate of evaporation. The water vapour is therefore picked up by the onshore winds resulting into heavy rainfall in the coastal areas of E.Africa between Mombasa and Dar es Salaam

Corriolis force effect

According to Ferrel's law, the South east trade winds are deflected to the right of their path as they cross the equator due to the rotation of the earth. This is responsible for the heavy rainfall received around the northern and north eastern shores of lake Victoria while low and un reliable rainfall experienced in the Ankole Masaka corridor

Perturbation

It refers to the development of low pressure belts over the Indian ocean due to intense insolation. This forces winds from the interior of E.Africa to blow offshore (seaward) resulting into heavy rainfall over the Indian ocean and dry conditions in North eastern Kenya

Coastal Configuration

The North east and South west alignment of the coast forces winds to blow parallel to the coast instead of blowing onshore. This is responsible for the low rainfall received in North eastern Kenya

Human activities such as deforestation, overgrazing, sinking of bore holes and swamp reclamation among others reduce the rate of evaporation and evapotranspiration

resulting into low rainfall e.g in the Karamoja region and Turkana land. On the other hand, afforestation and re-afforestation result into increase in the rate of evaporation and evapotranspiration hence increasing the amount of rainfall in the areas where the trees are planted

7. Examine the factors for the distribution of Natural forest vegetation in East Africa.
(25 marks)

Approach
- Define natural forest vegetation.
- Identify the types of natural forests in East Africa
-State the characteristics of each type of forest and where it is found descriptively or by drawing
a sketch map.
Explain the factors influencing the growth of each type of forest

-Natural forest vegetation refers to the community of a dense cover of trees growing naturally in aparticular physical environment

Natural forests in East Africa are grouped into three types. Namely; equatorial forests/ tropical rainforests, montane forests, mangrove and riverine forests

Equatorial tropical rain forests are common in areas of mabira, kalangala, Budongo, Kibaale, Imaramagambo and on the foot hills of Mount Elgon, Rwenzori, Kenya, Kilimanjaro and Meru.

Tropical rainforests are characterized by;

- ever green trees
- trees are tall
- trees have broad leaves,
- trees have huge and straight trunks
- trees have buttress roots to support the huge trunks,
- trees appear in mixed stand for example mahogany, iron wood, ebony e.t.c
- trees form 2-3 canopy layers. That is, upper layer of very tall trees, middle and lower layer.
- trees have thick bark and provide hard wood for example, mahogany, iron wood, rose wood, greenheart and ebony.
- Limited or no under growth because of the canopies which block sunlight from reaching the ground

Montane forests- sub divided into temperate and Bamboo.

Temperate forests exist at an altitude of about 2500m- 3000meters above sea –level and **characterized by;**

- dominance of coniferous soft wood trees species like cedar, podocarp and camphor.
- trees are tall near the tropical rain forests due to heavy rain fall
- trees are ever green,
- trees have straight trunks,
- trees have thick barks,
- trees have needle shaped leaves and no under growth.
- Trees are shorter towards the bamboo forest.

Bamboo forests exist at an altitude of about 3000m – 3500m above sea. Bamboo plants have the following characteristics;

- they appear in single layer,
- grow in pure stand
- have segmented or reed like stems with hollows inside to minimize water consumption which is relatively scarce at this altitude,
- have small, tough pointed leaves,
- they are ever green,
- have prop roots to anchor in the swallow soil.

Mangrove forests in the salty waters along the coast of East Africa between 50 north and 50 south of the equator for example Rufiji delta, areas near Mombasa, Lamu e.t.c
- Mangrove contain Medium height trees of about 12 meters,
- trees have aerial roots for breathing in mud,
- Have tap roots for filtering salts from the blackish water
- Have buttress roots to anchor firmly in the unstable mud flats
- trees have short and twisted trunks,
- trees have ever green broad leaves
- trees are of tropical hard wood.
- trees form a dense cover due to water logging conditions,

Factors favoring the growth and distribution of natural forests

The growth and distribution of natural forests in East Africa is influenced by; climate, type of soil, drainage, altitude, relief and biotic factors as explained below.

Climate- has influenced the growth and distribution of forests through its elements of rainfall, temperature and humidity. That is;
- hot and wet/ humid conditions have encouraged the growth of tropical rain forests.
- cool and wet conditions in highland areas have encouraged the growth of montane forests.
- hot and moist conditions in the coastal areas of East Africa have encouraged the growth of mangrove forests.

Altitude: refers to the height above sea level and affects temperate and rainfall.
- Low and high altitude about 1000m-2500m above sea level encourages tropical rain forest
- High altitude of about 2500m-3500m above sea level has encourage growth of montane forest vegetation
- Coastal areas of about 0-200m above sea level have encouraged the growth of mangrove forests

Nature of the soil. The Type of soil in terms of; fertility, depth and texture has influenced the growth of forests in the following ways;
- deep and fertile soils such as volcanic on gentle slopes of volcanic highlands, loamy and alluvial soils in low lying areas such as lake shores and valleys have encouraged growth of rain forests.
- shallow and fairly fertile soils on mountain slope have encouraged the growth of montane forests
- deep, muddy and saline soils have encouraged the growth of mangrove forests.

Drainage of the area influences the moisture in the soil. That is;
- Well drained areas such as gentle slopes and steep slopes have encouraged the growth of both rain and montane forests.

▪poorly drained or water logged areas such as salty marshes in the coastal areas and deltas have encouraged the growth of mangrove forests.

Influence of relief. That is;

▪lowlands and gentle slopes have encouraged growth of rain forests

▪fairly steep slopes or hilly areas have encouraged the growth of montane forests

▪low lying coastal plains have encouraged the growth of Mangrove forests.

Influence of relief biotic factors for example;

▪Bird have helped in dispersing seeds form which trees thrive

▪Human intervention through afforestation, re-afforestation and agro forestry has facilitated the existence of natural forests,

▪**Favorable Government policy** of conserving natural forests in form of forest reserves and national parks has facilitated the existence of natural forests for example Mabira, Budongo, Bugoma, IMaramagambo, Bwindi impenetrable forests, Elgon forests, Tsavo National parks e.t.c

▪Absence of **serious diseases and pests** such as elephants and giraffes which would have other wise destroyed and change the quality and quantity of forest vegetation. For example Mabira and Bwindi forests.

8.Describe the factors that influence the processes of soil formation in East Africa. (25 marks)

Processes of soil formation include;-Weathering, Laterisation, Leaching, Eluviation, Illuviation,Humification,mineralization Calcification,Gleization, Chelluviation, Podsolisation, Salinisation

The factors upon which soil formation and type depend are:

- ***Climate*** **:** climate affects the soil type both directly through its weathering effects and also indirectly as a result of its influence upon vegetation.
- ***Parent rock*** : The influence of the parent rock is very marked in the case of young soil which has not had time to develop. The nature of the rock influences the rate of weathering.
- ***Vegetation (plant) and animal*** **:** Both plants and animals influence the development of soil. The influence of

animals on the soil is largely mechanical. They assist in the breaking of rocks while some animals are of particular importance as they change the texture and chemical composition.

- ***Topography*** : The steepness of slope normally influence soils. Steep slopes encourage soil erosion and weathering.

Consequently steep slopes tend to have thinner soil whereas gentle slopes have deep soils.

- ***Time*** : All soils need at least some years to become mature and develop a permanent profile which remains

essentially the same with the passage of time.