MARKING GUIDE

NETWORK OF GEOGRAPHY TEACHERS ASSOCIATION

Uganda Advanced Certificate of Education

GEOGRAPHY

(PHYSICAL GEOGRAPHY)

Paper 1

00	-	*totally irrelevant answer*
1 – 8	-	*Rudimentary facts / few scattered facts*
9 – 11	-	*O level answer*
112 – 14	-	*Basic A' Level answer*
15 – 17	-	*Good but not out standing*
118 – 20	-	*very good answer*
21 – 25	-	*Excellent answer*

SECTION A

*Questions**1** and **2** are **compulsory***

COMPULSORY MAPWORK QUESTION

1. *Study the **1:50,000 EAST AFRICA (UGANDA) KAMPALA** map extract, part of sheet 71/1, Series Y732, Edition 3-U.S.D and answer the questions that follow;*
   (a) Determine the ;
   (i) grid reference of the road junction East of Bunamwaya. (01 mark)

   1 2
   GR of the road junction East of Bunamwaya is 512 283
   3 4

   (ii) direction of Namalusu island from Muyenga high level reservoir (01 mark)

   Direction is South – East

*(b) Calculate the gradient of the area along Northing **30** from Easting **55** to Easting **66**.* *(02 marks)*

$$Gradient = \frac{Amplitude}{Horizontal\ Equivalent}$$

$$= \frac{400ft}{11km}$$

NB: Change al to cm, 1foot = 30cm, 1km = 100,000cm

$$= \frac{400\ x\ 30}{11\ x\ 100{,}000} = \frac{12{,}000}{1{,}100{,}000}$$

$GR = \frac{1}{92}$ OR $1:92$ *1 mark*

*(c) Reduce the area shown on the map extract by **30%** and draw its sketch map. On the sketch map drawn mark and name;*

*(i) Any **three** physiographic features,*

(ii) Kampala built-up area,

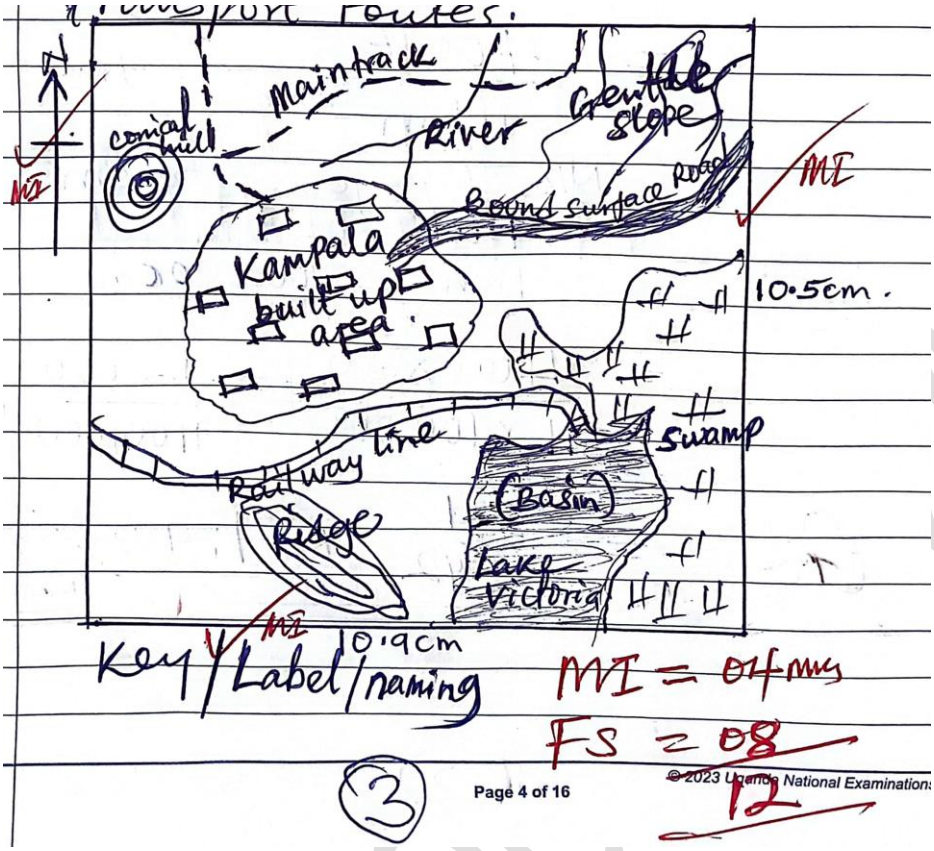
*(iii) Any **two** drainage features,*

*(iv) Any **two** transport routes* *(12 marks)*

***NB**: 30% = $30/100 = \frac{1}{3.3}$*

Hence the factor is $\frac{1}{3.3}$ or 3.3

A reduced sketch map of Kampala by 30% showing three physiographic features, Kampala built up area, two drainage features and two transport routes.



Physiographic features to consider:-

- *Conical hills*
- *Flat – topped hills*
- *Ridges*
- *Spurs*
- *Saddles / cols*
- *Basin*
- *Gentle slopes*
- *Low lands*
- *Bays and headlands*

  NB: Any 3 x 1 = 3 marks

Drainage features to consider

- *Lake Victoria*
- *Swamps ie. Either permanent or seasonal swamps but not both*
- *Rivers*

  NB: any 2 x 1 = 2 marks

Transport routes to consider

- *Any one type off road*
- *Railway line*
- *Main tracks / motorable tracks*
- *Foot paths*

NB: Any 2 x1 = 2 marks

Kampala built up area must be indicated as a form of area not just a dot.

(d) Examine the factors that have influenced the various land-use activities shown on the map extract. (06 marks)

- *Gentle slopes have encouraged construction of roads / road transport due to easy construction of roads e.g. the Kampala – Seeta – Mukono bound surface road etc*
- *Gentle slopes have encouraged settlements e.g. ground Kampala built up area like in Kawempe etc due to easy, construction of houses.*
- *The fertile soils have encouraged forestry like on the shores of lake Victoria at Bukasa and Buwaya in the south east because they support growth of forests / trees.*
- *Heavy and reliable rainfall has favoured crop growing evidenced by Bweyogerere Estate and the ginneries at Kawempe because it supports proper growth of crops.*
- *Well drained areas / gentle slopes have favoured borehole construction like at Bweyogerere to the north – east due to easy constructionnn*
- *Well developed transport routes like roads have favoured / attracted / encouraged settlements e.g. along the bound surface road from Kampala built up area to Kawempe and Kagoma in the North – west due tto easy means of transport / for easy accesibilty.*
- *Areas with social services / social aamenities like schools have attracted settlement e.g. at Nakawa and Kawempe because they offer the education services to the people.*

  NB: Vary the factors
- *Also vary the land uses*
- *Do not accept economic activities which are not landuses*
- *Explanation / reason is a must*

  Any 3 x 2 = 6 marks

  Influence with o out explanation, give half of the marks

  No evidence no mark

*(e) Account for the formation of **Murchison bay** found in the South East of the map.*

(03 marks)

- *A bay is where water of the lake / ocean <u>enters / projects into the adjacent land</u>*
- *It is formed by <u>wave erosion</u>*
- *Through processes of <u>hydraulic action, abrasion and solution.</u>*
- *Formed where there are <u>alternating hard and soft rocks along the shore</u> / coast.*
- *Which bring about <u>differential erosion.</u>*

- *The <u>hard rocks resist erosion by the waaves to form the headllands</u> while the <u>soft rocks are easily eroded away and water enters / projects into the adjacent land to form the bay.</u>*

  NB: Diagram off a bay can be drawn

  Any 3 x 1 = 3 marks Total = 25 marks

COMPULSORY: PHOTOGRAPH INTERPRETATION QUESTION

2. *Study the photograph provided below and answer the questions that follow;*

*(a) State any **two** characteristics of the photograph provided. (02 marks)*

It is a <u>ground horizontal</u> photograph with the following characteristics.

- *The horizon / skyline is seen*
- *It covers a relatively small areas*
- *Only one side of the features is seen*
- *Features in fore ground appear bigger and more – clear because they are near camera while features in the back ground appear smaller because they are faar from the camera.*

NB: Identification / stating the type of photograph = 1 mark

- *Any two characteristics = 2 marks*

(b) Draw a sketch of the area covered by the photograph and on it mark and label;

(i) the following physiographic land forms;

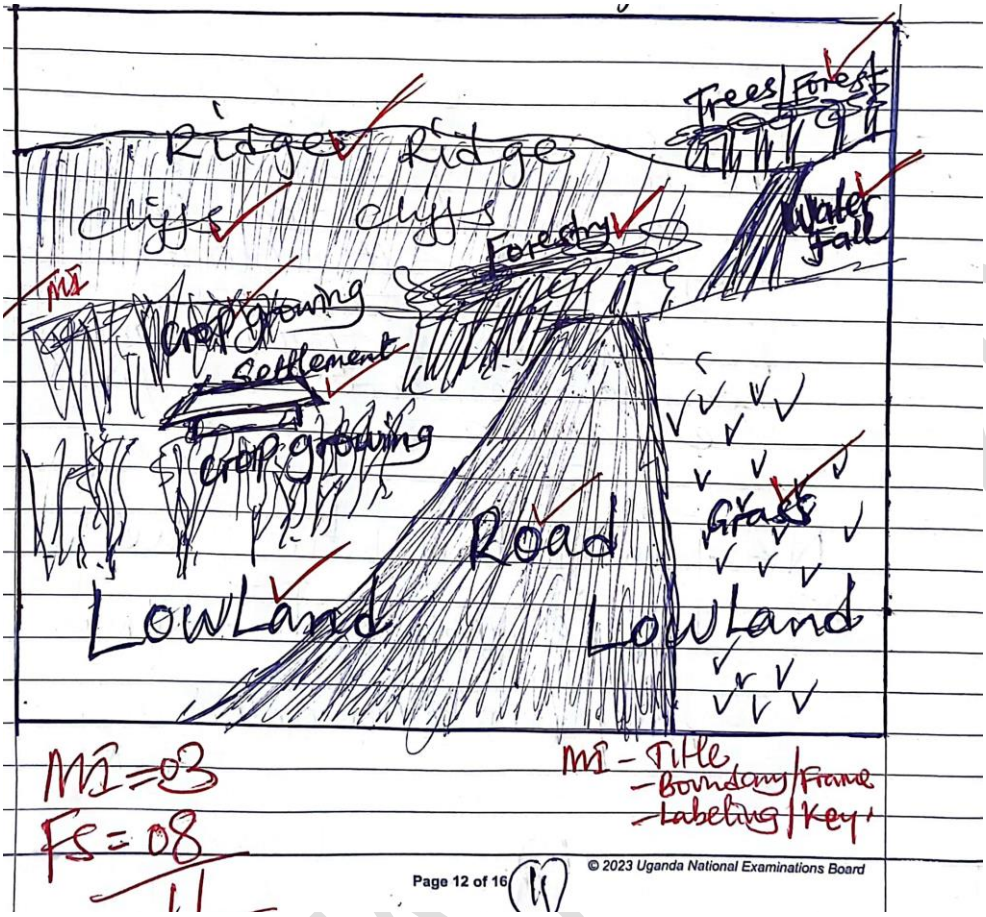
- *Ridge,*
- *Cliffs,*
- *Low lands.*

(ii) any two vegetation types.

(iii) two land-use types

(iv) a drainage feature. (11 marks)

A sketch / landscape sketch of the area covered by the photograph showing a ridge, cliffs, lowlands, two vegetation types, two landuse types and a drainage feature.



NB: Vegetable types;

- *Grass*
- *Forest / trees*
- *Thickets / shrubs*

Land use types

- *Road*
- *Crop growing / crop cultivation*
- *Settlements*
- *Forestry / tree planting*
- *Animal rearing*

Drainage features

- *Water fall / river*

(c) *Account for the formation of **either** the ridge **or** the low lands shown in the photograph.* *(05 marks)*

- *A ridge is an elongated rocky hill that stands above the surrounding lowlands.*
- *Formed by vulcanicity intrusive volcanicity*
- *Due to radioactivity and geo – chemical reactions and convectivity inn the mantle.*
- *These reactions generated intense heat hence melting the mantle rocks to form magma.*
- *Magma was intruded forming an intrusive igneous rock like a dyke*
- *The soft over – lying rocks were removed by denudation processes of weathering, erosion and mass wasting hence lowering the ground to form a low land.*
- *While the hard-igneous rock / dyke resisted weathering and erosion hence remained standing above the lowlands as a rocky ridge*
- *Diagram can be drawn showing an exposed ridge.*

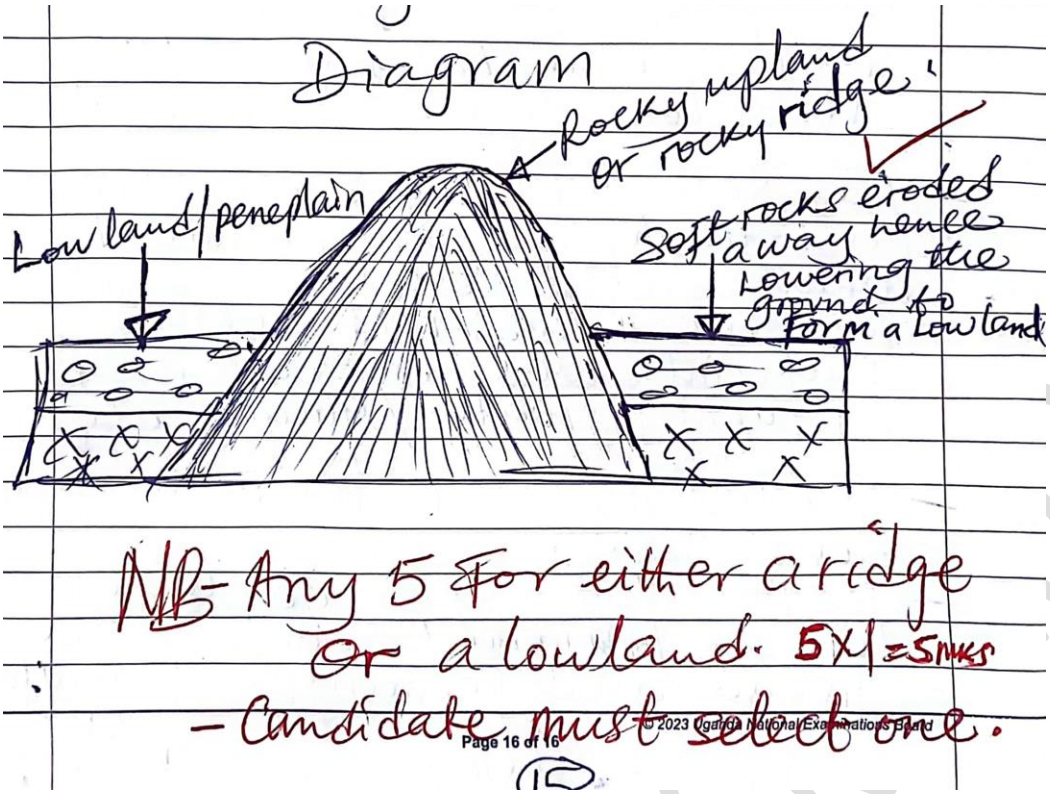
OR

Formation of lowland / peneplain

- *A low land / peneplain is a more or less leveled land surface*
- *Formed by denudation processes of weathering, erosion, mass wasting and later deposition over a long period of time*
- *The soft rocks were weathered by both physical and chemical weathering processes.*
- *The weathered rock debris / materials were eroded away by running water / glaciers etc*
- *Eroded materials were transported down slope*
- *Deposition occurred later hence lowering the ground and forming a low land.*

Peneplain / flat land

- *Low land / peneplain formation occurred together with formation of the rocky ridge / inselbergs / rocky uplands as the hard rocks on the upland resisted weathering and erosion forming the rocky ridge / upland in the background*



NB: Any five for either a ridge or a lowland. 5 x 1 = 5 marks
Candidate must select one

(d) Explain the challenges caused by the nature of the physical land scape shown in the photograph to the surrounding community. (05 marks)

- *Land slides due to steep slopes in the background*
- *Soil erosion due to steep slopes in the background*
- *Difficulty in construction of roads due to steep slopes in the background*
- *Limited land for settlement due to steepslopes / cliffs in the background*
- *Limited land for agriculture due to steep slopes / cliffs in the background.*
- *Difficulty in the agricultural mechanization due to cliffs or steep slopes in the background*
- *Flooding due to low lands in the foreground*

Any 5 x 1 = 5 marks

*(e) Giving reasons for your answer, suggest any **one** area in East Africa where this photograph could have been taken. (02 marks)*

- *Mbale, Bududa, Bulambuli, Kasese, Bundibugyo, Kabale, Kisoro etc*
- *Evidence; Uplands, cliffs, lowlands, crop growing in low lands.*

NB: Area - 01 mark
Reason – 01 mark

SECTION B

*Answer **one** question from this section.*

*3. (a) Examine the influence of **extrusive Volcanicity** on formation of **highlands** in East Africa. (15 marks)*

- *Candidates are expected to define a highland*
- *Give examples of highlands in East Africa due to extrusive volcanicity*
- *Define extrusive volcanicitty and describe its origin*
- *Then bring the highlands due to extrusive volcanicity*

A high land is an upland which is above 1500m above sea level. The highlands in East Africa due to extrusive volcanicity includes; Kigezi highlands, Mt. Elgon, Mt. Moroto, Kenya highlands, Mt. Kenya, Kilimanjaro highlands etc

- *Extrusive volcanity is a process through which the molten rock materials are ejected onto the surface of the earth through lines of weaknesses / vents where the materials cool, crystallise and solidify forming various extrusive volcanic features.*
- *Volcanicity originates from the earth's interior especially the mantle due to great intense heat caused by geo – chemical reactions and radio activity. The heat causes melting of the mantle rocks creating convective currents. The convective currents create tensional and compressional forces which create lines of weaknesses or vents through which magma is ejected on to the earth's surface to form highlands. The highlands due to extrusive volcanicity include the following:*

A composite cone / composite volcano

- *This is a large volcano / highland with fairly steep sides and made up of alternate layers of lava and ash ejected through the main event over a long period of tiem. It has a large crate on top.*
- *Foremed through successive explosive eruptions of large quantities of acidic lava ejected through the central vent over a long period of time.*
- *The acidic lava cools rapidly and accumulates around the vent to form a large cone / volcano*
- *Secondary eruptions occur later through secondary vents forming secondary cones*
- *Examples include Mt. Kirimanjaaro, Mt. Muhavuraa, Mt. Meru, Mt. Kenya, Mt. Elgon etc*
- *Draw a diagram*

Ash and cinder cone;

- *This is a steep sided volcano of usually low height composed of layers of ash and cinders*
- *Formed through violent explosive eruptions of acidic lava with high gas content.*

- *The acidic lava is ejected in a violent eruption which breaks it into smaller fragments to form the ash and cinders*
- *The ash and cinders accumulate around the vent hence building up a steep sided volcano / cone with a large crater on top.*
- *Examples include Teleki in Kenya, shozi, muganza, bisalo etc in South western Uganda.*
- *Diagram showing ash and cinder cone*

A cumulo done

- *This is a steep sided convex dome of acidic lava*
- *Formed when acidic lava is extruded and piles up around the vent quickly before spreading out wards*
- *The acidic lava which is viscous solidifies quickly around the vent and hardens to form a dome shaped rock mas with no visible crater called a cumulo – dome.*
- *Later extrusions are unabled to reach the surface hence forcing the initial layers outwards hence forming a cumulo dome.*
- *Examples include; Ntumbi cumulo – dome in Tsavo, National park, Katwe cumulo dome close to lake in Kasese etc*

A volcanic plug / pug dome;

- *This is a steep sided volcano with a narrow top standing prominently above the ground*
- *Formed when acidic lava which is viscous is extruded as a rigid cylindrical rock mass standing above the surrounding areas.*
- *The lava solidifies quickly without flowing for long distances.*
- *Denudation forces of weathering, erosion and mass – wasting gradually expose the base of the volcanic plug leading to its growth in size and height*
- *For example the Tororo rock in eastern Uganda.*
- *Draw a diagram showing a volcanic plug*

A basalt dome / shield volcano

- *This is a large flat topped dome of basic lava with gently sloping sides and has a wide base*
- *It has a large shallow steep sided sunken crater*
- *Formed when basic lava which is fluidy and mobile is poured on to the earth's surface through several fissures / vents and flows for long distances before solidifying*
- *Successive eruptions of this basic lava builds up a low lying volcano with a large base called a basalt dome*
- *Examples include Nyamulangira volcano and the Uganda – DRC border, marsabit in Kenya and the Virunga ranges.*
- *Diagram showing a basalt dome.*

A lava plateau

- *This is an upland with an almost flat top / summit and stretching over wider area.*
- *It is made up of successive layers of lava covering the original landscape of hills and vallerys*
- *Formed when basic lava is poured on to the surface of the earth and flows for a long distance before solidifying*
- *The basic lava spreads out over a wider area covering the original landscape of hills and valleys hence forming a lava plateau.*
- *Examples include the Laikipia lava plateau in Kenya, the Kisoro llava plateau and the lava plateaus in Ntungamo*
- *Diagram showing a lava plateau.*

NB: Impression marking 15 marks

(b) Giving specific examples, assess the importance of highland areas to the people of East Africa. (10 marks)

Positive

- *Promote tourism for income and foreign exchange e.g. Kigezi highlands, Mt. Rwenzori etc*
- *Used for reaserch / study purposes for knowledge e.g. Kenya highlands, Mtl Kilimanjaro etc*
- *Promote filming and photography for income and advertisement e.g. Mt. Elgon, Mt. Rwenzori etc*
- *Promotes formation of rainfall which promotes agriculture for provision of food and income e.g. Mt. Elgon*
- *Sources of rivers which provide water for domestic and industrial purposes e.g. Mt. Rwenzori*
- *Sources of minerals like copper mined on Mt. Rwenzori hence exported to get foreign exchange*
- *Attracts settlements on the lower slopes due to gentle slopes e.g. on the lower slopes of mt. Elgon, Mt. Rwenzori etc*
- *Promotes wildlife conservation hence protecting bio – diversity e.g. on Mt. Elgon, Mt. Kenya etc*
- *They are a source of rocks hence promoting rock quarrying for building materials e.g. Mt. Rwenzori and Kigezi highlands.*
- *They are used as sites for construction of telecommunication masts to boost the network and easy communication for the local people e.g. on Mt. Elgon, Mt. Rwenzori on the Tororo rock / Tororo volcanic plug etc*

- *Promote forestry hence promoting lumbering hence provision of timber for income and construction of houses e.g. From Mt. Elgon forests and Mt. Rwenzori forest*
- *They act as international boundaries hence promoting good international relationships between countries and therefore promoting trade e.g. Mt. Rwenzori and Mt. Elgon.*

Negative

- *Steep slopes limit construction of roads hence limiting accessibility and trade activities*
- *Promote the occurance of landslides leading to death and destruction of property*
- *Promote soil erosion leading to loss of soil fertility hence limiting agriculture*
- *Promote flooding on the lower slopes leading to denstruction of property and death of people e.g. in Kasese on the lower slopes Mt. Rwenzori*
- *They are hiding places for criminals e.g. rebels causing insecurity that limits economic activities like agriculrue and trade e.g. Mt. Rwenzori*
- *They creat rain shadow effect leading to aridity that limits agriculture e.g. Mt. Rwenzori in Kasese, Karamoja area due to Mt. Elgon etc*

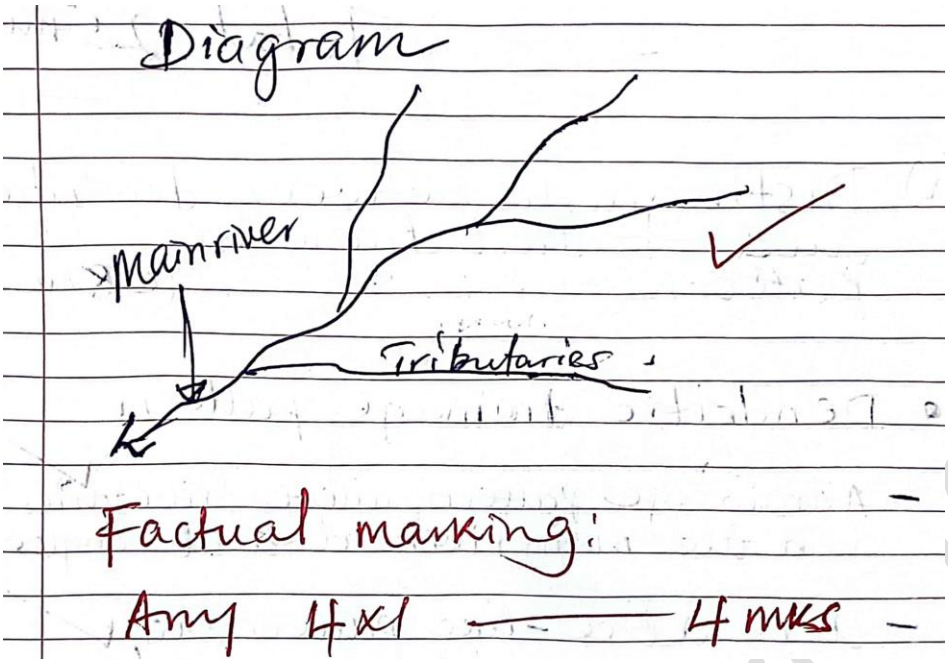
NB: Factual marking

- *All points must be tied to example of highlands*
- *No examples of highland no mark at all*
- *+ve – 07*
- *- ve – 03*

*4. (a) Distinguish between **dendritic** and **radial** drainage patterns. (08 marks)*

Dendritic drainage pattern

- *A drainage pattern where tributaries join the main river at acute – angles.*
- *It is a tree – like pattern i.e. resembles the branches of a tree*
- *Develops on gentle slopes, with homogeneous rocks*
- *Tributaries flow in the same direction of the main river before joining it at acute angles.*
- *Examples of this pattern can be seen along river Rufigi, River Ruvuma, River Namatala and River Tana etc.*



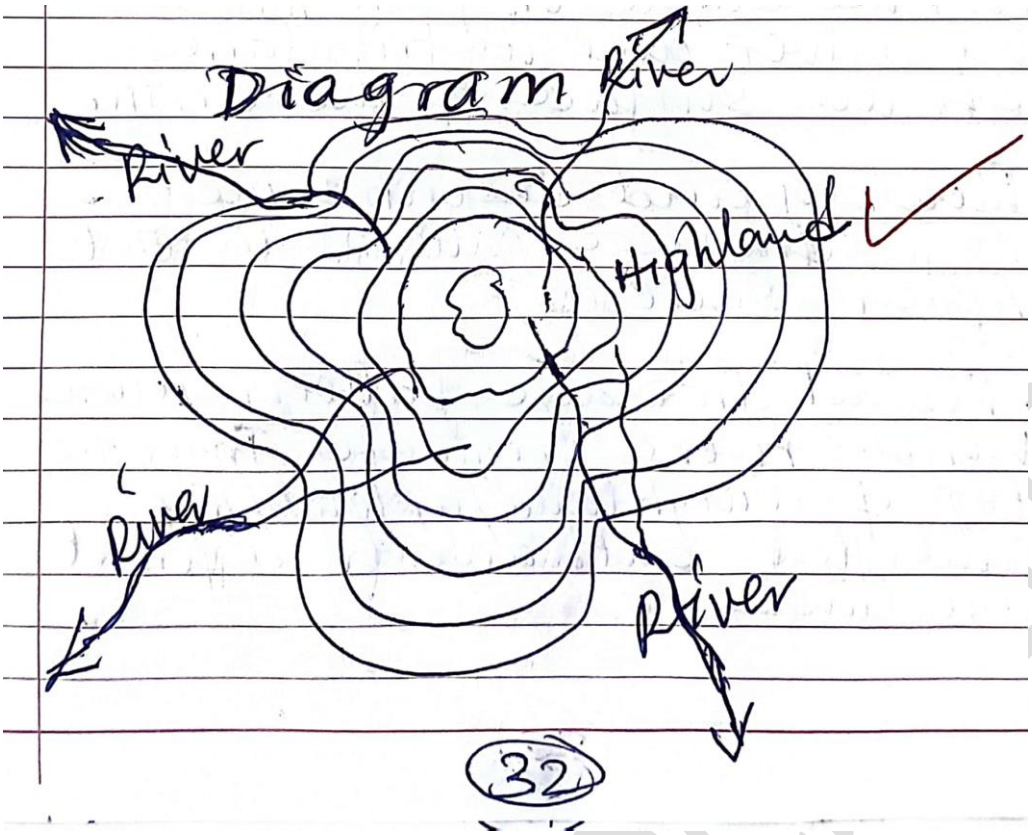
Factual marking

Any 4 x 1 = 4 marks

WHILE / WHERE AS

Radial drainage pattern;

- *A pattern where various rivers originate from the top of a highland / upland / hill and flow out wards to different directions like the spokes of a bicycle – wheel*
- *It develops on highlands / uplands / hills with steep slopes*
- *Developes on homogenous rocks.*
- *It can be seen on mountain Rwenzori with rivers such river Mubuku, River Myamgasani, River Nyamwamba and River Lume, on mountain Elgon with rivers like River Manafwa, River sipi, River Koitobos and River Turkwell etc*



Factural marking

Any 4 x 1 = 4 marks

*(b) Examine the influence of **rock structure** on the evolution of the different drainage patterns in East Africa. (17 marks)*

Candidates are expected to define the term drainage pattern as; the layout or plan made by a river and its tributaries on the surface of the earth.

- *Identify and describe the major drainage patterns in East Africa such as;*
- *Radical drainage pattern where various rivers originate from the top of a high land / upland / hill and how outwards to different directions.*
- *Dendritic drainage pattern which a free – like pattern where the tributaries join the main river at acute angles.*
- *Trellis / rectangular drainage pattern where tributaries join the main river at approximately right angles*
- *Annular drainage pattern*

- *Parallel drainage pattern*
- *Centripetal drainage pattern*
- *Barbed / hooked drainage pattern*

  Etc

Candidates are expected to explain the influence of nature of the rock / rock structure on the evolution of different drainage patterns as following:-

- *Homogenous rocks have led to development / formation of dendritic and radial drainage patterns*
- *Jointed rocks have led to evolution of Trellis / rectangular drainage pattern*
- *Heterogenous rocks have led to evolution of Trellis drainage pattern.*
- *Belts of hard and soft rocks lying side by side have led to development of parallel drainage pattern e.g. river Mkusi and River Hoima are parallel to each other along the Butiaba scarp*
- *Presence of dome – shaped rock structures hence forming radial drainage pattern.*
- *Presence of massive crystalline rocks leading to dendritic and radial drainage patterns*
- *Alternating hard and soft rocks on the uplands leads to formation of annular drainage pattern*

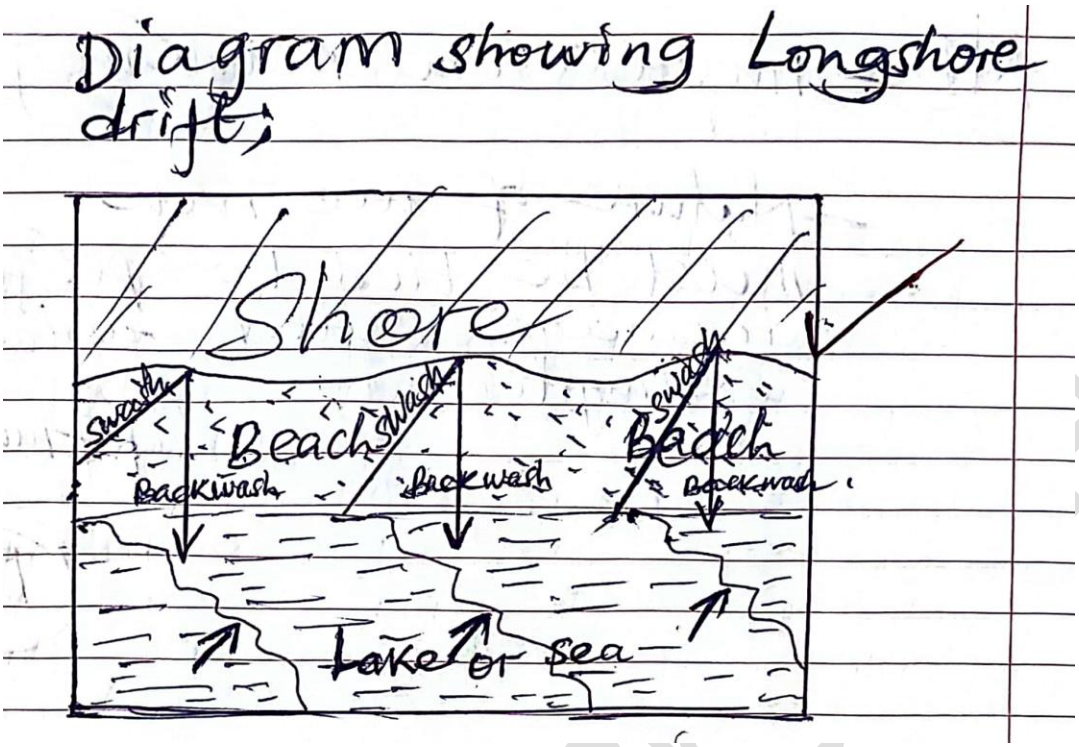
NB: Impression marking

Nature of the rock must be tied to specific drainage patterns with examples. *(17 marks)*

*5. (a) What is meant by the term **long-shore drift**?* *(05 marks)*

- *Long shore drift is a process of wave deposition*
- *It involves the movement or transportation of materials to the shore by waves in a zig – zag motion / path as the waves swashes break obliquely to the shore while the back – wash returns and drags materials down the beach at right angles to the shore hence depositing such materials.*

  Diagram showing long shore drift.



NB: *Factual marking – 5 marks*

*(b) Examine the influence of **long-shore drift** on formation of the different types of beaches in East Africa. (20 marks)*

Candidates are expected to define a beach as;

Accumulated deposits such as sand, shingles and pebbles on a gently sloping coastline / shoreline between low and high tide levels.

- *Beaches are formed through the process of long shore drift when the constructive waves deposit materials at the coast shore in form of sand, shingles or pebbles and these materials accumulate to form a beach such as Lutembe beach, kasenyi beach, Gabba beach, Aero – beach, Lido beach on the shores of lake Victoria, Nyali beach near Mombasa port in Kenya. The types of beaches include the following;*
- *A bay head beach. This is a deposit or a crescent of sand and shingles formed in a bay between headlands e.g. Lido beach, Kasenyi beach on the shores of Lake Victoria, Nyali beach at Mombasa etc*
- *A barrier beach; this is a long ridge of deposited materials such as sand, pebbles and shingles parallel to the coast / shore line and separated from the coast by a lagoon. It is formed on a gently sloping coastline by the waves which break some distance away from the coast (waves which break off shore) hence depositing materials before*

reaching the coast /shore line which accumulate forming a barrier beach. Examples are seen along the Kenyan coast near Mombasa port.

- *A beach berm; a ridge like feature formed by larger materials that accumulate at the furthest limit of swash action. Develop where a swash is stronger than a back swash e.g. Lutembe beach, Lido beach etc*
- *Beach cusps. These are projections of sand shingles forming small cone – shaped apex pointing sea – wards. They are formed by waves with a powerful swash e.g. at Mombasa.*

- ***Storm beaches;*** *These are beaches formed when strong wave deposit materials several metres above the water level during periods of storms. The materials may consists of large boulders and rocks.*
- ***Beach rocks****; these are beaches consisting of hard – crust – like deposits projecting above the sea. They are formed when shells, pebbles and shingles are cemented together by calcium carbonate.*

NB: *Diagrams / illustrations of the different types of beaches are a must Impression marking. (20 marks) Total 25 marks*

SECTION C

*Answer **one** question from this section*

6. Examine the causes and effects of Equatorial type of climate in East Africa.

(25 marks)

Candidates should define climate as; the average weather conditions of a place studied and recorded over a long period of time usually 30 years and above.

- *Point out areas where equatorial climate is found in East Africa i.e. Lake Victoria basin and some parts of the East African Coastal areas.*
- *Point out the characteristics of equatorial climate;*
  - *i) Heavy rainfall ofr 1000 – 2000mm on average*
  - *ii) Rainfall is reliable , well distributed throughout the year with no clear marked dry season*
  - *iii) Rainfall is in form of two maximas with peaks in march – April and October – November*
  - *iv) Rainfall is mainly convectional accomapned by lightning and thunder*
  - *v) The temperatures are hot throughout the year ranging between 23oC – 29oC. There is great uniformity of temperature throughout the year ranging between 25oC - 28oC on average*
  - *vi) Hottest temperatures are 38oC and coolest are 15oC depending on the location*

vii) *The annual temperature range is small ranging from 1^{o} – 4^{o}C on average. Also the diurnal temperature range is small*

viii) *Humidity is high about 80% due to high rates of evaporation and evapotranspiration*

ix) *There is dense cloud cover due to high evaporation and condensation*

x) *It is dominated by air masses that converge at the inter – tropical convergence zone (ITCZ) due to persistent low pressure*

Candidates should explain the factors that are responsible for equatorial climate;

- ***Latitude**. Equatorial climate is experienced in areas which ae between 5oN and 5oS of the equator leading to hot temperatures throughout the year hence high evaporation, high humidity, and heavy rainfall.*
- ***Altitude.** Equatorial climate is experienced in areas which are at low altitude of less than 1000 metres leading to hot temperatures throughout the year*
- ***Water bodies**. Water bodies like Lake Victoria, lake Kyoga, Indian Ocean experience high evaporation, water vapour goes to the atmosphere leading to high humidity, dense cloud cover, heavy rainfall etc in the surrounding areas etc*
- ***Vegetation.** There is equatorial climate in East Africa because of forests like Mabira, Budonogo, Kalinzu etc. From these forests, there is high evapotranspiration leading to high humidity, dense cloud cover and heavy rainfall.*
- ***Cloud cover.** Presence of dense cloud cover along the equator has contributed to equatorial climate as it prevents heat from escaping to space hence leading to hot temperatures and small temperature range hence equatorial climate*
- ***Air mass e.g**. South – East trade winds etc*
- ***ITCZ** and apparent movement of the over head sun etc*

Effects of equatorial climate in East Africa.

- *Leads to growth of forests that promote forestry and lumbering*
- *Lead to presence of many water bodies like lakes, rivers and swamps that promote fishing*
- *Heavy rainfall and hot temperatures promote the growing of plantation crops*
- *Lead to presence of swamps leading to handcraft industry*
- *Lead to presence of forests, swamps, and rivers which promote wildlife conservation and tourism*
- *Lead to heavy rainfall accompanied by hailstorms and floods which cause destruction of crops leading to food shortages and famine.*
- *The heavy rainfall lead to growth of forests and evolution of swamps which harbor pests and diseases causing vectors like Tsetse flies and mosquitoes and wild animals which are a threat to man hence discouraging settlements.*

- *The heavy rainfall encourages leaching and formation of lateritic soil not suitable for crop cultivation*
- *Heavy rainfall encourage soil erosion where there are hills which leaves the soil infertile hence discouraging agriculture.*
- *Heavy rainfall leads to floods that displace people.*

Impressional marking = 25 marks

7. (a) Examine the influence of climatic factors on the growth and distribution of Savanna vegetation in East Africa. (15 marks)

Candidates should define savavannah vegetation as a type of vegetation that lies between the tropical forest zone and desert areas.
Identify different types of savannah vegetation together, with areas where each type is found. Also give characteristics of each type of savannah vegetatioin.
Savannah woodlands found in western Tanzania, south western Tanzania (miombo woodland), in northern Uganda like Timu, morongole etc

Characteristics of savannah woodland

- *It is characterized by continous cover of trees.*
- *Trees are of tropical hard wood and of mixed stand e.g. the Acacia Baobabs etc*
- *Trees have medium height of about 8 – 16m high due to moderate rainfall*
- *Trees are umbrella shaped*
- *Trees have twisted trunks with thick and rough barks*
- *Some of the trees have swollen trunks e.g. Baobs to store water*
- *Trees are deciduous in nature i.e. shed off their leaves during the dry season to reduce moisture loss*
- *Dominant tree species include Acacia, babobab, cacti etc*
- *Trees have tiny leaves to reduce on transpiration*
- *Trees have waxy leaves*
- *There is dense growth of grass, bushes and shrubs*
- *Most trees develop branches close to the ground*
- *Savannah – grassland which lies between woodland and dry savanna found in the Nyika plains of Kenya, Northern Uganda the rift valley areas of western Uganda and areas around Bukoba in Tanzania*

Characteristics of savanna – grassland

- *It has tall grass like elephant and spear grass of about 1 – 4 metres high*
- *Grasses turn brown or yellow during the dry season and green during the dry season and green during the wet season.*

- *It has scatterd short trees and bushes grow within the grass and trees.*
- *The trees are deciduous in nature*
- *The trees have tiny / small leaves to resist transpiration*
- *Trees are fire and drought resistant.*
- *Dry bush and thicket / dry savanna common in northern, north western Kenya (Turkana land), north – eastern Kenya, Central Tanzania, North Eastern Uganda, ankole – Masaka corridor, Albert flats etc*

Characteristics of dry – savannah / dry bush and thicket

- *It is characterized by stunted trees with woody stems*
- *Have thorny bushy trees with shrubs growing in between*
- *The trees are short, with small waxy needle like leaves*
- *The grasses are poor, very short etc*
- *It has deciduous trees*
- *The dominant, species of trees include cacti, acacia, euphobia etc*
- *The trees are less than 8 metres in height*
- *Tress are drought resistant*

NB: Candidates may give general characteristics of savanna vegetation

Candidates should explain the influence of climate on the growth and distribution of the different types of savanna vegetations as follows;

- *Moderate rainfall of 760mm – 1000mm lead to growth of savanna woodland with medium height trees e.g. in western and southern Tanzania (miombo woodlands) and in some parts of northern Uganda.*
- *Moderate rainfall of between 600m – 750mm lead to growth of savanna – grassland with tall grasses e.g. in the Nyika plains of Kenya, northern Uganda etc*
- *Low rainfall of between 250mm – 500mm lead to growth of dry savanna (dry bush and thickests) with poor grasses, stunted trees and thorny bushes e.g. in north eastern Uganda, Turkana – land in northern Kenya*
- *Hot temperature of $25^oC – 2^{7o}C$ lead to the growth of savannah woodland with medium height trees like the miombo woodland in south – western Tanzania and savanna – grasslands with drought resistant trees that hve long tap roots e.g. in northern Uganda.*
- *Very hot temperatures of over 30oC lead to growth of savanna with stunted trees and poor grasses e.g. in north – eastern Uganda, Turkana – land in northern Kenya etc*
- *Moderate humidity of 50% - 60% leads to growth of savanna woodland with medium height trees e.g. in western Tanzania and northern Uganda.*
- *Moderate humidity of 40% - 50% leads to growth of savanna grassland with tall grasse e.g. in northern Uganda.*

- *Low humidity of less than 30% leads to growth of dry savanna with stunted trees and poor grassed eg. In north – eastern Uganda, northern, Kenya, Ankole - Masaka dry corridor etc*

  NB: impression marking (15 marks

(b) Account for the increasing degradation of Savanna – grassland vegetation in the different areas of East Africa. (10 marks)

Candidates should explain factors of degradation of savannah – grassland vegetation which include the following:

- *Stocking which has led to over grazing hence changing grasslands to dry bush and thicket e.g. in northern Uganda and north eastern Uganda.*
- *Un controlled bush burning has changed grasslands to dry savannah e.g. in northern Kenya, north eastern Uganda*
- *Tree – cutting for building materials has destroyed the medium height trees in savanna grassland turning them into very short and stunted trees hence dry savannah e.g. in northern and north eastern Uganda.*
- *Clearing of grasslands to create land for settlement and crop cultivation hence changing grasslands to dry savannah e.g. in northern Uganda.*
- *Mining / quarrying activities which have changed grassland vegetation to dry bush and thickets and to bare grounds*
- *Increased demand for wood fuel such as fire wood and charcoal hence changing grasslands to dry savanna e.g. in northern Uganda.*
- *Increased construction of transport routes like roads and railway lines hence clearing the tall grasses and turning savannah grasslands into dry bush and thickets e.g. in northern Uganda and northern Kenya.*
- *Increased industrialization hence destroying savanna grassland changing it to bare grounds in some areas with industries such as Nakasongola, tororo etc and also turning grasslands into dry savannah like in northern Kenya and northern Uganda.*
- *Bore – hole drilling that lowers the water table*
- *Prolonged drought season*
- *Pests and diseases like termites, caterpillars, locusts, harvester ants etc*
- *Natural fires*
- *Gazetting of savanna grassland areas into game parks*
- *The effect of prevailing winds which further intensify the drying effect etc*

NB: Factors for degradation should be well explained.

Showing the degradation / transition from savannah grassland to a negative effect / a poor type of vegetation.

Impression marking. = 10 marks
Total 25 marks

*8. (a) Distinguish between the **pedalfers** and **Pedocals** (06 marks)*

Pedalfers

- *Are an example of zonal soils / mature soils <u>rick in iron and aluminium components / compounds.</u>*
- *Pedalfers develop due to <u>extensive leaching in areas of heavy rainfall</u>*
- *Examples of pedalfers include; the brown <u>earth soils, latosols, the tropical black earth soils, etc in the</u> lake Victoria shores like in Mukono, Wakiso, Buikwe etc*
  Factual marking = 03 marks

While

Pedocals

- *Are an example of zonal soils / mature soils but <u>with high calcium carbonate content</u>*
- *Pedocals develop due to <u>calcification process under conditions of low rainfall but with very hot temperatures.</u>*
- *Examples of pedocals include the <u>chernozems, sierozems and chestnut soils in semi – desert areas</u>* like north – eastern Uganda, northern Kenya etc
  Factual marking = 03 marks

*(b) To what extent is the formation of **Azonal soils** in the different areas of East Africa a result of the nature of the parent rock? (19 marks)*

Candidates are expected to first explain what is meant by Azonal soils as;

- *Azonal soils are the young / skeletal soils without a clear soil profile*
- *They have shallow / poorly developed soil profiles*
- *Show similar characteristics of the original parent rock material*
- *Derived from unconsolidated materials like alluvium, sand and volcanic ash etc*
- *They are divided into two categories or groups namely lithosols and regosols*

Examples of Azonals include the following:-

- *The screes soils / mountain soils found on Mt. Slopes*
- *Alluvial soils formed from deposition of materials from the river / river borne materials such as silt and mud*
- *Marine soils from wave action through wave deposition e.g. clay soils, sand and mud flat – soils*
- *Glacial soils due to glacial erosion and deposition such as the till – soils, the fluvio – glacial soils, the moraine and out wash sandy soils found on glaciated mountain slopes such as Mt. Rwenzori and Kilimanjaro*
- *The wind blown soils such as loess, sand dunes and sand sheets.*
- *The volcanic soils ie. The recent lava and ash soils plus the cinders*

Candidates should give a stand and show the role of nature of the rock on formation of Azonal soils as;

- *Loose and light rock particles like sand have led to formation of wind blown soils such as sad dunes, loess and sand sheets.*
- *The hard crystalline rocks like granites resist weathering hence forming scree soils / mountain soils*
- *Soft rocks are also weathered and deposited forming young soils in the short run such as the alluvial soils, glacial soils / scree soils, glacial soils / scree soils etc on the lower slopes of mountains.*
- *Highly jointed rocks in highland areas are weathered by frost shattering to form the scree / mountain soils in the short run*
- *Also unjointed rocks experice limited physical weathering and chemical weathering hence forming shallow, immature soils such as the scree soils in the short run*
- *Dark – coloured rocks are weathered through exampansion and contraction hence forming the scree soils in the short run which are immature*
- *The light coloured rocks like sand stones limit physical weathering hence forming azonal soils like the scree soils etc*
- *Impermeable rocks do not allow water to percolate leading to limited chemical weathering etc hence forming immature azonal soils like the scree soils etc*

Candidates should evaluate the question and bring other factors such as;
The influence of climate

- *Heavy rainfall leads to flooding and deposition of alluvial materials along rivers to form alluvial soils which are immature soils*
- *Heavy rainfall also leads to a rise in the sea level that also causes flooding and deposition of new materials leading to marine soils on the shores of lakes and along the coast of East Africa.*

- *Hot temperature in arid and semi arid areas promote main physical weathering that breaks rocks into small fragments / screes hence forming the scree soils / sandy soils / sand dunes etc*
- *Differences in pressure in desert and semi desert areas causes strong winds that promote wind erosion and later deposition to form, the wind blown soils such as the sand dunes, loess and sand sheets e.g. in north eastern Uganda and northern Kenya.*
- *Temperature changes in highland areas or mountains like mountain Rwenzori promote main frost shattering leading to formation of the mountain soils / scree soils which are immature soils in the short run.*
- *Volcanic activity has led to formation of the lava, ash and cinder soils in the short run like in Kigezi highlands, Mt. Kilimanjaro and Elgon*
- *Influence of exogenic factors such as;*
    - *i) Wave erosion and deposition forming the marine soils*
    - *ii) Wind erosion and deposition forming the wind blown soils*
    - *iii) Glacial erosion and deposition forming the glacial soils*
    - *iv) River erosion and deposition forming the alluvial soils*
- *Influence of relief;*
- *Steep slopes form skeletal / immature soils like the scree soils*
- *Valleys / lows encourage deposition and flooding forming young soils in the short run*
- *Human activities like mining and quarrying from young soils in the short run. Also deforestation etc*
- *Time factor ie. Short period of time*

NB: Factors must be tied to specific examples of Azonal soils
Impression marking (19 marks)
Evaluatin – 02
Content – 17 marks

Total = 25 marks

END