

Geography

Date: 27 / 06 /2022

Period: 8H30 – 11H30



END OF TERM III EXAMINATIONS

GRADE / LEVEL: ADVANCED LEVEL S5

COMBINATIONS : HEG, MEG, MPG,BCG,HGL

DURATION: 3HOURS

MARKS: /100

INSTRUCTIONS

There are 18 questions in this paper

This paper has two section A and B.

SECTION A: This section is compulsory. (55marks)

SECTION B: Attempt any three questions. (45marks)

Use only a blue or black pen.

SECTION A: ANSWER ALL QUESTIONS (55MARKS)

1. State three main line graphs **(3marks)**
2. Give the meaning of the following words **(4marks)**
 - (a) Bearing
 - (b) A grid reference
3. a) Which instrument is used to measure the sunshine an area received? **(1marks)**
b) Give any three reasons why temperature reduces with an increase in altitude in the Troposphere. **(3marks)**
4. Outline any three methods of forest exploitation **(3marks)**
5. (a) What are the meanings of the following terms: **(3marks)**
(b) Find out any three underground mining methods **(3marks)**
6. Explain the characteristics of the sun **(4marks)**
7. Outline the characteristics of coniferous forest **(4marks)**
8. Outline any four characteristics of cooperative farming **(4marks)**
9. Using a well labelled diagram, identify the parts of the internal structure of the Earth. **(5marks)**
10. Identify four effects of world urbanization on the environment **(4marks)**
11. Identify any four factors that favor coffee plantation in Brazil **(4marks)**
12. Develop the meaning of any three modern method of fishing. **(6marks)**
13. Discuss the impact of folding on drainage system with relevant examples **(4marks)**

SECTION B: ANSWER ANY THREE QUESTIONS OF YOUR CHOICE(45MARKS)

14. *Given is the table showing temperature recorded at station Y*

Months	J	F	M	A	M	J	J	A	S	O	N	D
Temp. °C	22	20	19	21	23	27	28	20	19	24	24	20

- a) Build a simple line graph to portray the above statistical data. **(5marks)**
- (b) Identify the advantages and disadvantages of Age-sex graph. **(10marks)**
15. (a) Define the term Water cycle **(2marks)**
(b) Explain the factors that affect the amount sunshine of an area receives. **(7marks)**
- (c) Establish the differences between Cyclones and Anticyclones. **(6marks)**
16. (a) Identify any four factors influencing rainfall formation **(4marks)**
(b) Describe the characteristics of troposphere. **(4marks)**
(c) Analyse the importance of atmosphere **(7marks)**
17. (a) State the advantages of under population. **(5marks)**
(b) Examine ten factors responsible for the distribution of the population in the world. **(10marks)**
18. (a)(i) What is the meaning of soil catena. **(2marks)**
(ii) Evaluate the importance of soil catena. **(3marks)**
(b) Discuss all factors affecting soil fertility. **(10marks)**

END

S5 GEOGRAPHY MARKING GUIDE

SECTION A: ANSWER ALL QUESTIONS (55MARKS)

1. State three main line graphs (3marks)
The following are the main line graphs:
 - ▶ Simple line and curve graph
 - ▶ Group or comparative line graph
 - ▶ Compound line graphs
 - ▶ Divergence graphs

2. Give the meaning of the following words (4marks)
 - (a) **Bearing** is an accurate way of giving the direction of one place in relation to another. It is more accurate than direction because it has 360 points compared to the 16 points of a compass.
 - (b) **A grid reference** is a series of straight lines drawn vertically and horizontally on topographical maps where the lines cross each other to form squares of equal sizes. The lines running from north to south (vertical lines) are called Eastings.

3. a) Which instrument is used to measure the sunshine an area received? (1marks)
Sunshine is recorded by Sunshine recorder or Campbell Stokes apparatus.
b) Give any three reasons why temperature reduces with an increase in altitude in the Troposphere. (3marks)

The following are reasons of increasing temperature with increase in altitude in Troposphere:

- ✓ **The effects of terrestrial radiations.**
- ✓ **The effects of adiabatic compression.**
- ✓ **The effects of Ozone layer by absorbing ultraviolet radiations from the sun.**
- ✓ **Troposphere is the layer of all weather phenomena like cloud cover, precipitation, humidity which reduce the amount of solar radiations hence low temperature in lower surface of atmosphere**
- ✓ **The role of man's activities like bush burning, industrialization, use of automobiles that increase carbon concentration in the lower layers of atmosphere and hence increase in temperature.**

- ✓ **The presence of water vapor, aerosols and other impurities in atmosphere reduces the temperature in troposphere as you ascend.**

4. Outline any three methods of forest exploitation **(3marks)**

The methods of forest exploitation involve the way of utilizing the forest resources but in sustainable way; and at the same time insuring that sustainable forest management is practiced, making sure that there is continuous utilization of forests. The methods of forest exploitation are listed below:

- ▶ Preparation
- ▶ Felling
- ▶ Bucking
- ▶ Yarding or dragging
- ▶ Loading Process
- ▶ Barging
- ▶ Booming ground

5. (a) What are the meanings of the following terms: **(3marks)**

The meaning of the terms given:

a. **Mining:** Mining refers to all the processes by which minerals are obtained from the earth. Minerals may be in gaseous, liquid or solid form. The processes involved depend upon the mode of occurrence of the mineral.

b. **Open cast mining:** This is the easiest and the cheapest way of mining minerals that occur close to surface. This simply involves the removal of the overburden that is the earth or other rock bands lying above the mineral-bearing strata.

c. **Alluvial mining:** When minerals occur in alluvial deposits they are usually recovered by placer mining methods. This is done by mixing the alluvium with great deal of water and tilting or rotating the gravels until the lighter particles (sand, mud, dust, stones) are washed off, leaving behind the heavier ores, e.g. gold, tin, chromium, platinum, which have a higher specific gravity.

- (b) Find out any three underground mining methods **(3marks)**

The following are five underground mining methods:

- ▶ **Drift or Adit method**
- ▶ **Shaft method**
- ▶ **Solution method**
- ▶ **Drilling method**
- ▶ **Hill slop boring**

6. Explain the characteristics of the sun **(4marks)**

The characteristics of the Sun

The sun as any other heavenly body, has characteristics that distinguish it from the rest of other components of the solar system.

These are explained here under:

- ▶ It makes or emits its own light/heat
- ▶ It has the diameter of 139,200 km.
- ▶ Its temperature ranges from 4000-9000 degrees Celsius.
- ▶ Its mass stands at 1.98892×10^{30} kilograms.
- ▶ It has a density of 1.4 grams per cubic centimeters.
- ▶ The sun is made up of hydrogen and helium.
- ▶ Its radius is estimated to be at 695,500 kilometers.
- ▶ It takes 25 days to turn once on its axis.

7. Outline the characteristics of coniferous forest **(4marks)**

The characteristics of coniferous forests are:

- ▶ The coniferous forests consist of tall and softwood evergreen trees.
- ▶ There are limited species of trees. The existing trees are evergreen and grow apart.
- ▶ The coniferous tree species grow tall, straight and contain few branches.
- ▶ The type of trees in these coniferous forests grow in pure stands;
- ▶ Trees are conical shaped with needle-like leaves. These include firs, pine and cedar which are important variety of trees in these forests;
- ▶ The tree species often grow to a height of over 30m (100ft) tall;
- ▶ Coniferous tree species grow shallow roots and can collect enough water from top soil;
- ▶ They have shallow roots used to absorb the nutrients and water from the top soil;
- ▶ The coniferous vegetation has adapted to harsh conditions associated with winter season.
- ▶ Leaves are small, narrow and often needle-like with the capacity of reducing transpiration

8. Outline any four characteristics of cooperative farming **(4marks)**

Characteristics of cooperative farming

- ▶ There is collective ownership of resources such as factories, stores, and means of transport.

- ▶ Labour is provided by the members themselves. Only few technical personnel is sometimes hired.
- ▶ Profits and losses are shared equally by members.
- ▶ Credit facilities are available to the members from the funds collected.
- ▶ The members are educated and informed about new developments from time to time.
- ▶ The farms are either scattered or consolidated into one big unit.
- ▶ Land ownership may be on collective basis.
- ▶ Marketing of the produce is done collectively.
- ▶ Cooperatives are officially registered and governed by laws and regulations.
- ▶ There is quality control of the products.
- ▶ There is easy access to credit facilities to the members from the collected funds

9. Using a well labelled diagram, identify the parts of the internal structure of the Earth. **(5marks)**

10. Identify four effects of world urbanization on the environment **(4marks)**

Urbanization might cause the following problems:

- ▶ Urbanization results into pollution of land, air, water and noise. This is because of poor disposal of garbage from the domestic and industrial remaining. It also results into noise pollution from industry machineries, vehicles, and other means of transport,
- ▶ High energy consumption increases the release of CO₂ in the atmosphere. This leads to global warming.
- ▶ Most people do not have access to safe drinking water especially in developing countries. Thus, poor sanitation and poor quality of drinking water result into water-borne diseases like Cholera, *Typhoid*, *tuberculosis*, *dysentery and gastro-enteritis*.
- ▶ Sewage also provides nutrition to a vast array of *microbes, bacteria* and fungus adding to the eutrophication of surface water bodies, seriously affecting the human environment and the entire food web in the eco system. Even the ground contaminated by the industrial effluents in the atmosphere, brought down by precipitation.
- ▶ Waste disposal is a major problem in large cities.

11. Identify any four factors that favor coffee plantation in Brazil **(4marks)**

The following are conditions favoring coffee growing in Brazil:

- ▶ Abundant rainfall in Brazil due to its location around equator which encourages the growth of coffee.
- ▶ Presence of well-drained soils like the terra-roza which contain much potash as well organic material, favor the growth of coffee.
- ▶ Coffee growing requires a large labor force because the job of picking is done manually.
- ▶ Coffee growing as any other plantation requires a huge sum of capital. This is because during the first three to four years returns from coffee plantation are nil and expenditure are more.
- ▶ Presence of well-developed transport for both internal and external connections.
- ▶ Coffee grown in Brazil is internationally known. Brazil produce a high-quality coffee. This has abled the country to compete at international market.
- ▶ Increased investments in improving labor skills and incorporating new technology.
- ▶ Liberalization of trade and accepting more completion from foreign producers in local and international markets.
 - ▶ Privatization of States-owned enterprises

12. Develop the meaning of any three modern method of fishing.
(6marks)

Modern methods of fishing are following:

- **Drifting or use of drift nets:** A drift net is placed into the water body where fish are expected to be. This net is hanged vertically in the sea or Ocean in a comparable way the volley ball net is suspended. They are called drift nets because they keep on drifting. This means that they are mobile in response to the prevailing currents to some extent.
- **Trawling fishing method:** This is one of the modern fishing methods used to catch demersal fishes. A sizeable cone-shaped net known as a trawl is used. The entrance of the net is kept open using the floats that are fixed around the upper part it (Entrance). While the bottom edge of the entrance has aligned weights that pull it downwards, therefore, leaving the entrance open to allow fish get a way of entering the trawl net.
- **The gill net method:** This is a fishing method used to catch large tons of fish. It involves the use of net like that of the used in the drifting method. The upper end edge is fixed with floats and the bottom with weights. The several meshing parts of the net trap fish as they try to pass through the net. The strings of the mesh of the net get stuck into the gills of the fish as it tries either to move forward or backwards.

- **Long lining:** This method involves the use of several hooks spread out on long lines. The hooks are attached a few meters apart and buoyed at each end. They are baited and cast into water from a moving vessel. The fish are caught on the baited hook as they try to feed.
- **Seining:** seine nets such as the haul seine and purse seine have intermediate features between drift and trawl nets. The haul seine is like a drift net, kept floating vertically in the sea like a wall by corks on top and weights below.

13. Discuss the impact of folding on drainage system with relevant examples **(4marks)**

The impact of folding on drainage system with relevant examples

The following are examples impacts of folding on drainage system:

- Folding led to formation of many water falls in Rwanda and elsewhere in the World.
- Some of the waterfalls are located on the upward folded areas. A good example is Rusumo water fall.
- Fold Mountains are good catchment areas. A typical example in Rwanda is in Gicumbi District.
- **Folding has led to river reversal in Rwanda. A good example is the reversal of river Nyabarongo.**
- **Folded highlands act as watershed dividing the waters of Rwanda. A good example is the Congo-Nile Crest dividing Congo and Nile basins.**
- **Folding has led to the formation of numerous swamps along rivers and lakes in Rwanda.**
- **Folding has led to formation of various drainage patterns in Rwanda.**

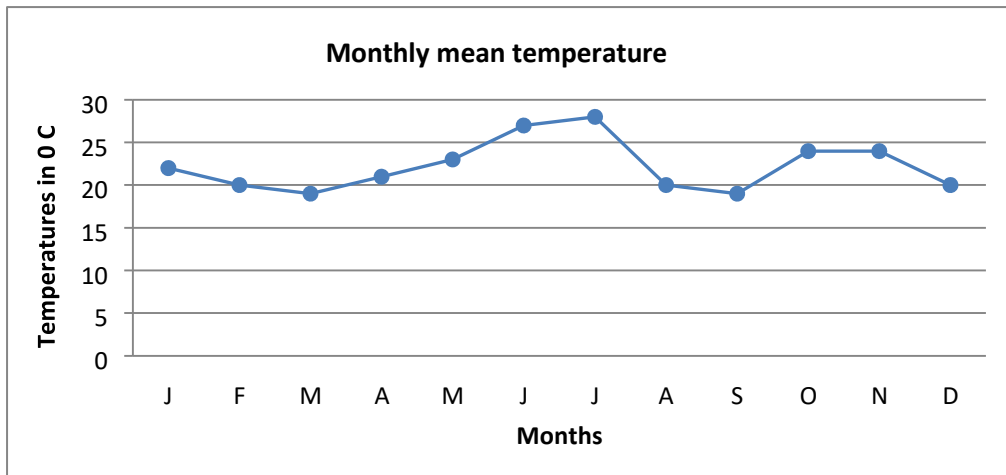
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SECTION B: ANSWER ANY THREE QUESTIONS OF YOUR CHOICE(45MARKS)

15. *Given is the table showing temperature recorded at station Y*

Months	J	F	M	A	M	J	J	A	S	O	N	D
Temp. °C	22	20	19	21	23	27	28	20	19	24	24	20

a) Build a simple line graph to portray the above statistical data. **(5marks)**



NB: Well drawn simple line graph=5marks

(b) Identify the advantages and disadvantages of Age-sex graph. **(10marks)**

The following are the main advantages of an age-sex graph:

- ✓ It provides instant display of the composition of the population being portrayed with consideration of the age and sex.
- ✓ It portrays the general shape of the population structure that facilitates analytical purpose.
- ✓ The features associated with the age-sex pyramid indicate factors affecting an area or region it presents.
- ✓ It gives a good visual impression that captures the attention of the reader or interpreter.
- ✓ It is easy to interpret.
- ✓ It has limited or sometimes no calculations involved. Therefore, it is easy to draw.
- ✓ Age-sex pyramid is suitable for comparison purposes. For example, the number of females and male in each area.

Disadvantages of an age-sex graph are:

- ✓ It is only used to represent the population structure.
- ✓ It is only used alone and hardly super-imposed on other methods.
- ✓ There is loss of important information due to the use of figures that are in age-cohorts.
- ✓ It cannot show the population distribution (it does not describe or show the trend of the population growth).
- ✓ It is only used in population geography.
- ✓ The actual figures may not be seen since in most cases percentages are used.
- ✓ It takes a lot of space.
- ✓ It takes a lot of time to construct.

- ✓ It is challenging to determine a suitable scale.

NB: Any five advantages and five disadvantages = 10 marks

16. (a) Define the term Water cycle **(2 marks)**

Water cycle: the water cycle also known as the hydrological cycle or the hydrologic cycle describes the continuous movement of water on, above and below the surface of the Earth. The water moves from one reservoir to another, such as from river to ocean, or from the Ocean to the atmosphere, by the physical processes of evaporation, condensation, precipitation, infiltration, surface runoff and subsurface flow. In doing so, the water goes through different forms: liquid, solid (ice) and vapor.

(b) Explain the factors that affect the amount sunshine of an area receives. **(7 marks)**

Factors that affect the amount of Sunshine an area receives are the following:

- ✓ Seasonality: Different seasons have varied amount of sunshine received. For example, during the rainy season, few hours of sunshine are expected than dry season. In the temperate region, more hours of sunshine are expected in summer than in any other seasons.
- ✓ Latitudinal location of an area: Equatorial and tropical latitudes get more sunshine than temperate latitudes. At extreme polar regions, there is total darkness during winter and total sunshine during summer period.
- ✓ Altitudinal location: Areas in the windward slopes tend to have limited sunshine because of having high humidity and cloud cover compared to areas in the leeward slopes receiving arid conditions.
- ✓ Ocean currents: Warm ocean currents trigger a lot of humidity, evaporation and cloud cover reducing hours of sunshine in the neighboring areas while cold ocean currents cause aridity and hence more hours of sunshine.
- ✓ The length of the day: Equatorial and tropical regions receive more hours of sunshine than temperate regions due to longer hours of the day.
- ✓ The presence of vaporizing surface: Water bodies and forests will result into additional humidity into atmosphere. This will reduce hours of sunshine compared to where such water bodies and forests are absent.
- ✓ Aspect: Slopes which facing the direction of the sun are able to receive more hours of sunshine than those which are sheltered.
- ✓ Climatic characteristics of an area: It is expected that hot desert regions tend to have more hours of sunshine than equatorial and savanna climates.

NB: Any five well explained factors = 5 marks

(c) Establish the differences between Cyclones and Anticyclones. (6marks)

The differences between anticyclones and cyclones:/6marks

- ✓ **In cyclones or depressions, pressure decreases towards the center while in anticyclones, pressure increases towards the center.**
- ✓ **Cyclones or depressions are associated with violent weather system like tornadoes and hurricanes while an anticyclone is associated with calm weather and soft winds.**
- ✓ **In cyclone or depression, there is violent convergence of winds which results into rainfall accompanied by violent thunderstorms while in anticyclone winds are diverging gently resulting into dry and hot climate.**
- ✓ **Cyclones form within the tropics where temperatures are high and moisture enough to promote enough convective instability while anticyclones form outside the tropics where air is subsiding.**
- ✓ **Cyclones have air circulations which are anticlockwise in the Northern hemisphere and clockwise in the Southern hemisphere while anticyclones move clockwise in the Northern hemisphere and anticlockwise in the southern hemisphere.**
- ✓ **Cyclones cover a short area and take a short time while anticyclones cover bigger areas (in certain latitudes) and they are a permanent features of those regions.**
- ✓ **The movement of anticyclones is slow compared to cyclones moving very fast.**
- ✓ **Tropical cyclones develop within water (oceans and seas) where there is no friction while anticyclones can develop on land.**

NB; Any six differences=6marks

17. (a) Identify any four factors influencing rainfall formation (4marks)

Factors influencing the rain formation are the following: /4marks

- ✓ **Moisture content of the air:** The atmospheric moisture depends on evaporation of water or ice through the input of heat energy. The regions having high temperature and abundance of surface water, and wide-open Oceanic surfaces for evaporation, receive higher amount of annual rainfall. Equatorial regions are typical examples of such places.
- ✓ **The convergent or divergent air circulation:** The convergent or divergent air circulation determines the ascent or descent of air and its adiabatic cooling or heating which in turn determines the amount of precipitation.
- ✓ **Topographic conditions:** Topographic conditions present both favorable and unfavorable conditions for precipitation. If the mountain barriers parallel to the coastal lands and there is onshore moist air, the moist air is forced by mountains to ascend and condense hence yielding precipitation. The leeward side would be dry while the windward side would experience rainfall.

- ✓ **Distance from the source of moisture:** Distance from the source of moisture determines the amount of rainfall in different areas. As the distance from the source of moisture (oceans, seas, rivers) increases, the moisture content reduces and hence the amount of precipitation decreases.

NB: Any four identified factors=4marks

(b) Describe the characteristics of troposphere. (4marks)

It is characterized by the following:

- It is the lowest layer of the atmosphere.
- The upper limit of the troposphere is called the tropopause.
- The temperature decreases with altitude at the rate of 6.5°C per km or 3.6°F/1000ft.
- The atmospheric pressure decreases also with altitude and reaches to 100 millibars and 250 millibars over the equator and poles respectively at tropopause.
- It lies between 10 km and 20 km above the sea level.
- All weather phenomena occur in this layer. These are evaporation, condensation and precipitation. Condensation is the conversion of vapour or gas into a liquid of different forms. Precipitation is water that falls to the ground as rainfall, snow or hail.
- The height of tropopause is 17 km over Equator and 9 to 10 km over the poles.

(c) Analyse the importance of atmosphere (**7marks**)

The atmosphere is important for the following reasons:/**5marks**

- ✓ It protects living things from harmful ultraviolet rays of the sun. This role is played by the ozone layer. The atmosphere serves as a protective shield against radiation and cosmic rays.
- ✓ Dense layers of molecular gases also absorb cosmic rays, gamma rays and x-rays, preventing these energetic particles from striking living things and causing mutations and other genetic damage.
- ✓ Even during a solar flare, which can greatly increase the damaging output of the sun, the atmosphere is able to block most of its harmful effects.
- ✓ It helps to regulate the heat during the day and night. On earth, however, molecules in the atmosphere absorb the sun's energy as it arrives, spreading that warmth across the planet. The molecules also trap reflected energy from the surface, preventing the night side of the planet from becoming too cold.
- ✓ The Earth's atmosphere protects and sustains the planet's inhabitants by providing warmth and absorbing harmful solar rays.
- ✓ The atmosphere traps the sun's energy and sends off many of the dangers of space.
- ✓ It provides the various gases that are useful to living things. These include oxygen.
- ✓ It provides precipitation that helps to sustain life on earth.
- ✓ The atmosphere is made of gases that are essential for photosynthesis and respiration, among other life activities.
- ✓ The atmosphere is a crucial part of the water cycle. It is an important reservoir for water and the source of precipitation.
- ✓ The atmosphere moderates Earth's temperature because greenhouse gases absorb heat.
- ✓ Atmosphere contains the oxygen and carbon dioxide, which living things need to survive.
- ✓ The atmosphere also serves an important purpose as a medium for the movement of water. Vapour evaporates out of oceans, condenses as it cools and falls as rain. Hence, providing life-giving moisture to otherwise dry areas of the continents.

Without an atmosphere, it would simply boil away into space, or remain frozen in pockets below the surface of the planet.

NB: Any five explained importance=5marks

18. (a) State the advantages of under population. **(5marks)**

Positive effects of under population include:

- ✓ **No congestion: A country with less population experiences little or no congestion.**
- ✓ **Availability of enough job opportunities for the people as a results of the small size of population.**
- ✓ **Increase in social and infrastructural facilities resulting from higher production per capita experienced by under developed country.**
- ✓ **Availability of enough idle resources resulting from excess in available resources compared to availing population.**
- ✓ **Low pressure on available social amenities in the country.**

(b) Examine ten factors responsible for the distribution of the population in the world. **(10marks)**

The population of the world in general is unevenly distributed. This is attributed to a number of factors. These factors include the following:

► **Reliable and adequate Rainfall:** There is a close relationship between areas of high rainfall and population distribution. Areas that receive high and reliable rainfall over 1500 mm attract high population densities because they are suitable for agriculture.

► **Soils:** Areas blessed with fertile soils encourage growth of a variety of crops; hence food and employment. This explains why such areas attract many people.

► **Pests and diseases:** Areas associated with pests such as tsetse flies and ticks discourage settlement. Many people fear to live in an areas known of pests since they cause diseases like Trypanosomiasis and East coast fever that discourage farming and settlement in some areas. Such places are sparsely populated. A good example is in Bunyoro in Uganda and Miombo woodland areas in Tanzania.

► **Altitude:** This refers to the height of the land above sea level. Altitude has an influence on population distribution, for example from 2700 m above sea level, temperatures are extremely cold which discourage settlements. There is also severe soil erosion at this altitude.

► **Vegetation:** The natural vegetation of an area is also an important influencing factor on population distribution. Dense forests, bush land, deserts and swamps are unfavourable areas for settlement. While grasslands are easy to settle therefore, attract high population density.

► **Relief:** The rugged areas or mountainous landscapes discourage settlement. For instance, the rift valley and lowlands especially along rivers are unfavourable for human settlement while some gently sloping areas are easy to work and build and hence attract more people.

► **Slave trade** that led to depopulation of various areas of origin and led to increased population to the areas where slaves were taken.

► **Migrations:** The internal migration such as rural-urban migration leads to an increase in population in urban areas and rural-rural migration may influence population distribution too. The influx of refugees from other countries results to increased population in the receiving countries. For example, the Northern part of Uganda has had its population increase as a result of the refugees from Southern Sudan.

► Civil wars: This one of the serious factors that have influenced population distribution on the African continent and the world at large. Countries such as Southern Sudan, Somalia, Democratic Republic of Congo have had their population reduce because of civil upheavals. In some countries tribal clashes push people away from their homelands to other places. For example, in some parts of Kenya Rift valley region.

► Government policies: Some areas may have reduced population because of the government policies prevailing. Land is set aside for establishment of national parks or construction of dams, whereas some policies such as establishment of irrigation schemes in dry lands or settlement schemes lead to population increase.

► Industrialization: Industrial towns like Nairobi, Kigali, Kampala and Kinshasa have large industrial establishments producing chemicals, foodstuff, plastics and textiles which attract people for paid employment hence a high population. However, their demarcated areas for industrial establishment may result into displacement of people.

► Energy resources and minerals: Energy resources and minerals attract people to settle in a given area. Minerals like coal in their prime age have greatly influenced the pattern of population distribution in countries like Great Britain, France, and Germany etc. This is because of the employment opportunities that are created and other social benefits or advantages.

► Historical factors: Areas that were occupied by kingdoms especially near the King's palaces, attracted a high population due to security. For example, the central part of Uganda where the population is high, the large population is attributed to the presence of the king's palace that marked a center of attraction to many people.

► Economic factors. The economic viability of an area lies in its carrying capacity and its ability to provide employment opportunities. This in turn affects not only the size of the population but also its spacing. A specific economic system tends to arrange people in a specific distributional pattern.

► Transport and communication: The establishment of roads, railways and communication lines attract dense population due to accessibility of the area.

► Political factors: Political factors have a great influence on population distribution and density in different areas. For example, countries that are politically stable attract a high population, whereas political instability in some countries can cause population displacement and migrations.

► Demographic factors: The changes in the distribution and density of population in the world take place through variations in the rate of natural increase (fertility and mortality rates). Developing countries that have a high birth rate will always have a high population growth leading to a high population density.

► Natural hazards and disasters: Areas known to be prone to earthquakes, landslides, volcanic eruptions, floods, glacial advances, storms, epidemics, fire, and severe droughts discourage settlement. Therefore, will have sparse population than regions that are free from such challenges.

19. (a)(i) What is the meaning of soil catena. **(2marks)**

Soil catena is a sequence of different soil profiles or **soil types** that occur down a slope. It shows the changes that take place in the soil from the top to the bottom of the slope. A long the slope, different soils develop. These are influenced by climate and angle of slope.

(ii) Evaluate the importance of soil catena. **(3marks)**

Soil catena is important in the following ways:

The soil catena (elluvial complex) is used for settlement;

The soil catena is used for rock quarrying for construction especially on free face which has no vegetation;

The valley bottoms are used for brick lying, e.g. Ruliba Clay Works along River Nyabarongo in Rwanda;

The illuvial complex is used for agriculture due to the deep soil profile derived from deposition;

The valley bottoms are used for rice growing and growth of vegetables and yams, etc.

(b) Discuss all factors affecting soil fertility. **(10marks)**

The following are the major factors affecting soil fertility: **/10marks**

▶ *Mineral matter*: A matrix of mineral particles derived from varying degrees of breakdown of the parent-rocks. The fertility of soil depends on the type of mother rock to which the rock was derived.

▶ *Organic matter or humus*: The fertility of soil depends on the amount of organic matter or humus available in soil. The higher amount of organic matter reflects the higher level of soil fertility.

▶ *Soil water or soil solution*: the required optimum amount of water depends on the type of crops to be grown in specific area. Some crops such as rice require much more amount of water while the crops like sweet potatoes, cassava required low quantity of water.

▶ *Soil nutrients*: these are chemical elements found in the soil. They help in plant growth and ensure the soil remains fertile.

▶ *Thickness (depth)*: Thin soils are not good for agriculture. Thick soils are good for agriculture (above 1 m of depth).

▶ *Soil permeability*: This is the ability of the soil to allow water to pass through it. Permeable soils are much more fertile than non-permeable soils.

▶ *Soil texture*: This refers to the size of soil particles. Clay loam soil are much fertile than other soil.

▶ *Soil acidity and alkalinity*: The basic soils are much more fertile than acidic soils.

NB: Any five discussed factors=10marks

END