DELHI PUBLIC SCHOOL BANGALORE - EAST

SOCIAL SCIENCE (GEOGRAPHY)

4. CLIMATE (NOTES)

NAME:_____ CLASS:IX SEC:_____ DATE: _____

I. Terms to remember:

1. **Climate**-The climate refers to the sum total of weather conditions and variations over a large area for a long period of time (more than thirty years).

2. **Weather**-'Weather' refers to the state of the atmosphere over an area at any point of time.

3. **'Monsoon'**-The word, 'monsoon' comes from the Arabic word' mausim' which means season. It implies a seasonal reversal in the wind direction during a year.

4. **Season**- A **season** is a division of the year based on changes in weather, ecology, and the number of daylight hours in a given region. On Earth, seasons are the result of Earth's orbit around the Sun and Earth's axial tilt relative to the ecliptic plane.

5. **Trade Winds-** The **trade winds** or **easterlies** are the permanent east-to-west prevailing winds that flow in the Earth's equatorial region. The trade winds blow mainly from the northeast in the Northern Hemisphere and from the southeast in the Southern Hemisphere, strengthening during the winter.

6. **Tropical Climate-** The climate found in tropical zone extending between the Tropic of Cancer and the Tropic of Capricorn (between 23 ½ degree N and 23 ½ degree S) is called tropical climate. Example: Nagpur, Sri Lanka, Tamil Nadu, Karnataka.

7. **Cyclones-** A large scale air mass that rotates around a strong centre of low atmospheric pressure, counter clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere as viewed from above (opposite to an anticyclone).Cyclones are characterized by inward-spiralling winds that rotate about a zone of low pressure.

8. **Kaal Baisakhi-** These are the local thunderstorms associated with violent winds, torrential downpours, often accompanied by hail. In West Bengal it is known as Kaal Baisakhi.

9. **Mango showers**- Towards the close of the summer season pre-monsoon showers are common especially in Kerala and Karnataka. They help in the early ripening of mangoes and are often referred as mango showers.

10. **Loo-** These are strong gusty, hot, dry winds blowing during the day over the north and north-western India.

11. **ENSO**- Southern oscillation is an irregular periodic change in pressure conditions, the variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean,

affecting the climate of much of the tropics and subtropics. The warming phase of the sea temperature is known as *El Nino* hence the phenomena is referred to as ENSO

II. <u>Very Short answers</u>:

12. **What do you mean by Coriolis force?**
    Ans-An apparent force caused by the earth's rotation. The Coriolis force is responsible for deflecting winds towards the right of the northern hemisphere and towards the left in the southern hemisphere. This is also known as Ferrel's Law.

13. **What is jet stream?**
    Ans-These are a narrow belt of high altitude (above 12000 m) westerly winds in the troposphere. Their speed varies from about 110 km/h in summer to 184 km/h in winter. A number of separate jet streams have been identified. The most constant are the mid latitude and the sub-tropical jet stream.

14. **What is Inter Tropical Convergence Zone?**
    Ans- The Inter Tropical Convergence Zone is a broad trough of low pressure in equatorial latitudes. This is where the north-east and the south east trade winds Converge. This convergence zone lies more or less parallel to the equator but moves north or south with the apparent movement of the Sun.

15. **What is El Nino?**
    Ans-This is a name given to the periodic development of a warm ocean current along the coast of Peru as a temporary replacement of the cold Peruvian current .El Nino is a Spanish word meaning 'the child' and refers to the baby Christ as this current starts during Christmas. The presence of El Nino leads to an increase in sea surface temperatures and weakening of the trade winds in the region.

16. **Mention any three characteristics of the Monsoon.**

    Ans: The characteristics of Monsoon are:

    - The Monsoons are pulsating in nature.
    - These are affected by different atmospheric conditions prevailing in the region.
    - The duration of the monsoon is between 100 – 120 days from early June to Mid-September.

17. **What is 'burst' of monsoon?**
    Ans: Around the time of the arrival of monsoons, the normal rainfall increases suddenly and continues constantly for several days. This is known as the 'burst' of the monsoon.

18. **What is the duration of Monsoon in India?**

    Ans: The duration of Monsoon in India is between 100-120 days from early June to mid-September.

19. **Which wind blows in India during winter?**
    Ans: North-East Trade wind and Western Disturbances blows in India during winter.

20. **Why does the global heat belt shifts northward?**
    Ans: Due to the apparent northward movement of the Sun.
    - The influence of the shifting of the heat belt can be seen clearly from temperature during March-May at different Latitudes.

21. **What is the Significance of Himalaya in our Country's Climate?**

Ans: -The Himalayas prevent the cold winds from Central Asia to enter the Indian Sub-continent.

- Due to these mountains Indian Subcontinent experiences comparatively mild winters as compared to the central Asia.

22. **What are the temperate cyclones? How do they influence the climate of India?**
Ans: - Temperate cyclone also known as depressions, enter India from the Mediterranean Sea in the cold season.
- These cause winter rains over the Northern plains and snowfall in the mountains
- The winter rainfall locally known as 'mahawat' is small, but is very important for the cultivation of Rabi crops.

23. **How do the variations in temperature affect the lives of the people in India?**
Ans: - They affect the food the people eat.
- The clothes the people wear.
- The kind of houses they live in.

III. <u>Answer in brief</u>: (60-80 words)

24. **'India has diverse climatic conditions'. Support this statement by giving examples, each of temperature and precipitation.**
Ans-
- India has diverse climatic conditions. Although India has monsoon type of climate but there are wide variations in temperature and precipitation.
- The mercury occasionally touches 50°C in the western deserts, and it drops down to as low as -45°C in winter around Leh.
- The annual precipitation is less than 10 cm in the North-west Himalayas and the western desert. It exceeds 400 cm in Meghalaya.
- Most parts of the country receive rainfall from June to September, but some parts like Tamil Nadu coast gets most of its rain during October and November.

25. **What is "October Heat"?**
Ans: The months of October-November form a period of transition from a hot rainy season to dry winter conditions.
- The retreat of monsoons is marked by clear skies, and rise in temperature.
- The land is still moist.
- Owing to the condition of high temperature and humidity, the weather becomes rather oppressive. This is commonly known as 'October Heat'.

26. **Give reasons :**

a) The delta region of the eastern coast is frequently struck by cyclones.
Ans: - In the mid-October, the mercury begins to fall at a rapid speed in Northern India.
- The low pressure conditions of the North-western India shifts to the Bay of Bengal by early November. This shift is associated with the occurrence of cyclonic depressions which originate in the Andaman Sea.
- These cyclonic depressions give rise to tropical cyclones which cause heavy and widespread rains in the deltas of the Godavari, the Krishna and the Kaveri.

b) 'India should have been an arid land'. But it is not- Why?

Ans: - India is located in the area of north-easterly trade winds. These winds start from the subtropical high-pressure belt of the northern hemisphere.

- They move south and due to the Coriolis force; they get deflected to the right and blow on towards the equatorial low-pressure.

- Usually, these winds have very little moisture as they blow over land.
- Due to which, they bring little or no rain.
- India has a very unique pressure and wind conditions. The southwest monsoon winds move over the warm ocean, and collect moisture and cause widespread rainfall over entire India.

27. **"Monsoon acts as a unifying bond". Explain.**
Ans: - The subcontinent of India has a great variation in temperature conditions, despite the moderating influence created by other factors.
- The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons. Even the uncertainties of rain and uneven distribution are very much typical of the monsoons.
- The Indian landscape, its animal and plant life, its entire agricultural calendar and the life of the people, including their festivities, revolve around this phenomenon.
- Year after year, people of India from north to south and from east to west, eagerly await the arrival of the monsoon.
- These monsoon winds bind the whole country by providing water to set the agricultural activities in motion. The river valleys which carry this water also unite as a single river valley unit.

28. **Explain the Southern Oscillation.**
Ans: - The tropical eastern South Pacific Ocean experiences high pressure, the tropical eastern Indian Ocean experiences low pressure normally.
- In certain years, there is a reversal in the pressure conditions and the eastern Pacific has lower pressure in comparison to the eastern Indian Ocean.
- This periodic change in pressure conditions is known as Southern Oscillation or SO.
- The changes in pressure conditions are connected to the El Nino. Hence the phenomenon is referred to as ENSO (EI Nino Southern Oscillation)

29. **Distinguish between South-west Monsoon and North-east Monsoon.**

Southwest Monsoon	**Northeast Monsoon**
(i) The summer period is marked by the southwest monsoon.	(i) The winter period is marked by northeast monsoon.
(ii) The southwest monsoon blow in a southwest direction to the mainland of India from June to September.	(ii) The northwest monsoon blow in a north easterly direction across India from mid-November to February
(iii) It blows in India into two branches namely the Arabian Sea branch and Bay of Bengal branch.	(iii) It does not possess any branches.
(iv) It carries lot of Moisture	(iv) These winds are dry as they blow land to land.

30. **What do you understand by Retreating Monsoon? When does it occur?**
Ans:

- Withdrawal of the Monsoon from the country is called the retreating of the monsoon.
- Withdrawal is a gradual process. In September, monsoon withdraws from the north western states and by mid-October from the northern half of the peninsular region.
- The monsoon finally withdraws from the country by early December.

31. **What are Western Cyclonic Disturbances?**
Ans- They are weather phenomena of the winter months brought in by the westerly flow from the Mediterranean region.
    - They usually influence the weather of the north and north-western regions of India.
    - These low pressure systems originate over the Mediterranean Sea and western Asia and move into India with the westerly flow.
    - They cause the much needed winter rains over the plains and snowfall in the mountains.
    - Although the total amount of winter rainfall locally known as '*mahawat*' is small, they are important for the cultivation of rabi crops.

32. **What is the pattern of annual rainfall distribution in India? Name any two states having heavy rainfall, two states having moderate rainfall and two having low rainfall.**
Ans: - The annual rainfall is highly variable from year to year.
- Parts of western coast and north eastern India receive heavy rainfall.
- Rainfall is low in Deccan plateau, east Sahyadris, Leh, Rajasthan, Gujarat.
- The rest of the country receives moderate rainfall.
- Thus the pattern of annual rainfall distribution is uneven in India.
- **Heavy rainfall** – Meghalaya, Arunachal Pradesh, Western parts of western ghats
- **Moderate rainfall** – Uttar Pradesh, Tamil Nadu
- **Low rainfall** – Rajasthan, Gujarat

IV. <u>Answer in detail</u>: (100-150 words)

33. **Explain the factors affecting India's climate**.
Ans: The factors affecting India's climate are:

- **<u>Latitude</u>**: The Tropic of Cancer passes through the middle of the country from the Rann of Kuchchh in the west to Mizoram in the east. Almost half of the country, lying south of the Tropic of Cancer, belongs to the tropical area. All the remaining area, north of the Tropic, lies in the sub-tropic. Therefore, India's climate has characteristics of tropical as well as subtropical climate.
- **<u>Altitude</u>**: India has mountains to the north which have an average height of about 6,000 metres. India also has a vast coastal area where the maximum elevation is about 30 metres. The Himalayas prevent the cold winds from Central Asia from entering the subcontinent. It is because of these mountains that this subcontinent experiences comparatively milder winters as compard to central Asia.
- **<u>Pressure and Winds</u>**: The climate and associated weather conditions in India are governed by the following atmospheric conditions namely Pressure and surface winds; Upper air circulation; Western cyclonic disturbances and tropical cyclones.
- The upper air circulation in this region is dominated by a westerly flow. An important component is jet stream. These jet streams are located approximately over 27°- 30° north latitude, they are known as subtropical westerly jet streams.

34. **Explain the distribution of rain caused by Monsoon**.

Ans:

- The windward slopes of the Western Ghats receive heavy rainfall.
- The Deccan plateau and the parts of Madhya Pradesh lies in the rain shadow area of the ghats and receive less rainfall.
- The north-eastern parts of India receive very heavy rain. Mawsynram receives the highest rainfall in the world.
- Rain in the Ganga plain decreases from east to west.
- Rajasthan and parts of Gujarat receive scanty rainfall.

35. **Describe the path of the Bay of Bengal branch of the Monsoon winds**.

Ans:

- The monsoon arrives at the southern tip of the Indian peninsula generally by the first week of June.
- The Bay of Bengal branch advances rapidly and arrives in Assam in the first week of June.
- The lofty mountains cause the monsoon winds to deflect towards the west over the Ganga plains.
- The Arabian Sea branch and the Bay of Bengal branch of the monsoon merge over the north western parts of the Ganga plains.
- Delhi receives the monsoon showers from the Bay of Bengal branch by the end of June.
- By Mid-July, the monsoon reaches Himachal Pradesh and the rest of the country.

36. **Describe the mechanism of Monsoon**.

Ans. To understand the mechanism of Monsoons, the following facts are important.

- The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around experience comparatively high pressure.
- The shift of the position of Inter-tropical Convergence Zone (ITCZ) in summer, over the Ganga plain.
- The presence of high pressure area, east of Madagascar approximately at 20°S over the Indian Ocean. The intensity and position of the high pressure area affects the Indian monsoon.
- The Tibetan plateau gets intensely heated during summer which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level.
- The movement of the westerly jet stream to the north of the Himalayas and the presence of tropical easterly jet stream over the Indian peninsula during the summer.

37. **'The pressure and wind conditions over India are unique'. Explain.**

Ans: -During winter, there is a high pressure area in the north of the Himalayas.

- Cold dry winds blow from this region to the low pressure areas over the oceans to the south.
- In summer, low pressure area develops over interior Asia as well as over north-western India.
- This causes a complete reversal of the direction of the winds during the summer.
- Air moves from the high pressure area over the southern Indian Ocean in a south-easterly direction, crosses the equator and turns right towards the low pressure areas of the Indian sub-continent.
- These are known as South-west monsoon winds.
- These winds blow over the warm oceans, gather moisture and bring widespread rainfall over the mainland of India.

38. **What do you mean by 'breaks' in the rainfall? Explain.**

Ans: -A phenomenon associated with the monsoon is its tendency to have breaks in rainfall.

- It has wet and dry spells. The monsoon rains takes place only for a few days at a time. They are interspersed with rainless intervals.
- These breaks in monsoon are related to the movement of the monsoon trough.
- For various reasons, the trough and its axis keep on moving northward or southward which determines the spatial distribution of rainfall.
- When the axis of the monsoon trough lies over the plains, the rainfall is good in these parts.
- On the other hand, whenever the axis shifts closer to the Himalayas, there are longer dry spells in the plains and widespread rain occur in the mountainous catchment areas of the Himalayan Rivers.

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