GEOGRAPHY

**SECOND TERM SS1 NOTE**

**SUBJECT CONTENTS**

* The structure of the earth
* The structure of the earth
* Classification of rocks
* Landforms of the world(mountains)
* Landforms of the world(plateau)
* Landforms of the world(plains)
* Weather and climate
* Weather and climate
* The Oceans
* The Oceans

**PLATEAU**

This is a tableland or a highland with flat or nearly flat surface.

**Characteristics of a plateau**

* They have extensive flat or level surface which usually descends sharply to the surrounding lowland.
* It has gentle slopes.
* They are often referred to as tablelands because of their flat or level surface.
* Plateaux are tabular in shape, steep sided with rough and irregular surface.
* They have narrow valleys and sometimes form hydrological centres.

**Types of plateaux**

There are three types of plateaux based on their mode of formation. These are:

1. Tectonic plateau
2. Volcanic plateau
3. Dissected plateau

**TECTONIC PLATEAU**

These plateaux are formed as a result of earth movement which cause the uplift of some areas and the depression of others.

Uplifted areas of land or undulating land form tectonic plateaux and the depressed area form basins.

Tectonic plateaux are of two types.

1. **Tableland:-** The uplifted areas of the level land slope down to the surrounding lowland
2. **Intermont:-** The uplifted areas of the level land slopes up or are enclosed by fold mountains.

Examples of tectonic plateau are deccan plateau (India), the harz plateau (Germany).examples of intermont plateau are the Tibetan plateau (in the Himalayas) Bolivia plateau between two ridges(in the andes)

**VOLCANIC PLATEAU**

Mode Of Formation: These plateaux are formed when molten lava comes out of the earth’s crust through a vent and spreads out in successive layers. The lava cools and solidifies to form volcanic or lava plateau.

Examples are Columbia snake plateau, Biu plateau in the north east of Nigeria.

**DISSECTED PLATEAU**

**Mode Of Formation:** These are formed by weathering an agent of denudation such as running water, wind, ice etc which wear down a large and extensive plateau into remnant structures of irregular surface.

Examples include Jos plateau (Nigeria), edges of fouta Djallon plateau (Guinea) and Kumasi Plateau (Ghana)**.**

**Disadvantages of plateaux**

1. Some plateaux are barriers to communication as they prevent road, railway and air port construction.
2. Some plateaux are associated with erosion which tends to reduce or prevent serious farming activities.

**Importance or uses of plateaux**

1. Plateau regions are usually good for animal rearing because they contain good pasture e.g the Obudu plateau (Nigeria).
2. Some special crops are cultivated in plateau areas e.g potatoes and apples on the Jos plateau, and tea and coffee on the east African plateau.
3. Some valuable minerals e.g. tin and columbite on the Jos plateau and other minerals in some plateau like gold, diamond are obtained.
4. Plateau in tropical regions create a pleasant climate which attracts white settlers e.g. the Jos plateau and the east African plateau.
5. Plateau are centres of tourist attractions e.g. Jos plateau and the East African plateau have wide variety of wild life and beautiful scenery which makes them tourist attraction.
6. H.E.P (Hydro electric power) is developed on plateau slopes e.g. Mambilla plateau.
7. Some plateaux are sources of many rivers.

**PLAINS**

Plains are extensive lowlands. They are usually either undulating or tilt in a particular direction.

**Types of plains**

Based on the mode of formation, there are three major types of plains. These are:

1. Structional plains
2. Erosional plains
3. Depositional plains

**Structional plains**

**Mode Of Formation**: These are relatively undisturbed horizontal surface of the earth formed by bedded sedimentary rocks. Examples include the Russian platform and the Great plain of USA.

**Erosional plains**

**Mode Of Formation:** These plains are formed by the agents of denudation such as rivers, wind, drain, rain, glacier and ocean waves which wear out irregular rock surfaces and smoothen them into plains known as erosional plains. Plains resulting from the action of these agents of denudation are called **peneplains** while those formed when wind blows and reduces a highland to a flat or level, but a gentle land is called **pedeplain.** Examples of erosional plains include Canadian shield and Hamada of Sahara Desert.

**Depositional plains**

**Mode Of Formation:** These are plains formed by the deposition of materials transported there by the various agents of transportation such as rivers, wind, waves, and glacier.

Depositional plains are grouped into the following categories

1. **Alluvial plains:** These are formed from the deposition of sediments eroded from the upper course of a river to the lower course of that river. The deposited materials on the lower course of the river form the alluvial plains e.g River Nile.
2. **Flood plains:** These are formed from the deposition of sediments eroded from the upper course of a river and deposited on the lower course, especially when the river overflows its banks. It can also be formed from deposition of sediments carried by running water e.g floods.
3. **Deltaic plains:** These are formed from the deposition of sediments brought down by a river onto the mouth of that river. Alluvial, flood and deltaic plains are all rich in fertile soils which are very good for serious farming activities.
4. **Outwash plains:** These are formed from the deposition of materials brought down by glacier.
5. **Aeolian plains:** These are formed in arid or desert and semi-arid regions where wind-blown sand is deposited to form an extensive plain.
6. **Lacustrine plains:** These are formed from the deposition of sediments which cover the beds of lakes that have become dry.
7. **Coastal plains:** These are formed from the deposition of sediments brought by ocean waves on the continental shelf. Coastal plains can also be formed by the uplift of part of the sea-floor bordering a continent.

**Importance or uses of plains**

1. They are sources of valuable materials: valuable materials e.g. gold and petroleum are found in plains, as in the coastal plain of Nigeria.
2. Plains are usually centers of population concentration e.g. the Nile alluvial plains and other plains in China and India.
3. Plains especially depositional plains are rich fertile soil which favour intensive agriculture
4. Rivers in plains provide water for drinking and transportation.
5. It provide employment opportunities: Rivers in plains (basins) provide jobs e.g. fishing.
6. Plains generally favour communications, railway and airports are generally built on level lands.
7. Plains are usually good for settlement development. Earliest civilization developed on plains (e.g. in Egypt and Mesopotamia).

**Disadvantages of plains**

1. Some plains especially in Delta areas may be flooded with water and this reduces human activities.
2. Plains are not good defensive centers.
3. Some plains may be barren e.g. outwash plains in some parts of Netherlands may be water-logged.
4. Some may pose serious barrier to communication especially in areas flooded by excessive water either river or after rain. It therefore increases the cost of developing such areas.

**WEATHER AND CLIMATE**

**Weather** is the condition of the atmosphere of a place at a particular time over a short period of time.

**Climate** is the average condition of weather of an area over a long period of time usually about 30 to 35 years.

**Differences between weather and climate**

1. The weather of any given place changes from time to time while climate of any area is comparatively constant.
2. The weather of a place is always very short while the climate of an area is experienced over a long period of time.
3. Weather operates in a small are while climate covers a large area.
4. Weather deals with specific events like conditions of temperature, wind etc while climate deals with a generalized event.
5. Weather is studied by its elements e.g. temperature, rainfall, wind etc while climate is studied by the factors affecting it e.g. latitude, altitude, ocean currents etc.
6. Weather is the condition of the atmosphere at a particular place while climate is the average weather condition of an area.

**ELEMENTS OF WEATHER**

The elements of weather include temperature, rainfall, wind, humidity, cloud pressure and sunshine.

**TEMPERATURE**

Temperature is the degree of hotness or coldness of an object or a place.

Sun is the source of all heat. It influences the actual amount of water vapour present in the air and also the rate of evaporation and condensation. Temperature is a very important element of weather. Temperature is recorded both in Fahrenheit (of) and centigrade (of)

To convert Fahrenheit to centigrade = (of - 32) 1.8

To convert centigrade to Fahrenheit =(1.8 oc) + 32of

Now let us convert 50of to centigrade

=(50of - 32) 1.8

=(18 1.8)oc

=10oc

Now let us convert 25oc to of

(1.8 25oc) +32

(45 +32)of =77of

Thermometer is the instrument used to measure temperature. It has a glass tube filled with mercury or alcohol. The mercury expands when it is heated, therefore it rises in the glass tube and the thermometer gives a high reading. If the weather is cool or cold, the mercury contracts, therefore, the thermometer gives a low reading.

A more elaborate form of thermometer is called the maximum and minimum thermometer.

**Mean daily temperature:** this is the average temperature of the day that is, you add the maximum and the minimum temperatures and divide by two.

**Mean monthly temperature:** This is the average temperature for a month, that is you add all daily temperature and divide it by the number of days in the month.

**Daily temperature range:** This is simply the difference between the minimum and maximum temperature for a day. The highest temperature usually occurs in the afternoon while the lowest temperature occurs at night.

**Annual range of temperature:** This is the difference between the coldest month and the hottest month. This largely determines the climate of many places.

A line joining places of equal temperature is called an **isothem**.

**RAINFALL**

Rainfall includes all form of precipitation such as snowfall, hail, dew, sleet, frost etc. there are three types of rainfall which are convectional, orographic or relief and cyclonic rainfall. Rainfall is measured by the instrument called a **rainguage.** It contains a funnel that leads into a bottle placed inside a metal container.

**Rainguage**

**Description:** A rainguage consists of a metal funnel that leads to a glass bottle enclosed within a copper cylinder. The funnel is connected to an inner container where the water is collected. There is also a measuring jar used for measuring the rain water.

**How rainguage is used**

The rainguage is installed 30cm above the ground level to avoid water splash. Rain that falls each day is collected into the glass jar. The rain water enters the inner container or glass jar through the funnel. The rainguage Is placed in an open space is free from tall trees and buildings to prevent any water splash from entering the funnel. The rainwater that falls in the inner container is emptied each day and measured in a calibrated measuring jar or it can be read directly from the glass jar. The total rain fall for each month is added at the end of the year to get the total rainfall for the year.

**Calculation**

**Formulae**

1. **Mean monthly rainfall**= Add total rainfall for the year

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No of days in the month

1. **Annual rainfall**= Add the total rainfall (January-December)
2. **Annual range of temperature**= month with the highest rainfall-month with the lowest rainfall.
3. **Mean annual rainfall**= Total rainfall

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1. Highest rainfall=month with the highest rainfall
2. Lowest rainfall= month with the lowest rainfall

A line joining places of equal amount is called **isohyets**

**LEAVE SPACE FOR DIAGRAM**

**WIND**

Wind is air in motion. It has speed and direction both of which can be measured. The direction of the wind is measured by an instrument called **wind vane** or **weather cock** while the speed or velocity of the wind is measured by a different instrument called **anemometer**.

**Description**

**Windvane**: windvane is made up of two parts. one part is the arrow or vane on the top, which is free to move with the prevailing wind. The other part is stationary and consists of a frame and four compass points. The vane or arrow points to the direction from which the wind is blowing so that wind is named from the direction it blows. Wind blows from high pressure to area of low pressure. Windvane is located in an exposed position so that tall buildings and trees do not deflect the wind direction.

**Isotach** is a line on weather map or charts connecting points of equal wind speed.

**LEAVE SPACE FOR DIAGRAM**

**HUMIDITY**

Humidity is the amount of water vapour in the atmosphere. This is a measure of the dampness of the atmosphere due to water in the gaseous state and it varies from place to place at different time of the day.

Humidity is measured by the instrument called **hygrometer**. The actual amount of water vapour present in the air is called **absolute humidity.**

Relative humidity is the ratio between the actual amount of water vapour and the total amount the air can hold at a given temperature. Relative humidity is expressed as a percentage.

If air contains only half the amount it can hold, the relative humidity is 50%.when the relative humidity reaches 100%,the air is said to be saturated. A line on a weather map or chart connecting points of equal relative humidity is called **isohume.**

**CLOUD COVER**

Clouds are tiny droplets of water vapour, suspended and floating in the air. These forms, shapes, heights and movements indicate the sky and weather conditions of a particular place.

Clouds are known to be caused as a result of rising air, which cools by expansion leading to the formation of water vapour droplets. Cloud can also be formed by temperature inversion. Cloud cover is also known to :

1. Aid formation of rain
2. Reflect shortwave radiation and
3. Cause reflection of solar radiation

The amount of sky in the atmosphere is measured by **oktas or eights.**

On maps, places with equal degree of cloudness are joined by lines known as **isonephs.**

**PRESSURE**

This refers to the weight air extract on the earth’s surface. Usually atmosphere pressure varies between 960mm and 1040 millibars or less at top of mountains.

The pressure is read in a unit of force called **millibars** . a normal atmosphere shows a reading of 760mm (76cm) or 1013 millibars. A reading of 790mm is regarded as high pressure while 700mm is regarded as low pressure. The instrument used in measuring pressure is called **barometer.** A line joining places of equal pressure is called **isobar.**

**Factors affecting pressure**

1. **Altitude:** When air descends, its pressure and temperature rises but when it ascends, it becomes less dense and its pressure and temperature fall. In other words, pressure decreases as altitude increases.
2. **Temperature:** When the temperature of the air increases, the pressure decreases and when the temperature decreases, its pressure increases.
3. **Wind:** It is known that wind blows from high pressure but to a low pressure belts.
4. **Rotation of the earth:** owing to the rotation of the earth, differences in pressure result in the deflection of the wind to the right in the southern hemisphere.

**SUNSHINE**

Sunshine is the amount of heat and the period of the sun’s rays are received at a place. However, this amount of sunshine depends on the season- a factor determined by latitude and the position of the earth in its revolution.

Sunshine duration is measured by **sundial or sunshine recorder.** On maps, places of equal sunshine are joined by lines called **isohels.**

**FACTORS AFFECTING CLIMATE**

**Climate varies from place to place because of the various factors affecting it in various places. These factors are:-**

1. **Latitude:** - Generally, temperature decrease from the equator to the polar regions. In the tropical regions, the sun’s rays strike the surface at an angle close to 90, so the heating is direct and concentrated. But in the temperate and polar regions, the sun’s rays strike obliquely therefore the energy of the sun is dispersed and its heating power is reduced.
2. **Altitude: -** In general, the higher we go, the cooler it becomes. Temperature falls by 0.65c for every 100m of ascent or by 6.5c for every 1000m of ascent. Therefore, the top of plateaux and mountains is usually cooler than their surrounding lowlands or plains. This decrease in temperature with increasing elevation is called lapse rate or environmental lapse rate. High altitude locations usually receive much rain which is called **relief or orographic rain.**
3. **Ocean Currents: -** Generally warm ocean currents raise the temperature of adjacent coast lands and cause dryness on coastland. This dryness as often created as the western coast of most deserts in bathed by cold currents.
4. **Slope or aspect:** - Sun – facing slopes are warmer than the leeward sides. Thus in the temperate and polar regions, equator – facing slopes are warmer than the sheltered (pole – facing opposite side).

The slope of mountains facing the direction of the prevailing winds also receive more rain than the leeward side, especially if the prevailing winds are on – shore and moisture – laden.

1. **Continentality Or Distance From The Sea**: - The climate of places close to the sea differs from that of places close to the sea differs from that of places farther inland owing to the moderating influence of the sea which is usually referred influence coastal areas usually have more equable climate, more rainfall and a longer rainy season than those further inland.

In general, places get progressively drier with distance from the sea and this can be observed in Nigeria as one moves from Lagos or Calabar to Maiduguri. Places very far from the sea often experience desert or semi – desert conditions.

1. **Cloud cover:** clouds form rain and also help to insulate the earth’s surface from the scorching heat of the sun. clouds therefore generally have a cooling effect during the day. At night, clouds serve as blanket which traps long wave radiation from the earth thereby preventing the earth from getting too cold when the sun goes down. In deserts, where there is usually little or no cloud cover, the moderating influence of cloud is lacking, therefore, daytime is usually very hot and nights very cold.

**IMPORTANCE OF WEATHER OR CLIMATE TO MAN**

1. **It determines the type of clothe people wear:** The type and nature of clothing worn by different people in different part of the world is due to differences in climate. Cold climate requires black and thick dresses while hot climate requires light dresses.
2. **It affects agriculture:** Weather and climate greatly affect agriculture. Climatic condition in certain places can encourage or discourage the cultivation of certain crops.
3. **It helps to supply information for free flow of :** The safety of trains and air-borne Aeroplane and various flights depend on a good knowledge of weather. Meteorologists who specialize in the study of weather give weather report to prevent train and Aeroplane crashes worldwide
4. **It determines the health condition of an area:** There is a relationship between weather and health condition. Some diseases are common and easily contracted in the hot weather conditions while some are common during cold weather conditions.
5. **Weather study gives warning of imminent environmental hazards:** it is possible to warn people of an impending storm, drought, flood, typhoon, hurricane through weather study.
6. **Weather and climate also affect human activities:** weather has a relationship with the performance of peoplein some sporting activities. Most of the people don’t perform optimally when the weather is hot but perform better when the weather is a bit cool. Also, hot weather conditions are not conducive to maximum mental activity unlike cool environment.
7. **Weather and climate also affect human settlement:** weather and climate affect the rate of which human beings live in a place. People settle in a place more conducive than in an area like desert where the environment is harsh and not conducive to live.

**THE OCEANS**

The ocean occupies over 70% or 360 million square kilometers of the earth’s total area of 510 square kilometers.

The study of oceans, the water in the oceans, the movement of water and the economic significance of the ocean is called **oceanography.**

**TYPES OF OCEANS**

There are four main types of oceans in the world and the rest constitute the seas. These are the Pacific Ocean which occupies 165 million km2, Atlantic Ocean occupies 82 million km2**,** Indian ocean occupies 74 million km2, Arctic ocean occupies 14 million km2.

The rest constitute the seas which occupies 25km2. Pacific Ocean is the largest of all the oceans.

**RELIEF OF THE OCEAN**

The ocean floor is made up five major relief features which are:

1. Continental shelf
2. Continental slope
3. Ocean ridge
4. Deep sea plain
5. Ocean deep

**Continental shelf**

* It is a shallow water zone surrounding the continent.
* It is a continuation into the sea of the coastal plain.
* It is broad in some coasts e.g the eastern coast of North America where it id over 100km wide.
* Generally, the gradient is gentle.
* It is of varying width which contain shallow water.
* It forms 70% of the total area of the ocean.

**Continental importance of continental shelf**

1. **It is a good fishing ground:** This is because the shallowness of the water which allows sunlight to penetrate thereby allowing fish food (plankton) to grow in the sea.
2. Itfavours the development of ports e.g of seaports such as Southampton, London, Hamburg, Hong kong, Singapore etc.
3. **It facilitates exploration of petroleum:** Since the continental shelf is shallow, it eases the exploration of crude oil.
4. **They are tourist centers:** Owing to its shallowness and peculiar position, they therefore facilitate tourist activities.

**Continental slope**

It is a fairly slope which extends from the end of the continental shelf to the main ocean floor called deep sea plain or abyssal plain.

**Ocean ridge**

* Ocean ridge takes the form of either a ridge or a plateau.
* It rises up from the deep sea plain.
* Some rise above the surface to form oceanic island.

**Deep sea plain**

It is the extensive undulating plain lying 2000 to 3000 m below the sea level and covers about two-third of the ocean floor.

**The ocean deep**

These are long narrow trough or trenches that plunge as great ocean deeps. Several of them are thousand of meters deep e.g Mariana trough in the pacific 10,690m. materials mainly deposited in the ocean floor include:

1. Oozes
2. Clay
3. Muds

**LEAVE SPACE FOR DIAGRAM**

**SALINITY OF THE OCEAN**

Salinity refers to the degree of saltiness or concentration of salt solution in oceans and seas. The degree of salinity varies from ocean to ocean and it is measured in percentage or parts per thousand. The more the amount of chemical salts (especially sodium chloride) dissolve in sea water, the higher the salinity.

On maps, lines drawn to join all places in the ocean having equal degree of salinity are called **isohalines**.

In Baltic sea salinity is 7 per 1000

In red sea salinity is 39 per 1000

In Dead sea salinity is 250 per 1000

In Lake Van in Turkey Asia salinity is 330 per 1000 which is the highest salinity in the world.

**Factors affecting salinity of ocean**

The following factors are causes of variations in salinity of seas and oceans

1. **The rate of evaporation:** the water around high pressure belts of the trade wind deserts between 20O and 30O N and S have high salinity because of the high rate of evaporation caused by high temperature and low humidity.
2. **The amount of fresh water added by precipitation streams and icebergs:** salinity is lower in equatorial water because of heavy rainfall and high relative humidity. Oceans into which huge rivers like the Amazon, Congo and Ganges flow have a lower salinity. Melting of icebergs add fresh water to Baltic, Arctic, and Antarctic waters and thereby lower their salinity.
3. **The degree of water mixing by currents:** salinity is high in wholly or partially enclosed seas e.g. Caspian sea because the water does not mix freely with the ocean water.

**Economic importance of the sea**

1. They are the source of fish consumed all over the world.
2. They influence rainfall in coastal areas.
3. Coastal beaches are used as tourist and resort centers e.g. the bar beach in Lagos.
4. Oceans are used as a major as major means of intercontinental transportation and international trade.
5. They are the habitat of certain important minerals such as salts and petroleum e.g. offshore mining of oil and gas in the coastal areas of Nigeria.