

Very Short Answer Questions

Q.1. What is Climate?

Ans. 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).

Q.2. What does 'weather' mean?

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

Q.3. What are the elements of weather and climate?

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

Q.4. What is the climate of India?

Ans. India's climate is described as 'Monsoon Type' climate.

Q.5. What is the variation of temperature in India?

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

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

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

Q.7. Define the term 'Monsoon'.

Ans. 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.

Q.8. Why are hills cooler during summer and people prefer to go to hill stations?

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

Q.9. Which tropic passes just from the centre of India?

Ans. Tropic of Cancer.

Q.10. Which surface winds are blowing from India?

Ans. India lies in the regions of north easterly winds.

Q.11. What is Coriolis force?

Ans. 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.

Q.12. What are Jet Streams?

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

Q.13. What are Western cyclonic disturbances?

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

Q.14. What do you understand by ITCZ?

Ans. 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.

Q.15. How does the presence of high pressure in the east of Madagascar affect the Indian monsoon?

Ans. 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.

Q.16. What do you understand by the term SO?

Ans. 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.

Q.17. What is El Nino?

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

Q.18. What does ENSO Mean?

Ans. 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.

Q.19. Name the two branches of South-west Monsoons of India.

Ans. (i) Arabian sea Branch **(ii)** Bay of Bengal Branch

Q.20. What is 'Mahawat'?

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

Q.21. What is 'Loo'?

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

Q.22. What is 'Kaal Baisakhi'?

Ans. 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.

Q.23. What are 'Mango-Showers'?

Ans. 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.

Q.24. Which region of India receives the highest rainfall in the world?

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

Short Answer Questions

Q.1. What do you know about 'South-Western Monsoon winds?

Ans. 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.

Q.2. Name the four main seasons of India.

Ans. Four main seasons of India are:

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

Q.3. What does 'breaks in rainfall' mean?

Ans. 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.

Q.4. How do heavy floods occur during monsoons?

Ans. 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.

Q.5. How is monsoon known for its uncertainty?

Ans. Monsoon is known for its uncertainties. The alteration of dry and wet spells of rains varies in intensity frequency and duration, while it causes heavy floods in one part, it may be responsible for droughts in the other.

Q.6. Differentiate between climate and weather.

Ans. (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.

Q.7. What type of climate does India have?

Ans. (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.

Q.8. Why does India have a monsoon type of climate?

Ans. (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 Indian subcontinent, the Himalaya's guide the flow of the monsoon winds bringing the whole of subcontinent under the influence of these 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.

Q.9. How does the latitude affect India's climate?

Ans. (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.

Q.10. How does altitude affect the climate of India?

Ans. (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.

Q.11. What is the coriolis force? Describe its effect briefly on the world climate.

Ans. 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.

Q.12. What are western cyclonic disturbances?

Ans. (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.

Q.13. What are Tropical cyclones?

Ans. (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.

Q.14. Give a brief note on the 'Inter Tropical Convergence Zone'.

Ans. (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.

Q.15. How is monsoon known for its uncertainties?

Ans. (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.

Q.16. What do you understand by 'October Heat'?

Ans. (i) In the month of October, day temperatures are high, nights are cool and pleasant. The land is still moist. Monsoon winds retreat.

(ii) Owing to the conditions of high temperature and humidity, the weather becomes oppressive during the day. Sky is clear.

(iii) This condition is commonly known as October Heat.

Q.17. Why are Thiruvananthapuram and Shillong rainier in June?

Ans. (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.

Q.18. Why is July rainier in Mumbai than in Thiruvananthapuram?

Ans. (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.

Q.19. Why are South West (S.W.) monsoons less rainy in Chennai?

Ans. (i) Chennai is located on the Coromandel coast. It lies in the rainshadow 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.

Q.20. Why is Shillong rainier than Kolkata?

Ans. (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.

Q.21. How does Delhi receive more rainfall than Jodhpur?

Ans. (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.

Q.22. Why has Leh moderate precipitation almost throughout the year?

Ans. Leh is also called a cold desert.

(i) Leh has moderate precipitation almost 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.

Long Answer Questions

Q.1. What are the variations in precipitation in India?

Ans. (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.

Q.2. What are the six major controls of the climate of the world?

Ans. (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 fast, 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.

Q.3. State how the pressure and wind conditions over India are unique.

Ans.

- During winter, a high pressure area develops north of the Himalayas.
- Cold dry winds blow from this region to the low pressure areas over the oceans to the south.
- In summer, a low pressure area develops over interior Asia as well as over northwestern India.
- This causes a complete reversal of the direction of winds during summer.
- 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.
- These winds 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. State how the pressure and wind conditions over India are unique.

Q4. What do you understand by the phenomenon of ENSO?

Ans. (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 Niño, 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 phenomenon is referred to as ENSO (El Nino Southern Oscillations).

Q.5. How does the process of withdrawal of monsoon take place in India?

Ans. (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.

Q.6. What is the role of 'western disturbances' in the Indian climate?

Ans. (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.

Q.7. State the chief characteristics of the hot weather season in India.

Ans. (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.

Q.8. Give a brief account of how monsoons advance into India.

Ans. (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 Ganges valley decreases from east to the west Rajasthan and parts of Gujarat get scanty rainfall.

Q.9. Give a brief account of the condition and characteristics of the retreating monsoons.

Ans.

- This is the transition period during the months of October and November.
- 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.
- The south-west monsoon winds weaken and start withdrawing gradually.
- By the beginning of October, the monsoon withdraws from the northern plains.
- The months of October and November form a period of transition from hot rainy season to dry winter conditions.
- When monsoons retreat, skies get clear and the temperature rises.
- While day temperatures are high, nights are cool and pleasant. The land is still moist.
- Owing to the conditions of high temperature and humidity, the weather becomes oppressive during the day. This is commonly known as October Heat.
- The low pressure conditions get transferred to the Bay of Bengal by early November.
- The cyclonic depressions originate from the Andaman Sea and cause heavy and widespread rains on the eastern coast.

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

Q.10. What is the distribution of rainfall in India?

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

(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.

Q.11. Differentiate between South West (S.W.) monsoons and North East (N.E.) monsoons.

Ans.

S.No.	S.W. Monsoons (Advancing monsoon)	N.E. Monsoons (Retreating Monsoon)
1.	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.
2.	These are onshore humid winds because they blow from sea to land.	These are offshore dry winds because they blow from land to sea.
3.	These are warm winds as they come from lower latitudes near equator.	They are rather cool winds.
4.	These warm and humid winds cause widespread rainfall.	These cold and dry offshore winds give no rains to India except Coromandel coast.
5.	These winds are known for their vagaries or uncertainties.	They do not suffer from the vagaries.

Q.12. Why do the north-east trade winds change their direction while blowing through the Ganga valley?

Ans. (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 this 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.

Q.13. Why are the deltas of the Krishna, Kaveri and Godavari frequently struck by cyclones?

Ans. (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.

Q.14. Which part of India experiences the highest diurnal range of temperature and why?

Ans. (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.

Q.15. Give reasons why parts of Rajasthan, Gujarat and the leeward side of the Western Ghats are drought prone.

Ans. (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 rainshadow 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.

Q.16. Have you heard of onset of monsoons? How does it take place in India?

Ans. (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.

HOTS (Higher Order Thinking Skills)

Q.1. "A relief feature has a major role to play in determining the climate of a place. Support the statement with any three relevant examples.

Ans. (i) Altitude: As one moves up to the higher altitudes, the atmosphere becomes less dense and temperature decreases. Therefore, hills cool down during summers.

(ii) 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 sides of mountains remain dry, whereas windward side is able to receive rain.

(iii) North Eastern hills: The maximum rainfall of the season is received in the north eastern hills. Garo, Khasi and Jaintia Hills located in Meghalaya traps the South West monsoon clouds and cause world's highest rainfall in Mawsynram in Meghalaya.

Q.2. Is it correct to say that India would have been an arid land without monsoon? Support your answer with five arguments.

Ans. India's climate depends entirely on Monsoons.

Five reasons are:

(i) Since Western Rajasthan do not receive rainfall, it is an arid and sandy region.

(ii) North Eastern winds which are prevailing in India are moving from land to sea, therefore they are dry. But due to deflection in the winds coming from South West direction, India does receive rains.

(iii) Without Monsoons we might not be having thick forests level.

(iv) Without Monsoon, Indian farmers might not be able to irrigate their lands in Peninsular India, as Peninsular rivers are seasonal and totally dependent on rains.

(v) The North Eastern Hills and Western Ghats are covered with lush green forests only because of Heavy rain in both these areas, or these areas might have been arid.

Q.3. What would have been the climate of India if the Himalayas were not in existence along the Northern Borders of India?

Ans. (i) India has Himalayas located at its north which have an average height of 6,000 mts.

(ii) The Himalayas prevent the cold winds from Central Asia from entering India.

(iii) Himalayas are also able to stop the South West monsoon winds, which cause rainfall in the northern plains of India.