

FIRST PAPER (PART-B) UNIT-1 (World Geography)**MAJOR PHYSICAL FEATURES****1. What is Geomorphic Process? Explain**

- The geomorphic process means bringing about changes in the configuration of the Earth's surface, due to physical stresses and chemical actions on materials present on the Earth.
- The formation and deformation of landforms on the surface of the earth are a continuous process which is due to the continuous influence of external and internal forces.
- These physical and chemical action occurs due to Endogenic and Exogenic process.
- The example of such geomorphic process are:
- **Exogenic Process** - Weathering (Physical, Chemical, Biological), Erosion/Degradation, Transportation, Deposition
- **Endogenic Process** - Volcanism, Diastrophism, Metamorphism, Earthquake, Landslides, Faulting and Folding

2. What are Exogenic Forces?

- The forces which derive their strength from the earth's exterior or originate within the earth's atmosphere are called as exogenic forces.
- The action of exogenic forces results in wearing down and hence they are considered as land wearing forces.
- Weathering, mass wasting, erosion and deposition are the main exogenic processes.
- All the exogenic processes are covered under a general term- "denudation". which means strip off or uncovers.
- The elements of nature capable of doing these exogenic processes are termed as geomorphic agents. They include the wind, water, waves etc.

3. Write short note on Endogenic Forces?

- Endogenic forces are those internal forces which derive their strength from the earth's interior and play a crucial role in shaping the earth crust.
- Examples – mountain building forces, continent building forces, earthquakes, volcanism etc.
- The endogenic forces are mainly land building forces.
- Endogenic forces can be classified as slow movement (diastrophic) and sudden movements.

4. What are the differences between Exogenic and Endogenic forces?

| S.No. | Endogenic Forces | Exogenic Forces |
|-------|---|---|
| 1 | These are internal forces that exist deep inside the Earth. | These are external forces operate and act on the surface of the Earth. |
| 2 | These forces are also known as 'constructive forces' as they create relief features on the surface of the Earth. | These forces are also known as 'destructive forces' as they at times result in destruction of the existing landforms through weathering and erosional activities. |
| 3 | The ultimate source of energy behind forces that drive endogenic movements is earth's internal heat. | Weathering, mass wasting, erosion, and deposition are the main exogenic processes. |
| 4 | Differences in temperature and pressure (temperature gradients or geothermal gradients and pressure gradients) among various layers of the earth give rise to density differences and these density differences give rise to conventional currents. | All the movements either within the earth or on the surface of the earth occur due to gradients from higher levels to lower levels, from high pressure to low pressure etc. |
| 5 | Convection currents in the mantle drive the lithospheric plates (crust and upper mantle) and the movement of the lithospheric plates (tectonics) is the cause behind endogenic movements. | The exogenic forces derive their energy from the atmosphere determined by the ultimate energy from the sun and also the gradient created by tectonic factors.. |
| 6 | Endogenic forces produce after-effects that are visible only damage. | Exogenic forces create changes visible over a period of thousands or millions of years. |
| 7 | Examples: Earthquakes and volcanic eruptions. | Examples: Winds, rivers, glaciers etc |

5. Write short note on tectonic plates with example?

- A tectonic plate is a massive, irregularly shaped slab of solid rock, generally composed of both continental and oceanic lithosphere.
- The plate size can vary greatly, from a few hundred to thousands of kilometers across.
- The oceanic plates are much heavier than the continental plates.
- Example of some major plates are pacific plate, Eurasian plate, Antarctic plates, Australian plate etc.
- The movement of the tectonic plates creates three types of tectonic boundaries; they are Convergent, Divergent and Transfer.

6. What do you mean by mountain? Write it's classification on the basic of their mode of formation?

- A mountain is an elevated portion of the Earth's crust, generally with steep sides that show significant exposed bedrock.
- Mountains can rise individually, but usually form in a series of mountains called a mountain range.
- Mountain have different climates than land at sea level and nearby flat land.
- Folding, faulting, volcanic activity, igneous intrusion and metamorphism can all be parts of the orogenic process of mountain building.
- It can be classified as:
 - (a) Fold Mountains.
 - (b) Block Mountains
 - (c) Volcanic Mountains/Accumulated Mountains
 - (d) Residual Mountains/Relict Mountains.

7. Explain fold mountains with example?

- Mountain ranges mainly consisting of uplifted folded sedimentary rocks are called Fold Mountains.
- They are formed due to the force of compression arising from the endogenic or internal forces.
- Thus, fold mountains are formed at the convergent boundaries of types:
 - (a) c – c plate convergence and
 - (b) o – c plate convergence
- Syncliness (trough) and anticlines (crest) are part of fold mountain.
- The Himalayas in Asia, the Alps in Europe, the Rockies in North America, and the Andes in South America are the most prominent fold mountains of the world.

8. Write short note on Block Mountains?

- Block Mountains are also formed by the internal or endogenic earth movement, which cause the force of tension and faulting.
- The down-lifting or uplifting of land in between two paralalled faults results in the formation of Block Mountains.
- A block mountain is also called as Horst and the rift valley formed as a result of faulting is called Garben.
- The Great African Rift Valley (Graben), the Rhine Valley (Graben) in Germany, the Vosges mountain in France etc are some examples of block mountains.

9. What is the difference between Block Mountains and Fold Mountains?

| S.No | Block Mountain | Fold Mountain |
|------|--|---|
| 1 | Block Mountain are formed due to faulting. | Fold Mountains are form due to folding. |
| 2 | It is caused when the horizontal movements within the earth's crust move away from each other. | It occurs with the horizontal movements within the earth's crust move towards each other. |
| 3 | Tension within the earth's crust causes the formation of Block Mountains | Compression within the earth's crust causes the formation of fold mountain. |
| 4 | Block mountains are wider in length as compared to the fold mountain. | Whereas fold mountain are greater in length but comparatively smaller in width. |
| 5 | The Sierra Nevada in USA, the Harz Mountain in Germany etc are some example of Block mountain | The Himalayas, Andes and Alps are some example of Fold Mountain. |

10. Write short note on Andes?

- Andes remaining along South America's western side and is among the world's largest mountain ranges.
- Its varied terrain encompasses glaciers, volcanoes, grassland, desert, lakes and forest.
- At 6962 meters, Mt. Aconcagua is the highest peak outside Asia.
- It lies in the southern Andes (the world's longest mountain range that is located along the entire western coast of South America.)
- Aconcagua is of volcanic origin, but it is not itself an active volcano.
- From Venezuela in the north, the range passes through Colombia, Ecuador, Peru, Bolivia, Argentina and Chile.

11. Which type of mountain is Mount Fuji?

- Mount Fuji, is the Japan's tallest and most famous mountain.
- It is an active volcano in the Ring of Fire, and is known for its graceful conical form.
- Mount Fuji sites at a 'triple junction'. Where three tectonic plates (the Amur Plate Okhotsk Plate and Philippine Plate) interact.
- It is a composite cone or stratovolcano, formed by violent eruptious have layers of rock, ash and lava.

12. What are Residual mountain. Give some example of such Mountain?

- Residual mountains are those that have been eroded by erosion agents such as winds, rain, frost and flowing water.
- The residual mountains are the hard rocks that are left behind.
- These mountains are made up of existing mountains such as folds, blocks and volcanoes.
- Wind, water, glaciers, waves and other agents of denudation wear away at high mountain. Hence residual mountain refers to the remaining portion of these mountains.
- The Aravalli mountain and the Parasnath mountain in Bihar are examples of this kind in India.
- The Namuli mountains in Mozambique and the Hambori Mountain in Mali are the other example of these mountains.

13. What are plateaus and how they are formed?

- A plateau landform is made up of an extensive area of flat which is usually bounded by a steep slope on all sides.
- Sometimes it can be enclosed by elevated portions of land such as hills and mountains.
- The top of the plateaus is a wide flat area of landmass but some of them can be short flatlands as well.
- Most of the plateaus are formed owing to volcanic forces such as extrusion magma of lava or erosions of the glaciers and other land masses because of water.
- Due to such formation, they are usually surrounded by mountains or deep valleys on all sides or on one side.

14. Mention some famous plateaus of the world?

- **Deccan plateau (India)**- It extends over 8 Indian States, covering entire South India and 3 Mountains.
- **Chotanagpur, Plateau (India)**- It has huge reserve of Iron, coal and manganese.
- **Tibetan Plateau (China)**- It is the highest and biggest plateau of world.
- **Katanga Plateau (Congo)**- Famous for copper mines.
- **East African Plateau**- Famous for Gold and Diamond mining.

15. What is the difference between mountain and plateau?

| S.No. | Mountain | Plateau |
|-------|---|---|
| 1 | A mountain is any natural elevation of the earth surface. | A plateau is an elevated flat land. |
| 2 | It is considerably higher than surrounding area. | It is a flat-topped table land, standing above the surrounding area. |
| 3 | Mountains are formed by movement of the tectonic plates in the Earth's crust. | Plateaus are formed owing to volcanic forces or erosions of the glaciers and other land masses. |

16. Write down the classification of Plateaus on the basis of their geographical location and structure of rocks?

OR

Write down the classification of Plateaus? Explain any two with example?

- **Intermontane Plateaus:** The plateaus which are bordering the mountain ranges (generally fold mountains) or partly or fully enclosed within them are the intermontane plateaus.
- **Piedmont Plateaus:** The Plateaus which is situated at the foot of a mountain and is locked on the other side by a plain or a sea/ocean is called piedmont plateau.
Example: The malwa plateau.
- **Continental Plateaus:** They are formed either by an extensive continental upliftment or by the spread of horizontal basic lava sheets completely covering the original topography.
Example: Plateau of Maharashtra
- **Volcanic Plateaus:** A volcanic plateau is a plateau produced by volcanic activity that builds up over time and forming a plateau from the resulting lava flows.
Example: Colambian Plateau, Deccan Traps
- **Dissected Plateau:** A dissected plateau is a plateau area that has been severely eroded so that the relief is sharp. Such an area may appear as mountains.
Example: The Allegheny Plateau, The Cumber land plateau.

17. What do you understand by the term Intermontane Plateaus? Where would you find one in Asia?

- A fenced-in or surrounded mountain is known as a central mountain range. The Plateau of Tibet and the Plateau of Mongolia are two mountains in central Asia.
- The Plateau of Tibet is surrounded by the Kunlun Mountains in the north and the Himalayas in the south.
- The province was elevated and subdivided into large blocks by errors or mutations in a single body.
- They are also widely promoted with a revitalized movement of some faulty lines.
- They are also evident in the construction of a series of large, south-facing, sloping ridges of an unusual structure at the edges of high-rise buildings to the north.

18. What is Piedmont plateau?

- Plateaus which is situated at the foot of a mountain and is locked on the other side by a plain or a sea/ ocean is called as a piedmont plateau.
- The word 'piedmont' means 'foot of a mountain'.
- They are also called as Plateaus of denudation as the areas once were high to the level of mountains, have now been reduced to the foot level of the mountain by various agents of erosion.
- Examples: The Malwa Plateau is an example of piedmont plateau.

19. Write short note on Continental plateau?

- They are formed either by an extensive continental upliftment or by the spread of horizontal basic lava (less viscous) sheets completely covering the original topography.
- This kind of plateaus shows an abrupt elevation in contrast to the nearby lowland or sea (i.e. more steepness on sides).
- The Continental Plateaus are also known as Plateaus of Accumulation.
- Examples: Plateau of Maharashtra is an example of the continental plateau.

20. Why Tibetan Plateau is called the “Roof of the world”? Explain.

- It is called the “Roof of the world” because it stands over 3 miles above sea level and is surrounded by imposing mountain ranges that harbor the world’s two highest summits i.e Mount Everest and K2
- It is bordered to the south by the inner Himalayan range, to the north by the Kunlur Mountains.
- The source of the famous Rivers in Asia such as the Indus, Brahmaputra, Me kong and Salween are all here.
- It contains the headquarter of the drainage basins of most of the streams in surrounding regions.
- It plays an important role in formation of Indian Monsoon.

21. Write short note on Laurentian Plateau.

- It is also known as Canadian Sheild.
- It is a large area of exposed Precambrian igneous and high-grade metamorphic rocks that forms the ancient geologic core of the North American Continent.
- It is one of the world’s richest area in terms of mineral ores.
- It is filled with substantial deposits of nickel, gold, silver and copper.
- The largest and one of the best known mining town extracting these minerals is Sudbury, Ontario.
- Its notable physical features are thousands of small lakes, thin layers of soil and rolling hills.

22. What do you mean by Plains?

- Plains are the most important landforms found on the earth surface.
- A plain is a low-lying relatively flat land surface with very gentle slope and minimum local relief.
- Most of the plain have been formed by deposition of sediments brought down by rivers.
- Besides rivers, some plains have also been formed by the action of the wind, moving ice and tectonic activities.
- Plains can be classified as:
 - (a) Structural Plain
 - (b) Erosional Plains
 - (c) Depositional Plains

23. Discuss the classification of Plains?**• Structural Plain:**

- (a) These plains are mainly formed by the upliftment of a part of the sea floor or continental shelf.
- (b) They are located on the borders of almost all the major continents.
- (c) The structural plains may also be formed by the subsidence of areas.

Erosional Plains:

- (a) Erosional plains are formed by the continuous and longtime erosion of uplands.
- (b) The surface of such plains is hardly smooth and hence, they are also called as peneplains.

• Depositional plains:

- (a) These plains are formed by the depositional activity of various geomorphic agents.

24. Mention the economic significance of plains?

- **Fertile Soil:** The plains generally have deep and fertile soil, as they have a flat surface the means of irrigation can be easily developed.
- **The Growth of Industries:** The rich agricultural resources, especially of alluvial plains, have helped in the growth of agro-based industries.
- The flat surface of plains favours the building of roads, airports and laying down railway lines resulted the expansion of means of transportation.
- Plains are centres of many civilizations.
- The most developed trade centres and ports of the world are found in the plains only and as much as 80% of the world's population lives here.

25. Write about the various types of depositional plains on the basis of their depositional activity?

- When plains are formed by the river deposits, they are called as riverine or alluvial plain.
- The depositions of sediments in a lake give rise to a Lacustrine plain or Lake. **Example:** The Kashmir Valley.
- When plains are formed by glacial deposit, they are called as glacial or Drift Plains.
- When the wind is the major agent of deposit on, those plains are called as Loess Plains.

26. Write short note on River Nile?

- The river Nile is in Africa, and is the longest river in the world.
- It originates in Burundi, South of the equator, and flows northward through northeastern Africa flowing through Egypt and finally draining into the Mediterranean Sea.
- The Ruvyironza River of Burundi is regarded as the fowl and ultimate Source of the Nile.
- It has a total length of about 6,695 km which included parts of Tanzania, Burundi, Rwanda, Congo, Kenya etc.
- In Egypt, the river Nile creates a fertile green valley across the desert. It was by the banks of the river that one of the oldest civilizations in the world began.

27. What do you mean by Lakes? Explain.

- A lake is a body of water of considerable size, localized in a basin that is surrounded by land apart from a river or other outlet that serves to feed or drain the lake.
- Lakes lie on land and are not part of the ocean, and therefore are distinct from lagoons and are also larger and deeper than ponds.
- Lakes are formed, developed and ultimately obliterated due to siltation and upliftment of lake beds due to diastrophic movements.
- The majority of lakes on Earth are fresh water, and most lie in the Northern Hemisphere at higher latitudes.
- Canada, Finland and Siberia contain most of the fresh water lakes.

28. Write down the main characteristics of lake?

- It consists of one or more basins partially or completely connected to each other.
- All parts of the lake will have the same water level (except for the effects of wind, ice cover and incoming rainfall)
- The lake usually does not have access to sea water.
- A significant portion of the sediment suspended in the water will accumulate at the bottom of the lake.
- Lakes are variable and changes with time.
- The average water volume of a lake must exceed a certain limit.

29. What are the differences between Permanent and temporary lakes?

| S.No. | Permanent Lake | Temporary Lake |
|-------|--|---|
| 1 | Permanent lakes are those whose source of water is mainly a glacier or some perennial river. | Temporary lakes are usually fed by rain water means they have rain water. |
| 2 | Example- Great lakes of North America, Dal Lake, Wular Lake etc. | Small lakes of deserts are examples of temporary lakes. |
| 3 | In this kind of lake evaporation is greater than precipitation. | In this evaporation is less than precipitation. |
| 4 | These lakes are deep and carry more water than ever be evaporated. | These lakes are comparatively shallower and carry less water. |

30. What are saline lakes?

- Salt lake or Saline lake is a landlocked body of water that has a higher concentration of salts and other dissolved minerals.
- Saline lakes can form where there is no natural outlet or where the water evaporates rapidly and the drainage surface of the water table has a higher-than-normal salt content.
- Because of the intense evaporation (negative freshwater balance more water is lost in evaporation than gained from rivers) these lakes are saline.
- Examples of salt lakes include Great Salt Lake, the Aral Sea and the Dead Sea.

31. What are Tectonic Lakes?

- Tectonic Lakes are formed by the deformation and resulting lateral and vertical movements of the Earth's Crust.
- Due to the warping (simple deformation), subsidence (sliding downwards), bending and fracturing (splitting) of the earth's crust, tectonic depressions occur.
- Such depressions give rise to lakes of immense sizes and depths.
- They include Lake Titicaca, and the Caspian Sea.

32. Write down the classification of lakes on the basis of their formation?

OR

Discuss the classification of lakes formed by earth movement and Glaciations?

- **Lakes formed by Earth movement**
 - (a) Tectonic lakes - They include Lake Titicaca and the Caspian sea.
 - (b) Rift valley lakes - The best example is the East African Rift Valley, Tanganyika, Rudolf etc.
- **Lakes formed by Glaciations**
 - (a) Cirque lakes or Tarns - Example of such lakes is lake Red Tarn (UK)
 - (b) Lakes due to morainic damming of valleys - Lake Windermere (UK)
 - (c) Rock-hollow lakes - Lake of Finland.
- **Lakes formed by volcanic activity.**
 - (a) Crater and caldera Lakes - Lonar in Maharashtra and Krakatao in Indonesia.
- **Lakes Formed by Erosion**
 - (a) Karst lakes - Lake Scutari (Yugoslavia)
 - (b) Wind-Deflated Lakes - Great Basin Utah (USA)
- **Lakes formed by Deposition**
 - (a) Lakes due to river deposits - Ox-bow lake
 - (b) Lakes due to damming of water - Lakes that are formed in Shiwaliks (Outer Himalayas).
 - (c) Lakes due to Marine deposits - Lake Chilka.
 - (d) Man-Made lakes - Lake Mead above the Hoover Dam on the Colorado River, (USA)

33. Discuss some of the important natural services provided by lakes?

- **Means of communication-** The Great Lakes St. Lawrence waterways used as the Chief arteries of commerce.
- Economic and Industrial development.
- **Water Storage-** Kohleru lake in Andhra Pradesh.
- **Hydro-electric power generation-** Artificial lakes like Hirakud.
- **Agricultural Purposes-** Many dams are built across artificial lakes for agriculture purpose like Bhakra Nangal Dam.
- **Regulating River Flows:** Hoover Dam on the River Colorado in USA.
- **Source of food:** Many large lakes have important Supplies of protein food in the form of fresh water fish.
- **Source of Minerals:** Salt lakes provide valuable rock salts like Dead Sea.

34. What do you mean by Glacier?

- A glacier is a large, perennial accumulator of crystalline ice, Snow, rock, Sediment and water that originates on land and moves down slope under the influence of its own weight and gravity.
- Glacier begins in places where more snow piles up each year than melts. After falling, the snow begins to compress or become denser and tightly packed.
- They are sensitive indicators of changing climate.
- Out of total water on Earth, 2.1% is in glaciers while 97.2% is in the oceans and inland sea.

35. Write down the classification of Glacier?

OR

Write down the classification of glacier based on their Size/Thermal Regime?

- **Size based Glacier:**

(a) **Ice cap:** An ice cap is a dome-shaped glacier mass flowing in all directions, Such as ice cap on Ellesmere Island in the Canadian Article.

(b) **Valley Glaciers:** Also called Alpine Glaciers or Mountain Glaciers, they form on mountain sides and move downward through valleys.

Example: Gorner Glacier in Switzerland and the Furtwangler Glacier in Tanzania.

(c) **Ice Sheets:** Unlike valley glaciers, Ice sheets are not limited to mountainous areas. They form broad domes and spread out from their centers in all directions. Example: The largest ice sheets, called continental glaciers, spread over vast areas of Antarctica and the island of Green land.

(d) **Cirque Glaciers:** They are short and wide, are confined to cirques or amphitheatres cut in the mountain landscape.

- **Thermal Regime Based Glacier:**

(a) **Polar Glacier:** A polar glacier is defined as one that is below the freezing temperature throughout it's mass for the entire year.

(b) **Temperate Glacier:** A temperate glacier is the one that's essentially at the melting point so liquid water coexists with glacier ice.

Example: They are found in North America, South America, Europe, Africa, Asia and New Zealand.

36. Discuss some of the important significance of Glaciers?

- **Glacier as Reservoirs:** About three quarters of Earth's freshwater is stored in glaciers. Therefore glacier ice is the second largest reservoir of water on Earth and the largest reservoir of freshwater on Earth.
- **Glaciers Feeding Rivers:** The Gangotri Glacier, one of the largest glaciers in the Himalayan Mountain is the source of the Ganga River.
- **Glaciers for Aquatic Life:** Many aquatic species in mountains environments require cold water temperature to survive which is provided by Glaciers.
- **Glaciers for people:** Glaciers provide people with many useful resources. Glacial till provides fertile soil for growing crops.

37. Write short note on Chilika Lake?

- Chilika Lake is a brackish water lagoon, spread over the Puri, Khurda and Ganjam districts of Odisha state on the east coast of India, at the mouth of the Daya River, flowing into the Bay of Bengal, covering an area of over 1,100 km.
- It is the largest coastal lagoon in India and the largest brackish water lagoon in the world after the New Caledonian barrier reef.
- It has been listed as a tentative UNESCO World Heritage site.
- It is the largest wintering ground for migratory birds on the Indian sub-continent. The lake is home to a number of threatened species of plants and animals.
- The lagoon hosts over 160 species of birds in the peak migratory season.
- In 1981, Chilika Lake was designated the first Indian wetland of international importance under the Ramsar Convention.

38. Write short note on Pulicat Lake?

- Pulicat Lake is the second largest brackish water lagoon in India, after Chilika Lake.
- Major part of the lagoon comes under Nellore district of Andhra Pradesh.
- The lagoon encompasses the Pulicat Lake Bird Sanctuary.
- The barrier island of Sriharikota separates the lagoon from the Bay of Bengal and is home to the Satish Dhawan Space Centre.

39. What is kayal?

- Kayals are defined as the shallow lagoons or inlets of sea that are parallel to the coastlines.
- Kayals are the backwater found in **Kerala** and are a unique feature of the Malabar Coast. The Kerala backwaters are series of pools and lakes resting equally to the Malabar Coast (the Arabian Sea coast).

40. What is lagoon?

- A lagoon is **a body of water separated from larger bodies of water by a natural barrier**.
- Lagoons are separated from larger bodies of water by sandbars, barrier reefs, coral reefs, or other natural barriers.
- The word "lagoon" derives from the Italian word laguna, which means "pond" or "lake."

41. What are Playa lakes?

- Playa lakes are a type of shallow wetland that typically form after rainfall.
- They can be found across the **Southern High Plains**, in states such as Oklahoma, New Mexico, Colorado, and Kansas.
- The highest density of playas can be found in Texas.

42. What is an Oxbow lake?

- An oxbow lake is a U-shaped lake that forms when a wide meander of a river is cut off, creating a free-standing body of water.
- Oxbow lakes are **the remains of the bend in the river**. Oxbow lakes are stillwater lakes. This means that water does not flow into or out of them.
- In south Texas, oxbows left by the Rio Grande are called resacas.

43. What is Lateral lake?

- Lateral lakes are formed where sediment from the main river blocks a tributary, usually in the form of a levee.
- A levee, dike, dyke, embankment, floodbank, or stopbank is an elongated naturally occurring ridge or artificially constructed fill or wall that regulates water levels.

44. What are Fluvial lakes?

- Fluvial (or riverine) lakes are lakes produced by running water.
- These lakes include plunge pool lakes, fluviatile dams and meander lakes.

45. What is Solution lake?

- A solution lake is a lake occupying a basin formed by surface dissolution of bedrock.
- In areas underlain by soluble bedrock, its solution by precipitation and percolating water commonly produce cavities.

46. What are Landslide lakes?

- Landslide lakes are lakes created by the blockage of a valley by either mudflows, rockslides, or screes.
- Such lakes are common in mountainous regions.
- Although landslide lakes may be large and quite deep, they are typically short-lived.

47. What are Aeolian lakes?

- Aeolian lakes are lakes produced by wind action.
- They are found mainly in arid environments although some aeolian lakes are relict landforms indicative of arid paleoclimates.

48. What are Shoreline lakes?

- Shoreline lakes are generally lakes created by blockage of estuaries or by the uneven accretion of beach ridges by longshore and other currents.
- They include maritime coastal lakes, ordinarily in drowned estuaries.

49. Write short note on Karewa?

- Sediments kept coming in through rivers and kept on depositing in that lake, thus resulting in the formation of a **lacustrine plain**.
- Over the time the water drained away leaving behind deposits viz. unconsolidated gravel and mud. These deposits are known as **KAREWA**.
- Karewa Landform is found in the Kashmir Himalaya.
- Kashmir Himalayas are famous for Karewa formations and it is divided into two stages, lower and upper.

50. What do you mean by Rift valley?

- A rift valley is a linear shaped lowland between several highlands or mountain ranges created by the action of a geologic rift.
- Rifts are formed as a result of the pulling apart of the lithosphere due to extensional tectonics. The linear depression may subsequently be further deepened by the forces of erosion.
- More generally the valley is likely to be filled with sedimentary deposits derived from the rift flanks and the surrounding areas.
- One of the best known examples of the formation of Rift lake is the East African Rift.

51. Write down the classification of Rift?

- Rifts can be classified in four types they are:
 1. The subduction-related rift
 2. The plume-related rift
 3. The mountain-related rift
 4. The transform-related rift

52. What is Horst and Graben?

- A horst is a raised block of the Earth's crust that has lifted, or has remained stationary, while the land on either side (graben) has subsided.
- Horst and Graben (valley and range) refers to a **type of topography created when the earth's crust is pulled apart**.
- The end result of this is a vast landscape of alternating valleys and ridges.
- The western United States is an example of this, in the physiographic province known as the Basin and Range.

53. What is Folding and Faulting?

- When the Earth's crust is pushed together via compression forces, it can experience geological processes called folding and faulting.
- Folding occurs when the Earth's crust bends away from a flat surface.
- Faulting happens when the Earth's crust completely breaks and slides past each other.

54. Write down the difference between Folding and Faulting?

| S.No. | Folding | Faulting |
|-------|---|---|
| 1 | Folding is caused due to horizontal movements. | It is caused generally due to vertical movements |
| 2 | Forces move towards a common centre | Forces move away from the common centre. |
| 3 | Due to compression, different types of folds are formed. | Due to tension, faults occur along which displacement of rocks take place. |
| 4 | It leads to the formation of anticlines and synclines | It leads to the formation of Block Mountains and Rift valleys, due to upliftment and subsidence of land. |
| 5. | They are generally common in sedimentary rocks e.g. the Himalayas and the Alps. | They are generally common in Igneous or Metamorphic rocks, e.g. Vosges and Black forest are Block Mountains and the river Rhine flows through the rift valley. In India, river Narmada and Tapi flow through a rift valley. |

55. How is Fault formed?

- A fault is formed in the Earth's crust **as a brittle response to stress**.
- Generally, the movement of the tectonic plates provides the stress, and rocks at the surface break in response to this.
- Faults have no particular length scale. Faults are planes of detachment resulting when rocks on either side of the displacement slip past one another.

56. Write down the types of fault?

- There are four types of faulting: **Normal, Reverse, Strike-slip, and Oblique**.
 1. **Normal:** A normal fault is one in which the rocks above the fault plane, or hanging wall, move down relative to the rocks below the fault plane, or footwall.
 2. **Reverse:** A reverse fault is one in which the hanging wall moves up relative to the footwall.
 3. **Strike-slip:** When rocks on either side of a nearly vertical fault plane move horizontally, the movement is called strike-slip.
 4. **Oblique:** An oblique-slip fault is special type fault that forms when movement is not exactly parallel with the fault plane.

57. What are convection currents? Explain.

- A convection current is a process that involves the movement of energy from one place to another.
- The Earth's crust is broken up into pieces called **plates**.
- The crust moves because of movements deep inside the earth.
- Heat rising and falling inside the mantle creates **convection** currents generated by radioactive decay in the core.
- The convection currents move the plates.
- Where convection currents **diverge** near the Earth's crust, plates move apart.

- Where convection currents **converge**, plates move towards each other.
- The movement of the plates, and the activity inside the Earth, is called **plate tectonics**.
- Plate tectonics cause **earthquakes** and **volcanoes**.
- The point where two plates meet is called a **plate boundary**.
- Earthquakes and volcanoes are most likely to occur either on or near plate boundaries.

58. Define the following terms Till plains, Drumlins and Esker?

- **Till plains** are an extensive flat plain of glacial till that forms when a sheet of ice becomes detached from the main body of a glacier and melts in place, depositing the sediments it carried.
- **Drumlins** are oval-shaped hills, largely composed of glacial drift, formed beneath a glacier or ice sheet and aligned in the direction of ice flow.
- **Eskers** are ridges made of sands and gravels, deposited by glacial meltwater flowing through tunnels within and underneath glaciers, or through meltwater channels on top of glaciers.

59. What are Moraines? Also mention its types.

- A moraine is **material left behind by a moving glacier**. This material is usually soil and rock. Just as rivers carry along all sorts of debris and silt that eventually builds up to form deltas, glaciers transport all sorts of dirt and boulders that build up to form moraines.
- Moraines are divided into four main categories: lateral moraines, medial moraines, supraglacial moraines, and terminal moraines.
- **Terminal moraines** are found at the terminus or the furthest (end) point reached by a glacier.
- **Lateral moraines** are found deposited along the sides of the glacier.
- **Medial moraines** are found at the junction between two glaciers.
- **Ground moraines** are disorganised piles of rocks of various shapes, sizes and of differing rock types. They are formed with melts out of the glacier in irregular heaps, forming rolling hills.

60. What is a hanging valley and how it is formed?

- Glaciers form U-shaped valleys through erosion. Hanging Valleys are found high up on the sides of larger U-shaped valleys.
- The ice has also melted in the hanging valleys, but because the land here is so much higher than in the larger U-shaped valley, water in the hanging valley forms waterfalls.
- They are formed when glaciers move through the main valley and cut off spurs.
- These include **Yosemite Falls, Ribbon Fall, Bridalveil Fall and Illilouette Fall**.

MAJOR GEOGRAPHICAL PHENOMENA**61. Explain Earthquake in short?**

- An earthquake is simply put, shaking of the earth's crust. It is caused due to the energy release, which triggers waves that travel in all directions.
- All natural earthquakes occur in the lithosphere. Seismic waves studies offer a full picture of the layered interior.
- The emanation of energy occurs along a fault.
- A fault is a sharp break in the crustal rocks.
- Rocks along a fault generally move in opposing directions.

62. Write down the different types of Earthquakes?

- **Tectonic earthquakes:** These are produced due to sliding of rocks along a fault plane.
- **Volcanic earthquake:** These are confined to areas of active volcanoes.
- **Collapse earthquake:** The roofs of underground mines collapse causing minor tremors in the areas of intense mining activity.
- **Explosion earthquakes:** These occur due to the explosion of chemical or nuclear devices.
- **Reservoir-induced earthquakes:** These occur in the areas of large reservoirs.

63. What are the major causes of Earthquake?

- It is caused due to the discharge of energy from faults and cracks in the crust of the earth. A fault in the crust of Earth is essentially a sharp break in crustal rocks.
- The point where energy is released is called the focus or hypocentre. It is generally located at the depth of 60 km.
- This energy release produces waves which travel in all directions.
- The point where the energy is released is called the focus of an earthquake or hypocentre.
- The point on the surface of the earth which is vertically above the focus is called epicentre. It is the first place to experience the waves.

64. What are Earthquake Waves? Also describe its types?

- The earthquake which originates in the lithosphere propagates different seismic waves or earthquake waves.
- Earthquake waves are basically of two types – body waves and surface waves.
- **Bodywaves** are generated due to the release of energy at the focus and moves in all directions traveling through the body of the earth.
- They travel only through the interior of the earth.
- When the body waves interact with surface rocks, a new set of waves is generated called as **surfacewaves**.
- These waves move along the earth surface.

65. Explain Primary waves?

- Primary waves are the fastest body waves (twice the speed of s-waves) and are the first to reach during an earthquake.
- They are similar to sound waves, i.e, they are longitudinal waves, in which particle movement is in the same direction of wave propagation.
- They travel through solid, liquid and gaseous materials.
- They create density differences in the earth material leading to stretching and squeezing.

66. Write in brief about Secondary waves?

- They arrive at the surface with some time-lag after primary waves.
- They are slower than primary waves and can pass only through solid materials.
- This property of S-waves led seismologists to conclude that the earth's outer core is in a liquid state. The entire zone beyond 105 degree from the epicentre does not receive S-waves.
- They are transverse waves in which directions of particle movement and wave propagation are perpendicular to each other.

67. What is the difference between primary waves and secondary waves?

| S.No. | Primary Waves | Secondary Waves |
|-------|--|--|
| 1 | The first wave to hit seismographs | The second wave to hit seismographs. |
| 2 | They are compression waves | They are shear waves |
| 3 | Can move through solids and liquids | Can only move through solids |
| 4 | Shake the medium in the direction in which they are propagating. | Shake the medium in that perpendicular to which they are moving. |

68. Explain Rayleigh waves?

- These waves follow an elliptical motion.
- A Rayleigh wave rolls along the ground just like a wave rolls across a lake or an ocean.
- Because it rolls, it moves the ground up and down and side-to-side in the same direction that the wave is moving.
- Most of the shaking felt from an earthquake is due to the Rayleigh wave, which can be much larger than the other waves.

69. What are Shadow regions of waves?

- The P-waves pass through all medium while S-waves passes only through solid medium. With the help of these properties of primary waves, seismologists have a fair idea about the interior of the earth.
- Even though P-waves pass through all mediums, it causes reflection when it enters from one medium to another.
- The variations in the direction of waves are inferred with the help of their record on seismographs.
- The area where the seismograph records no waves is called as 'shadow zone' of that wave.
- Accordingly, it is observed that the area beyond 1050 does not receive S-waves and the area in between 105 degree to 140 degree does not receive P-waves.

70. What do you mean by Seismometers and Seismograph?

- Seismometers are the instruments which are used to measure the motion of the ground, which including those of seismic waves generated by earthquakes, volcanic eruptions, and other seismic sources.
- A Seismograph is also another term used to mean seismometer though it is more applicable to the older instruments.
- The recorded graphical output from a seismometer/seismograph is called as a seismogram.
- Seismograph is an instrument while seismogram is the recorded output.

71. Write short note on Mercalli Scale and Richter Scale?

- The scale represents the **intensity** of earthquake by analysing the after effects like how many people felt it, how much destruction occurred etc.
- The range of intensity is from 1-12.
- The scale represents the **magnitude** of the earthquake. The magnitude is expressed in absolute numbers from 1-10.
- Each whole number increase in Richter scale represents ten times increase in power of an earthquake.

72. What are the major effects of Earthquakes?

- The following are the immediate hazardous effects of Earthquake:
 1. Shaking of ground
 2. Disparity in ground settlement
 3. Natural disasters like Tsunami, land slide, mud slides and avalanches
 4. Soil liquefaction
 5. Ground lurching and displacement
 6. Floods and fires
 7. Infrastructure collapse.

73. What is a Tsunami?

- The term Tsunami means harbor wave.
- They can be represented as a wave series and the feature that distinguishes such waves is their long wavelength.
- Tsunami should not be mistaken with the wave produced by massive winds.
- A wind-generated wave persists for a few seconds, while Tsunami persists for minutes to hours.
- Tsunami may be extremely damaging, which is not the wave generated by wind.

74. How Tsunami is generated and how often it occurs?

- An earthquake cause tsunamis.
- It should be observed that the sea floor's vertical movement can produce these.
- Landslide may also cause tsunamis and even volcanic activity.
- On an average a tsunami occurs in the Pacific ocean in every year.
- An example to take for India itself that was the Indian coast tsunami on 26 Dec. 2004

75. What are Volcanoes?

- A volcano is a vent or fissure in Earth's crust through which lava, ash, rocks, and gases erupt.
- An active volcano is a volcano that has erupted in the recent past.
- The mantle contains a weaker zone known as asthenosphere.
- Magma is the material present in the asthenosphere.
- Material that flows to or reaches the ground comprises lava flows, volcanic bombs, pyroclastic debris, dust, ash and gases.
- The gases may be sulphur compounds, nitrogen compounds, and trace amounts of argon, hydrogen and chlorine.

76. What is the difference between Lava and Magma?

- A Magma is the term used to denote the molten rocks and related materials seen inside earth. A weaker zone of the mantle called asthenosphere, usually is the source of magma.
- Once this magma came out to the earth surface through the vent of a volcano, it is called as the Lava.
- Therefore, Lava is nothing but the magma on earth surface.
- The process by which solid, liquid and gaseous material escape from the earth's interior to the surface of the earth is called as Volcanism.

77. Write down the classification of volcano? On the basis of Periodicity of eruptions.

- **Active Volcano:** An active volcano is one which is recently dropped and there is a possibility that it may erupt soon.
Example: Etna, Stromboli, Pinatubo etc.
- **Dormant Volcano:** A dormant volcano is one that has not erupted in a long time but there is a possibility it can erupt in the future.
Example: Vesuvius, Earren Island Volcano (Andaman)
- **Extinct Volcano:** An extinct volcano is one which has erupted, thousands of years ago and there's no possibility of an eruption.

78. What are the different types of volcanoes?

- **Cinder cones volcanoes:** Cinder cones are circular or oval cones made up of a small fragments of lava from a single vent that have been balloon up.
- **Composite Volcanoes:** Composite volcanoes are steep sided volcanoes composed of many layers of volcanoes rocks, usually made from high-viscosity lava, ash and rock debris.
- **Shield Volcanoes:** Shield Volcanoes shaped like a bowl or shield in the middle with long gentle slopes made by basaltic lava flows.
- **Lava Domes:** Lava domes are formed when erupting lava is thick to flow and makes a step- sides mound as the lava piles up are the volcanic vent.

79. Write short note on Shield Volcanoes?

- They are not very steep but are far and wider. They extend to great height as well as distance.
- They are the largest of all volcanoes in the world as the lava flows to a far distance. The Hawaiian volcanoes are the most famous examples of these.
- Shield volcanoes have low slopes and consist almost entirely of frozen lavas.
- These volcanoes are mostly made up of basalt (less viscous), a type of lava that is very fluid when erupted. For this reason, these volcanoes are not steep.
- **They are of low explosive in general**, but if somehow water gets into the vent they may turn explosive.
- The upcoming lava moves in the form of a fountain and throws out the cone at the top of the vent and develops into cinder cone.

80. Explain Cinder Cone Volcano in short?

- Cinder cones are circular or oval cones made up of small fragments of lava from a single vent that have been blown up.
- Cinder cones result from eruptions of mostly small pieces of scoria and pyroclastics that built up around the vent.
- Most Cinder cones erupt only once and they are extrusive igneous rocks.
- These volcanoes consist almost entirely of loose, grainy cinders and almost no lava.
- They have very steep sides and usually have a small crater on top.

81. Write short note on Composite Volcano?

- They are cone shaped with moderately steep sides and sometimes have small craters in their summits.
- Volcanologists call these “strato” or composite volcanoes because they consist of layers of solid lava flows mixed with layers of sand or gravel like volcanic rock called cinders or volcanic ash.
- They are characterized by the eruption of a cooler and more viscous lavas than basalt. These volcanoes often result in explosive eruptions.
- Along with lava, large quantities of pyroclastic materials and ashes find their way to the ground.
- This material accumulates in the vicinity of the vent openings and leading to the formation of layers, and this makes the mount appear as composite volcanoes.

82. What is Caldera?

- A caldera is a large depression formed when a volcano erupts and collapses.
- These are the **most explosive of the earth's volcanoes**.
- They are usually so explosive that when they erupt they tend to collapse on themselves rather than building any tall structure. The collapsed depressions are called calderas.
- Their explosiveness indicates that its magma chamber is large and in close vicinity.
- A caldera differs from a crater in such a way that a caldera is a huge depression caused by a collapse after a large-scale eruption
- Whereas a crater is a small, steep sided, volcanic depression bored out by an eruptive plume.

83. Explain the main causes of volcanoes?

- There is a huge temperature difference between the inner layers and the outer layers of the earth due to the differential amount of radioactivity.
- This temperature difference gives rise to convectional currents in the mantle.
- The convection currents in the mantle create convergent and divergent boundaries (weak zones).
- At the divergent boundary, molten, semi-molten and sometimes gaseous material appears on earth at the first available opportunity.
- The earthquakes here may expose fault zones through which magma may escape (fissure type volcano).
- At the convergent boundary, the subduction of denser plate creates magma at high pressure which will escape to the surface in the form of violent eruptions.

84. What are the positive effects of volcanism?

- Volcanism creates new fertile landforms like islands, plateaus, volcanic mountains etc.
Example: Deccan traps.
- The volcanic ash and dust are very fertile for farms and orchards.
- Volcanic rocks yield very fertile soil upon weathering and decomposition.
- Although steep volcano slopes prevent extensive agriculture, forestry operations on them provide valuable timber resources.
- Mineral resources, particularly metallic ores are brought to the surface by volcanoes.
- The famous Kimberlite rock of South Africa, the source of diamonds, is the pipe of an ancient volcano.
- In the vicinity of active volcanoes, waters in depth are heated from contact with hot magma giving rise to springs and geysers.

85. What are geysers and hot springs?

- Water that percolated into the porous rock is subjected to intense heat by the underlying hard rock which is in contact with hot magma in the mantle or the lower part of the crust.
- Under the influence of intense heat, the water in the capillaries and narrow roots in the porous rock undergoes intense expansion and gets converted to steam resulting in high pressure.
- When this steam or water at high pressure finds a path to the surface through narrow vents and weak zones, appear at the surface as geysers and hot water springs.

86. What are tropical Cyclones?

- A tropical cyclones is a rapidly rotating storm system characterized by a low-pressure centre, a closed low-level atmospheric circulation, strong winds and a spiral arrangement of thunderstorms that produce heavy rain and/or squalls.
- Tropical cyclones are regarded as one of the most devastating natural calamities in the world.
- They originate and intensify over warm tropical oceans.
- These are ferocious storms that originate over oceans in tropical areas and move over to the coastal areas causing violent winds, very heavy rainfall, and storm outpourings.

87. Write down the major conditions for formation of tropical cyclone?

- Large sea surface with a temperature higher than 27° C
- Presence of the Coriolis force
- Small differences in the vertical wind speed
- A pre-existing weak- low-pressure area or low-level-cyclonic circulation
- Upper divergence above the sea level system

88. What is the difference between Weather and Climate?

| S.No. | Weather | Climate |
|-------|--|--|
| 1 | The day to day information of atmospheric changes of a particular area at a specific time is called weather | Climate is the statistical information of the average weather condition of a specific region. |
| 2 | The weather of a place includes the short-term atmospheric conditions. | The climate of a country includes the long-term average atmospheric conditions. |
| 3 | The atmospheric elements of weather are air, pressure, humidity, wind, temperature, rain, cloudiness, storms, snow, precipitation etc. | When the atmospheric elements of weather are observed over the decades those become the affecting conditions of climate. |
| 4 | Weather conditions change very frequently. | Climate conditions change over a long period. |

89. What do you mean by the Eye of cyclone and also explain the Eye Wall?

- A mature tropical cyclone is characterized by the strong spirally circulating wind around the centre which is called the eye.
- The eye is an area with calm weather descending air. It is characterized by light winds and clear skies.
- Around the eye is the eyewall, where there is a strong spiralling rise of air to a greater height reaching the tropopause.
- The wind reaches maximum velocity in this region and torrential rain occurs here.
- From the eyewall, rain bands may radiate and trains of cumulus and cumulonimbus clouds may drift into the outer region.

WORLD CLIMATE**90. What do you mean by Climate?**

- Climate is the characteristic condition of the atmosphere near the earth's surface.
- Climate is a measure of the average pattern of variation in temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count and other meteorological variables in a given region over long periods of time.
- The Climate of a location is mainly governed by the factors of Latitude, Position relative to continents and oceans, Altitude, Local geographical features and position relative to large- scale atmospheric circulation patterns.
- Any independent study of each of these elements does not present any comprehensive view of climate. On the basis of these elements, there could be thousands of types of climates in the world.

91. Mention the important features of climate and weather?

- The influence of climate and weather can be seen in day to day activities of human beings. Forces of nature have regulated to a very great extent the sort of food we eat, what we wear, how we live and work.
- Conditions of temperature, precipitation and humidity may promote or discourage the growth of fungus and diseases which may be injurious to both men and crops.
- Meteorological stations are set up all over the globe to provide weather updates and predict future conditions.
- A fair knowledge of the weather is not only useful but often essential.

92. What are the different elements of climate?

- Elements of climate are those quantities or properties that are measured regularly.
- There are various environmental elements which have significant influence on the climate of a region.
- Among them, temperature, pressure, precipitation and winds are the most important because of their far-reaching global influence.
- These elements are affected in different manner by the following climatic factors: latitude, altitude, continentality, ocean currents, insolation, prevailing winds, slope and aspect, natural vegetation and soil.

93. What are the major factors that affect climate?

- **Ocean Currents:** They tend to influence the temperature of a place significantly.
- **Topography:** The shape of land also influence the climate of a region. For example, low lying areas are relatively hotter and receive less rainfall than those regions situated at a higher attitude.
- **Wind Directions:** The directions of wind, both to and from where it is blowing has an impact on the climate as well.
- **Distance From Sea:** The nearness to the sea and other water bodies is an influential factor. For Example, the coastal areas are wetter and cooler interior regions.
- **El-Nino Phenomenon:** El-Nino or the uneven heating of the water surface in the pacific ocean tends to affect both rainfall and wind platform.

94. Write down the classification of Climate and their characteristics according to Koppen?

- **A-Tropical Climate:** The average temperature of the coldest month is 18° C or higher.
- **B- Dry Climate:** Potential evaporation exceeds precipitation.
- **C-Warm Temperate Climate:** The average temperature of the coldest month of the (Mid- latitude) Climate years is higher than minus 3° C but below 18° C
- **D-Cold Snow forest Climate:** The average temperature of the coldest month is minus or below.
- **E-Cold Climate:** Cold Climates average temperature for all months is below 10° C
- **H-Highlands:** Cold due to elevation.

95. What is Tundra type of climate?

- This type of climate is found in regions of **north of the Arctic Circle and south of Antarctic Circle.**
- The tundra climate is characterized by a very low mean annual temperature.
- In mid-winter temperatures are as low as $40 - 50^{\circ}$ C below freezing.
- There are no trees in the tundra.
- Lowest form of vegetation like mosses, lichens etc. are found here and there.
- Climatic conditions along the coastal lowlands are a little favourable.

96. What do you mean by Laurentian climate?

- It is the intermediate type of climate between the British Type Climate (moderate) and the Taiga Type Climate (extreme) of climate.
- It has features of both the maritime and the continental climates.
- Rainfall occurs throughout the year with summer maxima (easterly winds from the oceans bring rains)
- Annual rainfall ranges from 75 to 150 cm (two – thirds of rainfall occur in the summer).

97. Write short note on Taiga Climate?

- It is found only in the northern hemisphere due to great east-west extent and absent in the southern hemisphere because of the narrowness in the high latitudes.
- Experienced in the regions just below Arctic circle.
- Summers are brief and warm reaching 20-2° C whereas winters are long and brutally cold
– always 30-40° C below freezing.
- Annual temperature range of the Siberian Climate is the greatest (Almost 50-60° C in Siberia).

98. What is Mediterranean Climate?

- Mediterranean Climate is a major climate type characterized by hot, dry summers and cool, wet winters.
- It entirely confined to the western portion of continental masses, between 30° and 45° north and south of the equator.
- The basic cause of this type of climate is the shifting of the wind belts.
- Mean annual precipitation ranges from 35 – 90 cm.
- Temperature of warmest month greater than or equal to 10° C.

99. Explain Steppe climate in short?

- It lies in the Westerly wind belt (mid-latitudes or temperate region).
- Its grasslands are practically treeless due to continentality (deep within the interiors of the continents where rain bearing winds don't reach). Here climate is continental with extremes of temperature.
- Temperatures vary greatly between summer and winter. The summers are hot and the winters are cold.
- Summers are very warm, over 18 – 20° C. The average rainfall may be taken as about 45 cm, but this varies according to location from 25 cm to 75 cm.
- The heaviest rain comes in June and July (late spring and early summer).

100. Write short note on Savanna Climate?

- It is also called the tropical wet and dry climate and is experienced in Savanna or tropical grassland regions of the world.
- This type of climate has alternate wet and dry seasons similar to monsoon climate but has considerably less annual rainfall.
- Also, there is no distinct rainy season like in monsoon climate.
- In it floods and droughts are most common.
- Vegetation, wildlife and human life are quite different from monsoon climate regions.

101. What do you mean by Monsoon climate?

- Monsoons are land and sea breezes on a much larger scale.
- Unlike equatorial wet climate, monsoon climate is characterized by distinct wet and dry seasons associated with seasonal reversal of winds.
- Floods in wet season and droughts in dry season are common.
- Usually there are three seasons namely summer, winter and rainy season.
- The basic cause of monsoon climates is the difference in the rate of heating and cooling of land and sea.
- In the summer, when the sun is overhead at the Tropic of Cancer, a low pressure is created in Central Asia.

102. Explain El-Nino?

- El-Nino is an abnormal weather pattern caused by the warming of the Pacific near the equator, of the coast of South America.
- El-Nino condition occurs when surface water in the equatorial Pacific becomes warmer than average and east wind blow weaker than normal.
- When this warming occurs the usual upwelling of cold, nutrient rich deep ocean water is significantly reduced.
- The presence of the El-Nino to an increase in Sea-surface temperatures.
- El Nino is the name given to the occasional development of warm ocean surface waters along the coast of Ecuador and Peru.

103. Write down some major impact of El-Nino?

- **Impact on ocean:** El Nino impacts ocean temperatures, the speed and strength of ocean currents, and local weather from Australia to South America.
- **Increased Rainfall:** Convection above warmer surface waters brings increased precipitation.
- **Diseases caused by Floods and Droughts:** Diseases thrive in communities devastated by natural hazards such as flood or drought.
- **Positive impact:** It can sometimes have a positive impact too. For example: El-Nino reduces the instances of hurricanes in the Atlantic.
- **In South America:** As El Nino brings rain to South America, it brings droughts to Indonesia and Australia.

104. What is La Nina? Explain it with example.

- It is also sometimes called Elviejo, Anti-El Nino or simply a cold event.
- La Nina events represents periods of below average sea surface temperature across the east- central equatorial Pacific.
- La Nina events is observed when the water temperature in the Eastern Pacific gets comparatively colder than normal, as a consequence of which, there is a strong high pressure over the eastern equatorial Pacific.
- La Nina is characterized by lower-than-normal air pressure over the western Pacific.
- La Nina events are also associated with rainier than normal condition over southeastern Africa and northern Brazil.

105. Write short note on Global Warming?

- Global warming is a gradual increase in the earth's temperature generally due to the green house effect caused by increased level of carbon dioxide CFCs and other pollutants.
- In other words global warming is the gradual heating of the surface of the Earth, ocean, and atmosphere.
- Global warming begins with the greenhouse effect, which is caused by the interaction between incoming radiation from the sun and the atmosphere of Earth.
- The atmosphere is acting as a greenhouse due to the presence of greenhouse gases.

106. Write in brief about Greenhouse effect?

- The greenhouse effect is a normal process that warms the surface of the Earth.
- Solar radiation reaches the atmosphere of Earth and some of this is reflected back into space.
- The rest of the energy of the sun is absorbed by the terrestrial and the oceans, heating the Earth.
- Heat radiates from Earth towards space.
- Some of this heat is trapped by greenhouse gases in the atmosphere, keeping the Earth warm enough to sustain life.
- Human activities such as burning fossil fuels, agriculture, and land clearing are increasing the amount of greenhouse gases released into the atmosphere.

107. Discuss the main types of Rainfall based on their origin?

- **Convictional rainfall** - The air on getting heated becomes light and rises in convection currents. As the air rises, it expands and drops the temperature and subsequently, condensation takes place and cumulus clouds are formed. Such rain is usually in the summer or the hotter part of the day. This rainfall is usually associated with hail and graupel
- **Orographic or relief rainfall** - When the saturated air mass comes across a mountain, it is forced to rise. The rising air expands, eventually, the temperature falls, and the moisture gets condensed. The region situated on the leeward side is known as the rain-shadow area.
- **Cyclonic or frontal rainfall** - Cyclonic activity causes cyclonic rain and it occurs along the fronts of the cyclone. When two masses of air of unlike density, temperature, and humidity meet then it is formed. This rain falls gradually for a few hours to a few days.

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