



Class 9	Social Studies	Geo Ch 4: Climate
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1. What is Climate?

Answer: Climate refers to the sum total of weather conditions and variations over a large area for a long period of time (more than 30 years).

2. What does 'weather' mean?

Answer: Weather refers to the state of the atmosphere over an area at any point of time.

3. What are the elements of weather and climate?

Answer: Temperature, atmospheric pressure, winds, humidity and precipitation are the elements of weather and climate.

4. What is the climate of India?

Answer: India's climate is described as 'Monsoon Type' climate.

5. What is the variation of temperature in India?

Answer: In some parts of Rajasthan the highest temperature is 50°C and it is around - 45°C at Drass in Jammu and Kashmir.

6. What is the variation of annual precipitation in India?

Answer: The annual precipitation is over 400 cms in Meghalaya and less than 10 cms in Ladakh and western Rajasthan.

7. Define the term 'Monsoon'.

Answer: The word monsoon is derived from the Arabic word 'Mausim' which literally means season. Monsoon refers to the seasonal reversal in the wind direction during a year.

8. Why air temperature decreases from equator to polar?

Answer: Due to curvature of the earth, the amount of total energy received varies according to latitude. As a result, air temperature decreases from the equator towards the poles.

9. Why hills are cooler during summer and people prefer to go to hill stations?

Answer: As one goes from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases.

10. What does the term 'Sentimentality' mean?

Answer: As the distance from the sea increases its moderating influence decreases and the people experience extreme weather conditions. This condition is known as sentimentality, i.e. very hot during summers and very cold during winters.

11. Which tropic passes just from the centre of India?

Answer: Tropic of Cancer.

12. Which surface winds are blowing from India?

Answer: India lies in the regions of north easterly winds.

13. What is Coriolis force?

Answer: It is an apparent force caused by earth's rotation. Coriolis force is responsible for deflecting winds towards the right in northern hemisphere and towards the left in the southern hemisphere.

14. What do you know about 'South-Western Monsoon winds'?

Answer: 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 over the Indian subcontinent. These are known as South- West Monsoon Winds.

15. What are Jet Streams?

Answer: Jet streams are fast blowing winds moving in the upper air atmosphere.

16. What are subtropical westerly Jet streams?

Answer :The Jet streams are located approximately over 27° to 30° north Latitude, therefore they are known as subtropical westerly Jet streams.

17. In which parts of India subtropical westerly Jet streams blow?

Answer: Over India these jet streams blow south of the Himalayas, all throughout the year except in summers. They are responsible for the western cyclonic disturbances in north and north-western parts.

18. What are tropical easterly Jet streams?

Answer: An easterly Jet stream called the tropical easterly Jet streams blow over peninsular India, approximately are 14°N during the summer month

19. What are Western cyclonic disturbances?

Answer: The Western cyclonic disturbances are weather phenomena of the winter months brought in by the westerly flow from the Mediterranean region.

20. When does tropical cyclone occur in India?

Answer: Tropical cyclones occur during the monsoon as well as in October. These cyclones originate in the Bay of Bengal, hit the eastern coast of India and cause heavy rains causing damage to life and property.

21. Who noticed the phenomena of the monsoons in India?

Answer: The sailors who came to India in historic times were one of the first to have noticed the phenomenon of monsoon. They benefitted from the reversal of the wind system as they came by sailing ships at the mercy of winds.

22. How differential heating and cooling of land and water help in understanding mechanism of monsoon?

Answer: Differential heating and cooling of land and water creates low pressure on the land of India while the seas around experience comparatively high pressure leading to the shifting of winds from south to north.

23. What do you understand by ITCZ?

Answer: It means Inter Tropical Convergence Zone. It is a broad trough of low pressure in equatorial latitude. This is where northeast and southeast trade winds converge.

24. How does the presence of high pressure in the east of Madagascar affect the Indian monsoon?

Answer: The presence of the high pressure area, east of Madagascar approximately at 20°S over the Indian Ocean, its intensity and the position of this high pressure area also affects the Indian monsoon.

25. What do you understand by the term SO?

Answer: SO means southern oscillation. Normally when the tropical eastern South Pacific ocean experiences high pressure, the tropical eastern Indian ocean experiences low pressure. This periodic change in pressure conditions is known as Southern Oscillation.

26. What is El Nino?

Answer: El Nino is a warm ocean current that flows past the Peruvian coast in place of cold Peruvian current every 2 to 5 years.

27. What does ENSO Mean?

Answer: ENSO is the combination of El Nino and southern oscillation. The changes in pressure conditions are connected to El Nino, hence the phenomenon is referred to as ENSO.

28. What do you mean by 'Burst of Monsoon'?

Answer: Around the time of arrival of the monsoon the normal rainfall increases suddenly, and continues constantly, for several days. This is known as 'burst of the monsoon'

29. Name the two branches of South-West Monsoons of India.

Answer: (i) Arabian sea Branch (ii) Bay of Bengal Branch

30. Name the four main seasons of India.

Answer: Four main seasons of India are:

- (i) The cold weather season
- (ii) The hot weather season
- (iii) The advancing monsoons
- (iv) The retreating monsoons.

31. When do we experience cold weather season in India?

Answer: It begins from mid November in northern India and stays till February.

32. What is the average temperature of North India and Coastal plains during winter?

Answer: The average temperature in coastal areas is between 24° – 25°C, while in the northern plains, it ranges between 10° to 15° Celsius.

33. Why winters in India experience dry season?

Answer: During this season northeast trade winds prevail over the country. Since they blow from land to sea in most part of the country, it is dry season.

34. What is 'Mahawat'?

Answer: The total amount of winter rainfall is locally known as 'Mahawat'.

35. In which months do we experience the hot weather season?

Answer: In the months of March, April, May and June, it is hot weather season in India.

36. In which regions of India does 'Elongated low Pressure Area' develop?

Answer: Towards the end of May an elongated low pressure area develops in the region extending from Thar desert in the northwest to Patna and Chotanagpur Plateau in the east and southeast.

37. What is 'Loo'?

Answer: These are strong gusty, hot dry winds blowing during the day over the north and northwestern India.

38. What is the effect of 'Dust storms' in India during summers?

Answer: Dust storms are very common during the month of May in northern India. These storms bring temporary relief as they lower the temperature and may bring light rain and cool breeze.

39. What is 'Kaal Baisakhi'?

Answer: Kaal means destruction or calamity brought in the month of Baisakh. It is known as Kaal Baisakhi. It occurs in West Bengal and are pre-monsoon showers.

40. What are 'Mango-Showers'?

Answer: Mango showers are the pre-monsoon showers taking place on the coast of Kerala and Karnataka. Since they help in the early ripening of mangoes, they are called Mango showers.

41. Which region of India receives the highest rainfall in the world?

Answer: Mawsynram in the southern region of Khasi hills in Meghalaya, receives the highest average rainfall in the world.

42. What does 'breaks in rainfall' mean?

Answer: It means wet and dry spells of rain. The monsoon rainfall takes place only for a few days at a time, these rainless intervals in between are called as "breaks in rainfall".

43. How is monsoon known for its uncertainty?

Answer: Monsoon is known for its uncertainty there is a wet spells both and also these spells of rains vary in intensity frequency and duration.

44. Which force is responsible for the deflection of wind from its normal path?

Answer: The Coriolis force is responsible for the deflection of wind from its normal path.

45. What are the controls affecting the climate of India?

Answer: The controls affecting the climate of India are latitude, altitude, pressure and wind system, distance from the sea, ocean currents and relief features.

46. How will you define climate?

Answer: Climate refers to the sum total of weather conditions and variations over a large area for a long period of time.

47. Why does India have a monsoon type of climate?

Answer: The climate of India is strongly influenced by monsoon winds. Hence, it has a monsoon type of climate.

48. Which winds account for rainfall along the Malabar Coast?

Answer: The South-West monsoon winds are responsible for rainfall along the Malabar Coast.

49. Define monsoons.

Answer: Monsoons refers to the complete reversal of winds over a large area leading to a change of seasons.

50. What do you understand by 'break' in monsoon?

Answer: 'Break' in monsoon refers to the wet and dry spells of the monsoon. In other words, the monsoon rains take place for a few days at a time. They are interspersed with rainless intervals.

51. What is the effect of the presence of El Nino in the Western Pacific Ocean?

Answer: It has the effect of retarding the arrival of the monsoon.

52. The heavy rainfall on the Coromandel coast is due to which weather phenomenon?

Answer: The heavy rainfall on the Coromandel coast is due to the cyclonic depressions originating over the Andaman Sea, which occur during the season of retreating monsoon.

53. Which factor is responsible for the Indian sub-continent having milder winters when compared to locations in Central Asia?

Answer: The Himalayan mountains act as a barrier for the cold winds of Central Asia and prevent them from reaching the Indian sub-continent, thus ensuring a milder winter.

54 Is it correct that the maximum rainfall in the winter season in India occurs in Meghalaya?

Answer: No, it is incorrect. The maximum rain in Meghalaya occurs during June–September. The maximum rainfall in the winter season occurs in Tamil Nadu.

55. Is it true that the monsoon winds are regular in arrival over India?

Answer: No, it is not true. The monsoon's behaviour is very erratic, as it depends on many factors.

56. Which season in Northern India has the characteristics of low humidity, weak winds and low temperature?

Answer: The winter season in North India has the characteristic of low humidity, weak winds and low temperature.

57. The phenomenon of the monsoon is experienced in which range of latitudes?

Answer: The phenomenon of the monsoon is experienced in the equatorial regions from latitude 20°N to 20°S.

58. In which season does the heat belt shift Northwards?

Answer: The heat belt shifts Northwards during the summer season.

59. In which season does the rainfall in Ganga valley reduce from East to West?

Answer: Rainfall in Ganga valley reduces from East to West during the season of advancing monsoon.

60. The phenomenon of 'October Heat' is characteristic feature of which season?

Answer: The phenomenon of 'October Heat' occurs during the season of Retreating Monsoon.

61. Why is the unifying influence of the monsoon on the Indian sub-continent quite perceptible?

Answer: The monsoon provides water to set the agricultural activities in motion and as the major occupation of the people is agriculture, the monsoon acts as a unifying bond.

62. What is the duration of the monsoon season in Western Rajasthan?

Answer: The advancing monsoon reaches Western Rajasthan in the beginning of July. Thus, the monsoon season in Western Rajasthan is from 1st July to 15th September.

63. Which city out of Chennai, Guwahati, Jodhpur and Mumbai has the minimum rain?

Answer: Jodhpur has the minimum rain, as it is in Western Rajasthan (near the Indian Desert). The other cities mentioned have moderate to heavy rain.

64. Why does Thiruvananthapuram have an equable climate?

Answer: Thiruvananthapuram is on the coast and thus has an equable climate due to moderating influence of sea.

65. Which feature of the Indian sub-continent does not allow the South-West monsoon winds to escape from India?

Answer: The Himalayan mountains do not allow the South-West monsoon winds to escape from India, as they act as a barrier to the monsoon winds and also deflect the monsoon winds Westwards from Assam.

66. Which area receives the highest rainfall in the world?

Answer: Mawsynram in the Southern region of Khasi hills, receives the highest rainfall in the world.

67. In which season, loo is experienced over the 'Northern Plains'?

Answer: Loo is experienced during summer season over the Northern plains.

68. What is the cause of rainfall during winters in the North-Western part of India?

Answer: Western disturbances which is common phenomenon during winters in the North-Western part of India bring rainfall during the period.

Short Answer Type Questions

1. What is 'October Heat'?

Answer: In the month of October monsoon winds retreat. It is marked by clear skies and rise in temperature. Owing to the conditions of high temperature and humidity, the weather becomes rather oppressive during the day. This condition is called as 'October heat'.

2. Differentiate between climate and weather.

Answer:(i) Climate: It refers to the sum total of the weather conditions and variations over a large area for a long period of time.

(ii) Weather: It refers to the state of atmosphere over an area at any point of time. The elements of weather and climate are the same.

3. What type of climate does India have?

Answer: (i) India has a 'monsoon type' of climate.

(ii) This type of climate is found mainly in South and Southeast Asia.

(iii) It is called 'monsoonal' since India receives pre-monsoon showers in the month of May, proper monsoon during the hot weather season, winter monsoon due to western disturbances in winter and a little rain when the monsoons retreat.

4. How do heavy floods occur during monsoons?

Answer: When axis of rainfall shifts closer to Himalayas, there are large dry spells in the plains and widespread rain occurs in the mountainous catchment areas of Himalayan rivers. These heavy rains bring devastating floods causing damage to life and property in the plains.

5. What are the characteristic features of a tropical monsoon climate?

Answer: A 'tropical monsoon climate' results from the monsoon winds, which change direction according to the seasons. This type of climate has high temperature almost throughout the year. This climate has the driest month occurring near the winter solstice.

6. Which town out of Jaisalmer, Leh, Shillong and Thiruvananthapuram will be the hottest during daytime in June?

Answer: Jaisalmer will be the hottest because it is in Western Rajasthan (far away from the sea), which receives the monsoon in July only. Shillong and Leh are in mountainous regions, whereas Thiruvananthapuram is on the sea coast, the sea having a moderating influence on its temperature.

7. Why does Nasik receive much less rainfall than Mumbai?

Answer: Nasik is located on the leeward side of the Western Ghats, whereas Mumbai is located on the windward side. Leeward sides of mountain ranges receive much less rainfall than the windward sides.

8. Out the towns/cities of Bhuj, Kolkata, Thiruvananthapuram and Shillong, where will the monsoon arrive last?

Answer: It will arrive the last in Bhuj, as it is in the North part of Gujarat, where the Arabian sea branch of the monsoon will reach at the end. All other towns mentioned are falling near the starting points of the monsoon.

9. Why does India have a monsoon type of climate?

Answer: (i) Climate of India is strongly governed by the monsoon winds. Monsoon winds are confined to tropical lands between 20° North and 20° South.
(ii) In the India subcontinent, the Himalaya's guide the flow of the monsoon winds bringing the whole of subcontinent under the influence of this winds.
(iii) These winds account for 75% to 90% of annual rainfall from June to September.
(iv) It is influenced by South-West monsoons. Retreating monsoon's and North-East monsoons.

10. How does the latitude affect India's climate?

Answer: (i) The Tropic of Cancer passes almost from the middle of the country.
(ii) Almost half of the country, lying south of the Tropic of Cancer, belongs to the tropical area.
(iii) All the remaining area in the north of the Tropic lies in the sub-tropical area. Therefore, India's climate has characteristics of tropical as well as sub-tropical type of climate.

11. How does altitude affect the climate of India?

Answer: (i) India has mountains to the north which have an average height of about 6,000 mts.
(ii) The Himalayas prevent the cold winds from Central Asia, from entering the subcontinent.
(iii) It is due to these mountains that the Indian subcontinent experiences comparatively milder winters as compared to Central Asia.

12. What is the coriolis force? Describe its effect briefly on the world climate.

Answer: Coriolis force is an apparent force caused by the Earth's rotation. It is responsible for deflecting winds towards the right in the northern hemisphere and towards the left in the southern hemisphere. Under the effect of Coriolis force, the trade winds moving from sub-tropical high pressure belts to equatorial low pressure belts become north-east trade winds in the northern hemisphere and south-east trade winds in the southern hemisphere. As a result, they bring heavy rainfall to the east coast and the west coast remains dry.

13. What are western cyclonic disturbances?

Answer: (i) Western cyclonic disturbances are a weather phenomenon of the winters. (ii) They are brought in by the westerly flow from the Mediterranean region. (iii) They usually influence the weather of the north and north-western regions of India.

14. What are Tropical cyclones?

Answer: (i) They occur during the monsoon, as well as in October and November.
(ii) These disturbances affect the eastern coastal regions of India.
(iii) They originate over the Andaman sea and are often very destructive.

15. Give a brief note on the 'Inter Tropical Convergence Zone'.

Answer: (i) The Inter Tropical Convergence Zone is a trough of low pressure in equatorial latitudes.
(ii) This is where the north-west and the south-east trade winds converge.
(iii) This convergence zone lies more or less parallel to the equator but moves north or south with the apparent movement of the Sun.

16. Define Kaal Baisakhi and Mango Showers.

Answer: (i) Kaal Baisakhi: It is a calamity for the month of Baisakh. These are thunderstorms associated with violent winds, torrential rains often accompanied by hail.
(ii) Mango Showers: Towards the close of the summer season, pre-monsoon showers are common especially in Kerala and Karnataka. Since they help in the early ripening of mangoes, they are called Mango Showers.

17. How is monsoon known for its uncertainties?

Answer: (i) The alternation of dry and wet spells varies in intensity, frequency and duration.

- (ii) It may cause heavy floods in one part and drought in the other part.
- (iii) It is often irregular in its arrival and retreat. Hence, monsoons affect the farming schedule of millions of farmers all over the country.

18. What do you understand by October Heat?

- Answer:** (i) In the month of October, day temperatures are high, nights are cool and pleasant. The land is still moist.
- (ii) Owing to the conditions of high temperature and humidity, the weather becomes oppressive during the day.
 - (iii) This condition is commonly known as October Heat.

19. Why are Thiruvananthapuram and Shillong rainier in June?

- Answer:** (i) The monsoons break there with full fury, right in the beginning of June. This month as a whole has good rains.
- (ii) The monsoon also strikes these places directly. Their location helps them get the first and full impact of the monsoon currents.

20. Why is July rainier in Mumbai than in Thiruvananthapuram?

- Answer:** (i) Mumbai is located about 10° north of Thiruvananthapuram. The monsoon reaches here in the second week of July.
- (ii) The first ten days of June are rainless in Mumbai, but July as a whole is very rainy for it.
 - (iii) The monsoon breaks with full force on June 1 in Thiruvananthapuram. June is rainier here than July.

21. Why are South West (S.W.) monsoons less rainy in Chennai?

- Answer:** (i) Chennai is located on the Coromandel coast. It lies in the rain shadow region of the Arabian Sea branch of S.W. monsoons. It first strikes the western coastal region and is almost exhausted by the time it reaches Chennai.
- (ii) The Bay of Bengal branch runs nearly parallel to the Coromandel coast. So, it also fails to give rains to Chennai.
 - (iii) Besides, offshore dry winds blow over this region in the summers.

22. Why is Shillong rainier than Kolkata?

- Answer:** (i) The Bay of Bengal branch of S.W. monsoons approaches Shillong about a week before it touches Kolkata. So, the early start of monsoons gives Shillong more rains.

(ii) Shillong is also located on the 1500-metre high Meghalaya plateau. A sub-branch of the Bay of Bengal branch strikes it directly. Here the Garo, Khasi Hills capture the clouds like a funnel and cause heavy rains, i.e. more than Kolkata.

23. How does Delhi receive more rainfall than Jodhpur?

Answer: (i) Delhi receives more rainfall since it is better located with respect to the arrival of the monsoons and the western disturbances.

(ii) It gets mild rains from both the branches of S.W. monsoons as well as the western disturbances.

(iii) Jodhpur gets rains mainly from the Arabian Sea branch of the monsoon. Thermal heating during the summer also reduces precipitation. Winter is dry in this region.

24. Why has Leh moderate precipitation almost throughout the year?

Answer: Leh is also called a cold desert. Leh has moderate precipitation almost

(i) throughout the year because of its topographical location.

(ii) It lies on the landlocked high Ladakh plateau, beyond the Himalayas.

(iii) The local precipitation is very less, but it is well distributed in the form of rains in summers and snowfall in winters.

25. Why the houses in Rajasthan have thick walls and flat roofs?

Answer: In Rajasthan, the weather is very hot and there is less rainfall. Some part of the state is covered with desert. The thick walls of the houses insulate the people against the heat in summer and extreme cold in winter due to the desert. Flat roofs are easier to construct and as there is not much rainfall, water will not collect on the rooftops.

26. Why is it that the houses in the Tarai region and in Goa and Mangalore have sloping roofs?

Answer: The houses in the Tarai region and in Goa and Mangalore have sloping roofs because they get heavy rain during the monsoon season. When there are sloping roofs, the rain water can easily flow off towards the ground or to a receptive unit where water is collected instead of collecting on the rooftop.

27. Why is it said that “Monsoon wind is known for its uncertainties”? Explain any three reasons.

Answer: Monsoon wind is known for its uncertainties because

- (i) The movement of low pressure trough controls the spatial distribution of rainfall.
- (ii) The alternation of wet and dry spells varies in intensity, frequency and duration.
- (iii) It sometime causes heavy floods in one part, it may be responsible for drought in other.
- (iv) It is often irregular in its arrival and retreat.

28. Why houses in Assam are built on stilts?

Answer: Most of the world's deserts are located in the Western margins of continents in the subtropics because the prevailing winds in the tropics are tropical easterly winds. The tropical easterly winds become dry by the time they reach the Western margins of the continents and so they bring no rainfall. Thus, the region becomes devoid of moisture which causes dry conditions leading to formation of deserts.

29. Why does most of Tamil Nadu not get much rain from the South-West monsoon during the period June-September?

Answer: This area falls in the leeward region of the Sahyadris (Western Ghats) and so it does not receive rain from the Arabian sea branch of the monsoon. The Bay of Bengal branch of the monsoon travels North-Eastwards to Assam and so bypasses Tamil Nadu almost totally. Thus, Tamil Nadu does not get rainfall from either branch of the advancing monsoon.

Long Answer Type Questions

1. What are the variations in Indian temperature?

- Answer:**
- (i) In summer, the maximum temperature goes up to 50°C in some parts of Rajasthan.
 - (ii) Whereas it may be around 20°C in Pehalgam in Jammu and Kashmir.
 - (iii) The night temperature at Drass in Jammu and Kashmir may be as low as minus 45°C.
 - (iv) Thiruvananthapuram, on the other hand may have a temperature of 20°C.
 - (v) In the Thar Desert, the day temperature may rise to 50°C and drop to 15°C the same night.
 - (vi) On the other hand, there is hardly any difference in the day and night temperatures in Andaman and Nicobar islands or in Kerala.

2. What are the variations in precipitation in India?

Answer: (i) There are variations not only in the form and types of precipitation but also in its amount and the seasonal distribution.

(ii) Precipitation is mostly in the form of snowfall in the upper parts of the Himalayas but it rains over the rest of the country.

(iii) The annual precipitation varies from 400 cm in Meghalaya to less than 10 cm in Ladakh and western Rajasthan.

(iv) Most parts of the country receive rainfall from June to September but some parts like the Tamil Nadu coast gets most of its rains during October and November.

3. What are the six major controls of the climate of the world?

Answer: (i) Latitude: Due to the round shape of the Earth, the amount of solar energy received varies according to latitude. As a result, air temperature decreases from the equator towards the poles.

(ii) Altitude: As one moves up to the higher altitudes, the atmosphere becomes less dense and temperature decreases. Therefore, hills are the cooler during summers.

(iii) Pressure and winds: Pressure and wind system of an area depend on the latitude and altitude of the place. Thus, it influences the temperature and rainfall pattern.

(iv) Distance from the sea: If the region is close to the sea, it makes the temperature moderate but if it is away from the sea, it experiences extreme weather conditions.

(v) Ocean currents: Ocean currents along with the onshore winds affect the climate of a coastal area. Any coastal area with warm or cold currents flowing past it, will become warm or cold if the winds are onshore.

(vi) Relief: High mountains act as barriers for cold and hot winds. They may also cause precipitation if they lie in the path of rain-bearing winds. The leeward side of mountains remains dry, whereas the windward side is able to receive rain.

4. State how the pressure and wind conditions over India are unique.

Answer:(i) During winter, a high pressure area develops north of the Himalayas.

(ii) Cold dry winds blow from this region to the low pressure areas over the oceans to the south.

(iii) In summer, a low pressure area develops over interior Asia as well as over northwestern India.

(iv) This causes a complete reversal of the direction of winds during summer.

(v) Air moves from the high pressure area over the southern Indian ocean in a south-westerly direction, crosses the equator and turns right towards the low pressure area over the Indian sub-continent.

(vi) These winds are known as south-west monsoon winds.

(vii) These winds blow over the warm oceans, gather moisture and bring widespread rainfall over the mainland of India.

5. What are jet streams? How do they affect the climate?

Answer: Jet streams are fast blowing winds moving in the upper air of the atmosphere. Sub-tropical Westerly Jet Streams: These jet streams are located approximately over 27°–30° north latitude; therefore, they are known as sub-tropical westerly jet streams. Over India, these jet streams blow south of the Himalayas all through the year except in summer. During winters, the cyclonic disturbances are brought into India by these jet streams. (ii) Tropical-easterly Jet Streams: These easterly jet streams blow over peninsular India, approximately over 14°N, during the summer months. It is believed to be responsible for the sudden outbreak of the south-west monsoon in India.

6. State the factors which help us understand the mechanism of monsoon. Or Discuss the mechanism of monsoons.

Answer: (i) 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. (ii) The shift in the position of Inter Tropical Convergence Zone (ITCZ) in summer over the Ganga plain is a trough of low pressure in the equatorial latitude. This is where the northeast and the Southeast trade winds converge.

(iii) The presence of the high pressure area, east of Madagascar also affects the Indian monsoons.

(iv) The Tibetan plateau gets intensely heated during summer, which results in the formation of low pressure area over the plateau.

(v) The movement of the westerly jet streams to the north of the Himalayas and the presence of tropical easterly jet streams over the Indian Peninsula during summers, also affects the mechanism of monsoon.

7. What do you understand by the phenomenon of ENSO?

Answer: (i) Normally, when the tropical eastern south pacific ocean experiences high pressure, the tropical eastern Indian Ocean experiences low pressure.

(ii) But in certain years, there is a reversal in the pressure conditions and the eastern pacific has low pressure in comparison to the Indian Ocean.

(iii) This periodic change in pressure conditions is known as Southern Oscillation (SO). (iv) The difference in pressure over Tahiti, in the Pacific Ocean and Darwin in northern Australia is computed to predict the intensity of the monsoon.

(v) A feature connected with the SO is the El Nino, a warm ocean current that flows past the Peruvian coast, in place of the cold Peruvian current every 2 to

5 years.

(vi) The changes in pressure conditions are connected to the El Nino. Hence, the phenomena is referred to as ENSO (El Nino Southern Oscillations).

8. What do you know about the onset of monsoon in India?

Answer: (i) Around the time of arrival of the monsoon, the normal rainfall increases suddenly and continues constantly for several days.

(ii) This is known as 'burst' of the monsoon and can be distinguished from the pre-monsoon showers.

(iii) The monsoon arrives at the southern tip of the Indian Peninsula generally by the first week of June.

(iv) Then it gets divided into two?the Arabian Sea branch and the Bay of Bengal branch. (v) The Arabian Sea branch reaches Mumbai about ten days later.

(vi) The Bay of Bengal branch also advances rapidly and arrives in Assam in the first week of June.

9. How does the process of withdrawal of monsoon take place in India?

Answer: (i) Withdrawal or the retreat of monsoon is a more gradual process.

(ii) The withdrawal of the monsoon begins in the northwestern states of India, by early September.

(iii) By mid-October, it withdraws completely from the northern half of the peninsula.

(iv) The withdrawal from the southern half of the peninsula is fairly rapid.

(v) By early December, the monsoon withdraws from the rest of the country.

10. State the chief characteristics of the cold weather season in India.

Answer: (i) Cold weather season takes place from December to February.

(ii) The temperature decreases from south to north.

(iii) The average temperature of the Northern Plains ranges between 10° to 50°C whereas the average temperature of Chennai is between 24°C to 25°C.

(iv) Days are warm and nights are cold. (v) During this season, northeast trade winds prevail over the country; they blow from the land to the sea and are dry.

(vi) Tamil Nadu coast receives rainfall, as these winds blow from the sea to the land.

(vii) The weather is marked by clear skies, low temperatures, low humidity and feeble variable winds.

11. What is the role of western disturbances' in the Indian climate?

Answer: (i) A characteristic feature of the cold weather season over the northern plains is the inflow of cyclonic disturbances from the west and the northwest.
(ii) These low pressure systems originate over the Mediterranean sea and Western Asia and move into India, along with easterly flow.
(iii) They cause the much needed winter rains over the plains and snowfall in the mountains.
(iv) Although the total amount of winter rainfall, locally known as 'Mahawat' is small, it is very useful for rabi crops. These winds are called western disturbances since they came from the western part of India.

12. State the chief characteristics of the hot weather season in India.

Answer: (i) India experiences the hot weather season from the month of March to May. (ii) The temperature in the northern plains of India is between 42 to 45°C and in the Deccan plateau, between 35 to 38°C.
(iii) Towards the end of May, an elongated low pressure area develops in the region extending from the Thar Desert to Patna and Chotanagpur plateau.
(iv) During the hot weather season, strong, gusty, hot, dry winds known as the 'Loo' blows. Direct exposure to these winds may even prove to be fatal.
(v) Dust storms are very common during the month of May in northern India. These storms bring temporary relief as they lower the temperatures.
(vi) This is also the season of localised thunderstorms associated with violent winds and torrential rains known as Kaal Baisakhi in West Bengal.

13. Give a brief account of how monsoons advance into India.

Answer: (i) In early June, the low pressure conditions over the northern plains intensify. (ii) These south-east trade winds cross the equator and blow in south- westerly direction, entering the Indian peninsula as the south-west monsoons.
(iii) As these winds blow over warm oceans, they bring abundant moisture to the sub-continent. (iv) These winds are strong and blow at an average velocity of 30 km per hour. (v) Early in the season, the windward side of the Western ghats receives very heavy rainfall, more than 250 cm.
(vi) The maximum rainfall of this season is received in the northeastern part of the country. Mawsynram in Khasi Hills receives the highest average rainfall in the world.
(vii) Rainfall in the Gangs valley decreases from east to the west Rajasthan and parts of Gujarat get scanty rainfall.

14. What do you understand by the phenomenon of 'breaks in the rainfall'?

Answer: (i) The Indian monsoon have wet and dry spells. The monsoon rains take place only for a few days, at a time. They are interspersed with rainless

intervals.

(ii) These breaks in monsoon are related to the movement of the monsoon trough.

(iii) The trough and its axis keeps on moving northward or southward which determines the distribution of rainfall.

(iv) When the axis of the monsoon trough lies over the plains, rainfall is good in these parts.

(v) On the other hand, whenever the axis shifts closer to the Himalayas, there are longer dry spells in the plains and widespread rains in the mountains catchment areas of the Himalayan rivers.

(vi) These heavy rains bring devastating floods that cause damage to life and property in the plains.

15. Give a brief account of the condition and characteristics of the retreating monsoons.

Answer: (i) This is the transition period during the months of October and November.

(ii) With the apparent movement of the Sun towards the south, the low pressure trough over the northern plains becomes weaker. This is gradually replaced by a high pressure system.

(iii) The south-west monsoon winds weaken and start withdrawing gradually.

(iv) By the beginning of October, the monsoon withdraws from the northern plains.

(v) The months of October and November form a period of transition from hot rainy season to dry winter conditions.

(vi) When monsoons retreat, skies get clear and the temperature rises.

(vii) While day temperatures are high, nights are cool and pleasant. The land is still moist.

(viii) Owing to the conditions of high temperature and humidity, the weather becomes oppressive during the day. This is commonly known as October Heat.

(ix) The low pressure conditions get transferred to the Bay of Bengal by early November. (x) The cyclonic depressions originate from the Andaman Sea and cause heavy and widespread rains on the eastern coast.

(xi) These tropical cyclones are often very destructive and affect the coast of Odisha, West Bengal and Bangladesh.

16. What is the distribution of rainfall in India?

Answer:(i) The western coast and northeastern India receive rainfall of over about 400cm.

(ii) It is less than 60 cm in western Rajasthan and adjoining parts of Gujarat, Haryana and Punjab.

(iii) Rainfall is equally low in the interiors of the Deccan plateau and east of the Sahyadris. (iv) A third area of low precipitation is around Leh in Jammu

and Kashmir.

(v) The rest of the country receives moderate rainfall.

(vi) Snowfall is restricted to the Himalayan region.

17. Why do the north-east trade winds change their direction while blowing through the Ganga valley?

Answer: (i) A feeble high pressure area develops over the north-western part of India in the cold weather season. Light winds begin to blow outwards.
(ii) These dry north-westerlies winds come; in contact with the Indian trades (north-easterlies) over the Ganga valley.
(iii) The direction of north-easterlies changes as a result of their contact as well as under the influence of topography.
(iv) Their direction is north-westerlies down the Ganga valley and northerlies over the Ganga-Brahmaputra Delta.
(v) Over the Bay of Bengal, the trade winds retain their original north-easterlies direction, as they are free from the influence of any topography over the sea.

18. Why is monsoon considered a unifying bond?

Answer: (i) The Himalayas protect the subcontinent from extremely cold winds from Central Asia. This enables northern India to have uniformly higher temperature when compared to other areas on the same latitude.
(ii) The Peninsular plateau under the influence of the sea from three sides has moderate temperatures.
(iii) The seasonal alternation of wind systems and the associated weather conditions provides a rhythmic cycle of seasons.
(iv) Even the uncertainties of rain and uneven distribution are very typical of the monsoon.
(v) The Indian landscape, its animals and plant life, its entire agricultural calendar and the life of the people including their festivities revolve around this phenomenon.
(vi) These monsoon winds bind the whole country by providing water to get the agricultural activities in motion. The river valleys which carry this water also unite as a single river valley unit.

19. Differentiate between South West (S.W.) monsoons and North East (N.E.) monsoons.

S.W. Monsoons	N.E. Monsoons
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They blow from south-west to north- east from June to September.	They blow from north-east to south-west from the month of Dec, Jan and Feb.
These are onshore humid winds because they blow from sea to land.	These are offshore dry winds because they blow from land to sea.
These are warm winds as they come from lower latitudes near equator.	They are rather cool winds because they blow from the north.
These warm and humid winds cause widespread rainfall.	These cold and dry offshore winds give no rains to India except Coromandel coast.
These winds are known for their vagaries or uncertainties.	They do not suffer from the vagaries.

Answer:

20. Why are the deltas of the Krishna, Kaveri and Godavari frequently struck by cyclones?

Answer: (i) The low pressure conditions over north-western India, get transferred to the Bay of Bengal by early November.
(ii) This shift is associated with the occurrence of cyclonic depressions which originate over the Andaman Sea.
(iii) These cyclones generally cross the eastern coasts of India and cause heavy and widespread rains.
(iv) These tropical cyclones are often very destructive.
(v) The thickly populated deltas of the Godavari, the Krishna and the Kaveri are frequently struck by cyclones, which cause great damage to life and property.
(vi) Sometimes, these cyclones arrive at the coasts of Odisha, W. Bengal and Bangladesh. The bulk of rainfall of the Coromandel coast is derived from depression and cyclones.

21. Which part of India experiences the highest diurnal range of temperature and why?

Answer: (i) Diurnal range of temperature is the difference between maximum and minimum temperature of a day.
(ii) Diurnal range of temperature is high in desert regions like Rajasthan, Thar Desert and interior parts of Rann of Kutch.
(iii) In these sandy areas, the day temperature may rise to 50° and drop down to near freezing point the same night.
(iv) It is so because the sand absorbs heat very fast during day and loses heat very fast at night.

22. Why does the rainfall decrease from east to the west in northern India?

Answer: (i) The northern plains receive rains from the Bay of Bengal branch of the S.W. monsoons.

(ii) It strikes the Myanmar's Arkan mountains and gets deflected westward along the Himalayas.

(iii) Maximum precipitation is recorded in the north-eastern part of India and West Bengal.

(iv) As the monsoon moves westwards, they gradually lose moisture and rainfall decreases from east to west over the northern plains.

(v) The clouds are almost exhausted by the time they reach western Rajasthan.

23. Give reasons why parts of Rajasthan, Gujarat and the leeward side of the Western Ghats are drought prone.

Answer: (i) Western Rajasthan and part of Gujarat are desert type regions with extreme climate. Intense thermal heating makes the desert land very dry.

(ii) The Arabian Sea branch runs parallel to Aravallis, providing no barriers to the clouds, leaving it again a dry region.

(iii) The Bay of Bengal branch is unable to reach up to western part and in winters even western disturbances also hardly give any rains to this region.

(iv) The leeward side of the Western Ghats also lies in the rain shadow of S.W. monsoon.

(v) With the result, regions lying at the same latitude are unable to receive rains, if they are on the leeward side of the Western Ghats.

24. Have you heard of onset of monsoons? How does it take place in India?

Answer: (i) With the arrival of monsoon, the normal rainfall increases suddenly and carries on for several days.

(ii) This is also known as 'burst of monsoon' and can be distinguished from the pre-monsoon showers.

(iii) The monsoon arises at Southern tip of Indian peninsula generally by the first week of June approximately.

(iv) Then it gets divided into two: The Arabian Sea branch and Bay of Bengal branch.

(v) Then it starts moving upwards, the Arabian Sea branch reaches Madhya Pradesh, U.P. in about ten days.

(vi) The Bay of Bengal branch also advances rapidly and arrives in Assam in the first week of June.

25. If you are living in North India, how would you experience cold weather season over there?

Answer: (i) Cold weather season normally takes place from December to February.
(ii) Temperature keeps on decreasing.
(iii) Average temperature is between 10° to 20° C.
(iv) Days are warm and nights are cold.
(v) North East trade winds blow from land to sea, which are incidentally cold and dry.
(vi) We prefer to wear woollen clothes and like to sit under the Sun.

26. How is the climate of India governed by the atmospheric condition? Explain with three suitable examples.

Answer: The climate of India is governed by the atmospheric conditions in the following ways Pressure and surface winds During winter, the North of Himalaya has a high pressure area and over the ocean, to the South, there is a low pressure area. So, cold wind blows towards the sea. In summer, a low pressure area develops over North-Western India. So, there is a complete reversal of direction of winds. So, wind rich in moisture gathered from ocean moves towards the mainland and brings widespread rainfall.
(ii) Upper air circulation It is dominated by a Westerly flow. Jet stream is one of its important components. These are located over 27°-30° North latitude, therefore, they are also called subtropical Westerly jet streams. This brings Western cyclonic disturbance in the North and North-Western India.
(iii) Tropical cyclones These occur during the monsoon as well as in October-November and are part of the Easterly flow. These disturbances affect the coastal regions of the country.

27. Write any four characteristics of Arabian Sea branch of South-West monsoons?

Answer: Any four characteristics of Arabian Sea branch of South-West monsoons are as follow
(i) The Arabian Sea branch strikes the Western Ghats between last week of May and first week of June and provides abundant rainfall.
(ii) This branch precipitates heavily along the Western coast from Kerala to Gujarat.
(iii) The Eastern part or leeward side of Western Ghats does not receive much rainfall. Therefore, Southern plateau remains comparatively dry.
(iv) Rajasthan receives scanty or almost no rainfall.

28. What is the ITCZ? What is its significance?

Answer: The North-East and South-East trade winds converge in a low pressure zone from about 5°N to 5°S, known as the Inter Tropical Convergence Zone (ITCZ). Solar heating in the region forces air to rise through convection, which results in widespread rain in this region. The ITCZ is a key

component of the global circulation system and this zone is the wettest area on the planet. The equatorial region does not have a dry season and is constantly hot and humid.

29. Mention any three characteristics of the Indian Monsoon.

Answer: Some features of the monsoon are

- (i) **Burst** Around the time of its arrival, the normal rainfall increases suddenly and continues constantly for several days. This is known as the 'burst' of monsoon.
- (ii) **Break** The monsoon has a tendency to have 'breaks' in rainfall. Thus, the rain is interspersed with rainless intervals.
- (iii) **Retreating Monsoon** This is the transition season of monsoons during October–November, when the monsoon winds are retreating.

30. "Location and relief are important factors in determining the climate of India" Explain the statement with examples.

Answer: Following are the ways in which location and relief features affect the climate of a place

- (i) **Location** The amount of solar energy varies according to latitude. Air temperature generally decreases on moving from equator to poles. This is why, Antarctic is the coldest region. When we move from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases. The hills, therefore, are cooler during summers.
- (ii) **Relief** High mountains act as barriers for cold and hot winds. They may also cause precipitation if they are high enough and lie in the path of rain-bearing winds. For example, the leeward side of mountains remains relatively dry.

31. Why is the distribution of rainfall in India not uniform? Explain any three reasons.

Answer: The reasons for the uneven distribution of rainfall in India are

- (i) **Relief and Topography** The windward side of mountains and hills receive more rainfall than leeward side.
- (ii) **Latitudinal and Longitudinal Extent** The tropical and coastal regions and plains receive more rainfall than the plateau and desert regions in the interior.
- (iii) **Vagaries of Monsoon** The unpredictability of the monsoon along with phenomena like monsoon troughs and depressions lead to uneven distribution of rainfall.

32. What are Western disturbances? How do they affect the climate of India?

Answer: The Western disturbances are weather phenomena of the winter months. These are the temperate cyclones which originate over Mediterranean Sea and Western Asia and move into India, along with the Westerly flow of jet streams. They disturb the calm and quiet weather of the North and North-Western India by causing cyclonic rains over the plains and snowfall in the mountains. Winter rainfall caused by them locally known as 'Mahawat' is of immense importance for the cultivation of rabi crops.

33. How does the change in pressure conditions over the Southern oceans affect the monsoons?

Answer: Southern oceans affects the monsoon over the conditions because
(i) When the tropical Eastern South Pacific Ocean experiences high pressure, the tropical Eastern Indian Ocean experiences low pressure. In this condition the monsoon rainfall will be average.
(ii) In some years, it is reverse when pressure difference is negative means below average and late monsoon.
(iii) The change in pressure conditions is connected to the El Nino.

34. What are jet streams and how do they affect the climate of India?

Answer: Jet streams are a narrow belt of high-altitude winds in the troposphere. The sub-tropical Westerly jet stream blowing South of the Himalayas are responsible for the Western cyclonic disturbances experienced in the North and North-Western parts of the country during the winter months. The sub-tropical Easterly jet stream blowing over peninsular India is responsible for the tropical cyclones that affect the Eastern coastal regions of India during the monsoon as well as during the October to November period.

35 Why are the delta regions of Eastern India struck by cyclones?

Answer: Owing to transfer of low pressure conditions over Bay of Bengal, this shift generate cyclonic depressions over Andaman sea. These cyclone coming under influence of retreating monsoon winds generally cross the Eastern coast and struck the thickly populated delta region of Godavari, Krishna and Kaveri rivers. These are often destructive and cause great damage to life and property.

36. How do the following factors influence the climate of India? (a) Latitude (b) Altitude (c) Distance from the sea

Answer: Following factors influence the climate of India are mention below (a) Latitude The part lying to the South of the Tropic of Cancer experiences the vertical rays of the sun but the part lying beyond the Tropic of Cancer

experiences the slanting rays of the sun therefore, India's climate has the characteristics of tropical as well as sub-tropical. (b) Altitude The Himalayas do not allow the cold Arctic winds to enter India, hence, it experiences milder winters. High mountains act as barriers and obstruct the winds to cause precipitation and the leeward side remains dry. (c) Distance from the Sea India has a long coastline and the sea exerts a moderating influence on the coastal areas.

37. Why is monsoon considered as a unifying bond?

Answer: The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons. Monsoon rains are unevenly distributed and typically uncertain. The Indian landscape, plant and animal life, agriculture, the people and their festivities, all revolve around the monsoon. They eagerly wait for its arrival and when it arrives, it binds the whole country by providing water to kick-start agricultural activities. That is why the monsoon is considered as a unifying bond.

38. Explain, what is monsoon? Name the two branches of monsoon and explain any one.

Answer: Monsoon refers to the seasonal reversal in the wind direction during a year. The two branches of monsoon are

- (a) Arabian Sea Branch
- (b) Bay of Bengal Branch

Bay of Bengal Branch

- (i) This branch of monsoon advances rapidly and arrives in the North-Eastern part of the country. Mawsynram in the Southern ranges of the Khasi hills receives the highest average rainfall in the world.
- (ii) The lofty mountains cause the monsoon winds to deflect towards the West over the Ganga plains.
- (iii) Delhi generally receives the monsoon showers from the Bay of Bengal branch by the end of the June.
- (iv) The Bay of Bengal branch merges with the Arabian Sea branch over the North-Western part of the Ganga plains.

39. Which part of India experiences the highest diurnal range of temperature and why?

Answer: The North-Western part of India comprising the Indian Desert experiences the highest diurnal range of temperature. This is because of the fact that sand (found in ample quantity in this region) gains and loses heat very quickly. As a result of this phenomenon, there is a wide difference between day and night temperatures in this region. The day temperature may rise to 50°C and drop down to near 15°C the same night.

40. What is El Nino? Explain any two features of it.

Answer: El Nino is a name given to the periodic development of warm ocean current along the coast of Peru as a temporary replacement of the cold Peruvian current. Features of 'El Nino' are as follows

- (i) The presence of the El-Nino' leads to an increase in sea-surface temperatures.
- (ii) It weakens the trade winds in the regions and causes heavy rainfall, floods or droughts in different regions of the world.

41. Differentiate between the cold weather season and the hot weather season in India by explaining two distinctive features of each.

Answer:

Cold Weather Season	Hot Weather Season
Northern India becomes a high pressure region, causing winds blowing outward.	Northern India becomes a low pressure region, causing air circulation, around it,
Temperatures are low and decreasing from the South to the North.	The global heat belt shifts Northwards, causing high temperatures in North India.

42. Why North-West India receives rainfall in winter? Give any three reasons.

Answer: North-West India receives rainfall in winter because

- (i) Cyclonic disturbances occur from the West and the North-West.
- (ii) These low-pressure systems, originate over the Mediterranean Sea and Western Asia and move into India, along with Westerly flow.
- (iii) They cause winter rains over Punjab, Haryana and Northern Plains.

43: How is the Arabian Sea branch of South-West monsoons responsible for good rainfall in Northern Plains of India? Why doesn't it give rain in Central Peninsula?

Answer:(i) The part of South-West Monsoons which blows over Arabian sea is responsible for high rainfall on the Western coast of India.

(ii) These winds enter through Saurashtra and enter Northern plains. These winds strike the Himalayas and give fairly good rainfall as they have abundant moisture.

(iii) South-West monsoons are perpendicular to the direction of Western Ghats. Thus, they give heavy rainfall on the windward side of the Western Ghats.

(iv) Central Peninsula lies on the leeward side of the Western Ghats. Thus, Arabian Sea branch of South-West monsoon does not reach this region.

44: Define burst of monsoons. Give an account of the climatic conditions of the cold weather season in India,

Answer: When monsoons arrive in India, the normal rainfall increases suddenly and continues constantly for several days. This is called burst of monsoon. Climatic conditions of the cold weather.

- (i) Cold weather season prevails from November to February.
- (ii) The temperature decreases from South to the North.
- (iii) Days are warm and nights are cold.
- (iv) The North-East trade winds prevail over the country. From these winds some amount of rainfall occurs on the Tamil Nadu coast.
- (v) The weather is marked by clear sky, low temperatures and low humidity and feeble, variable winds.
- (vi) Low pressure systems, originate over the Mediterranean Sea and move into India, along with the Westerly flow. They cause the much needed winter rains over the plains and snowfall in the mountains

45: Why are South-West monsoons less rainy in Tamil Nadu? Explain.

Answer: Tamil Nadu happens to be in the rain shadow area (Tamil Nadu is on the leeward side of the Western Ghats which obstructs the South-West monsoon.) The section of Western Ghats bordering Tamil Nadu and Kerala captures the South-West monsoon from the Arabian Sea branch. Therefore, South-West monsoon winds provide less rainfall in Tamil Nadu. This region receives rainfall from retreating monsoon.

46. Define 'Kal Baisakhi' and 'Loo'. In which parts of India are they experienced? Or Define Kaal Baishakhi, Mango Showers and Loo.

Answer: Kal Baisakhi These are local thunderstorms associated with violent winds, torrential downpours, often accompanied by hail. Loo These are strong, gusty, hot, dry winds blowing during the day over the North and North-Western India. Sometimes they even continue until late in the evening. Direct exposure to these winds may even prove to be fatal. Mango Showers Towards the close of summer season, pre-monsoon showers are common, especially in Kerala and Karnataka. They help in early ripening of mangoes. These are called as mango showers.

47. Why do the Western Ghats receive more rainfall than the Eastern Ghats? Explain briefly.

Answer: Western Ghats receive more rainfall than the Eastern Ghats because

- (i) Western Ghats receive rainfall from the Arabian Sea monsoon winds. As these winds blow over warm oceans, they bring abundant moisture.
- (ii) The Ghats do not allow the winds to cross over without shedding their

moisture on the Western slopes.

(iii) When these winds reach the Eastern coast, they are almost dry.

(iv) Another branch of South-West monsoon i.e., the Bay of Bengal branch moves parallel to the Eastern coast. In this way, this region is located in an unfavourable position with reference to the monsoon winds.

48. "Indian monsoon is said to be a unifying bond for the people of the country." Suppose the monsoon is disturbed for a prolonged period of time. What do you think, how will it affect the country?

Answer: In the following ways it will affect the country

(i) There will be a change in landscape.

(ii) The fauna and flora will be disturbed.

(iii) Due to change in cycle of season, Indian agricultural cycle will be disturbed.

(iv) Many of the festivals like Baisakhi, Pongal, Onam, Bihu, etc will come to an end.

(v) Rivers will run short of water so religious rituals will be disturbed.

(vi) Drinking water will go short.

(vii) River navigation and many of the recreational activities will come to halt.

49. Explain any four features of advancing monsoon with reference to India.

Answer: These are any four features of advancing monsoon

(i) Monsoon has two branches. The Arabian Sea branch reaches Mumbai in the second week of June. By mid-June, it reaches Gujarat and Central India.

(ii) The Bay of Bengal branch reaches Assam in the first week of June. Due to lofty mountains, it deflects towards the West over the Ganga plains.

(iii) The two branches merge over the North-Western part of Ganga plains.

(iv) By the first week of July, Western UP, Punjab, Haryana and Eastern Rajasthan receive the monsoon.

50. Where is Mawsynram located? Why does Mawsynram receive the highest amount of rainfall?

Answer: Mawsynram is located in the Southern ranges of the Khasi hills at a height of 1500 m above the sea level. It receives the highest (annual rainfall 1140 cm) rainfall of the world. Mawsynram receives the highest amount of rainfall because

(i) This place is enclosed by hills on three sides.

(ii) The relief features give this place a funnel-shaped location.

(iii) The Bay of Bengal monsoon is trapped in these hills. These winds try to get out of it, but are forced to pour down there.

51. Distinguish between the South-West Monsoon and North-East Monsoon.

South-West monsoon	North-East Monsoon
This season is from June to September	This season starts from December and ends in February.
It does not rain continuously. There are rainless intervals in this season.	It does not possess any rainless intervals.
It blows in India as the Arabian Sea branch is due to this type of monsoon.	Minor portion of the annual rainfall in India is due to this of monsoon.

Answer:

52. Why does the rainfall decrease from the East to the West in Northern India?

Answer: In summer, the monsoons rise both from the Bay of Bengal and the Arabian sea. The monsoons which rise from the Bay of Bengal cause heavy rainfall in the Brahmaputra valley and the Meghalaya hills (e.g., in Mawsynram). Because of the Himalayas, the monsoon winds then take a Western turn and move up the Ganga valley, but as they proceed Westwards, they become drier and therefore they cause less and less ram as they move forward. As such, Kolkata gets an annual rainfall of 119 cm, Patna 105 cm, Allahabad 76 cm and Delhi 56 cm.

53. Give an account of weather conditions and characteristics of the cold season.

Answer: The cold weather season begins from November in Northern India and stays till February. December and January are the coldest months in the Northern part of India.

- (i) The weather is normally marked by clear sky, low temperatures, low humidity and feeble variable winds.
- (ii) Days are warm and nights are cold. Frost is common in the North and higher slopes of the Himalayas experience snowfall.
- (iii) During this season, the North-East trade winds blow from land to sea and hence for most parts of the country it is a dry season. Some amount of rainfall occurs on the Tamil Nadu coast from these winds as they blow there from sea to land.
- (iv) A characteristic feature of the cold weather season over the Northern plains is the inflow of cyclonic disturbances from the West and the North-West. The low pressure systems originate over the Mediterranean sea and Western Asia and move into India along with the Westerly flow. They cause the much needed winter rains over the plains and snowfall in the mountains.
- (v) Although the total amount of winter rainfall locally known as 'Mahawat' is

small, it is of immense importance for the cultivation of Rabi crops.

(vi) The peninsular region does not have a well defined cold season. There is hardly any noticeable change in temperature pattern during winter due to the moderating influence of the sea. This types of question will not be asked in the examination. Only two or three sub-parts will be asked

54. Describe the climatic conditions of India during retreating monsoon. Or Describe any three main features of retreating monsoon.

Answer: Following are the phenomena of the retreating monsoons

(i) It occurs in the months of October and November.

(ii) The monsoon trough or the low pressure trough over the Northern plains becomes weaker and it is gradually replaced by a high-pressure system.

(iii) The South-West monsoon winds weaken and start withdrawing gradually. The months of October–November from a period of transition from hot rainy season to dry winter conditions.

(iv) The retreat of the monsoon is marked by clear skies and rise in temperature.

(v) Day temperatures are high, nights are cool and pleasant. The weather becomes rather oppressive during the day, it is commonly known as 'October heat'.

55. Describe the regional variations in the climatic conditions of India with the help of suitable examples.

Answer: There are regional variations in the climatic conditions of India which can be understood with the help of the following examples (i) The months of December and January are the coldest in Northern India where the temperature ranges between 10°–15°C. (ii) In summer, the mercury occasionally touches 50°C in some parts of the Rajasthan desert, whereas it might be around 20°C in Pahalgam in Jammu and Kashmir. (iii) On a winter night temperature at Drass town in Jammu and Kashmir may be as low as –40°C. Thiruvananthapuram on the other hand may have a temperature of 22° C. (iv) Annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and Western Rajasthan. In the Himalayas precipitation is in the form of snow fall. (v) Coastal regions do not experience much variation in temperature pattern due to the moderating influence of the sea.

56. Discuss the mechanism of monsoons.

Answer: The climate of India is described as the monsoon type

(i) The factors affecting the climate of an area are latitude, altitude, pressure and wind system as well as distance from the sea.

(ii) India lies in the region of North–Easterly winds. These winds originate

from the sub-tropical high pressure belt in the Northern Hemisphere, get deflected to the right due to the Coriolis force and move on towards the equatorial low pressure area.

(iii) In summer, a low pressure area develops over interior Asia and North-Western India. This causes complete reversal of the direction of the winds. Air moves from the high pressure area over the Southern Indian Ocean, crosses the equator and turns right towards the low pressure areas over the Indian sub-continent. These are known as the South-West monsoon winds. These winds blow over the warm oceans, gather moisture and bring widespread rainfall over the mainland of India.

(iv) The upper air circulation in this region is dominated by a Westerly flow.

(v) The duration of the monsoon is between 100-120 days from early June to mid-September.

(vi) The Southern Oscillation (SO) and jet streams also affects the monsoon.

57. "India has diverse climatic conditions". Explain by giving two examples each of temperature and precipitation. Or "India has diverse climatic conditions." Support this statement by giving three examples. Or Describe the regional variation in climate conditions of India with the help of suitable examples.

Answer: Regional variations in the climatic conditions in India

(i) In summer, the mercury occasionally touches 50° C in some parts of the Rajasthan desert, whereas it may be around 20° C in Pahalgam in Jammu and Kashmir.

(ii) On a winter night, temperature at Drass in Jammu and Kashmir may be as low as -45°C. Thiruvananthapuram, on the other hand, may have a temperature of 22°C.

(iii) The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and Western Rajasthan.

(iv) Most parts of the country receive rainfall from June to September. But some parts like the Tamil Nadu coast gets a large portion of its rain during October and November.

(v) While precipitation is mostly in the form of snowfall in the upper parts of Himalayas it rains over the rest of the country.

(iv) Coastal areas experience less contrasts in temperature conditions. Seasonal contrasts are more in the interior of the country.

(vii) There is decrease in rainfall generally from East to West in the Northern plains.

58. "The monsoon is considered a unifying bond in India". What moral values you could inculcate from this statement?

Answer: Following are the moral values that the very unifying nature of the monsoon inculcate in us

(i) Bringing happiness to all without any bias.

(ii) Service to the mankind without any desire.

- (iii) Developing the feelings of integrity and oneness.
 - (iv) Respect for variations and differences.
 - (v) Treating all whether it be a plant, an animal or humans equally to the best.
 - (vi) Providing life and livelihood to all.
 - (vii) Promoting equality and uniformity.
 - (viii) Leading a routine and disciplined life.
 - (ix) Respecting the value of time.
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