

# **GEOGRAPHY**

## **Question Bank**

**Class - IX**

**Half early portion**

**Chapter - 1, 2, 3, 4, 5, 6, 7, 8**

**World Map Pointing**  
**(2019-2020)**

**Geography**  
**FIRST TERMINAL PORTION**  
**QUESTION BANK - 2019-2020**

**CHAPTER – 1**  
**EARTH AS A PLANET**

**Exercise Question and Answer :-**

1. What is the surface of the earth made up of ?  
A. Surface of the earth made up of 71% of water. The remaining 29% is made up of the landmass, which is also made of rocks and minerals.
2. What is water cycle ?  
A. Continuous supply of water in to the atmosphere through the process of evaporation, transpiration , condensation followed by precipitation.
3. Name the planet that cannot support life. Give reason why ?  
A. Except earth no other planet can support life for example mercury, mars does not have favorable condition to support life like the Earth.
4. Why is Earth called watery as well as Blue Planet ?  
A. This is because 71% of water and 29% land made the watery and its atmospheric bluish appearance as blue color spread more in the atmosphere which reflect in to the abundant water and made the earth appears blue from the outer space.
5. State the three factors that have made life possible on the planet earth.  
A. Ideal distance from the sun maintain earth moderate temperature.
  - Presence of water cycle
  - Presence of Atmospheric cover
  - Presence of Lithosphere and Hydrosphere
6. Compare the significance of atmosphere of the Earth with those of other planets.  
A. The atmosphere of the Earth is different from that of other planets and the composition of atmosphere of other planets is not suitable for living being, thus cannot sustain life. As the Earth a atmosphere consist of right amount of

oxygen, CO<sub>2</sub>, nitrogen, and other gas and has a different layer which protect from harmful rays.

7. Why only side of the moon is visible to us ?  
A. This is because the moon's rotation and revolution period is same – 27days approx.
8. Give reason ;- Q. earth is considered as habitable planet. Why?  
A. This is because the Earth has moderate temperature.
  - Ideal distance in between sun and Earth
  - Presence of Atmosphere, Lithosphere, Hydrosphere
9. There is an antipodal arrangement of land and water on Earth.  
A. This is because here is land in one part (Northern hemisphere) of the globe and the other part (southern hemisphere) water bodies. there is balance between water and land.
10. Sun doesn't rise everywhere same time.  
A. This is because the spherical shape of the Earth.

**Extra Question :-**

- Q. What is Heat Cycle ?  
A. On the whole the earth receive only 45% to 47% of the solar energy reaching the atmosphere 15% is absorbed by the atmosphere 40% reflected back into space by the atmosphere.
- Q. State any three proof of the round shape of the Earth  
A. (i) Circumnavigation of the Earth.  
A. Line of visibility increasing with height.  
B. Sunshine and Sunset  
C. All the celestial bodies are spherical.  
D. Lunar Eclipse  
E. Aerial photographs

**Q.** What is the equatorial diameter A.

12,757 Km

**Q.** What is the polar diameter A.

12,714 Km

**Q** What makes the earth a unique planet in the solar system?

**Ans.** Our earth is the only planet which supports life due to the presence of atmosphere, hydrosphere and lithosphere.

**Q** What is the position of the earth in the solar system in terms of distance from the sun?

**Ans.** The earth is the third planet in terms of distance from sun in the solar system.

**Q** Where does the earth stand among the planets of the solar system in terms of size?

**Ans.** Earth is the fifth largest planet in the solar system.

**Q** What do you mean by ecosystem?

**Ans.** An ecosystem is the interaction between living and non-living components like soil, water and air in which food chain works by flow of sun's energy.

**Q** Why does the earth have optimum temperature conditions?

**Ans.**

- The average distance between the sun and the earth is about 150 million kilometers.
- Earth is neither too close to the sun nor too far from it. So, it is neither too hot like Mercury nor too cold like Neptune.
- Thus the average temperature of the earth on the sunlit side is about 17 degree centigrade, which is suitable for life.

**Q** Give three ways by which the atmosphere protects the earth from harmful conditions.

**Ans.** The three ways to protect the earth from harmful conditions are as follows:

- (a) The ozone layer present in the stratosphere checks the harmful ultraviolet rays of the sun.

(b) The atmosphere absorbs the terrestrial radiation emitted by the earth and keeps the earth warm even during night.

**Q** Give three evidences to prove that the earth is a spherical heavenly body.

**Ans.** The three evidences are as follows:

**(a) Magellan's circumnavigation :**

- Ferdinand Magellan's crew navigated throughout the earth to take a full round of our planet from 1519 to 1522 AD which proved the spherical shape of the earth without encountering any sharp edge.

**(b) Sighting of a ship from the sea port**

- If we observe a ship approaching a sea port from a certain distance, first the top of the ship is seen.
- As the ship comes closer to the sea port, we can see the funnel/mast of the ship as well as the full ship.

**(c) Lunar eclipse**

- During lunar eclipse, we can see the earth casting circular shadow on the moon.

**Q** Mention three features of the moon that make it unsuitable for life.

**Ans.** The three features that make the moon unsuitable for life is as follows :

- There is an absence of atmosphere as moon cannot hold the gases due to its weak gravitational pull.
- Since there is no atmosphere to protect moon from falling meteors, life is not possible.
- Water is not present on the moon.

**Q** Explain the significance of the hydrosphere.

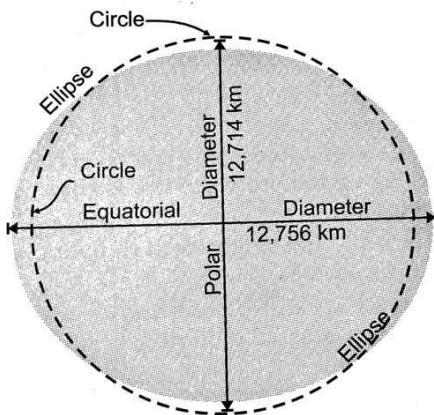
**Ans.**

- The earth is known as a watery planet as it has abundance of water in all the three states i.e. solid, liquid and gas.
- 71% of the earth's surface is covered by hydrosphere.
- It is necessary for carrying out chemical reactions in the bodies of living organisms.

- Water also helps in dissolving and transporting nutrients from the soil to plants.
- It helps the plants to make food.

**Q** Study the picture and answer the following questions.

- Is the earth a complete sphere?
- What does the picture show about the shape of the earth?



Ans.(a) No, it is a Geoid.

- It shows that the Equatorial diameter 12756 km is more than the polar diameter 12714km means it bulges at equator and flattens at the poles.

## **CHAPTER – 2 Latitude & Longitude**

Exercise question and answer :-

**Q1. Why do we need to locate places on earth ?**

Ans – To find a exact location of the place on the globe one has to use a map with a network of latitude and longitude on a grid.

**Q2. What do you mean by the latitude of a place ?**

Ans – The latitude of place is the angular distance of that place north or south of the equator.

**Q3. What is mean by Prime Meridian ?**

Ans – The longitude of zero degree passing though Greenwich near London.

**Q4. Explain why there is no higher latitude other than  $90^{\circ}$  north and south ?**

Ans – There is no here latitude other than  $90^{\circ}$  North and south because it is a  $90^{\circ}$  angle between the equator and the poles, two points at the poles we cannot get any further than the poles.

Q5. Explain why lines of longitude are called Meridian of longitude.

Ans- Longitude are series of imaginary lines run from north poles to south pole as all the meridian meaning 'mid-day' as all the pieces on the same time meridian have their noon at the same time.

Q6. State the properties of lines of latitude?

Ans – I. Help us to find the/locate places on earth.

II. Divides the earth into important heat zones.

III. Latitudes help in calculating the distance.

IV. Great circles (equator) reduce time fuel for route navigator.

V. Great circles routes are the shortest routes between various places on the earth.

Q7 State the properties of lines of longitudes.

Ans.- It is Used for locating places on the globe.

II. Determining the local time of a place.

III. Determining the day and date on the globe.

Q8. The distance between the successive parallels of latitude is 111km explain?

Ans.  $40,000/360^{\circ} = 111$ km each longitude distance.

Q9. What are the limits of two temperature zones ?

Ans.  $23\frac{1}{2}^{\circ}\text{N}$  to  $60\frac{1}{2}^{\circ}\text{N}$  and  $23\frac{1}{2}^{\circ}\text{S}$  to  $66\frac{1}{2}^{\circ}\text{S}$ .

Q10. What are the places in the Torrid zone hotter and Frigid zone colder than other zones .

Ans- Frigid zone receives direct/vertical sunrays throughout the years. Fridge zone receives oblique/slanting rays of the sun that because coder than the zones.

Q11. How is local time of a place is fixed ?

Ans – When the sun in overhead to its meridian on longitude.

For Example –  $80^{\circ}\text{E}$  meridian all the places on that longitude will have noon at that time.

Q12. If the GMT at 00 longitude is 12noon find the local time of a place ( $30^{\circ}\text{E}$ ).

Ans-  $0^{\circ}$                      $30^{\circ}\text{E}$   
|                            |  
12.00                    (Time) ?  
(noon)

Difference in longitude  $30^{\circ}-0^{\circ} = 30$

Since, time difference in between longitude is 4minutes,  $1^{\circ}=4' = 30&4=120$  minutes convert into hour = 2hrs

As  $30^{\circ}\text{E}$  is situated east of  $0^{\circ}$  (PM) as time at  $0^{\circ}$  would be added.

So,                     $12\text{hr} + 2 \text{ hr} = 14.00 \text{ hr}$   
                          = 2 pm.

So,  $30^{\circ}\text{E} = 2\text{PM}$

Q13. Why the standard time is considered necessary?

Ans – Standard time is considered necessary because of the earth different places on the earth surface expansion different part of the day on  $1^{\circ} = 4'$  since it is not possible to have own local time, a system of standard time with the standard meridian.

Q14. What are time zones? How many time zones are there.

Ans – Zones or belts of given east-west longitudinal extent within which standard time is applied according to a uniform system. There are 24 time zones.

Q15. London experience lower temperature than Singapore why ?

Ans – London is located in temperate zone, where as Singapore is located in Torrid Zone.

Q16. What is International Date Line?

Ans- It is an Imaginary line along with  $180^{\circ}$  passes through Pacific Ocean and determines the date and day.

Q17. Why do some countries have many Time zones?

Ans. – Because some countries have vast extension east to west or west to east to avoid time confusion.

Q18. What are small circles?

Ans – Except equator all other latitudes are small circles.

Q19. Except for the equator, other parallels of latitudes are not Great Circles, Why?

Ans- Equator divides the globe into two equal halves, which other parallels do not.

Q20. How is the use of local time inconvenient in practical life ?

Ans- It is inconvenient in day to day life because it varies from place to place as  $1^{\circ} = 4'$  so, to avoid time confusion in daily life local time is not considered.

Q21. Name the important Climatic zone ?

Ans –

- i.      Torrid zone      -  $23\frac{1}{2}^{\circ}\text{N}$  to  $23\frac{1}{2}^{\circ}\text{S}$  to  $66\frac{1}{2}^{\circ}\text{S}$
- ii.     Temperate zone -  $23\frac{1}{2}^{\circ}\text{N}$  to  $66\frac{1}{2}^{\circ}\text{N}$  and  $23\frac{1}{2}^{\circ}\text{S}$  to  $66\frac{1}{2}^{\circ}\text{S}$
- iii.    Frigid zone      -  $66\frac{1}{2}^{\circ}\text{N}$  to  $90^{\circ}\text{N}$   
              -  $66\frac{1}{2}^{\circ}\text{S}$  to  $90^{\circ}\text{S}$

## **GIVE REASONS**

1. Latitudes and longitudes are always expressed in angles.  
Ans. Because when they interest each other they form right angle.
2. Large countries have many time zones.  
Ans. They have vast extension from east – west and west – east.
3. International Date Line is not a straight line like other longitude.  
Ans. Meridian  $180^{\circ}$  chosen an IDL because it passes through middle of the Pacific Ocean and there is practically no landmass, and to avoid landmass deviation has been taken so that there would be no time date confusion and this deviation made the zigzag line.
4. A person gains time as he travels towards east.  
Ans. This is because for each  $1^{\circ}$  longitude towards east there is an increase in time by 4 minutes.
5. The intervals between successive parallel are constant.  
Ans. This is because earth is divided into  $18^{\circ}$  parallels at the intervals  $1^{\circ}$
6. A person travelling from Mumbai to London has to alter his watch.  
Ans. This is because Mumbai lies east of the prime meridian 5 hours 30 minutes ahead of London, the person has to cross  $180^{\circ}$  meridian.
7. The difference between I.S.T. and G.M.T. is 5 hours and 30 minutes.  
Ans. Longitude I.S.T. ( $82^{\circ}12'E$ ) and G.M.T. ( $0^{\circ}$ ) I.S.T. lines east of G.M.T. and ahead of 5 hours, 30 minutes.

Extra questions –

1. State the importance of Great circle route.
  - A. (i) Great circle routes are the shortest distance between the two places on the earth.
  - (ii) Used mainly to save time and fuel.

2. What is the circumference of the Earth? A.  
40,000 km, 40,075 km
3. Why latitudes are known as parallels.
  - A. Each Latitude is an imaginary circle parallel to the equator and centered on the polar axis.
4. Name the two reference lines with respect to which the different places on the earth are located.

**Ans.** “Equator” and the “Prime Meridian” are two important reference lines on which the different places of the earth are located.

5. Name the longitude used as a fixed line of reference.

**Ans.** Greenwich meridian or  $0^{\circ}$  meridian is used as a fixed line of reference.

6. Which of the parallels latitudes is a great circle? Why?

**Ans.** Equator is the only latitude known as a great circle because it divides the earth into two equal parts.

7. Which meridian is used for determining the standard time of India?

**Ans.** The 82 $^{\circ}$  East longitude is used for determining the standard time of India.

8. What do you mean by local time of a place?

**Ans.** This time recognized by the mid-day sun is known as “Local time” of that place.

9. Why do different countries follow standard time?

**Ans.**

- Different countries have more than one longitude passing through them. Different longitudes have different local times which could not be followed because they can create a lot of confusion.
- To avoid difficulties and confusion; the local time of a central meridian is taken as the standard time for the whole country or a large area.

## **Differentiate the following;**

10. Great Circle and Small Circle

**Ans.**

Great Circle	Small Circle
1. A great circle divides the earth into two equal parts. 2. Equator is the only latitude known as 'a great circle'. All the longitudes along with their diametrically opposite longitudes are called great circles.	1. A small circle does not divide the earth into two equal parts. 2. Except equator, all the other latitudes are small circles.

11. Local time and Standard time

**Ans.**

Local time	Standard time
1. The time of a place recognized by the mid-day sun is called the local time. 2. The local time of different longitudes cannot be followed practically because it creates difficulties and confusion.	1. The local time of the central meridian is taken as the standard time for the whole country or a large area. 2. To avoid difficulties and confusions, standard time is practically followed.

### **Give reasons for the following :**

12. The places located relatively eastward experience a new day first.

**Ans.** The sun does not move but the earth rotates from west to east. So the places located in the east see the sun first and a new day is experienced first in the places located in the east.

13. Navigators and aviators follow the Great circle routes.

**Ans.** The route along the arc of a great circle provides the shortest possible route which saves fuel, time and expenditure. So special great circle charts are used where routes are marked as straight lines.

14. How can the general climate of an area be described with the help of the lines of latitudes?

**Ans.**

- The direct rays of the sun fall only between the tropic of cancer and the tropic of Capricorn. So in the torrid-zone, the temperature is high throughout the year.
- Beyond the tropic of cancer and tropic of Capricorn, the rays of the sun become more slanting. The slanting rays travel more distance through the atmosphere and spread on a larger area hence the temperate zone has moderate climate.
- Near the polar region, the sun never shines above the horizon. The rays are very slanting and less effective. So minimum of sunshine is received in the polar region. So the polar region is very cold.

15. Why is it necessary to make a correction of date when one crosses the International Date Line?

**Ans.**

- If you are travelling eastward from Greenwich meridian to a place “A” located at longitude  $180^{\circ}$ , the time will be 12 hours ahead of Greenwich time. So when it is 6 am in Greenwich on Wednesday, it is 6 pm on Wednesday at station A.
- If you are travelling westward from Greenwich to the same place “A” on longitude  $180^{\circ}$ , the time will be 12 hours behind Greenwich time i.e. 6 pm but on the previous day, Tuesday.
- Thus there is difference of 24 hours on both the sides of International date-line.

## Questions Based on Time Sums

**Q14.** Find out the time difference between Greenwich meridian ( $0^{\circ}$  longitude) and Allahabad ( $82^{\circ} 30' E$  longitude).



### Ans

Longitude of Greenwich =  $0^{\circ}$  Longitude of  
Allahabad =  $82^{\circ}30'E$

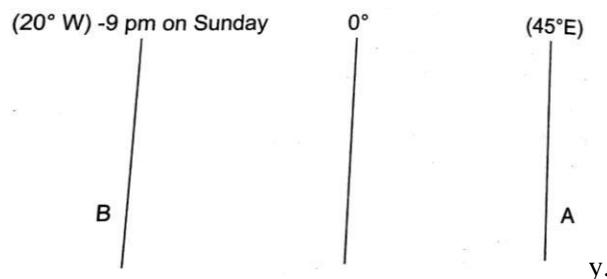
Longitude difference between Greenwich meridian and Allahabad

$$= 82^{\circ} 30' - 0^{\circ} = 82^{\circ} 30'$$

Time difference between two places =  $82^{\circ} 30' \times 4 = 330'$  or 5 hrs 30 min.

Since, Allahabad is situated at the east of Greenwich so the time of Allahabad will be 5 hrs 30 minutes ahead of Greenwich time. Thus, when it is noon at Greenwich the time at Allahabad will be 5 : 30 pm.

**Q15.** Find out the time of station A located at  $45^{\circ}$  east longitude when the time at station B located at  $20^{\circ}$  west longitude is observed 9 pm on Sunday.



**Ans.** The time at station A = ( $45^{\circ}$  E)

Time at station B ( $20^{\circ}W$ ) – 9 pm on Sunday.

The difference of longitude between the stations A and B =  $45 + 20 = 65$  longitudes.  $1^{\circ}$  of longitude makes a difference of 4 minutes. So the time difference between these longitudes will be  $65 \times 4 = 260$  minutes.

As station A is located to the east of station B so the time of station A will be ahead of the time of station B.

Thus the time of station A = 9 pm + 2hrs 20 minutes = 11: 20 pm. Answer :- Time  
of station A will be 11 : 20 pm.

## **CHAPTER – 3**

### **ROTATION AND REVOLUTION**

Exercise Question and Answer –

Q1. What is mean by the Inclination of the Earth Axis ?

Ans – The Earth spins on an imaginary line called Axis, it makes an angle of  $66\frac{1}{2}^{\circ}$  with the plane of elliptic and is tilted  $23\frac{1}{2}^{\circ}$  from a line perpendicular to that plane.

Q2. Name the effects of Earth rotation.

Ans - - Occurrences of day and night.

- Occurrences waves and tides
- Occurrences of cyclones and anticyclone
- Coriolis force deflection of winds and ocean currents.

Q3. State two effects of west to east rotation of the Earth.

Ans - - All the heavenly bodies that appears in the eastern sky.

- Sunrise and sunset east and west respectively.

Q4. What causes slight paltering of the Earth at two poles.

Ans – Rotation of the Earth causes centrifugal force at the center that caused the flattening of poles and bulged at the equator.

Q5. Explain the meaning of "Solstice"? (Equinox)

Ans – Solstice – Means the sun standing still or reaching the highest point. It occurs when the altitude of the sun is highest at the tropic of cancer on 21<sup>st</sup> of June. It is in Tropic of Capricorn on 22<sup>nd</sup> of December.

Q6. Which is the longest day in Northern and southern hemisphere ?

Ans – In Northern Hemisphere: 21<sup>st</sup> June

In southern Hemisphere: 22<sup>nd</sup> December

Q7. What is Leap Year?

Ans - Earth revolution period is 365days 6hrs every after 4years 1day is to be added on 29 February.

Q8. What do you mean by the Sidereal Day?

Ans - Earth's revolution period is 23hrs 56minutes 4.09 sec.

Q9. State the speed of Earth's rotation?

Ans - Cyclone and Anticyclone

- Tides and Waves
- Deflection of winds and ocean currents

Q10. Attitude of the sun varies at a place according to the season.

Ans – The attitude of the sun varies at a place according to the season due to the inclination of the Earth's axis.

Q11. Seasons are revered in Northern and Southern Hemisphere.

Ans – Season are revered in the Northern and the Southern Hemisphere because of the Earth's inclination and due to the revolution of the earth.

Q12. Winds get deflected from their normal path.

Ans – This is due to the Coriolis force effect caused by the rotation of the Earth.

Q13. The region beyond the Arctic Circle is also remaining as the land of midnight sun.

Ans- The region beyond the Arctic Circle is also remain as the land of the midnight sun because the sun is above the horizon for 24 hours.

Q14. The speed of rotation of the earth is much faster at Singapore than that at help or river.

Ans – The speed of the earth decreases from the equator to the poles to Singapore is located in the equatorial region (near the equator) and tropic (in Russia) is located farther from the equator therefore the speed of rotation of the earth at Singapore is much faster at Singapore than at tropic or Russia.

**Q15.** Mid-day sun can be sun overhead in Chennai twice a year but not even at once in Delhi.

**Ans –** This is because the movement of the sun is confined in between the tropic i.e. in between (tropic of cancer and tropic of Capricorn) Chennai is located in between the tropic and Delhi is located farther from tropic of cancer therefore Midday sun can be sun twice Chennai but that even over in Delhi.

**Q16.** The Poles experience six month day and six month night.

**Ans –** because of the inclination or Tiltiness of the earth's axis therefore the place receives the ray of the sun therefore they experience six month day and six month night

**Q17.** Noon is hotter than morning.

**Ans-** Noon is hotter than morning this is because during noon, the earth is more inclined towards the sun and is therefore closer to the sun. The sun is overhead to a particular region in noon and that region receives the direct vertical rays of the sun in morning time, the particular place receives the slanting rays of the sun

**Q18.** The variation in the length of the days and nights goes on increasing towards the poles.

**Ans-** Due to the inclination of the earth's axis, the variation in the days and night goes on increasing towards the poles.

**Q19.** The Sun is never overhead beyond the tropics.

**Ans –** Because of the earth's inclination, the movement of the sun is confined in between the tropics i.e. the tropic of cancer and the tropic of Capricorn.

**Q20.** The regions near the North Pole and the South Pole have six months of continuous dry-light and darkness.

**Ans-** This is because the polar regions or the regions which are situated near the north pole and the south pole receive extreme slanting rays of the sun-throughout the year and also due to the inclination of the earth the poles experience six months of continuous daylight.

**Q21.** Name the area which is experiencing practically no variations of season.

**Ans.** Equatorial region has no variations of seasons.

**Q22.** When there is winter in India, what season is there in New Zealand?

**Ans.** When there is winter in India, there would be summer season in New Zealand.

**Q23.** Mention any two important combined effects of inclined axis.

**Ans.** The two effects are as follows :

- Due to the inclined axis of the earth, each of the poles is presented alternately to the direct rays of the Sun. So both the hemispheres experience summer and winter alternately.
- The length of day and night differs from place to place. It means that where summer season is experienced, the days are longer and where winter season is experienced the days are shorter.

**Q24.** Why are days and nights equal on 21<sup>st</sup> of March and 23<sup>rd</sup> of September all over the world?

**Ans.**

- The days and nights are equal on 21<sup>st</sup> of March and 23<sup>rd</sup> of September all over the world because the inclination of the earth's axis does not have any effect on the duration of a day.
- This happens because circle of illumination touches both the poles making 12 hours of a day and 12 hours of night.

**Q25.** Explain why is day and night always equal at the equator throughout the year ?

Ans. The rays of the sun fall almost vertically at the equator throughout the year.

**Q26.** What are the seasons in the Northern and the Southern Hemispheres on 23<sup>rd</sup> of September?

**Ans.**

- On 23<sup>rd</sup> September, the sun is vertically overhead at the equator and the days and nights are equal.
- It is autumn in the Northern Hemisphere and spring in the Southern Hemisphere.
- On September 23<sup>rd</sup>, the duration of sunlight is 12 hours on all the places on the earth.

**Q27.** Name two countries where sun is overhead on June 21<sup>st</sup> and two other countries where it is overhead on December 22<sup>nd</sup>.

**Ans.**

- Sun is overhead on 21<sup>st</sup> of June over India and Bangladesh.
- Sun is overhead on 22<sup>nd</sup> of December over Australia and South Africa.

**Q28.** We see the sun, moon and other heavenly bodies rising in the east and setting in the west.

**Ans.**

- We see the sun, moon, stars and other heavenly bodies rising in the east and setting in the west because the earth rotates from west to east constantly.
- The sun, moon and stars appear to move from east to west across the sky.
- It happens due to rotation of the earth from west to east.

**Q29.** Vertical rays are hotter than slanting rays. Give reasons.

**Ans.**

- Vertical or direct rays are hotter because they make higher angle in the tropical zone as they pass through less atmosphere and they are concentrated over a smaller area. So their heating power is greater than that of the slanting or oblique rays.
- On the other hand, outside the tropics due to curvature of the earth the slanting rays make low angle because they pass through atmosphere and spread over a large area. Much heat is absorbed by clouds, dust particles and water vapour so oblique rays have less heating power.

**Q12.** Poles experience six months of days and nights.

**Ans.**

- The poles experience six months of days and six months of nights due to inclined axis of the earth, each of the poles is presented alternately to the direct rays of the sun.
- When the northern hemisphere is tilted towards the Sun, the North pole has continuous days for six months (summer in the northern hemisphere) and there is continuous night in the South pole, which is turned away from the Sun.
- When the southern hemisphere is tilted towards the sun, there is continuous day for six months in the South pole (summer in the southern hemisphere) and there is continuous night in the North pole.

**Q13.** Every forth year has an extra day. Give reasons.

**Ans.**

- The earth completes its one revolution around the sun in approximately 365 days and 6 hours. For our convenience, we consider the year as consisting of only 365 days and ignore the 6 hours.
- To accommodate the additional 6 hours or  $\frac{1}{4}$  th of a day each year, every fourth year (divisible by the number 4) is taken as a leap year.
- In a leap year, there are 365 days instead of 365 days. An extra day is added in the month of February having 29 days. For example, 2000, 2004, 2008 and 2012 are leap years.

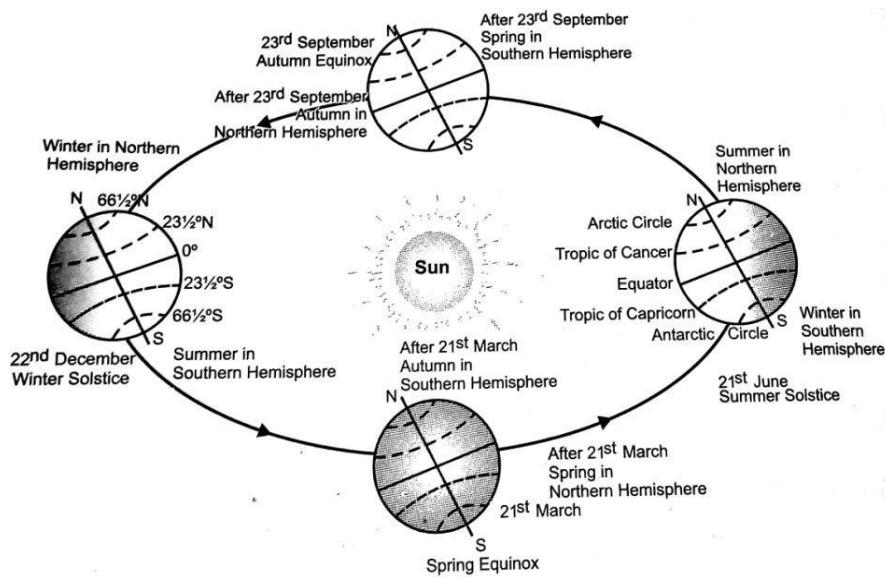
**Q14.** Chennai experiences the mid-day sun twice a year while New Delhi never experiences it.

Why?

**Ans.**

- Chennai lies in the Torrid Zone where vertical rays of the sun are faced twice a year. Once when the apparent movement of the sun is northward (from 22<sup>nd</sup> of December to 21<sup>st</sup> of June) and once when the apparent movement is southward (from 21<sup>st</sup> June to 22<sup>nd</sup> December).
- The vertical rays are never experienced beyond the tropics due to inclined axis of the Sun.
- New Delhi is in the temperate zone or beyond the tropic of cancer, so it never faces midday sun making 90° angle.

**Q15.** Study the following diagram and answer the questions given below :



- What is the direction of the earth's revolution along its orbit?  
(Clockwise/anticlockwise)
- Mention the dates when the days and nights are equal throughout the globe.
- Which hemisphere is inclined towards the sun on 21<sup>st</sup> of June? What season is experienced over there in June month?

**Ans.**

- Anticlockwise
- 21<sup>st</sup> March spring equinox 23<sup>rd</sup> September Autumn equinox
- Northern hemisphere. Summer season is experienced over there in June month.

**Define following –**

1. Earth's axis –

It is an imaginary line passing through the earth from the North Pole to the South Pole on which the earth spins or rotates.

Axis of the earth makes an angle of  $66\frac{1}{2}^{\circ}$  to the orbital plane.

2. Plane elliptic – The elliptical plane along which the earth revolves around the sun is called as the elliptical plane.

3. Perihelion

The earth is said to be in perihelion on January 3<sup>rd</sup> because the mean distance between the earth and the sun is least which is approximately 147 million km..

4. Aphelion

On July 4<sup>th</sup>, the earth is at farthest point from the sun and is said to be in aphelion because the distance between the earth and the sun is about 152km.

5. Ferrell's law

Ans – All the moving bodies on the earth's surface i.e. the ocean currents and winds are deflected towards the right in the Northern atmosphere and left in the southern atmosphere due to the coriolis effect which is caused by the rotation of the earth. This is called as the Ferrell's law.

6. Rotation –

The movement of the earth around its own axis from west to east in 24 hours, which causes day and night is termed as rotation. The earth takes 23 hours 56 minutes and 4 seconds to complete one rotation.

### **Distinguish between the following pairs-**

1. Solstice and Equinox

#### **Solstice**

It is of two types – Summer and Winter solstice

It occurs on 21<sup>st</sup> June in N the word palatial in Latin means standing still reaching the highest point

It occurs twice a year on 21 June and 22 December

#### **Equinox**

It is of two types Spring and Autumn

The word equinox has derived from the latin word **Equi** equal and **nox** night

It occurs twice a year on vernal or doing equation on 21<sup>st</sup> march and autumn equation on 23<sup>rd</sup> September

2. Perihelion and Aphelion

#### **Perihelion**

It is the nearest distance in between the earth and the sun

The distance is about 147million km.

It occurs on January 3<sup>rd</sup>

#### **Aphelion**

It is the far that distance in between the earth and the sun

The distance is about 152million km

It occurs on July 4<sup>th</sup>

3. Rotation and Revolution

#### **Rotation**

It is the movement of the earth into own axis

The earth takes 23hrs 56minutes and 04 second to complete one rotation

Rotation of the earth occurs day and night

#### **Revolution**

It is the movement of the earth around the sun along with own orbit.

The earth takes 365days and 6hrs to complete one revolution

Revolution of the earth causes changes in season.

#### **4. CHAPTER – 4 EARTH'S STRUCTURE**

Exercise Question and Answer –

Q1. What do you understand by the lithosphere?

Ans. Lithosphere or the pole sphere is the realm of the earth which contain the entire top curd of the earth including the land mass and the ocean flows. The word lithosphere has been taken from the Greek word "lithos" meaning role the outer layer of the earth's structure is about 6-48 m thick and consist of two layer – sial and sima.

Q2. Name of the two layers of the lithosphere

Ans – Sail and Sima are the two layer of the lithosphere.

Q3. What do you understand by the mantle?

Ans – Mantle is the second layers of the earth and is located in between the crust and the core with it upper boundary marked by the Mohorovicic Discontinuity and its lower boundary is marked by the boundary Guttenberg discontinuity the depth of the mantle layers 35km to 2900km.

Q4. What is the portion of the mantle in the earth?

Ans – Mantle is the second layer of the earth situated in between the crest and the core. The depth of the mantle varies between 35km to 29000km.

Q5. What is core? By what other name is it known?

Ans – Core is the central of the earth. It probably consist of a from Nickel alloy (Nife) with a temperature estimated to be about 2700c.

Barosphere is the other name of core.

Q6. State the compaction of the sial layer.

Ans – Sial consist of the solid or continental part of the earth's crust. They are composed of many kinds of rocks which have the density and composition of granite it is predominant of silica and aluminum in its composition.

Q7. State the properties of the core of the earth.

Ans – Are consist of nickel and iron with a temperature estimated to be about  $2700^{\circ}\text{C}$  But is forced into a solid state by increased pressure.

**Q13.** Name of the most important and abundant elements which are found on the earth's crust.

**Ans –** Silicon and Iron are the most important chemical that are abundantly found on the earth's crust.

**Q14.** What is meant by the Mohorovicic discontinuity ?

**Ans –** The contact zone of the crust and the mantle is called as the Mohorovicic discontinuity.

**Q15.** What if the mantle composed of?

**Ans –** The mantle is composed of magnesium, silicon, iron and substantial quantities of sulphides the lower mantle is composed of nickel and iron.

### **Define the following**

16. Crust: earth's outer shell of crystalline surface rock. Ranging from 5km to 60km in thickness from the oceanic crust to the mountain ranges is as the earth crust.

17. Core: The central part of the earth below the depth of 2900km. Its density ranges from 13 gm/cm<sup>3</sup> to 16 gm/cm<sup>3</sup>

**Q1.** What do you mean by the term “crust of the earth”?

**Ans.**

- The outermost rocky layer of the earth is called the crust or lithosphere.
- The word “Lithos” means “rocks” or “stones” in Latin.

**Q2.** Name two distinct layers of the crust.

**Ans.**

- The two distinct layers of the crust are Sial and Sima.
- The continents are made up of sial whereas the ocean floor is formed of sima.

**Q3.** Distinguish between the Sial and Sima layers.

**Ans.**

Sial	Sima
<ol style="list-style-type: none"><li>1. It is uppermost layer of the crust consisting of silicate and aluminium</li><li>2. The continents are formed of Sial as they are made up of lighter materials.</li><li>3. The average thickness of Sial is 25km from the surface.</li><li>4. The average density of Sial is 2.7 gm/cc.</li></ol>	<ol style="list-style-type: none"><li>1. It is the lower layer of the crust consisting of silicate and magnesium.</li><li>2. The ocean floor is formed of Sima as it is composed of slightly heavier rock materials.</li><li>3. The average thickness of Sima is 35 km.</li><li>4. The average density of Sima is 3.0 to 3.4 gm/cc.</li></ol>

**Q4.** Differentiate between the upper mantle and the lower mantle.

**Ans.**

Upper Mantle	Lower Mantle
<ol style="list-style-type: none"><li>1. The upper mantle is also known as the Asthenosphere.</li><li>2. It is in a semi-liquid state or in a partially molten state. This layer is supposed to be the source of volcanic material.</li><li>3. The temperature ranges from 500 to 900°C.</li></ol>	<ol style="list-style-type: none"><li>1. The lower mantle is also known as the Mesosphere.</li><li>2. The lower mantle behaves like solid due to extreme pressure exerted by the overlying layers.</li><li>3. The temperature ranges from 1600 to 4000°C.</li></ol>

**Q5.** Inspite of high temperatures in the interior of the earth, the inner core acts as a solid layer. Why?

**Ans.**

- The inner core behaves like a solid layer due to extreme pressure exerted by overlying layers on it.
- As a result, the rocks are highly compressed to they behave like solid.

**Q6.** In which part of the earth is Nife found?

**Ans.** The core is composed of dense materials mainly nickel and iron or ferrum.

So it is also known as Nife (Ni = Nickel and Fe= Ferrum). So Nife is found in the core or the central part of the earth.

**Q7.** Write one difference between Moho discontinuity and Gutenberg discontinuity.

**Ans.**

- Moho discontinuity is the distinct seismic discontinuity which lies between the silica crust and the ultramafic mantle.
- Gutenberg discontinuity is the distinct seismic discontinuity that lies between the earth's silicate mantle and its liquid iron, nickel outer core.

**Q8.** Mention any three characteristics of Sial.

**Ans.**

- The uppermost layer of the crust is called Sial consisting of silicate and aluminium (SI = Silicate, AL = Aluminium).
- The continents are composed mainly of lighter rock materials formed from silicon and aluminium. So the Sial is thick over the continents and very thin or absent on the ocean floor especially the Pacific Ocean.
- The average density of Sial is 2.7 gm/cc (gram per cubic centimeter).

**Q9.** Why is the composition of the crustal layer of the earth of great interest?

**Ans.**

- The composition of the crustal layer of the earth of the earth is of great interest because we get most of our minerals from the crust of the earth.
- It also has the valuable soil layer which is essential for the growth of both the cultivated and wild plants.

**Q10.** Mention any three characteristics of the core.

**Ans.**

- The central layer of the earth is known as the core.
- The core of the earth has a radius of about 3,500 km.
- The core is composed of dense materials mainly nickel and iron or ferrum. So it is also known as Nife (Ni = Nickel and Fe= Ferrum).

## **Give reason for the following :**

**Q11.** The continents are placed above the ocean floor.

**Ans.** The continents are made up of lighter Sial and ocean floor is made up of heavier Sima. According to the law of gravitation, the lighter material would be placed above. Thus continents are placed above the ocean floor.

## **Extra questions :**

### **1. Define the crust**

Ans. : It is the outermost layer of the earth that is also known as the Lithosphere. The word “Lithos” means “rocks” or “stones” in Latin.

- The crust is a very thin layer having an average thickness of about 60 km that forms less than 1% of the earth.
- The crust is sub-divided into two parts according to its composition.

### **Sial**

- The uppermost layer of the crust is called Sial consisting of silicate and aluminium.

(SI= silicate , AL= aluminium)

- On an average , its thickness is upto 25 km from the surface
- The continents comprise mainly of lighter rock materials formed from silicon and aluminium. So the Sial is thick over the continents and very thin or absent on the ocean floor especially in the Pacific Ocean.

The averagedensity of Sial 2.7 gm/cc (gram per cubic centimetre).

### **The concentric layers of the Earth at a glance**

Composition	Thickness	Density
Sial-Silicon, Aluminium	25 km	2.7 gm/cc
Sima-Silicon, Magnesium	35 km	3.0-3.4 gm/cc
Mantle-Magnesium, Iron Silicate	2,800 km	3.0 gm/cc-
5.5gm/cc		
Core-Nickel, Iron	3,500 km	13gm/cc-15
gm/cc		

### **Sima**

- The layer below the Sial is known as Sima consisting of magnesium. (SI = silica, MA = magnesium)

- The average thickness of this layer is about 35 km.
- Sima is the oceanic crust lying mainly under the oceans, composed of slightly denser or heavier rock materials.
- The average density of Sima varies from 3.0 to 3.4 gm/cc.

Sial and Sima together form the lithosphere. The boundary between the crust and the mantle is called the Moho or Mohorovic discontinuity named after the Yugoslav scientist. The Sial being lighter than Sima, is considered floating on the denser Sima forms the basis of Wengner's Continental Drift Theory.

## 2. Define the Mantle

Ans. ● The layer lies between the crust and the core.

The material of the mantle is composed of silicates magnesium and iron.

- The mean density of the mantle is 4.5 gm/cc that varies from 3.0 gm/cc at the top to about 5.5 gm/cc at its base.
- The average thickness of the Mantle is about 2,800 km.
- Mantle is also subdivided into two distinct parts i.e., upper mantle and lower mantle.
- The temperature in the mantle is too high. It is about 850 °C in the upper region and 2208°C in the lower region.
- There is a zone of discontinuity in the density between mantle and the core known as Gutenberg Discontinuity.

## 3. Define the Core

Ans. ● The central layer of the earth is known as the core.

- This dense layer is also known as Barysphere.
- The core of the earth has a radius of about 3,500 km .
- The core is composed of dense materials mainly nickel and iron or ferrum so it is also known as Nife ( Ni = Nickel and Fe= Ferrum).
- The core is subdivided into two parts i.e., the outer core and inner core.
- The core has dense materials like iron and nickel. So the density of core is between 13 g/cc to 15 g/cc .

## 4. What do you mean by "lower velocity zone"?

Ans. ● The upper mantle known as the Asthenosphere is in a semi -liquid state or in a partially molten state.

## 5. In which part of the earth is Nife found?

Ans. : The core is composed of dense materials mainly nickel and iron or ferrum. So it is also known as Nife (Ni= Nickel and Fe = Ferrum)

So Nife is found in the core or the central part of the earth.

**6. Write one difference between Moho discontinuity and Gutenderg discontinuity.**

Ans. Moho discontinuity is the distinct discontinuity which lies between the silica crust and the ultramafic mantle.

Gutenberg discontinuity is the distinct seismic discontinuity that lies between the earth's silicate mantle and its liquid iron, nickle outer core.

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## **CHAPTER – 5** **LANDFOMS OF THE EARTH**

Answer to the following question.

Q1. What are plain?

Ans. – Plains are the extensive flat areas of low attitude they have a local relief of less than 150meters the low level is important characteristics of the plains is that they have a completely level or meanly level surface. Some plains have gently rolling topography and the slope is gradual.

Q2. What is Orogenesis ?

Ans.- The force of mountain building that occurs in a large scale is called orogenesis literally the growth of a mountain is termed as orogenesis.

Q3. Name the different types of mountain. Describe each of them with the help of example.

Ans.- Mountains are often classified according to the mode of their formation which are namely 1. Fold mountain 2. Block mountain, 3. Residual mountain, 4. Volcanic Mountain

Fold mountain – This mountain and chains such as the Himalayas, the alps and the Rockies are known as the New fold mountain.

The pennined alppalachians, cape ranges of south America are the old fold mountains.

Block Mountain – The vosges and the black forest mountain are the examples of the block mountain.

Residual mountains – The highlands of scotland the Central spain, the mecca and the of the western plateau lands of the united states of America are some of the examples of residual mountain.

Volcanic Mountain -

The mountain that are formed by the cooling and solidification of hot molten lava are termed as Volcanic Mountains. Mount visuvious, mount are some of the examples of the volcanic mountains

Q4. What is plateau ?

Ans- A plateau is an elevated tract of a relatively flat land usually limited on at list one side by a steep slow falling abruptly to a lower land.

Q5. Name the various types of plateaus with examples.

- (i) Intermontane plateau – Pt. of Tibet, Pt. of Peru, the Mexican plateau
- (ii) Mountain border plateau – Patagonian plateau in South America.
- (iii) Domed plateau – Mesas in Spain
- (iv) Volcanic plateau – The deccan plateau in India.

Q6. State few advantages of plains.

Ans – The main advantages of plains are follows –

- (i) Construction of settlements, roads, rails, etc. Is easy on a flat and soft surface.
- (ii) Fertile soils of the alluvial plains are of the world. In arid areas irrigation can be provided economically and comfortably.
- (iii) Most of the big cities are situated in the plains, as plains provide them a fertile land and moderate climate movement is easy that encourages agricultural and industrial development. All of the alluvial plain that densely populated areas.

Q7. Explain the type of depositional plain.

Ans – (i) Alluvial plain – These are formed by the gradual accumulation of the silt, brought about by the rivers. As a river leaves the mountains, the water spreads out and the fast speed is arrested. The sluggish water deposits the material.

(ii) Plain formed by the glacier deposit. The plains are very fertile owing to the deposit left by the continental glaciers. When the glacier melt, the debris are deposited. Such plain are extensive in size. Ex- The plain of Central and North Zone America.

(iii) Aeolian Loes Plain – These plains are formed by the material which are carried out and deposited by the winds Eg. Loess deposits of northern China

(iv) Lacustrine Plains—These plains result from the filling of the lake beds, when rivers enter a lake they are muddy, when the river comes into the lake. The water is comparatively without any silt. Eg. Plains of Hungary in Europe, And plains surrounding Great Lakes.

**7.** What force is responsible for the formation of a Young Fold Mountain?

**Ans.** The tectonic forces especially horizontal compression taking place inside the earth's crust are responsible for the formation of these mountains.

**8.** Give three examples of Young Fold Mountain.

**Ans.** The Himalayas, Andes, Alps and Rockies are examples of Young Fold Mountain.

**9.** What are orogenic Periods?

**Ans.** The mountain building periods are known as orogenic periods.

**10.** What is an intermontane plateau? Give two examples of the same.

**Ans.**

- These are the highest and most extensive plateaus in the world.
- Such plateaus are enclosed by Fold Mountains from all sides and have a great variety of topographical features.

**For example :**

(a) The Tibetan plateau which is also known as the “Foot of the World” is the highest plateau, located between Kunlun and the Himalayas.

(b) The Bolivian plateau is surrounded by the Great Andes mountain ranges.

**11.** Give two examples of old fold mountains. Name the old fold mountains.

**Ans.**

- The Appalachians in North America and the Urals in Asia are the examples of old fold mountains.
- The Aravallis in India are also examples of old fold mountains.

**12.** Name two belts of young fold mountains in the world.

**Ans.** The belts of young fold mountains are as follows.

(a) **The Circum Pacific belt** : There are many fold mountains present in this belt along the margin of Pacific Ocean in South America (Andes Mt.) and in North America (Rocky Mt.) as well as in Asia also.

(b) **The Mid World Mountain Belt** : This belt stretches from Europe to Asia along the Alpine – Himalayan belt where young fold mountains like Elburz, Zagros, Hindukush, the Great Himalayas etc. are located.

**Give reasons for the following :**

**13.** The Delta plains are considered as the most fertile lands of the world.

**Ans.**

- These plains are formed at the mouth of a river by the fertile material deposited by the running water. The river flows very slowly due to excess of load being carried by it.
- The large amount of silt which is rich in minerals is deposited every year during floods and the soil gets replaenished. Delta plains support agriculture, as they are very fertile. For example; The Ganga-Brahmaputra delta in Bangladesh, Hwang-Ho plain in China, Nile delta of Egypt etc.

**14.** Piedmont alluvial plains are found along the foothills of mountains. Give reasons.

**Ans.**

- As the river leaves mountains and enters the plain region, the slope of the land changes from steep to gentle. So it is difficult for the river to carry its eroded material (pebbles, boulders etc.) with it.
- The river starts depositing its load at the foothill areas of the mountains and forms piedmont Alluvial Fans or plains. In India, it is known as “Bhabar”, which is found along the foothill regions of the Himalayas.

**15.** Discuss some characteristics of young fold mountains.

**Ans.** The characteristics of young fold mountains are as follows;

- They have been formed relatively in Alpine mountain building period.
- They have steep slopes and deep valleys.
- They have sharp pointed snow covered peaks.
- They have complex folding and faulting of rock layers.
- Volcanic activities are common in these mountains.

- They are much higher than the old fold mountains.
- They have extremely rough topography.
- They have parallel ranges called cordillera.
- These mountains are still growing in height.

**Distinguish between the following :**

16. Young fold mountains and Old fold mountains.

**Ans.**

Young fold mountains	Old fold mountains
<p>1. They have been formed relatively recently in Alpine mountain building period.</p> <p>2. They have steep slopes and deep valleys. They have extremely rough topography with sharp pointed snow covered peaks.</p> <p>3. They have complex folding and faulting of rock layers. They are much higher than the old fold mountains. These mountains are still growing in height. The Himalayas, Andes, Alps and Rockies are the examples of young fold mountains.</p>	<p>1. They have been formed long ago in Caledonian and Hercynian mountain building periods.</p> <p>2. They have gentler slopes. They have rounded tops and sculptured domes.</p> <p>3. They are highly eroded by the agents of gradation. They are lower than the young fold mountains. The Appalachians, the Urals and the Aravallis in India are examples of old fold mountains.</p>

**17. Intermontane plateau and Piedmont plateau.**

**Ans.**

Intermontane plateau	Piedmont plateau
<ol style="list-style-type: none"><li>1. Plateaus surrounded by hills and mountains on all sides.</li><li>2. Such plateaus are enclosed by fold mountains on all sides and are highest and most extensive plateaus in the world.</li><li>3. Tibetan plateau is the highest plateau in the world located between Kunlun and The Great Himalayas. It is an example of such plateau.</li></ol>	<ol style="list-style-type: none"><li>1. A plateau formed at the foothill or any mountain is called a piedmont plateau.</li><li>2. Such plateaus are bounded by mountains on one side and by plains or by an ocean on the other side.</li><li>3. The Patagonia plateau of Argentina is an example of such plateau.</li></ol>

**18. Residual mountains and volcanic mountains.**

**Ans.**

Residual mountains	volcanic mountains
<ol style="list-style-type: none"><li>1. Residual mountains are formed by the hard rocks which could not be eroded by the agents of gradation such as winds, rivers and glaciers.</li><li>2. Residual mountains are relatively higher than the surroundings</li></ol>	<ol style="list-style-type: none"><li>1. Volcanic mountains are formed by the accumulation of molten lava, cinders dust. Ashes around the vent after the eruption of a volcano.</li><li>2. Volcanic mountains are tall, gentle and conical shape with</li></ol>

<p>generally with rounded tops.</p> <p>3. Some examples are: Mesas and Buttes of western plateau land of U.S.A. and Hills of Parasnath and Rajmahal in India.</p>	<p>pointed tops.</p> <p>3. Some examples are : Mt. Cotopaxi of Ecuador and Mt.Fujiyama of Japan.</p>
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**19.** Anticlines and synclines.

**Ans.**

<b>Anticlines</b>	<b>Synclines</b>
<p>1. The up folds formed by horizontal compression created by tectonic forces is known as anticlines.</p> <p>2. These up folds form fold mountains.</p> <p>3. Pressure from beneath the earth forces the earth surface upward to form an up fold.</p>	<p>1. The down folds formed by horizontal compression created by tectonic forces is known as synclines.</p> <p>2. These down folds form valleys.</p> <p>3. Activity within sedimentary layer allow the surface to sink to form a down fold.</p>

**20.** How are Aeolian Loess plains formed?

**Ans.**

- The Aeolian Loess Plain is formed by the material transported and laid down on the surface of the earth by winds.
- Such plains are generally found at the outskirts of deserts.
- These are made up of fine dust particles of dust.
- These Loess plains are very fertile. They are extensively found in the north western parts of China.

**21.** Give some significance of plateaus.

**Ans.**

- Most of the plateaus of the world have arid or dry climate. So they support fewer inhabitants than the plains.

- Grazing and forestry are the main occupations.
- Deccan plateau in India is rich in minerals so it supports mineral based industries.
- Some large cities like Mexico city, Quito and Bogota, located over 2,000m above the sea level are situated on higher plateaus. Here, slightly higher rainfall can support more people.

## **CHAPTER – 6** **ROCKS AND ROCK CYCLE**

Define the following –

Q1. Mineral – The substance can have definite chemical composition with its own chemical and physical properties are called minerals. They are generally found in crystalline form.

Q2. Rocks - A mixture of chemicals bound together (like granite) or may be a mass of mineral like rock salt.

Q3. Sills – They are a sheet like body of igneous rocks. It forms when magma forces its way between two layers of sedimentary rocks and there cools and solidifies. Sills are formed highly fluid basaltic magma which can be injected between the older rocks without deforming them in horizontal sheets.

Q4. Dyke – It is sheet like a body of intrusive igneous rocks in vertical sheets.

Q5. Conglomerate – It consists of rounded or sub-rounded fragments of water, pebbles, gravel, cemented together by a matrix of calcium carbonate, silica etc.

**Distinguish the following –**

Q1. Rocks and Minerals :

### **Rocks**

It can be defined as an aggregate of substance that has definite chemical minerals that forms a more or less composition with own chemical and definite unit of the earth's crust

### **Minerals**

physical properties.

Q2. Volcanic Rocks and Plutonic Rocks

### **Volcanic Rocks**

The small scale igneous intrusions which are formed due to the cooling and solidification of the hot magma during volcanic activity in the cracks, beneath the earth's surface are called volcanic rocks. Eg.- Sill, Dyke.

### **Plutonic Rocks**

The rocks that have a coarse grain size that results from their having been formed at depth where cooling have occurred slowly. Eg.- Granite

### Q3. Acidic Igneous Rocks and Basic Igneous Rocks

#### **Igneous Rocks**

They have more content of silica.

Eg.- Granite

#### **Basic Igneous Rocks**

They have less content of silica.

Eg. - Gabbro

### Q4. Thermal Metamorphism and Dynamic Metamorphism

#### **Thermal Metamorphism**

When the changes take place due to high temperature, the new rocks formed due to thermal metamorphism. Eg.- Graphite

#### **Dynamic Metamorphism**

When the changes takes place due to high pressure, it is called dynamic metamorphism.

#### **Give Reasons :-**

Q1. Igneous rocks are also called primary rocks –

Ans- Igneous rocks are also called primary rocks because they solidify from rock in hot molten state, known as the magma of interior rocks and first to be formed.

Q2. Extrusive igneous rocks generally have small crystals-

Ans- This is because they come in contact with the atmosphere to become small crystals as the rate of cooling is faster.

Q3. Rocks are of great economic significance –

Ans- This is because they have been a major controlling factor in the development of the industry and society.

### **EXTRA QUESTIONS**

**Q1.** What do you mean by ores? Give an example.

**Ans.** Some rocks contain metal compounds in large quantities that can be obtained economically. These rocks are called ores. For example, iron ore.

**Q2.** On what basis the rocks are classified? Name three types of rocks.

**Ans.** The rocks are classified on the basis of their mode of formation. They are as follows :

- (a) Igneous rocks
- (b) Sedimentary rocks
- (c) Metamorphic rocks

**Q3.** What do you mean by the word ‘Igneous’?

**Ans.**

- They are of thermal origin. In fact, the word, Igneous is derived from a Latin word “ignis” means fire, In Sanskrit, it is Agni. These rocks were formed by solidification of hot fluid rock materials (magma).

**Q4.** What processes are involved in the formation of igneous rocks?

**Ans.**

- Igneous rocks are formed due to cooling, solidification and crystallization of molten materials of the earth known as magma. It is found at great depths in the interior of the earth.

**Q5.** Why are igneous rocks crystalline in nature?

**Ans.**

- Igneous rocks are formed by the deposition, solidification and crystallization of molten magma either on the surface or below its interior. Crystallization takes place during the cooling process.
- It means that these rocks are composed of close fitting mineral crystals that have formed in the rock substance.

**Q6.** Which rocks are associated with fossil fuels?

**Ans.** Sedimentary magma flows below the surface between layers of rocks horizontally. It then hardens there. This layer of intrusive igneous rock is known as sill.

**Q7.** Which agents are responsible for deposition of sediments?

**Ans.**

- The agents of gradation like rivers, winds, glaciers and sea waves or ocean waves are responsible for deposition of sediments.
- They are also known as transportation agents.

**Q8.** Name the most abundant minerals of the earth’s crust.

**Ans.**

- The most abundant minerals of the earth’s crust are silicon, aluminium, iron, magnesium, calcium, potassium and sodium.

- The earth's crust contains more of silicon and aluminium whereas the earth as a whole contains more of iron, silica and magnesium.

**Q9.** Name some important landforms made by intrusive igneous rocks and some landforms made by extrusive igneous rocks.

**Ans.**

- The landforms made by intrusive igneous rocks are sill, dyke, batholiths, laccolith etc.
- The landforms made by extrusive igneous rocks are basic lava cone, lava plug, crater etc.

**Give reasons for the following :**

**Q10.** Metamorphic rocks are harder and more resistant than the original rocks.

**Ans.**

- Metamorphism takes place over long periods of time, especially during mountain building process.
- The intense pressure over millions of years alters the texture and nature of original rocks completely which makes the rocks harder and more resistant than the original rocks.

**Q11.** Give three causes of metamorphism.

**Ans.** The three main cause of metamorphism are as follows :

- Metamorphism may be caused as a result of volcanic activity when the original rocks come in contact with hot magma, they are transformed.
- Metamorphism is also caused due to movements in the earth's crust or sometimes even under ordinary conditions, when a rock lies deep within the crust, where they are altered due to the influence of high temperature.
- Metamorphism takes place over long periods of time, especially during mountain building process when intense pressure over millions of years alters the texture and nature of original rocks completely. It makes the rocks harder and more resistant than the original rocks.

**Q12.** Classify the following rocks according to their type :

Basalt, Gypsum, Rock salt, Quartzite, Limestone, Granite, Graphite, Slate, Coal and Marble.

Ans.	Basalt – Igneous rock salt – Sedimentary rock Limestone – Sedimentary rock Metamorphic rock Sedimentary rock	Gypsum – Sedimentary rock Rock Quartzite – Metamorphic rock Granite – Igneous rock Graphite – Slate – Metamorphic rock Coal – Marble – Metamorphic rock
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**Q13.** Thermal and Dynamic metamorphism.

**Ans.**

Thermal metamorphism	Dynamic metamorphism
<ol style="list-style-type: none"> <li>1. The original rocks are transformed or altered due to the influence of high temperature.</li> <li>2. This happens when the original rocks come in contact with hot magma or heat generated by friction between moving layers of different rocks.</li> </ol>	<ol style="list-style-type: none"> <li>1. The original rocks are transformed or altered mainly due to the influence of extremely high pressure.</li> <li>2. This happens when the rocks reach at a great depth within the earth's crust during earth movements.</li> </ol>

**Q14.** Distinguish between Magma and Lava

**Ans.**

Magma	Lava
<ol style="list-style-type: none"> <li>1. It is the fluid rock material generated within the earth.</li> <li>2. It forms plutonic and intrusive igneous rocks after cooling and crystallization.</li> <li>3. It is highly heated molten rock material.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is the fluid rock material poured out on the surface of the earth by volcanic vent or fissure.</li> <li>2. If forms extrusive igneous rocks after cooling and solidification.</li> <li>3. It becomes cool as soon as it reaches on the surface due to the contact with atmosphere.</li> </ol>

**Q15.** Distinguish between Acid igneous rocks and Basic igneous rocks.

**Ans.**

Acid igneous rocks	Basic igneous rocks
<p>1. They are formed by the magma having higher content of silica and lower content of metallic minerals like iron and magnesium.</p> <p>2. They are light weight rocks.</p> <p>3. They are formed by highly viscous magma.</p>	<p>1. They are formed by the magma having lower content of silica and a large content of metallic minerals or high percentage of oxides of denser elements.</p> <p>2. They are dense and heavy rocks.</p> <p>3. They are formed by less viscous magma which is highly fluid.</p>

## **CHAPTER – 7**

### **VOLCANOES**

Answer the following –

Q1. Earthquakes are closely associated with Volcanic belts. Give reason.

Ans.- This is because the lighter lava could tent to rise above the solid rocks which create a lateral pressure on the surface and the crust is shaken.

Q2. Lava activity is profitable to man. Give reason.

Ans.- This is because volcanic activity are very useful from medical point of view and they are good for cultivation. Various mineral resources are also found.

Q3. Volcanic activity and earthquake occur in the same belt. Give reason.

Ans- They are associated with the meeting zone of continents and the oceans which are the weaker zone.

Q4. What are volcanoes?

Ans.- A volcano is a vent in the crust of the earth connect by a conduit to an underlying magma chamber from molten lava, volcanoes, gases and steam are included.

Q5. What is volcanicity?

Ans- It is the process which involves intrusion of magma in the earth's crust. On extrusion of such molten material into the earth's surface. This process gives rise to volcanic eruption.

Q6. What is crater ?

Ans- It is an abrupt circular depression formed by an extrusive volcanic material, by collapse or by impact of meteorite.

Q7. What is the circum-pacific belt?

Ans- Chain of andesite volcanoes making up mountain belts and iron arcs surrounding the pacific ocean belt.

Q8. Define Lava ?

Ans- Lava can be defined as the magma that reaches the earth surface .

**Q2.** Mention any two factors on which the nature of volcanic eruption depends.

**Ans.** The nature of volcanic eruption is determined by the following factors.

- (a) The composition of magma
- (b) The temperature of magma
- (c) The quantity of dissolved gases present in magma.

The temperature and composition of magma influence its viscosity. The viscosity determines whether the volcanic eruption will be violent or quiet.

**Q3.** What is geothermal energy?

**Ans.**

- It is the energy from steam or hot water produced from hot or molten underground rocks.
- Hot springs or geysers are common in a volcanic region which are used to harness geothermal energy.

**Q4.** Why are dormant volcanoes considered the most dangerous volcanoes?

**Ans.** Dormant volcanoes are most dangerous volcanoes because people are caught unaware as they do not get chance to escape.

**Q5.** How is a crater formed? What is a crater lake? Give an example.

**Ans.**

- When a volcano erupts explosively, a part of summit gets blown up and a depression is formed which is usually funnel-shaped. It is known as a crater.
- Sometimes rainwater gets accumulated in such depressions forming lakes.
- For example-Lake Nukuru in Kenya is a crater lake. The sulphur of this lake attracts flamingoes for making their nests.

**Q6.** How is a composite cone formed?

**Ans.**

- Composite cones grow very high by the accumulation of alternate layers of lava and ash. They start growing as cinder cones but later on they develop into composite cones due to and explosive eruption, which forms a layer of ash followed by eruption of lava.
- Lava solidifies on the layer of ash forming a thick sheet. Sometimes a branch pipe grows from the main vent forming parasite cones on the slopes of the volcano.

**Q7.** Name the two major volcanic belts where largest numbers of volcanoes are located.

**Ans.** The major volcanic belts of the world are as follows :

- (a) The Circum Pacific Belt or “Ring of Fire”.
- (b) The Mid World Mountain Belt.

**Q8.** Name at least two famous volcanoes located in each of the belts named by you.

**Ans.** The volcanoes found in these belts are :

- (a) In the Circum Pacific Belt or “Ring of Fire”- Chimborazo and Cotopaxi in Andes Mountain.
- (b) In the Mid World Mountain Belt - Mt.Vesuvius and Mt.Stramboli.

**Give reasons for the following :**

**Q9.** Some volcanoes erupt violently.

**Ans.**

- Some volcanoes erupt violently with a great force. The sudden escape of gases and steam lowers the melting point below the crust, which melts the semi-solid magma.
- Magma along with other rock materials, gases and steam gets enough force to eject which results in loud explosions.

**Q10.** Volcanoes are common in the belt of young fold mountains.

**Ans.**

- Volcanic eruptions take place in the weaker or unstable area of the crust because magma finds its easy way to reach the surface.
- The Mid World Mountain Belt coincides with the young fold mountain belt of Alpine Himalayan mountain system because the crust beneath the young fold mountains is highly restless and unstable. These mountains are still rising in height due to horizontal compression between the crustal plates resulting into volcanic eruptions.

**Q11.** Mention the products of volcanic eruption.

**Ans.** The materials erupted by volcanoes are in liquid, solid and gaseous state.

- **Liquid material :** The molten rock material found below the earth's crust, which contains gases and water vapour, is known as magma. When magma reaches the earth's surface, most of the gases escape and it is called lava.
- **Solid material :** The rock fragments, dust particles and ash thrown out in large quantities by the volcano.
- **Gases :** Steam (the most abundant), sulphur dioxide, hydrogen, hydrogen sulphide. Carbon dioxide and other gases.

**Q12.** Geysers and Hot Springs.

**Ans.**

Geysers	Hot Springs
<ol style="list-style-type: none"><li>1. Geysers are the fountains of hot water and superheated steam which gush through a narrow opening with explosion.</li><li>2. Geysers do not flow continuously.</li><li>3. These are found in volcanic regions only.</li></ol>	<ol style="list-style-type: none"><li>1. These are the springs of hot water found in the area where rain water sinks through the cracks and gets an opening due to hydraulic pressure to come out on the surface.</li><li>2. The hot springs flow continuously.</li><li>3. These are found in the volcanic regions as well as in the areas where there are no volcanoes.</li></ol>

**Q13.** Crater and Caldera.

**Ans.**

Crater	Caldera
<ol style="list-style-type: none"><li>1. It is a funnel-shaped depression formed at the summit of a volcano.</li><li>2. It is formed due to repeated volcanic activities.</li><li>3. In case of a crater, only top of a volcano is removed.</li></ol>	<ol style="list-style-type: none"><li>1. It is the enlarged form of crater.</li><li>2. It is formed by the collapse of the summit or sometimes due to violent explosion when the summit blows off.</li><li>3. Caldera is formed when entire central portion of the volcano is destroyed.</li></ol>

**Q14.** What are hot springs? Why do they have great medicinal value? Give some examples.

**Ans.**

- Hot springs is a natural flowing of the hot water from underground. It is a spring that brings hot water to the surface. Hot Springs are also known as thermal springs, which are more widespread than geysers.
- The hot underground water makes an opening due to hydraulic pressure and gushes out as a spring at the junction of permeable and impermeable rocks. Hot water from the spring emerges slowly without any noise or explosion.
- Hot springs contain many minerals, as hot water is a better solvent. Many health centres are associated with such springs as the hot spring water has a great medicinal value.

**Q15.** Explain the causes of volcanism.

**Ans.** Cause of volcanism :

1. Heat and pressure of interior of the earth
  - The temperature and pressure of earth's interior keeps on increasing from the surface towards the centre due to the presence of radioactive minerals in the crust and mantel.
  - Since rocks are bad conductor of heat so the interior of the earth becomes too

hot as the heat could not escape on its own. The rocks start melting due to extreme heat and build up great pressure.

The pressure forces heat to find out a way to escape through cracks along the line of weakness.

## 2. Plate Tectonics

- The “Plate Tectonics theory” explains that the earth is composed of a series of separate moving plates which move or slide over each other.
- The plate margins are weaker so a great deal of displacement of rocks takes place along the margin of plates.
- So the plate margins are associated with earthquakes and volcanic activities.

## 3. Magma chamber

- All major volcanoes are connected with huge magma chambers by a vent.
- The magma chambers have extremely high temperature. They melt weak rocks. So fresh magma continues to mix with it.
- Magma has different gases, water vapour and silicates that force it to move vertically as line of weakness is found.

# CHAPTER – 8

## EARTHQUAKE

### **Answer the following –**

## Q1. What is an earthquake ?

Ans. – An earthquake can be defined as the series of shocks due to a sudden movement in the crystal rocks, generated from a point known as seismic focus between the crust and mantle.

**Q2. State the causes of Earthquake.**

Ans. – Earthquake are caused due to the following reasons :-

## Volcanic eruption

## Plate tectonic

## Folding

### Anthropogenic factors Q3.

Define (i) fissure (ii) epicenter

Ans. – (i) Fissure is an open fracture in the rock (ii) epicenter is the point on earth's surface directly above the focus of an earthquake.

Q4. What is mean by Richter scale?

Ans. – It is an open ended logarithmic scale that estimates the magnitude of earthquake.

Designed by Charles Richter in 1936.

Q5. What is Sial ?

Ans- Sial is the general term for silica rich rocks that form the continental landmass.

**Q6.** What do you mean by the intensity of an earthquake?

**Ans.** The destructive power of an earthquake is known as its intensity.

**Q7.** Mention two important scales to measure the intensity of an earthquake.

**Ans.** The intensity of an earthquake is measured by two important scales.

**Q8.** What are the factors on which the intensity of an earthquake depends?

**Ans.** The intensity of an earthquake depends on these factors :

- (a) Total energy released during earthquake.
- (b) The distance of any particular place from the epicenter.

**Give reasons for the following :**

**Q9.** Earthquakes are common in the belts of young fold mountains.

**Ans.**

- Young fold mountains are still rising due to crustal disturbances beneath them.
- Folding and faulting caused by compression and tension are main cause of earthquake in mid-world mountain belt where there is Alpine-Himalayan belt of young fold mountains.

**Q10.** What is a “Tsunami” ? How is it produced due to an earthquake?

**Ans.**

- Tsunami is a Japanese word, which means destructive harbor waves.
- Tsu means harbor and name means waves.
- Tsunami is a series of waves created when a column of water is displaced.
- These huge waves are generated due to the deformation of sea floor by seismic activities and by volcanic activities.

**Q11.** Give an example of a recent “Tsunami” caused by an earthquake.

**Ans.**

- The last Tsunami occurred on December 26, 2004 after an earthquake in Indonesia which resulted in 2,72,000 deaths in 12 countries including 10,000 deaths in India alone.
- These waves may be 50 ft. high and capable of destroying entire coastal settlements.

**Q12.** Mention some factors responsible for Tsunami.

**Ans.**

- These are many factors responsible for Tsunami.
- For example, earthquakes, mass movements above or below water body, volcanic eruptions and other underwater explosions, landslides, large meteoroids or asteroid impacts and testing with nuclear weapons at sea.

**Q13.** Seismic focus and Epicentre.

**Ans.**

Seismic focus	Epicentre
<p>1. The point below the earth's surface from where earthquake originates is known as seismic focus.</p> <p>2. It lies in the interior of the earth, usually has a depth of less than 60 km below the surface of the earth.</p>	<p>1. The point on the earth's vertically above the seismic focus or the origin point of an earthquake is called the epicenter.</p> <p>2. It is the most affected area in the surface of the earth.</p>

**Q14.** The odd behaviours of different animals help in predicting an earthquake.

How?

**Ans.**

- The odd behaviours of animals often precede an earthquake. Burrowing animals, underground creatures like snakes come out of hibernation.
- Aquatic creatures like ducks refuse to enter water.
- Fish jumped out of the water.

**Q11.** Which regions of the world are associated with frequent earthquakes?

**Ans.** Earthquakes are mainly associated with the unstable portion of the earth's crust. They also coincide with the belts of volcanoes.

**Q12.** Explain the role of plate Tectonics in the occurrence of earthquakes.

**Ans.**

- The plate tectonic theory describes that the crust of the earth is composed of a series of separate moving plates, which move or slide over each other.
- The radioactive elements present in the earth's crust and upper mantle give energy for the convectional currents.
- These currents slowly push the over lying plates here and there and a great deal of displacements of rocks takes place along the margins of the plates.
- The boundaries of these moving plates are associated with earthquakes, volcanic activities, crustal faulting, subduction of the crust etc.

## **2<sup>ND</sup> TERM**

# **Weathering**

## **Chapter - 9**

### **Extra questions :**

#### **1. Name three major type of weathering.**

Ans. : There are three major types of Weathering :

1. Mechanical or Physical weathering
2. Chemical weathring.
3. Biological weathering.

#### **2. Name the main agents of weathering.**

Ans. • The atmospheric agents like temperature, moisture and frost, temperature changes, humidity, precipitation are the main agents of weathering.  
• Plants, animals and humans are also involved in the process of breaking up of rocks.

#### **3. Name the chief agents of soil erosion.**

Ans. The chief agents of soil erosion are as follows :

- |     |          |     |           |
|-----|----------|-----|-----------|
| (a) | Winds    | (b) | Rivers    |
| (c) | Glaciers | (d) | Sea waves |

#### **6. What is the role of pressure in physical weathering ?**

Ans. : Igneous and metamorphic rocks get crystallized due to combined action of temperature and pressure deep inside the earth. At the time of erosion of such rocks, that pressure is released which leads to cracks in the rocks.

#### **9. What is meant by exfoliation ?**

Ans. • Some rocks are poor conductors of heat. When the rock consists of homogeneous minerals, the outer layer expands during daytime and contracts at night more than the inner ones.  
• The outer layer thus peeled off from the parent rock in the form of concentric shells like peeling off layers of an onion. This type of weathering is known as exfoliation.

#### **10. Mechanical weathering is more effective in desert regions.**

Ans. : Mechanical weathering especially due to winds is more effective in desert regions because arid and semi-arid regions have dry surface where winds can easily pick the finer particles of soil.

## **11. Chemical weathering is more effective in humid regions.**

Ans. : Chemical weathering or decomposion and disintegration of rock due to chemical reaction occurs in the presence of water. So it is more effective in humid regions.

## **12. Granular disintegration is common in hot deserts.**

Ans. : Hot deserts have a great range of temperature between day and night. Coarse mineral grains form some rocks.

- If the rocks are coarse grained and have different colours, the different parts of the same rock absorb different amount of insolation. Consequently there is difference in expansion and contraction which leads to stress within the rock. When such rock disintegrate grain by grain, they found gravel or coarse and.

## **13. Describe the process of oxidation.**

Ans • Certain minerals present in the rocks absorb atmosphere oxygen along with moistors. So new chemical compounds are formed which can be eroded easily and the rocks become weak.

- Many rocks have some amount of mineral iron, which absorbs atmospheric oxygen from the air.
- Iron changes into oxide, which is porous in nature. So it gets easily turned into brown or red powdery mass.
- The agents of gradation erode the upper layer of the rock having iron oxide. The upper layer of the rock cannot protect the lower layers, which results in further disintegration.
- Sometimes, rainwater having dissolved oxygen also works on the minerals present in the rocks.

## **15. How does carbonation lend to weathering of rocks ?**

Ans. • This process takes place when some minerals present in the rocks absorb carbon dioxide from the atmosphere.

- Sometimes carbon dioxide present in the atmosphere dissolve in rainwater and forms a weak carbonic acid that can easily dissolve limestone and chalk.
- When carbon dioxide combines with calcium carbonate, it forms calcium bicarbonate which dissolves in water and can wash away the limestone easily.

## **16. How are human activities responsible in increasing the rate of soil erosion ?**

Ans. • Human activities such as deforestation, cultivation of land, mining etc. also contribute towards the weathering of rocks.

- Blasting in the mountainous areas to construct roads and for mining also disturb the rock strata.
- Wrong farming practices and unplanned mining activities are also responsible for soil erosion.

## 17. Distinguish between the following :

### **Weathering and erosion**

#### Ans.      **Weathering**

1. A process of a complex interaction of physical, chemical and biological processes, which ultimately lead to disintegration of rocks.
2. Main elements of weathering are- temperature changes, humidity, and precipitation present in the atmosphere.
3. It is a static process. No transportation is involved (except by gravity).
4. Weathering is a creative process of formation of soil and new minerals.

#### **Erosion**

1. A process of gradual removal or wearing away of soil layer on the surface of the earth.
2. Main agents of erosion are running water, glaciers, winds and sea waves present on the surface of the earth.
3. Dynamic process in which erosion, transportation and deposition are involved. Transportation forms the basis of erosion.
4. Erosion is a destructive process because it wears away the earth's surface.

## 18. Mechanical weathering and chemical weathering.

#### Ans. : **Mechanical weathering**

1. In this type of weathering there is no change in chemical constituents of rocks.
2. Physical breaking up of rocks takes place due to temperature change, moisture and pressure etc.

#### **Chemical weathering**

1. In this type of weathering, minerals rocks are dissolved or altered in the presence of water.
2. Temperature, moisture etc. cause minerals in the rocks to dissolve or change them into some other minerals.

## 19. Solution and hydration.

#### Ans. :      **Solution**

1. It is the simplest process of chemical weathering. It works when rainwater reaches the ground. It is charged with
2. It dissolves the soluble minerals like

#### **Hydration**

1. Some crystalline minerals such as feldspar and potash absorb water that makes them swell up.
2. These minerals become soft and turn

sodium chloride present in the rocks.

into a powdery mass due to expansion particles that causes stress within the rocks.

3. When the soluble minerals dissolve, the materials that constitute the rocks, form a solution and are washed away by rainwater or by river water resulting in the breakup of the rocks.

3. Due to this process, the rocks become and ultimately lead to crumble.

20. What is meant by denudation?

Ans: Disintegration and decomposition of rocks as well as wearing down of the elevated portion of the land surface is called denudation.

21. What is the dominant activity of a river in the upper part of its course

Ans: Erosion is the dominant activity of the river in the upper part of its course.

22. Name the dominant activity of the river in the middle part of its course.

Ans: Transportation is the dominant activity of the river in the middle part of the river.

23. Name the dominant activity of the river in the lower part of its course.

Ans: Deposition is the dominant activity of the river in the lower part of its course.

24. What is corrosion?

Ans: Chemical erosion by running water is called corrosion.

25. Name three features formed through erosion by river. Ans:

Three features formed by erosion are:

- a. The formation of V-shaped valleys and gorges.
- b. The formation of Canyons.
- c. The formation of waterfalls.

26. In which parts of India can meanders and Ox-bow lakes be seen?

Ans: Meanders and Ox-bow lakes can be seen along most of the rivers in the northern plains of India.

27. How is a delta formed?

Ans: The deposition of sediments over a large area near the mouth of a river, at the sea forms a triangular shaped formation called delta.

28. Name the process by which wind erosion is operative.

Ans: The process by which wind erosion is operative is:

- a. Deflation, (ii) Abrasion, (iii) Attrition.

29. What is the effect of deflation?

Ans: Deflation leads to the formation of large depressions in the deserts.

30. What is mushroom rock?

Ans: A mushroom rock is an isolated upstanding rock, broader at the top and having a rather narrow trunk or neck, indicating undercutting of projected rockmasses.

31. What is Loess?

Ans: Fine dust blown beyond the limits of loess is found in the Hwang-Ho basin in north-west China.

32. All rivers do not form deltas.

Ans : All rivers do not form deltas because it is necessary for the formation of delta that the river should bring a large amount of sediments and only a river actively eroding the upper parts of its course brings enough sediments to form a delta.

33. Deposition is the chief activity of a river in the lower course.

Ans : Deposition is the chief activity of a river in the lower course because its velocity becomes very low due to which it is unable to carry the entire load.

34. Wind is an important agent of erosion in arid and semi-arid regions.

Ans : Wind is an important agent of erosion in arid and semi-arid regions because firstly these regions lack in moisture so the dry soil and dust particles can be easily carried away by the wind. Secondly, these regions do not have a continuous cover of vegetation hindering the flow of the wind.

35. Oxidation and Carbonation

Ans:

Oxidation	Carbonation
1. This process takes place when the oxygen of the atmosphere combines with some other element of rock.	1. This process takes place when the carbon dioxide combines with some other element of rock.
2. Common in rocks containing iron compounds.	2. Limestone is especially susceptible to this process.

36. Gorges and Canyons

Ans:

Gorges	Canyons
1. Gorges are I-shaped.	1. Canyons are narrow and steep-sided but not I-shaped.
2. They have a short length.	2. They have a long length.
These are formed in the areas of resistant rocks where the weathering is less effective on the valley slopes.	3. These are formed in arid regions where the sandy soils are quickly eroded by the river.

37. Delta and Estuary

Ans

Delta	Estuary
The depositional area formed by the river near its mouth is called the delta.	1. An estuary is the tidal mouth of a large river, where the tide meets the stream.
2. Deltas are good for agriculture being very fertile, e.g., Sunderban delta of the Ganga and Brahmaputra.	2. It provides an ideal site for harbours, e.g., Harbour cities such as London, Hamburg.

38. Rapids and Cascades

Ans:

Rapids	Cascades
When a river appears jumping over somewhat raised parts of its bed, the feature formed is called a rapid.	A group of rapids or small waterfalls is called cascades.

39. Deflation and Abrasion

Ans:

Deflation	Abrasion
1. Process of removal of loose and dry material from the surface, by wind is known as deflation.	1. The process of wearing away of exposed rock surface by the impact of sand particles being carried by the wind is abrasion.
2. This process is responsible for the formation of large depressions, known as deflation hollows.	2. This process is responsible for a large variety of landforms.

# **Tides & Ocean Currents**

## **Chapter - 10**

### **1. Name the various forms of the ocean water movements.**

Ans. :There are two types of regular movements in the ocean water.

(a) Horizontal movement(ocean current)

(b) Vertical movement (rising of bottom water as well as sinking of surface water or waves and tides)

### **2. Name the three ways in which movement of ocean water takes place.**

Ans. :The movement of ocean water takes place in three different ways . The are :(a) waves,(b) currents and (c) tides.

### **3. Name the factors responsible for sub surface movement of ocean water.**

Ans. :Variation in density of water from one part to another due to difference in salinity and temperature is the main factor responsible for sub surface movement of ocean water .

### **4. State one difference between waves and tides.**

Ans. :Waves are mainly produced by pushing action of winds on the surface of oceans whereas tides are produced due to gravitational forces of the sun and the moon.

### **5. What are the main causes of occurrence of tides?**

Ans. :There are two main causes of occurrence of tides:

(a) The gravitational pull of the moon and to some extent by the pull of the sun.

(b) The daily motion or rotation of the earth causes the westward progress of tides.

### **6. How do tides modify the coastline?**

Ans. :Tides destroy the coastlines and move the debris to the sea. They help to form creeks and inlets.

### **7. What is meant by the amplitude or range of tide?**

Ans. :The average difference in water level between high and low tides at any place is called the amplitude or the range of tide. The range of tides at any place is subjected to many variable factors.

### **8. What are waves ? What causes waves ?**

Ans. : The up down movement seen on the surface of ocean water are known as waves.

The pushing action of winds blowing over the ocean is the most important cause of the formation of waves.

The particles of water move up and down and pass on their movement of the immediate next particles due to push of the winds. Water rises and falls in the form of waves.

### **9. What are the types of ocean on the basis of temperature?**

Ans. : The ocean currents are divided on the basis of temperature into two main types:

- (a) The warm ocean current : These currents flow from the low latitudes (warmer areas) in the tropical zone towards the high latitudes (colder areas) in the temperate and sub-polar zones. These currents flow away from the equator.
- (b) The cold ocean current : These currents flow from the high latitudes (colder areas) towards the low latitudes (warmer areas). These currents flow from polar regions to the equator.

### **10. The time of high tide changes everyday Why ?**

Ans: Every place should experience high tide after 12 hours. But this never happens because the high tides occur at a regular interval of about 12 hours and 26 minutes.

This happens due to the fact that the moon is revolving around the earth in the same direction as the earth's rotation from west to east.

If the moon had been stationary, each place on the earth's surface would have come under it exactly after 24 hours and would have experienced the next high tide after a lapse of 12 hours and the next after 24 hours, because they occur twice a day.

### **11 Under what situation do tides become stronger?**

Ans: When the sun, the moon and the earth are in a straight line, the attraction of the moon and the sun complement each other and thus the tides are stronger.

### **12. In what way are the tides helpful for fishermen?**

Ans: Tides are helpful for fishermen as they make use of tides for sailing to the sea and returning to the harbour.

### **13. In what way are the tides helpful in navigation?**

Ans: Tides are helpful in navigation because at the time of high tide, the depth of the water near the coastal areas increases and enables big ships to enter the ports.

### **14. What is drift?**

Ans: If the mass of water moving on the surface of an ocean is broad, slow and shallow, it is termed as drift.

### **15. What is the flow of ocean current in terms of salinity of water?**

Ans: Ocean currents on the water surface move from the areas of less salinity to the areas of high salinity.

16. How do planetary winds lead to the formation of Ocean Currents?

Ans: The planetary winds blow continuously in a particular direction and drag the surface water due to the force of friction. This leads to the formation of ocean currents.

17. Why is a Moon responsible for tides to a greater extent than the Sun?

Ans: The Moon, being closer to the Earth, exerts a strong gravitational pull on it so it is responsible for tides to a greater extent than the Sun.

18. What happens when the warm and the cold currents meet?

Ans : When warm and cold currents meet, they cause dense fog which provides ideal temperature conditions for the fish to survive because the chief food of fish (plankton) is found in abundance.

19. Why does the Alaskan Coast remain ice-free in winter ?

Ans: Because of the warm Kuro ShioCurrent.

20. What helps a ship to enter shallow harbours ? Give atleast oneexample.

Ans: Strong tidal currents helps ships to enter shallow harbours e.g.Diamond harbor of Kolkata, India.

21. New Foundland has thick fog all the year round.

Ans : New Foundland has thick fog all the year round because near this region the warm Gulf Stream meets and cold Labrador Current which produces very thick fog over the area.

22. From where do the following currents originate.

a. Gulf Stream

Ans: Gulf Stream originates in the Gulf of Mexico.

b. Labrador Current

Ans: Labrador Current originates from the ArcticOcean.

c. BenguelaCurrent

Ans: Benguela Current originates in the AntarcticOccan.

d. North and South EquatorialCurrent

Ans: North and South Equatorial Current originate in the western coast ofMexico.

23. Spring Tide and Neap Tide

	Spring Tide	NeapTide
Ans:	When the tide is of a higher magnitude than the normal tide, it is called Spring Tide.	1. When the tide is not of a higher magnitude it is called Neap tide.
	happens when the sun, the moon and the earth are in a straight line and due to this, attraction of the moon and sun complement each other and thus the tides are stronger.	2. It happens when the sun, the moon and the earth form three corners of a triangle and the attraction of the sun and the moon neutralise each other. This makes the tides weaker.

24. Warm Currents and Cold Currents

	Warm Currents	Cold Currents
Ans:	Warm currents originate near the Equator and flow towards the poles, e.g., Gulf Stream	Cold currents originate in the high latitudes and flow towards the Equator ,e.g.,Labrador Current.

25. Name the various forms of the ocean water movements.

Ans: There are two types of regular movements in the ocean water:

- a. Horizontal movement (ocean current) and
- b. Vertical movement (rising of bottom water as well as sinking of surface water or waves and tides)

26. Name the factors responsible for sub surface movement of ocean water.

Ans: Variation in density of water from one part to another due to difference in salinity and temperature is the main factor responsible for sub surface movement of ocean water.

27. What are the types of ocean currents on the basis of temperature?

Ans: The ocean currents are divided on the basis of temperature into two main types:

- a. **The warm ocean current :** These currents flow from the low latitudes (warmer areas) in the tropical zone towards the high latitudes (colder areas) in the temperate and sub-polar zones. These currents flow away from the equator.
- b. **The cold ocean current :** These currents flow from the high latitudes (colder areas) towards the low latitudes (warmer areas). These currents flow from polar regions to the equator.

## Composition of the Atmosphere

### Chapter - 11

#### **1. Name five layers of the atmosphere.**

Ans. On the basis of change in temperature with increase in height and structure, the atmosphere can be divided into five concentric layers.

- |                      |                      |                    |
|----------------------|----------------------|--------------------|
| (a) The Troposphere  | (b) The Stratosphere | (e) The Mesosphere |
| (c) The Thermosphere | (d) The Exosphere.   |                    |

#### **2. What do you mean by the term “tropopause” ?**

Ans. • The upper limit of troposphere is called the “tropopause”. At tropopause, the temperature stops decreasing.  
• Here, the temperature may be as low as - 58°C. Tropopause separate troposphere from stratosphere.

#### **3. Name the green house gases.**

Ans. The green house gases are - water vapour, carbon dioxide, chlorofluoro carbons (CFCs) methane, and nitrogen oxide.

**4. State the composition of gases in the atmosphere.**

Ans. :The atmosphere is a mixture of several gases, water vapour and dust particles. Nitrogen and oxygen are the two chief gases. The composition of air varies not only from place to place but also from time to time

The most abundant gas in the atmosphere is nitrogen forming about 78% of the volume of pure dry air.

Oxygen form about 21% of the volume of prudery air.

Other gases found in small quantities include argon (0.93%), carbon dioxide (.03%), neon, ozone, hydrogen, hukium, methane etc.

**5. What do you mean by chemical composition of the atmosphere?**

**Homosphere:**

Ans. :It is the lower portion of the atmosphere extending up to a height of about 80 km from the surface of the Earth . Although, the density of air decreases with height, the proportion of gases present over here is more or less uniform.

The only exceptions are the presence of water vapour and dust particles in the lower layers and ozone exception in the upper portion of homosphere.

Troposphere ,stratosphere and mesosphere are included in it.

**Heterosphere :**

It is the upper portion of the atmosphere extending from 80 km , and according to meteorologists, for all practical purposes, the upper limit is considered till 480 km. Above this height , the atmosphere is rarified.

The gases present over here are not evenly mixed . Thermosphere in which the lower layer is called ionosphere and the Exosphere where lighter gases like hydrogen and helium are present are included in it.

**6. What types of particulate matters or solid particles are present in the atmosphere ? What is their significance?**

Ans. Smoke particles are mostly found in the industrial regions where fossil fuels like coal, petroleum are burnt as the sources of energy.

Dust particles are found in abundance in desert regions.

The dust , smoke, salt grain, pollen grains etc scatter solar radiation causing are red or orange colour in the sky during sun rise and sun set.

They serve as condensation nuclei. The moisture present in the atmosphere gets condensed around them.

Dust particles are so fine that can float in the air and play an important role in weather phenomena . They also absorb terrestrial radiation and keep the lower layers of the atmosphere warm at night.

**7. How is ozone layer formed in the stratosphere?**

Ans. :Ozone is a form oxygen with three atoms instead of the more usual two . It is formed when ultraviolet rays of the Sun split oxygen molecules in the upper part of the stratosphere. Its own existence results from the absorption by oxygen of the short-wave ultraviolet radiation from the Sun, a process leading to the rise in temperature that occurs at the stratopause.

**8. What are the reasons for global warming ?**

Ans. :According to some climatologists, the temperature of the Earth is increasing alarmingly as a result of human activities, reckless cutting of the trees, during the vegetation , excessive use of fossil fuel, air pollution etc. It increases the amount of CO<sub>2</sub> in the atmosphere, which along with other gases enhanced the absorption of radiations from the Earth's surface which result in the warming of lower atmosphere.

**9. The atmospheric layers are denser at lower level and are rarified at higher levels.**

Ans. : The heavier gases like carbon dioxide, oxygen etc. tend to concentrate in the lower layers of the atmosphere due to gravitational pull of the Earth. So 99% of the total mass of the atmosphere is found within 32 km from the surface.

The lighter gases like hydrogen and nitrogen are mostly found in the upper layers of the atmosphere . So the density of air decreases rapidly upwards.

**10. Stratosphere provides ideal conditions for Jet aircrafts to fly.**

Ans. :This layer has no water vapour and dust particles. Generally, it is a tranquil zone in which at lower level, the temperature is relatively constant..

Cloud do not form and large convective currents are absent. It is free from weather phenomena. So it provides ideal flying conditions for Jet aircrafts.

**11. The temperature in this layer decreases with altitude in the troposphere.**

Ans. :The temperature in this layer decreases with increases in height. Roughly, at a rate of 1°C for every 165 metres or approximately 6.4°C per km . This is called the normal lapse rate.

As we go higher , the effect of terrestrial radiation decreases .So the temperature also goes down with increases in height.

**12. Temperature increases with increasing height in stratosphere.**

Ans. :At higher levels in the stratosphere, the temperature increases with height due to the absorption of the ultraviolet radiation of the sun by ozone present in this layer. The temperature slowly increases to  $4^{\circ}\text{C}$ .

**13. How are ions of the ionosphere useful for long distance communication?**

Ans. :These electrically charged gas molecules reflect radio waves back to the earth thereby making radio communication or long distance communication possible.

**14. All weather phenomena takes place in the troposphere.**

Ans. : most of the weather phenomena like formation of clouds, fog, frost, blowing of winds, storm, thunder, lightning and rain that affect our life, take place within troposphere

This layer contains almost all the water vapour and most of the dust particles . Water vapour condenses into clouds and fog. Excessive condensation may result in precipitation. The dust particles serve as condensation nuclei. So horizontal and vertical air circulation leads to air turbulence and makes the troposphere, region of intense mixing.

**15. The temperature of lower layers of the atmosphere is increasing.**

Ans. Carbon dioxide and water vapour act as green house in the sense that these gases allow the visible light of the Sun to reach the surface of the earth and absorb the outgoing terrestrial radiation, mainly infrared rays in the form of long waves.

Thus, the atmosphere near the earth's surface is warmed by long wave radiation. This phenomenon in which the atmosphere near earth's surface is heated up due to trapping of infrared rays by carbon dioxide and water vapour in the atmosphere is called the Green House Effect.

**16. What are ions ? Where and how are they formed ?**

Ans. Ionosphere or Thermosphere lies above the Mesopause. It extends from 80 km to about 480 km.

The temperature increases with increase in height. It reaches up to  $1480^{\circ}\text{C}$ .

This increase in temperature is due to the gas molecules. In this layer it absorbs the X-rays and short wave ultraviolet radiation of the Sun..

**17. What are the causes of destruction of ozone layer in the atmosphere ?**

Ans.1. The Chloro Fluoro Carbons (CFCs) :

Scientists have found that continuous release of synthetic chemicals mainly Chloro Fluoro Carbons into the atmosphere. They are widely used as cooling fluid in the refrigerators, air-conditioning and as cleaning agents, fire extinguishing fluids spray cans, car propellants and in insulating foam. So there is a worldwide demand.

## **20. How CFCs are responsible for ozone depletion ?**

Ans. The Chloro Fluoro Carbons (CFCs) :

Scientists have found that continuous release of synthetic chemicals mainly Chloro Fluoro Carbons into the atmosphere play a major role in the depletion of Ozone layer.

CFCs are man made synthetic industrial chemical compounds containing chlorine, fluorine and carbon atoms. They are widely used as cooling fluid in the refrigerators, air-conditioning and as cleaning agents, fire extinguishing fluids, spray cans, car propellants and in insulating foams. So there is a worldwide demand.

CFC molecules slowly release through leaks in these gadgets during the foam blowing processes and enter into the stratosphere where intense ultraviolet rays split them, freeing chlorine atoms, and these combine with oxygen. It can convert the ozone into ordinary oxygen molecules, reducing the concentration of ozone in the stratosphere.

## **23. Give some consequence of global warming.**

Ans. : Shrinking of ice cover in Arctic, Antarctic, Alaska and Greenland region.

Sea level will rise, sea water will submerge the coastal areas especially islands like Maldives.

The increasing sea temperature has damaged 90% of the coral in Indian Ocean. Coral reefs are sometimes referred to as the rain forests of the sea, serve as breeding grounds of many species of marine life. They also protect coast lines from storms.

Increasing global temperature may adversely affect the evaporation rate of surface water, soil moisture, precipitation etc. This would cause drying of agricultural lands hence reduction in average and total crop production.

There would be serious problems in the ecological balance, which may affect all living beings on the earth.

## **24. Suggest some methods to retard the process of global warming.**

Ans. : Serious steps should be taken to retard the process of global warming .

For example, conservation of forests, planting more and more trees , reduce deforestation , use of alternative energy sources, reduce industrial pollution, reduce release of CO<sub>2</sub>, controlling CFCs release in the atmosphere , reduce the quantity of chemical fertilizers for growing crops.

25. How does the atmosphere govern life on the earth?

- Ans: (a) The atmosphere protects the earth from harmful ultraviolet and infrared rays of the sun.
- (b) The atmosphere has oxygen and nitrogen, the life sustaining gases.
- (c) It helps not only in retaining the necessary warmth on the earth but also in the circulation of water vapour which is the main source of rainfall.

26. What are variable components of the atmosphere?

Ans: There are also variable components like water vapour, dust particles, smoke, salt and pollen grains etc present in the air. The quantity of these components varies from place to place.

27. What is the significance of water vapour? How is water vapour added to the atmosphere?

Ans. • It plays the most significant role in the atmosphere.

- It is the source of condensation, clouds and all forms of precipitation. It is added to the atmosphere by the process of evaporation of water from oceans, seas, lakes, rivers etc and also by transpiration from the leaves of the plants.
  - a. Like carbon dioxide, water vapour is capable of absorbing heat radiated by the Earth and keeps the lower layers of the atmosphere warm at night.

**Give reasons for the following:**

1. Ionosphere protects the earth from meteors and obsolescent satellites.

Ans : The thermosphere or ionosphere protects us from meteors and obsolete satellites. The high temperatures burn up nearly all the debris falling on the Earth.

- The temperature increases with increase in height. It reaches up to 1480°C.
- This increase in temperature is due to the gas molecules. In this layer it absorbs the X-rays and short wave ultraviolet radiation of the Sun.
- As a result, the gas molecules break-up into positively and negatively charged particles. These electrically charged particles are known as ions and this process by which atoms are changed into ions by the addition or removal of electrons making them electrically charged is known as “Ionisation”.

2. What are the harmful effects of ozone depletion?

Ans. • The ultraviolet rays can enter the Earth's lower atmosphere to some extent through this

ozone hole and may lead to disastrous consequences. The excessive radiation of ultraviolet rays of the sun would render man and animals blind, cause skin cancer, reduce immunity, cause crop and flora damage and destroy many aquatic and microscopic forms of life.

- The intensity of sun light varies according to seasons. So the amount of depletion varies with latitudes and seasons.

# **INSOLATION**

## **Chapter - 12**

### **1. What is meant by the term 'insolation'?**

Ans. :The incoming solar energy intercepted by the earth is called Insolation.

### **2. Name the processes of transfer of heat.**

Ans. :The transfer of heat takes place by these processes :

- (a) Radiation      (b) Conduction      (c) Convection      (d) Advection

### **3. The south facing glaciers in the Himalayas melt faster than of north flowing glaciers.**

Ans. :In northern hemisphere , the south facing slopes are warmer than those facing north due to the fact that the sun's rays strike the south facing slopes at steeper angle than they do at the north facing slopes.

Mountains like the Great Himalayas having east west alignment, have their southern slopes more exposed to the sun, which the northern slopes remain sheltered from it. So. The glaciers moving down southwards melt faster than those moving down northwards.

### **4.The vertical rays of the sun give more heat than the slanting rays.**

Ans. : The vertical or direct rays of the sun pass through less atmosphere and they are concentrated over a smaller area . So their heating power is greater than that of the oblique rays.

The oblique or slanting rays of the rays pass through more atmosphere and are spread over a large area. Much heat is absorbed by clouds; dust particles and water vapour. So oblique rays have less heating power.

### **5. Deserts have high diurnal range of temperature whereas the places close to equator have a lower range of temperature.**

Ans : Presence of clouds also affect the temperature of a place in two ways:

- Clouds prevent the incoming solar radiation from reaching the earth's surface.
- Clouds also prevent the terrestrial radiation from escaping out into the space. This is the reason why cloudless regions like deserts have high temperature during day time and at night due to absence of clouds, terrestrial radiation escapes rapidly

reducing the temperature leading to high diurnal range of temperature over there.

- In contrast to deserts, the equatorial regions, having extensive cloud cover, experience low diurnal range of temperature.

6. The cold currents have tropical deserts developed in their adjoining coastal areas.

Ans : On the other hand, winds that blow over a cold current cannot pickup water vapour and remain dry. This is the reason why Kalahari and Atacama deserts are developed on the western coasts where cold ocean currents called Benguela and Peruvian Currents flow respectively.

## Distinguish between the following :

5. Insolation and terrestrial radiation.

Ans:

Insolation	Terrestrial radiation
1. The incoming solar radiation reaching the surface of the earth is known as incoming solar radiation.	1. The sun's energy absorbed by the earth's surface and radiated by the earth.
2. It is the major source of energy on the surface of the earth.	2. The atmosphere mainly gets heated by the terrestrial radiation from below upwards.
3. It is received in the form of short waves.	3. The terrestrial radiation takes place in the form of long waves.

6. Weather and climate.

Ans:

Weather	Climate
refers to the day to day condition of the atmosphere, especially in the layer near the ground.	1. It refers to the average weather conditions.
Weather refers to a particular observation station or any specific region.	2. Climate refers to more or less stable climatic pattern of a large region.
Weather may change over a short period of time, like a day, a week, a month.	3. Climate refers to the average of the data calculated over a long period. Normally over 35 years of climatic data are considered.
Temperature, rainfall, pressure, winds, humidity, sunshine, cloudiness etc. are the elements of weather.	4. The averages of elements of weather, variations and extremes are recorded, processed with systematic observation.

7. Maritime climate and continental climate.

Ans:

Maritime Climate	Continental Climate
This type of climate is experienced in those areas of the country which are located in the coastal region.	1. This type of climate is experienced in those countries which are located in the interior part of the continent.
Here, the daily and annual range of temperature is low.	2. Here, the daily and annual range of temperature is high.
The temperature is almost same even in winters and in summers due to the effect of seabreeze and landbreeze.	3. Here, cold winters and hot summers are experienced because there is no effect of these sea.

**8.** Why are vertical rays of the sun more effective in heating of the atmosphere than the slanting rays?

Ans : This is because the mid day sun is almost overhead within the tropics throughout the year. The vertical or direct rays of the sun pass through less atmosphere and they are concentrated over a smaller area. So their heating power is greater than that of the oblique rays.

**9.** Why is a seasonal variation in temperature experienced at a place?

Ans : • The temperature of the atmosphere also varies from season to season. The angle of incidence of the sun's rays and the duration of sunlight are the main causes for seasonal variation.

- In northern hemisphere, during summer season, the sun's rays strike the surface of the earth at higher angle and duration of sun light is more. So summers are hotter.
- During winter the sun's rays make lower angle of incidence and the duration of sunlight is shorter. So winters are colder.

**10.** What is the effect of ocean currents on the rainfall received in the coastal areas ? Explain with examples.

Ans : • The effect of ocean current is more marked when the winds blow from sea to land. The onshore winds blowing over a warm ocean current pickup moisture and bring much rain to adjoining coastal areas. For example, prevailing westerlies blow. This sea to land, bring heavy rainfall on the west European coast throughout the year.

- On the other hand, winds that blow over a cold current cannot pickup water vapour and remain dry. This is the reason why Kalahari and Atacama deserts are developed on the western coasts where cold ocean currents called Benguela and Peruvian Currents flow respectively.

**11.** How do winds affect the temperature of any place?

Ans : • Winds also modify the temperature of the region over which they blow. The cold winds blowing from higher to lower latitudes (like polar winds) reduce the temperature of the region where they blow. The northern parts of China receive cold winds from central Asia and temperatures are very low over there especially in winters.

- Winds blowing from the lower latitudes are warmer than those blowing from higher latitudes.
- The onshore winds (blowing from the sea) reduce the summer temperature and raise the winter temperature in the coastal areas.

**12.** What is the effect of clouds and natural vegetation on distribution of insolation at any place ?

Ans :**Clouds**

Presence of clouds also affect the temperature of a place in two ways :

- Clouds prevent the incoming solar radiation from reaching the earth's surface.

- Clouds also prevent the terrestrial radiation from escaping out into the space. This is the reason why cloudless regions like deserts have high temperature during day time and at night, due to absence of clouds, terrestrial radiation escapes rapidly reducing the temperature leading to high diurnal range of temperature over there. In contrast to deserts, the equatorial regions, having extensive cloud cover, experience low diurnal range of temperature.

### **Natural Vegetation**

- Natural vegetation also modifies the temperature of any region.
- Thick vegetation cover does not allow much of insolation to reach the surface. So there is less range of temperature variation in the region covered with forest than an open ground or a desert.
- This is the reason why temperature in the regions covered with dense forests are lower than the open area in the same latitude.
- Trees also give away water vapour by the process of transpiration during the day which helps in lowering the temperature of air above the forest region.

## **Pressure Belts and Winds**

### **Chapter - 13**

#### **1. What is meant by the term atmospheric pressure'?**

Ans. The pressure exerted by the weight of vertical column of air per unit of area is called atmospheric pressure.

#### **2. Name the instrument used to measure atmospheric pressure?**

Ans. Atmospheric pressure is measured with the help of an instrument called barometer.

#### **3. Name the planetary winds.**

Ans. The planetary winds are as follows :

- (a) Trade winds
- (b) Westerlies or anti-trade winds
- (c) Polar winds

#### **4. Why is “Chinook Wind” known as “snow eater”?**

Ans. It is a warm dry wind that descends the eastern slopes of Rocky Mountain of North America.

It is also known as “snow eater” as it brings about sudden rise in temperature in a short period of time. This sudden increase in temperature helps in melting snow in Prairies.

**5. What are isobars? What do they indicate?**

Ans. Isobar is an imaginary line drawn on a map or a weather chart, joining places having equal atmospheric pressure, supposing these places to be at the sea level. When the isobars are far apart there is little variation of atmospheric pressure and when the isobars are close to one another, there is a great difference of atmospheric pressure over smaller area. It indicates stormy weather. Thus the spacing of isobars indicates the pressure gradient.

**6. Mention the factors which affect the atmospheric pressure of a place?**

Ans. The atmospheric pressure depends on these factors

- (a) Temperature
- (b) Altitude
- (c) Rotation of the earth
- (d) Water vapour

**7. Name the world's pressure belts.**

Ans. The major pressure belts of the world are as follows :

- (a) Equatorial Low Pressure Belt or Doldrums ( $15^{\circ}\text{N}$  to  $5^{\circ}\text{S}$ )
- (b) Sub Tropical High Pressure Belt ( $30^{\circ}\text{N}$  to  $35^{\circ}\text{N}$  and  $30^{\circ}\text{S}$  to  $35^{\circ}\text{S}$ )
- (c) Sub Polar Low Pressure Belt ( $60^{\circ}\text{N}$  to  $65^{\circ}\text{N}$  and  $60^{\circ}\text{S}$  to  $65^{\circ}\text{S}$ )
- (d) Polar High Pressure Belt ( $80^{\circ}\text{N}$  to  $90^{\circ}\text{N}$  and  $80^{\circ}\text{S}$  to  $90^{\circ}\text{S}$ )

**8. What is meant by Coriolis effect? Why is it caused?**

Ans. In 1935, Gustav Gaspard de Coriolis explained that winds do not move in a straight path but they deflect because of the spinning of the earth on its axis that causes air to measure to be deflected. This curving motion is called the Coriolis Effect.

It is caused due to rotation of the earth.

**9. What is Ferrel's Law?**

Ans. The direction of this turning effect is stated as Fertel's law. The deflection was explained by an American scientist W. Ferrel in 1856.

Ferrel's law states that any object or fluid moving horizontally in the northern hemisphere tends to be deflected to the right of its path of motion. In the southern hemisphere, the moving object tends to be deflected to the left of its path of motion.

**10. What are Doldrums? Why are they called so?**

Ans. The equatorial low pressure belt experiences calm conditions with very little wind. Hence, it is known as the Doldrums meaning "dull".

Sailors avoid the Doldrums because of lack of regular winds in the region.

**11. What are horse latitudes? Why are they called so?**

Ans. The Sub Tropical High Pressure Belt is also known as the horse latitude because years ago, the horse merchants used to carry horses along with passengers and other cargo in the ships across the Atlantic Ocean. As soon as ships used to reach the Sub tropical high pressure belt, it was difficult for the captains to proceed further due to calm conditions prevailing over there and the weight of the cargo. They considered throwing the horses into the sea as a solution to reduce the load and proceed. They were unaware of the fact that the excess load was felt due to the descending air exerting pressure over this belt.

**12. What is the direction of trade winds in both the hemispheres?**

Ans. In the northern hemisphere, the trade winds blow from north east to south west. Thus, it is known as North East trade winds.

In the southern hemisphere, they blow from south east to north west. Thus, it is known as South East trade winds.

**13. What do you mean by the terms "Roaring Forties", "Furious Fifties"?**

Ans. The westerlies are more constant and stronger throughout the year in the south hemisphere due to the absence of large landmasses and dominance of oceans over there. They blow with great force so they are known as "Roaring Forties" (near  $40^{\circ}$ S latitude). "Furious Fifties" (near  $50^{\circ}$ S latitude).

**14. State the main features of trade winds.**

Ans. The trade winds blow from the sub tropical high pressure belts to the equatorial low pressure belt between  $30^{\circ}$ N and  $30^{\circ}$ S latitudes.

**15. State the main features of westerlies.**

Ans. The westerlies blow from the sub-tropical high pressure belt (horse latitude) to the sub polar low pressure belt in the temperate latitudes between  $30^{\circ}$  and  $60^{\circ}$ N and  $30^{\circ}$ and  $60^{\circ}$ S of the equator.

**16. What are the consequences of shifting of pressure belts?**

Ans. As the pressure belts and wind belts shift with seasons, consequently the belts the receive rainfall by the prevailing winds also change.

The Mediterranean region which lies between  $30^{\circ}$  and  $40^{\circ}$ N and S has trade winds blowing during their summer season. These winds blow offshore and are dry.

**17. What are local winds? What are the main causes for the development of local winds? Give two examples each of hot and cold local winds.**

Ans. The winds which are caused due to the variation in local heating and cooling of smaller areas are called the local winds. Such winds are of local significance only so they are called local winds.

**18. Mention the factors which affect the atmospheric pressure of a place ? Ans:**

The atmospheric pressure depends on these factors:

- |                           |                  |
|---------------------------|------------------|
| (a) Temperature           | (b) Altitude     |
| (c) Rotation of the earth | (d) Water vapour |

**19. How is the name “Trade Winds” derived?**

Ans : • They derive their name from a nautical expression “to blow tread” meaning to blow steadily in the same direction and in constant or regular path.

- a. Their name has been derived from the Latin word which means to blow in a constant direction.
- b. In ancient days, the ships used to cross the Atlantic Ocean from west European shore to the West Indies with the help of pushing action of trade winds.

**20. What are the causes of shifting of pressure belts?**

Ans : • The earth is inclined on its axis at an angle of  $23.5^{\circ}$  and it revolves on its orbit around the sun in about 365 days. Thus, the revolution of the earth on an inclined axis causes changes in relative position of the earth and the sun or an apparent migration of the sun.

- a. The main cause of the pressure belts is the varying amount of heat received from the sun. So the pressure belts follow the apparent, annual migration of the sun to the north and south of the equator.

**21. What are monsoon winds ? How are they caused?**

Ans : • The word “Monsoon” is derived from the word “Mausim” meaning season. The monsoon is a typical example of a periodic wind. It is also similar to land-sea breeze on a large scale.

- a. Monsoon winds are best developed over the Indian subcontinent. They develop due to unequal heating of land and sea. They blow from sea to land for six months and from land to sea for six months.

22. South West Monsoon and North East Monsoon winds.

Ans:

South West Monsoon winds	North East Monsoonwinds
These winds blow from south west to north eastdirection.	1. These winds blow from north east to south westdirection.
These winds blow in summerfrom sea tolard.	2. These winds blow in winter from land tosea.
These are moisture laden winds which bring heavy rain from the sea to Indian subcontinent and adjoiningcountries.	3. These winds are dry and bring rain only in Coromandel coast after crossing Bay ofBengal.
These winds are associated with hot and humidclimate.	4. These winds are associated with cold and dryclimate.

23. Sea breeze and Land breeze.

Ans:

SeaBreeze	Land Breeze
Land gets heated more quickly than the sea during day time. So the warm airabove the landrises forminga lowpressure.	1. Land is a good radiator of heat. So, after sunset the land radiates its heat rapidly and high pressure is formed on land at night.
The adjoining sea is comparatively cooler. The cool air above the sea is heavy. So it forms high pressure on thesea.	2. The sea is comparatively warmer, and an area of low pressure is formed on the sea duringnight.
The pressure gradient forces the wind to blow from high to low pressure or from sea to land forming sea breeze.	3. This pressure differencecauses movement of wind from high to low pressure or from land to sea as land breeze.
Sea breeze brings cooling effect to the coastal areas during theday.	4. Nights are not very cold in the coastal areas.

24. Cyclone and Anticyclone.

Ans:

Cyclones	Anticyclones
Cyclone is a small system of low atmospheric pressure in the centre to which winds blow from the surrounding high pressure areas.	1. An anticyclone is a system of high atmospheric pressure in the centre from which the winds blow outwards in all directions.
Cyclones blow in an anti-clockwise direction in the northern hemisphere and in a clockwise direction in the southern hemisphere, according to Ferrel's law.	2. They blow in clockwise direction in the northern hemisphere and in anticlockwise direction in the southern hemisphere, according to Ferrel's law.
Cyclones cause dull weather, overcast skies and very heavy rainfall accompanied by thunder and lightning.	3. They do not bring rain because they are formed by sinking air which gets heated. Anticyclones are associated with clear skies, fair and stable weather.

Give Reasons

25. There is a low pressure belt in the equator whereas high pressure belts in the polar region.

Ans: • The Equatorial region receives vertical rays of the sun almost throughout the year.

Hence, the air is very hot due to rapid terrestrial radiation.

- a. The hot air expands and becomes less dense. So the light air rises creating low pressure in this region.
- b. The strong centrifugal force and the high water vapour content due to excessive evaporation are also responsible for the formation of low pressure.
- c. The polar region has extremely cold temperature throughout the year. So this region develops a belt of dense, heavy sinking air causing high pressure belt.
- d. Due to the rotation of the earth, a strong centripetal force is caused which also contributes to the high pressure over the polar region.

26. Temperature and pressure are inversely related to each other.

Ans : • There is an inverse or opposite relationship between surface pressure and temperature. When the temperature is high, air expands and becomes less dense and lighter. So, warm air exerts less pressure.

- a. On the other hand, when the temperature falls, the cold air which is denser exerts more pressure. This is the reason for having a low pressure belt in the equatorial region and high pressure belts in the polar regions.

27. The Mediterranean regions receive rainfall only in winter.

Ans : • The Mediterranean regions come under the influence of wet westerlies in winter season due to shifting of world pressure belts.

- a. The westerlies are on shore winds which bring moisture from the seas. So these regions get rain in winters only.

# **Humidity**

## **Chapter - 14**

### **Q.1. When is the air said to be unsaturated?**

Ans. The air is said to be unsaturated when the amount of water vapour in the air is lesser than the amount it can hold.

### **Q.2. How is absolute humidity expressed? Give an example.**

Ans. Absolute humidity is expressed in grams of vapour per cubic metre of air. Example. If the Absolute humidity is 20 gm/cu.m. it means that in a sample of one cubic metre of air, the amount of water vapour present is 20gm.

### **Q.3. It is necessary for two factors to be present for convectional rain to be caused. What are they? Also explain how they are responsible this type of rain?**

Ans. The two factors that cause convectional rain are :

- (a) Intense heating of the land surface.
- (b) Presence of moisture in the air.

The intense heating of the land causes the air above it to get heated . It therefore expands, rises to higher altitudes and cools. The temperature falls below dewpoint, resulting in the formation of clouds and then rain.

### **Q.4. What is Evaporation ? Name the factors that affect evaporation.**

Ans. Evaporation is the process by which a liquid is transformed into gas or vapour. The atmosphere receive its supply of moisture form the Earth's surface through evaporation from oceans, lakes, seas etc. Evaporation is a cooling process.

- (a) The amount of water available
- (b) Temperature - higher temperature causes more evaporation
- (c) Relative Humidity
- (d) Area of evaporating surface
- (e) Air pressure.

### **Q.5. State the principal factors affecting the distribution of rainfall. Which are the wettest regions of the world ?**

Ans. Many factors control the distribution of precipitation in the world namely latitude, temperature, moisture, atmospheric disturbances, differential heating of land and water etc.

However the principal factors controlling the distribution of precipitation on the earth are :

- (a) Latitude (b) Continents and Oceans (c) Mountain Barriers

**Q.6. Mention the conditions required for the formation of dew.**

Ans. The prerequisite conditions for dew formation include.

- (a) Calm air or low wind speed (<1 knot at 2 metres )
- (b) High relative humidity near the surface.
- (c) Suitable radiating surface.
- (d) Cold and long nights.

This clear skies, clam weather, associated with anticyclones help in the formation of dew.

**Q.8. What is smog ?**

Ans. Smog is fog mixed with dust particles and smoke. It is most frequent in the industrial cities and in regions where the population is dense . During a smog visibility becomes poor and it also affects one's health.

**Q.10. Name an area where convectional rain is experienced in summer Give a reason for your answer.**

Ans. Due to intense heating of the land in summers , convection rainfall is caused in tropical grasslands and in the interior of continents in the middle latitudes.

**Q.11. What is meat by precipitation ?**

Ans. Falling of water from the atmosphere in any form is termed as precipitation.

**Q.12. What are the different forms of precipitation.**

Ans. The different forms of precipitation are :

- (a) Rainfall (b) Snowfall
- (c) Sleet (d) Hail

**Q.15. What is Convection?**

Ans. When the air over a particular area on the earth surface becomes warmer than the air around it, the warmer parcel of air starts rising upwards. This vertical movement of air is called convection.

**Q.16. Which type of rainfall is called Relief Rainfall?**

Ans. Orographic rainfall is also called Relief Rainfall.

**Q.17. What do you mean by the rain shadow area?**

Ans. When the ascending air reaches the mountain summit and descends on the leeward side, it is warmed by compression during its descent, and thus become drier and drier. The part of land, over which this dry wind blows, is known as the Rain shadow area. The area faces the Leeward slope.

**Q.18. Which instrument is used to measure the rainfall?**

Ans. The rain gauge is used to measure the amount of rainfall.

**Q.19. Name the two regions of India where orographic rainfall is experienced.**

Ans. Two regions in India where Orographic rainfall is experienced are the windward slopes of the Western Ghats and the winds slopes of the Khasi Garo hills.

**Q.20. Fogs are experienced off the coast of Newfoundland.**

Ans. Off the coast of Newfoundland, the warm North Atlantic Drift meets the cold Labrador Current from the north. This causes fogs to be formed at lower levels. The temperature of the water at these latitudes very low.

21. What are the three states of water in the atmosphere?

Ans: Water can be found in all three states of matter in the atmosphere:

- Solid: Ice in the frozenstate.
- Liquid: Water in the liquidstate.
- Gas: Water vapour in the gaseousstate.

22. How is water added into the atmosphere ? What are the chief sources of moisture in the air?

Ans : The sun's rays cause oceans, lakes, rivers, etc. to get heated. Water changes into water vapour by evaporation and is added into the atmosphere. This invisible water vapour is an important component of theair.

23. During the rainy season in summer, one feels more uncomfortable. Why?

Ans : When condensation occurs, the latent heat is released back into atmosphere which results increase in temperature. So one feels more uncomfortable during rainy season than when the skies are clear.

24. Name the different forms of condensation.

Ans: The different forms of condensation are as follows:

- Dew, (b) Frost, (c) Fog, (d) Mist, (e) Clouds.

25. Name an area where convectional rainfall occurs throughout the year and an area where it is experienced only in summer. Give reasons for both.

Ans : • Convectional rainfall is common in the equatorial region where the region has uniformly high temperature due to vertical rays of the sun throughout the year. The air gets heated by

conduction due to contact with hot surface.

The tropical grasslands and the interior parts of the continents also receive such type of rainfall in the summer season only due to intense heating of land.

26. What are the different forms of precipitation?

Ans : The different forms of precipitation are as follows :

- (a) Rainfall, (b) Drizzle, (c) Snowfall, (d) Sleet, (e) Hailstone.

27. Dew occurs mostly during the winternights.

Ans : • In winter season the rapid terrestrial radiation from the surface of the earth makes the lowest layer of the atmosphere very cold because it is in contact with the cold surface.

- So at winter nights, the air gets saturated, hence, condensation begins as droplets of water called “dew”.

28. The windward sides of mountains receive more rainfall than the leeward sides.

Ans : • When the moisture laden winds are unable to cross the mountain lying as a barrier in their direction of movement, they are forced to ascend the mountains.

- The sudden ascend causes cooling of air adiabatically leading to condensation and precipitation.
- So, the windward slopes that face a wind blowing steadily from a warm ocean receive heavy rainfall where most of the moisture is dropped.

#### Distinguish between the following :

29. Absolute humidity and relative humidity.

Absolute humidity	Relative humidity
Ans. The actual amount of water vapour present in one unit volume of air is known as absolute humidity.	1. The ratio between the actual amount of water vapour present in the atmosphere at a given temperature and the maximum amount of water vapour that the air can retain at that temperature is known as relative humidity.
It is expressed in gram per cubic meter of air,	2. It is always expressed as a percentage.
It does not take temperature in consideration.	3. It takes temperature into consideration.
It does not help in knowing about the amount of water vapour needed to air to get saturated.	4. It is very useful method of expressing humidity as it helps to know the comparative wetness or how humid the air is.

30. Evaporation and condensation.

Ans.

	Evaporation	Condensation
	Evaporation is the process by which water is converted into water vapour.	1. Condensation is the process by which water vapour gets converted into droplets of water or ice.
	The heat energy is absorbed in this process.	2. The heat energy is released in this process.
	Evaporation takes place throughout 24 hours at all temperatures.	3. Condensation begins only when the air is fully saturated.
	Rate of evaporation increases if the air is hot and dry.	4. It needs very low temperature.

31. Fog and mist.

Ans:

	Fog	Mist
	Thin clouds formed near the surface of the earth are called "fog".	1. When fog is less dense, it is called mist.
	2. It has larger droplets of water.	2. It has smaller droplets of water.
	3. The visibility is less than 1km.	3. The visibility extends up to 2km.
	It is dangerous as it causes problems of visibility.	4. It is beneficial to plants.

32. Convective rainfall and orographic rainfall.

Ans:

	Convective rainfall	Orographic rainfall
	Convective rainfall is related to the convectional currents formed due to hot surface of the earth.	1. Orographic rainfall is related to rising of air current because of the obstruction created by a mountain.
	This type of rainfall is common in the equatorial regions.	2. This type of rainfall is common in the areas where mountains check the rain bearing winds.

33. How is convective rainfall caused? Give two characteristics of the same.

Ans:

- The convective rainfall is caused by the convectional currents.
- The intense heating of air due to the extremely hot surface and abundance of moisture are the favourable factors which cause this type of rainfall.
- This type of rainfall is common in the equatorial region where the region has uniformly high temperature due to vertical rays of the sun throughout the year.

Characteristics of convective rainfall

- The heavy clouds drop very heavy torrential rain, often accompanied by thunder and lightning.

- This type of rainfall occurs mostly between 2 pm and 4pm in equatorial region when condensation occurs resulting into heavy rainfall. The equatorial regions receive annual rainfall more than 200cm.
34. How is orographic rainfall caused ? What are the chief requirements for this type of rainfall?

Ans : • This type of rainfall is caused by the cooling of the moisture-laden air as it rises over a high relief barrier.

- When the moisture laden winds are unable to cross the mountain lying as a barrier in their direction of movement, they are forced to ascend the mountains.
- The sudden ascend causes cooling of air adiabatically leading to condensation and precipitation.
- The windward slopes that face a wind blowing steadily from a warm ocean receive heavy rainfall where most of the moisture is dropped.

### **The chief requirements for orographic rainfall**

- A mountain barrier facing a sea should be high enough to check the onshorewinds.
- Moisture laden winds blowing from a warm sea.

35. How is cyclonic rainfall caused?

Ans. • Precipitation associated with the passage of a tropical or temperate depression in middle and high latitudes is known as cyclonic rainfall.

- The cold polar air mass and the warm westerly air mass blowing from opposite direction converge near the sub-polar low pressure belt.
- When two air masses with different physical properties converge as the warm moist airmass meets and over rides colder heavier air mass, they can't get mixed with each other due to extreme difference in nature (warm and cold). So a front is formed between them.
- Warm air mass being lighter ascends over cold air mass along the front while cold air mass settles down. The moisture carried by the warm air cools which leads to condensation and rainfall.

# **Pollution**

## **Chapter - 15**

### **Q.1. What are biodegradable pollutions?**

Ans. Biodegradable pollutant are materials like sewage, that decompose fast by natural processes. Such pollutants are harmful only when their rate of decomposition is slower than their rate of release.

### **Q.2. Why are non biodegradable pollutants harmful?**

Ans. Non Biodegradable pollutants are more harmful as they do not decompose in the soil or their process of decomposition is very slow. Plastics, radioactive waste are examples of non biodegradable pollutants.

### **Q.3. How is the air polluted from smelting of metals?**

Ans. Smelting is the process of obtaining metals from ores. For this chemicals are used, which release many gases into the atmosphere. Coal which is used for melting the ore also releases a large amount of carbondioxide and sulphur dioxide. This pollutes the atmosphere.

### **Q.4. What are the major causes of water pollution?**

Ans. The water bodies like rivers, lakes, seas etc. are polluted mainly by various activities of man. Rapid Industrialization generate waste products which are disposed into water bodies. The Paper, chemical, textile, leather and other industries are mainly responsible.

Domestic waste contains detergents and bacteria which is released into water bodies destroying aquatic life.

### **Q.5. Name the major gas pollutants.**

Ans. The major gas pollutants include carbon dioxide, hydrogen sulphide, sulphur dioxide, nitrogen oxides etc.

### **Q.6. Give example of man made sources causing pollution on the earth.**

Ans. To a great extent, man is responsible for increasing the pollution of earth. The various manmade sources include vehicles which are increasing. Vehicular pollution consists of carbon monoxide which is dangerous for one's health Burning of garbage, brick kilns, industrial pollution use of air conditioners, heating elements, radioactive emissions etc. all help in increasing pollution on earth.

**Q.7. Give 2 examples of the following pollutants.**

**(a) Primary air pollutants.**

**(b) Secondary pollutants.**

**(c) Gas pollutants.**

Ans (a) Smoke, dust

(b) Smog, ozone

(c) Carbon dioxide, Hydrogen sulphide.

**Q.8. Name some natural pollutants.**

Ans. Some major natural pollutants are emissions from volcanic eruptions, forest fires, pollen scattering and fine sand blown the earth surface.

**Q.9. Name three major anthropogenic sources of pollutants.**

Ans. Three major anthropogenic sources of pollutants are:

factories

thermal power stations

burning of fossil fuels in automobiles

**Q.10. Name the primary polluting gases.**

Ans. Carbon monoxide, sulphur dioxide, carbon dioxide.

**Q.11. How is smog formed?**

Ans. Smog is formed by chemical reactors between pollutants from automobile exhausts and industrial emissions.

**Q.12. Mention the sources of carbon dioxide emissions.**

Ans. (i) Burning of fossil fuels

(ii) Vehicular emissions

**Q.13. What does the term 'Environmental Pollution' Pollution refer to?**

Ans. Environmental pollution refers to any unfavourable alteration of our surroundings, wholly or largely as a by product of man's actions.

**Q.14. Define 'Air pollution'.**

Ans. Air pollution is defined as the contamination of air with dust, smoke and harmful gases which cause undesirable effects of humans, animals, plants and their environment.

**Q.15. Define ‘Water Pollution’.**

Ans. Water pollution is defined as alteration of water, making it unsuitable for designated use in its natural state.

16. Name the major gas pollutants.

Ans : The major gas pollutants include carbon dioxide, hydrogen sulphide, sulphur dioxide, nitrogen oxides etc.

17. Give examples of man made sources causing pollution on the earth.

Ans : To a great extent, man is responsible for increasing the pollution on earth. The various manmade sources include vehicles which are increasing. Vehicular pollution consists of carbon monoxide which is dangerous for one's health. Burning of garbage, brick kilns, industrial pollution use of air conditioners, heating elements, radioactive emissions etc. all help in increasing pollution on earth.

18. Name any four diseases caused due to pollution of water.

Ans : Pollution of water can cause many water bornediseases.

- A. Hepatitis is caused by a virus.
- B. Diarrhoea is an acute disorder of the intestines.
- C. Cholera is also caused due to infected water.
- D. Typhoid is caused by contaminated water.

19. For what were the following places important?

- A. Minamata
- B. Bhopal
- C. Chernobyl

Minamata is a village in Japan, where more than 50 people died due to mercury poisoning.

- D. Bhopal: The gas tragedy on 3rd Dec. 1984 was caused due to the leakage of 40 tonnes of methyl isocyanate into the atmosphere from the Union Carbide Factory.
- E. Chernobyl: This disaster occurred on April 26, 1986 at the nuclear plant in Ukraine.

20. Give 2 examples of the following pollutants.

- (a) Primary air pollutants.
- (b) Secondary pollutants.
- (c) Gas pollutants.

Ans: (a) Smoke, dust

- (b) Smog, ozone
- (c) Carbon dioxide, Hydrogen sulphide.

21. Name some natural pollutants.

Ans: Some major natural pollutants are emissions from volcanic eruptions, forest fires, pollen scattering and fine sand blown from the earth surface.

22. Name some of the metals which are injurious to health.

Ans: Lead, Cadmium and Mercury.

23. List the sources of water pollution.

Ans. The main sources of water pollution are:

- (a) Natural sources like gases, soil, minerals, waste created by animals and other living organisms present in the water.
- (b) Man-made sources such as
  - (i) domestic effluents
  - (ii) sewage
  - (iii) industrial effluents
  - (iv) agricultural effluents
  - (v) radioactive wastes
  - (vi) thermal pollution
  - (vii) oil pollution

24. How is lead a source of pollution?

Ans : Lead is used in many industries and may accumulate in the biological system. Lead can enter water from many sources like the mining and smelting of lead bearing ores and metals, lead plumbing, paints and ceramic glazes and the disposal of lead-zinc batteries in the garbage.

25. Which disease is caused by mercury?

Ans : The disease caused by mercury is Minamata disease. Mercury dumped into water is transformed into water soluble methyl mercury by bacterial action which accumulates in fish. This disease occurs with

the consumption of such marine creatures.

**26. What is meant by acid rain ? How is it created?**

Ans : Acid rain means the presence of excessive acids in rain water.

Burning of coal, fuel wood or petroleum produce sulphur and nitrogen. These two react with oxygen and are converted into their respective oxides-SO<sub>2</sub>and NO<sub>2</sub>whicharesolubleinwater. When it rains, these oxides react with large quantities of water vapour of the atmosphere to form acids, like sulphuric acid, sulphurous acid, nitric acid and nitrous acid. These acids when they precipitate together with rain or snow, create acidrain.

**27. Mention two serious accidents which had a very serious effect on the Ozonelayer.**

Ans : Two serious accidents which had a very serious effect on the Ozone layer depletion are :

- (i) the leakage of a lethal gas from the ‘Union Carbide’ factory atBhopal.
- (ii) the Nuclear disaster atChernobyl.

**28. What is the effect of Global warming on weather and climate?**

Ans : The consequent increase in the global mean temperature is referred to as global warming which affects weather and climate in the following manner :

- (i) Rise in temperature would cause widespread changes in precipitationpatterns.
- (ii) The frequency of extreme events, e.g., droughts, flood etc. is expected to increase substantially.
- (iii) The climate change will increase threats to humanhealth.

**29. How do you reduce pollution by change of raw materials?**

Ans:If some type of raw material is responsible for causing air pollution,another type of raw material can be used to reduce or to eliminate the formation of pollutants. For example LPG or CNG can be used instead of using coal or diesel in order to reduce undesirable fumes and particles. Low sulphur content fuel, which has less harmful emissions can be used instead of using high sulphur fuel.

**30. Name two devices to control airpollution.**

Ans : The two devices used for air pollution control are :

- (i) Scrubber
- (ii) ElectrostaticPrecipitator.

**31. How should the radioactive waste be stored and disposed off?**

Ans : The radioactive wastes should be stored in deep layers of the Lithosphere. High activity solid wastescouldbepackedinshieldedcontainers.Lowlevelliiquidandgaseouswastesareusually diluted or dispersed to maximum allowable limits beforedisposal.

32. Increase in the amount of CO<sub>2</sub> in the atmosphere may lead to global warming.

Ans : If the amount of CO<sub>2</sub> in the atmosphere increases, it retains the heat in the atmosphere and thus raises the temperature of the atmosphere. Such disturbances in the heat balance of the Earth's atmosphere may lead to 'Global warming.'

33. The use of CFCs is the most important cause for the depletion of the Ozone layer.

Ans : The CFC are man-made gases used in refrigerators and air-conditioners. The CFC compounds produce chlorine atoms which are six times more destructive for the ozone layer. The CFC compounds escape and finally break down in the atmosphere.

34. Eutrophication

Ans : Eutrophication is the process of depletion of oxygen from waterbodies occurring either naturally or due to human activities,

35. Bio-magnification

Ans : The term Biomagnification means increasing the concentration of various toxic substances along the food chain.

36. Qualitative pollutants and Quantitative pollutants

Ans:

Qualitative Pollutants	Quantitative pollutants
These pollutants do not exist in the environment but are introduced into the environment.	(i) These pollutants exist in nature but when their concentration or quantity increases upto a critical level they (then) act as pollutants.
Examples – Pesticides (DDT), chemical fertilizers, herbicides, etc.	(ii) Examples – carbon dioxide, nitrogen oxide etc.

37. Renewable resources and non-renewable resources

Ans:

Renewable Resources	Non-Renewable Resources
Renewable resources are those which can be generated continuously in nature and are inexhaustible	(i) Non Renewable resources are those which cannot be quickly replenished when exhausted.
Example : Solar energy, wind energy, tidal energy	(ii) Example : coal, petroleum, natural gas.

38. (a) What is carpooling ?  
(b) How does it help in reducing pollution in cities ?  
(c) In what other ways can congestion and pollution be reduced on the roads ?
- Ans. (a) Carpooling is sharing the car by more than one person, who are generally travelling towards the same destination.  
(b) Carpooling is a more environment friendly and sustainable way to travel by sharing journeys. Thus, the carbon emissions are reduced. It also helps in the lessening of traffic, congestions and solves parking problems as well.  
(c) Promotion of public transport – trams, trains, buses etc.

39. What are the benefits of keeping a ‘No smoking zone’?
- Ans : It is very important to keep a ‘NO Smoking Zone’. First of all, to a certain extent the smokers will be disciplined as they will be restricted to smoke only in a specified area. In this way the health of the non smokers will be safeguarded, as unnecessary inhaling of impure air brings about diseases like asthma, breathing problems, etc.
- In the ‘No Smoking Zone’, the polluted air can be treated immediately so that the effect of the smoke can be reduced instantly.

# **Natural Regions of the World**

## **Chapter - 16**

### **Q.1. What is natural region?**

Ans. A natural region is identified on the basis of uniformity of climatic conditions, soils, natural vegetation, and animal life.

### **Q.2. What is the aim of dividing the world into natural regions?**

Ans. The aim of dividing the world into natural regions is to study the variations in natural environment and its impact on human life, in different parts of the world.

### **Q.3. what forms the basis of a general scheme of natural regions of the world?**

Ans. The latitudinal location and extent of an area forms the basis of a general scheme of natural regions.

### **Q.4. Name four major temperate regions.**

Ans. Four temperate (thermal) regions are :

- (a) Tropical regions
- (b) Warm temperate regions
- (c) Cool temperate regions
- (d) Polar regions

### **Q.5. Where does the polar region lie?**

Ans. The polar region lies beyond  $65^{\circ}$  latitude (i.e. beyond Arctic and the Antarctic Circles) and the Pole in each hemisphere.

### **Q.6. What is the main characteristic feature of the Tropical Monsoon climate?**

Ans. The main characteristic feature of the Monsoon climate is the seasonal reversal of the winds. In summer, the winds blow from sea to land while in winter the winds blow from land to sea.

### **Q.7. Account for the importance of the Monsoons in India?**

Ans. The Monsoons are very important in India as

- (a) Agriculture is the most important occupation, so the farmers are dependent on the rains.
- (b) Water is required in the rivers for the dams.
- (c) Economy depends on the rains for agricultural production. Failure of rains means failure of crops.

**Q.8. Name any four trees found in the deciduous forests of India. Mention one characteristic of these trees.**

Ans. The trees found in the deciduous forests of India are teak, shisham, neem, sandalwood. These trees have broad leaves and thick barks so that they can conserve moisture. These trees shed their leaves in autumn.

**Q.9. Write about the Taiga and Tundra Regions under the heading (i) location and (ii) vegetation.**

Ans. (a) Taiga

Location  $55^{\circ}$  N to  $70^{\circ}$  N

Vegetation : Coniferous trees

e.g. Pine, fir, cedar, spruce

(b) Tundra

Above  $65^{\circ}$  N

Treeless region : sub-soil

Frozen : Grasses and Flowering plants in places.

**Q.10. State the location of the Equatorial Region.**

Ans. Equatorial Region extends between  $10^{\circ}$ N and  $10^{\circ}$ S latitudes astride the Equator.

**Q.11. Which parts of Asia and S. America are included in the Equatorial Forest region.**

Ans. The equatorial region in Asia includes :

- (a) Indonesia
- (b) Malaysia
- (c) Irian Jaya
- (d) Papua New Guinea and
- (e) The southern islands of Philippines

The equatorial region in South America includes :

- (a) The Amazon basin
- (b) The coastal lowlands between the Guyana and Brazilian highlands
- (c) The coastal part of Colombia.

**Q.12. Which type of rainfall is more common in Equatorial Regions?**

Ans. Convectional rainfall is more common in Equatorial Regions.

**Q.13. What are the chief features of the climate of Equatorial Regions?**

Ans. Chief features of climate of this region are :

- (a) It receives a large amount of insolation.
- (b) Relative humidity remains high throughout the year.
- (c) Almost equal days and nights throughout the year.
- (d) Little seasonal variation in the climatic conditions because of vertical sunrays all the year round.
- (e) Climate is not unbearable because of cloudiness and heavy rainfall.

**Q.14. Mention the major trees found in the equatorial forests.**

Ans. Major trees of the equatorial forests are :

Mahogany, Ebony, Ivory wood, Dye wood, Cinchona and Rose wood.

**Q.15. Name any four countries which have a monsoon climate.**

Ans. India, Pakistan, Bangladesh, Myanmar, etc. have a monsoon climate.

**Q.16. Mention the location of the Tropical monsoon type regions.**

Ans. Monsoon type regions are located in the zone extending between 50 and 300 latitudes on either side of the Equator.

17. What is the aim of dividing the world into natural regions?

Ans: The aim of dividing the world into natural regions is to study the variation in natural environment and its impact on human life, in different parts of the world.

18. Describe the life of people in the tropical desert region?

Ans: The people in the tropical desert region may be classified in three categories:

- a. Pastoral nomads – hunters and food gatherers.
- b. Caravan traders – Oasis dwellers
- c. Date-palm cultivators – Oasis dwellers

19. Name the continents where the equatorial regions are situated.

Ans: The continents where the equatorial regions are situated are-South America, Africa and Asia.

20. Account for the scanty vegetation in a hot desert.

Ans: There is sparse vegetation in a desert because of:

- a. absence of moisture
- b. very high temperature
- c. rapid evaporation

21. What are Xerophytes ? Give examples.

Ans : Xerophytes are plants that have the capacity of adapting themselves to the dry conditions. Some have thick leathery leaves, some have thick stem to store water while others have sharp thorns. The plants which are called xerophytes are the cactus, prickly pears etc.

22. Why do fruit trees grow well in the Mediterranean Region? Where are these regions located?

Ans : The Mediterranean Regions are located between 30° and 40° North and South latitudes, mainly on the western side of continents. They are characterized by dry warm summers and mid rainy winters with plenty of sunshine. This helps in the growth of fruits like peaches, pears, apricot, oranges, lime, grapes and olives.

23. Why is there a complete reversal of the pressure gradients over Asiatic landmass?

Ans: There is complete reversal of pressure gradients over Asiatic landmass because of the northward and the southward migration of the Sun and consequent differential heating of the continent and adjoining seas.

24. Where are the following deserts located?

- a. Arabian desert, (b) Thar desert, (c) Kalahari desert, (d) Atacama desert.

Ans : (a) The Arabian Desert is to the east of the Red sea.

b. The thar desert is in the Indian subcontinent.

c. The Kalahari desert is in the southern parts of Africa.

d. The Atacama desert is in South America extending along the Pacific coast to the west of the Andes mountains.

25. Why is the Mediterranean region popular for fruit processing industry?

Ans : The easy availability of fruit as a raw material leads to the development of the fruit processing industry. The popularity of viticulture witnessed a revolution in the manufacturing industry especially in the production of wines.

26. By what names are the grasslands known in:

- (a) North America      (b) South Africa      (c) Hungary  
(d) Eurasia      (e) Australia

**Ans:** The grasslands are known as:

- (a) Prairies in North America      (b) Veld in South Africa  
(c) Pastaz in Hungary      (d) Steppes in Eurasia  
(e) Downs in Australia.

27. What are the names given to shifting agriculture in the following countries?

- a. South America      (b) Africa      (c) Indonesia

Ans: (a) Milpa (b) Fang (c) Ladang

28. In which natural region is shifting agriculture carried on ? What are its characteristics?

Ans : Shifting agriculture is carried on backward regions which are densely forested. The trees are cut down, burnt and then crops are grown. When the fertility decreases the people shift to another plot of land and repeat the procedure.

29. There is little seasonal variation in the climatic condition of the equatorial regions.

Ans : Due to almost vertical sunrays all the year round, there is little seasonal variation in the climatic conditions.

30. Climatic conditions in the Mediterranean region do not favour grasses.

Ans : Climatic conditions in the Mediterranean region do not favour grasses because most of the rain occurs in the cool season when the growth is slow.

31. The western margins of continents are extremely dry.

Ans: The western margins of continents are extremely dry because the Trade Winds blow from the interior of continents as offshore winds.

### 32. Warm temperate region and Cool temperate region.

Ans: Warm temperate region

## Cool temperate region

1. It extends from 30°N to 45°N latitudes in each hemisphere.  
1. It extends from 45°N and 65°N latitudes in each hemisphere.
  2. It includes Mediterranean type, tropical desert type and monsoon type climatic type regions.  
2. It includes west-European type, temperate grasslands and Taiga Climatic region.

### 33. Evergreen and Xerophytic trees of Mediterranean region

Evergreen trees	Xerophytic trees
evergreen trees of Mediterranean region have no regular season for shedding their leaves.	1. Xerophytic trees of Mediterranean region adapt themselves to the dry summer.
2. They have needle-shaped leaves.	2. They have small, stiff, shiny leaves, thorns and long roots and waxy surface.
Pines, firs, cedars and cypresses are the main evergreen trees of this region.	3. The vine (with long roots) laurel (with leathery leaves), cork oak (with thick spongy bark) are some examples of this region.

## 34. Steppes and Prairies

Ans:	Steppes	Prairies
	The grasslands in Eurasia are known as the Steppes.	1. The grasslands in North America are known as Prairies.
	The Steppes of Eurasia occur on either side of the Ural mountains covering the parts of Eastern Europe and Western Siberia in Asia.	2. The prairies of North America lie between the Rockies and the Great Lakes of North America.

Define the terms:

### 35. Shifting cultivation

Ans : It is a migratory system of agriculture. In this system, at first the small trees of an area are cut by a long thick bladed knife then, the slash is burnt, and crops are planted among the stumps by dropping the seeds into holes, made with a pointed stick.

### 36. Horticulture

Ans: It is an art and science of raising fruits, vegetables and flowers.

37. What are the prevailing winds in the Mediterranean region ? How do they affect the climate?

Ans : The Mediterranean region experiences winds from different directions in summer and winter.

The prevailing winds are :

- (i) Trade Winds
- (ii) Westerlies
- (iii) Temperate cyclones.
- (iv) Apart from the above prevailing winds there are local winds (some hot and some cold), which are experienced in this region. The Mistral, Sirocco and Bora are most known among such winds.

The Prevailing winds affect the climate in the following ways :

During summer the prevailing winds are the Trade Winds because during the summer season in the Northern Hemisphere, all pressure and wind belts shift towards the north. These winds become dry by the time they reach the western margins of the continents, thus do not cause any rainfall in these regions. Hence the summer season remains dry.

In winter the prevailing winds are the Westerlies because during the winter season in the Northern Hemisphere, all pressure and wind belts shift towards the south. The Westerlies

reach the western coast of the continents as on shore winds and cause rainfall on the western margins of the continents.

Temperate cyclones also cause heavy showers as this region comes under the influence of the temperate cyclonic winds during winters. During the passage of cyclones the weather changes frequently from cloudy and rainy to bright sunny days.

38. In spite of the large number of trees the Equatorial regions cannot be exploited. Why ? Give four reasons.

Ans : The difficulties in exploring the Equatorial rainforests are as follows.

- The cost of cutting the trees is very high as they are very hard.
- Transportation becomes difficult due to dense undergrowth.
- A large variety of trees makes lumbering difficult.
- The large number of creepers holding the trees together make felling difficult.

# **W o r l d   M a p   P o i n t i n g**

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## **1. Map Work**

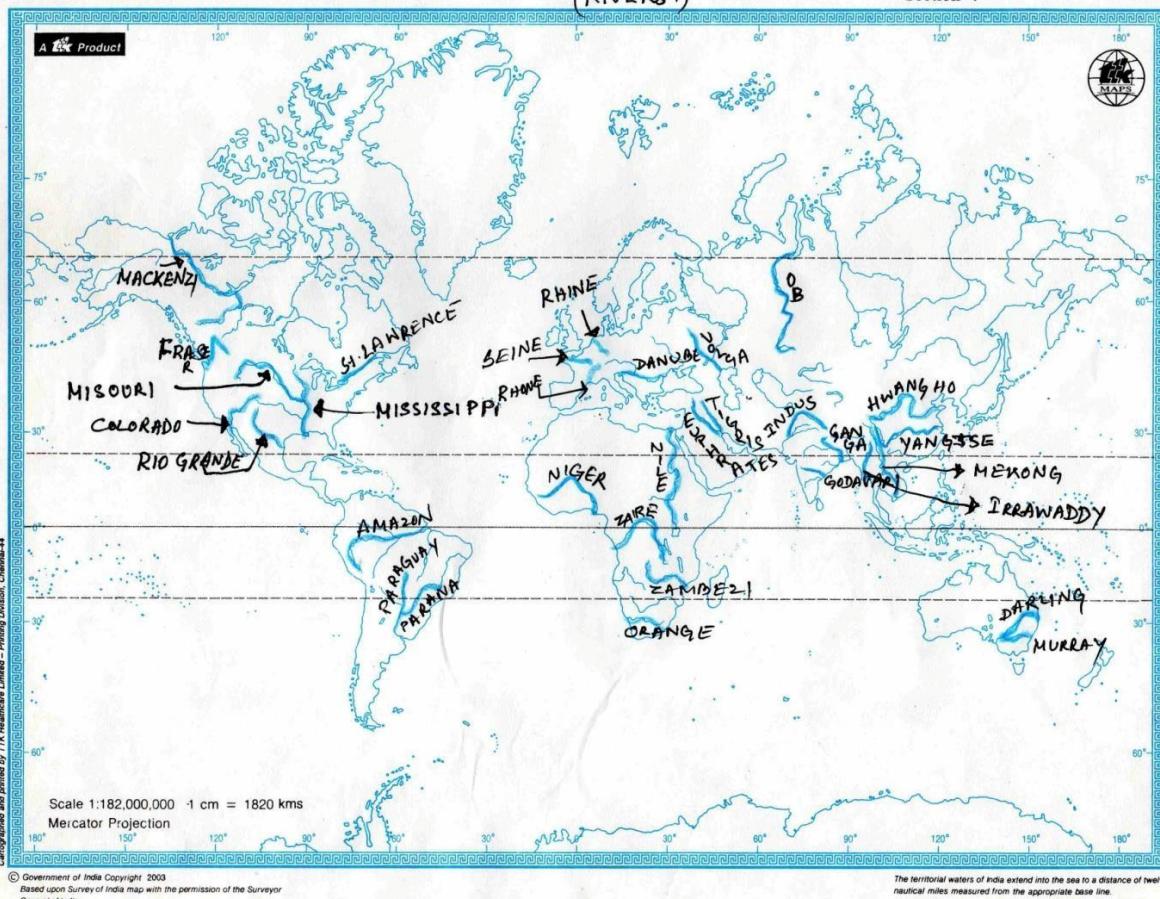
**On an outline map of the World, candidates will be required to locate, mark and name the following :**

- i. The major natural regions of the World - Equatorial, Tropical Monsoon, Tropical Deserts, Mediterranean type, Tropical grasslands. Temperate grasslands, Taiga and Tundra.
- ii. The Oceans, Seas, Gulfs and Straits - all Major Oceans, Caribbean Sea, Black Sea. Caspian Sea, South China Sea, Mediterranean Sea, Gulf of Carpentaria, Hudson Bay, Persian Gulf, Gulf of Mexico, Gulf of Guinea, Bering Strait, Strait of Gibraltar, Strait of Malacca.
- iii. Rivers – Mississippi, Colorado, Amazon, Paraguay, Nile, Zaire, Niger, Zambezi, Orange, Rhine, Volga, Danube, Murray, Darling, Hwang Ho. Yangtze Kiang, Ob, Indus. Ganga, Mekong, Irrawaddy, Tigris, Euphrates.
- iv. Mountains – Rockies, Andes, Appalachian, Alps. Himalayas, Pyrenees, Scandinavian Highlands, Caucasus, Atlas, Drakensburg, Khingan, Zagros, Urals, Great Dividing Range.
- v. Plateaus – Canadian Shield, Tibetan Plateau. Brazilian Highlands, Patagonian Plateau. Iranian Plateau, Mongolian Plateau.

# WORLD – RIVERS

(RIVERS).

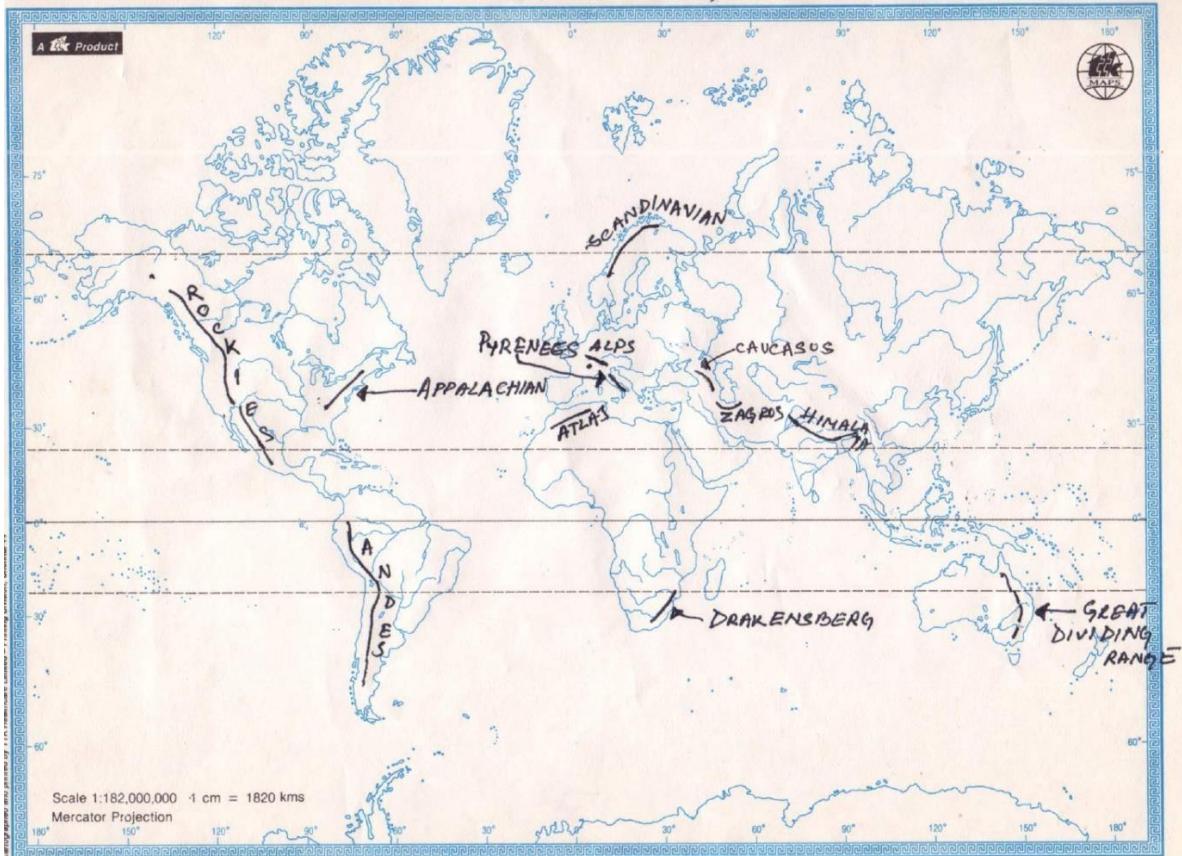
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# WORLD – RIVERS

## MOUNTAINS, PLATEAUS

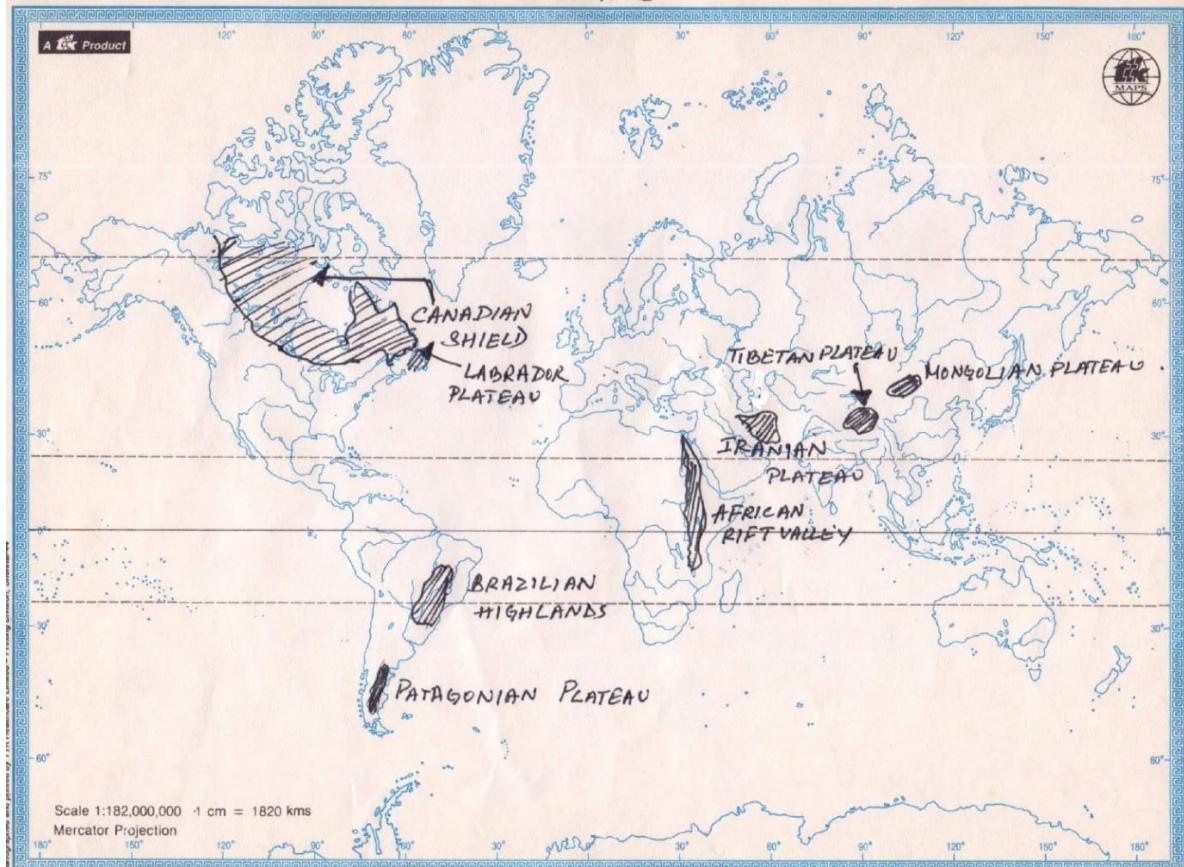
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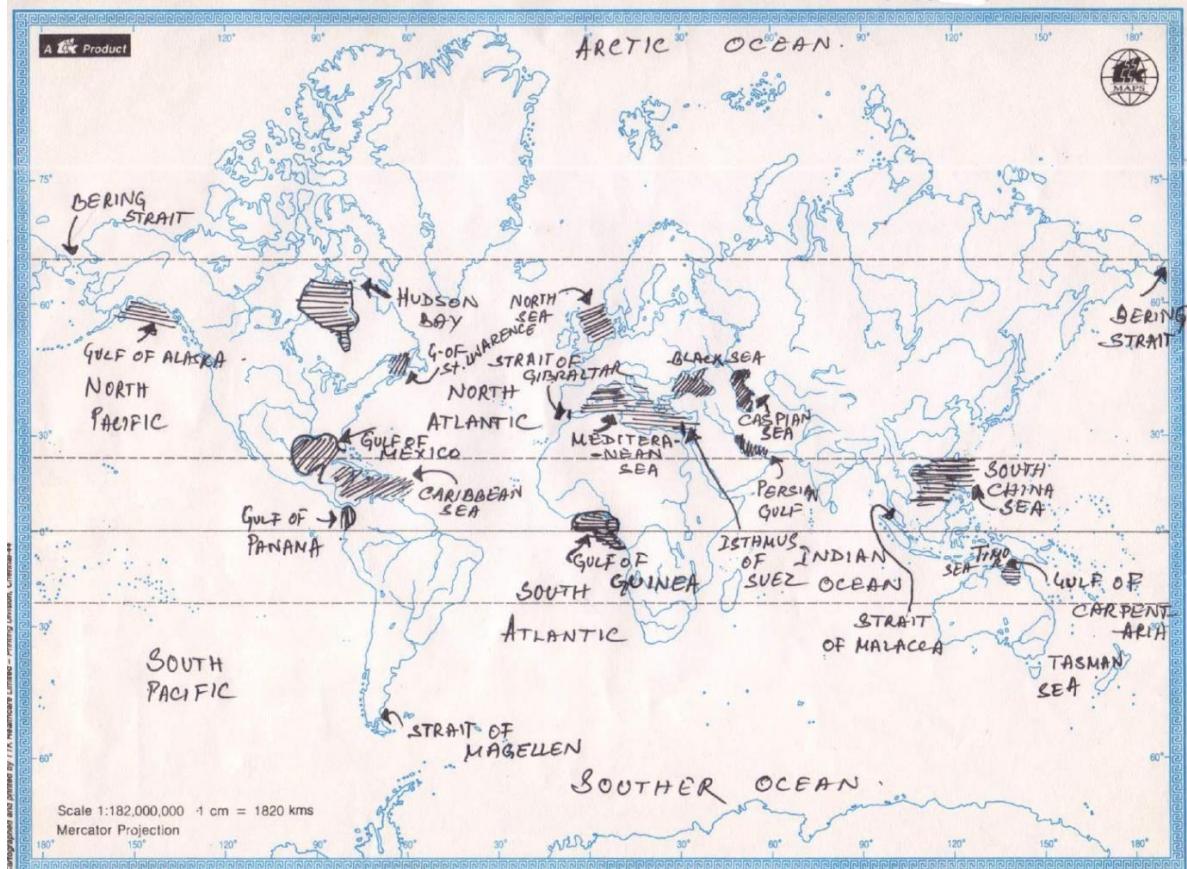
## PLATEAUS

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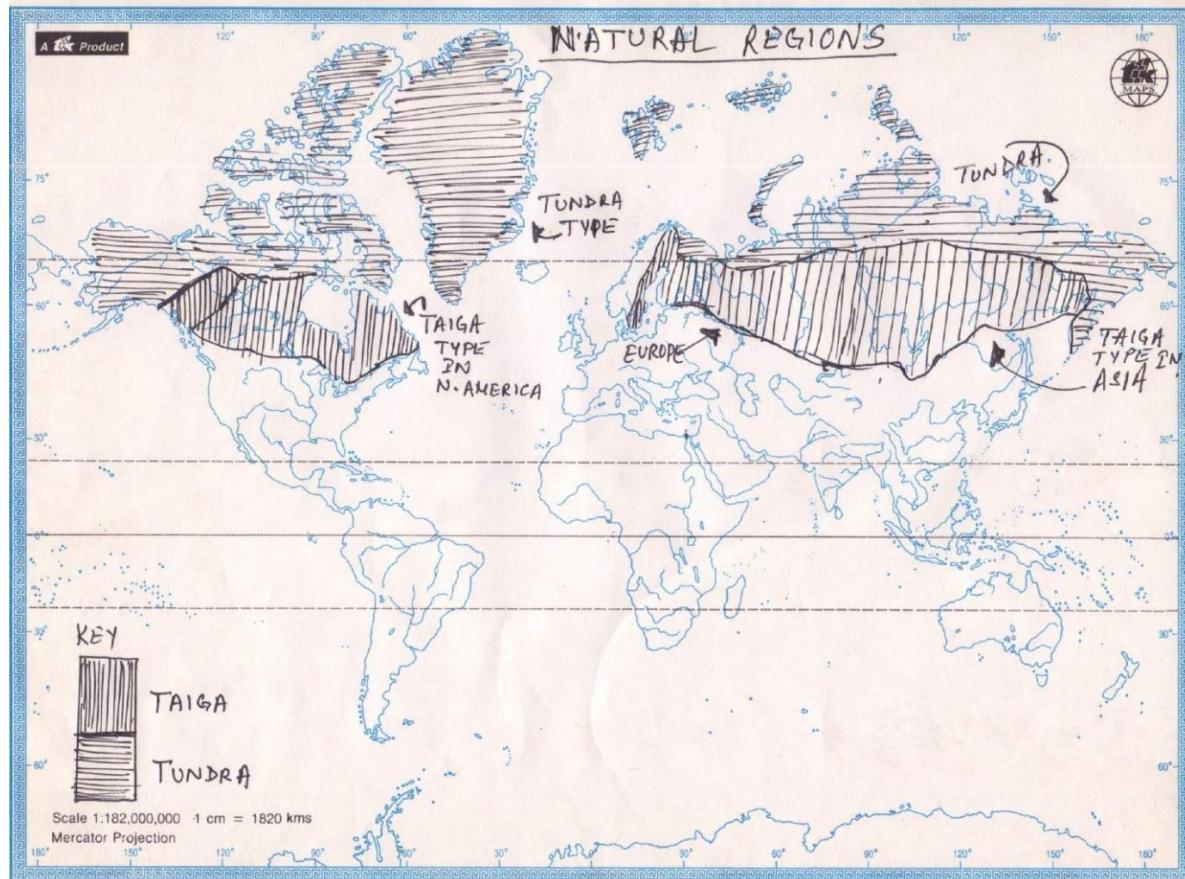
# WORLD – RIVERS

OCEAN, SEAS, GULFS, BAYS.



# WORLD – RIVERS

Std. :  
Section :



## WORLD - MAIN RIVERS

संसार - मुख्य नदियाँ

