

Introduction:

Climate refers to the sum total of weather conditions and variations over a large area for a long period of time (more than thirty years). Weather refers to the state of the atmosphere over an area at any point of time.

The elements of weather and climate are the same, i.e. temperature, atmospheric pressure, wind, humidity and precipitation. The climate of India is described as the 'monsoon' type. In Asia, this type of climate is found mainly in the south and the southeast.

FACTORS AFFECTING INDIA'S CLIMATE:

There are six major controls of the climate of any place. They are:

1. LATITUDE,
2. ALTITUDE,
3. PRESSURE AND WIND SYSTEM,
4. DISTANCE FROM THE SEA
5. OCEAN CURRENTS
6. RELIEF FEATURES.

THE INDIAN MONSOON

The climate of India is strongly influenced by monsoon winds. The sailors who came to India in historic times were one of the first to have noticed the phenomenon of the monsoon. They benefited from the reversal of the wind system as they came by sailing ships at the mercy of winds. The Arabs, who had also come to India as traders named this seasonal reversal of the wind system 'monsoon'.

The monsoons are experienced in the tropical area roughly between 20° N and 20° S. To understand the mechanism of the monsoons, the following facts are important.

- (a) 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.
- (b) The shift of the position of Inter Tropical Convergence Zone (ITCZ) in summer, over the Ganga plain (this is the equatorial trough normally positioned about 5°N of the equator. It is also known as the monsoon trough during the monsoon season).
- (c) The presence of the high-pressure area, east of Madagascar, approximately at 20°S over the Indian Ocean. The intensity and position of this high-pressure area affects the Indian Monsoon.
- (d) The Tibetan plateau gets intensely heated during summer, which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level.
- (e) The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer.

THE SEASONS: The monsoon type of climate is characterised by a distinct seasonal pattern. The weather conditions greatly change from one season. Four main seasons can be identified in India – the cold weather season, the hot weather season, the advancing monsoon and the retreating monsoon with some regional variations.

DISTRIBUTION OF RAINFALL

- Parts of western coast and north eastern India Receive over about 400 cm of rainfall annually.
- Less than 60 cm in western Rajasthan and adjoining parts of Gujarat, Haryana and Punjab.

- Rainfall is equally low in the interior of the Deccan plateau, and east of the Sahyadris.
- A third area of low precipitation is around Leh in Jammu and Kashmir.
- The rest of the country receives moderate rainfall.
- Snowfall is restricted to the Himalayan region.
- The annual rainfall is highly variable from year to year.
- Variability is high in the regions of low rainfall such as parts of Rajasthan, Gujarat and the leeward side of the Western Ghats.
- Areas of high rainfall are liable to be affected by floods, areas of low rainfall are drought-prone

Multiple Choice Questions (MCQ) (1 Mark)

Q.1 Choose the right term: it refers to the state of the atmosphere over an area at any point of time.

- (a) Climate (b) Humidity (c) Weather (d) Rainfall

Q.2 Which type of climate prevails in India ?

- (a) Mediterranean (b) China Type (c) Equatorial (d) Monsoon

Q.3 Which of the following receive most of its rain during October and November?

- (a) Rajasthan (b) Tamil Nadu (c) Punjab (d) Kerala

Q.4 Which of the following latitudes pass through the middle of the country?

- (a) Tropic of cancer (b) Tropic of Capricorn (c) Equator (d) Arctic Circle

Q.5 Indian subcontinent experiences comparatively mild winters as compared to Central Asia because of.....

- (a) The Himalayas (b) Mizoram (c) Northern Plains (d) Thar Desert

Q.6 Which of the following winds are responsible for the bulk of rainfall in India?

- (a) Southwest Monsoon (b) Northeast Monsoon (c) South north Monsoon (d) Westerlies

Q.7 What is ITCZ ?

- (a) Inter Tropical Converter zone (b) Inter Tropical Convergence zone
(c) Indian Tropical Converter zone (d) None of these

Q.8 In which of the following months the Monsoon retreats?

- (a) August (b) September (c) October (d) November

Q.9 Which of the following is not a climatic condition of the cold season of India?

- (a) High Rainfall (b) Clear Sky (c) Low Temperature (d) Low Humidity

Q.10 Which of the following crops is benefited because of winter cyclonic disturbances?

- (a) Rabi Crops (b) Kharif Crops (c) Zaid Crops (d) None of These

Q.11 What is Loo ?

- (a) These are Cyclones (b) These are Cold Winds
(c) Strong, Dusty, hot, Dry winds blowing during the day over the north and western India
(d) These are variable winds blowing in cold season

Q.12 Which of the following two states are affected by pre monsoon showers ?

- (a) Kerala, Punjab (b) Punjab, Haryana (c) Kerala, Karnataka (d) Haryana,

Rajasthan

Q.13 Which is the Wettest city of India ?

- (a) Cherapunji (b) Mawsynram (c) Barmer (d) Ladakh

Q.14 In which of the following hills Mawsynram located ?

- (a) Khasi Hills (b) Aravalli Hills (c) Nilgiri Hills (d) Anaimalai Hills

Q.15 Which of the following is responsible for the bulk of rainfall in the coromandal coast ?

- (a) South West Monsoon (b) North East Monsoon
(c) Western Disturbance (d) Depressions and Cyclones

Q.16 Which one of the following places receives the highest rainfall in the world?

- (a) Silchar (c) Cherrapunji (b) Mawsynram (d) Guwahati

Q.17 The wind blowing in the northern plains in summers is known as:

- (a) *Kaal Baisakhi* (c) Trade Winds (b) *Loo* (d) None of the above

Q.18 Which one of the following causes rainfall during winters in north-western part of India?

- (a) Cyclonic depression (c) Western disturbances
(b) Retreating monsoon (d) Southwest monsoon

Q.19 Monsoon arrives in India approximately in:

- (a) Early May (c) Early June (b) Early July (d) Early August

Q.20 Which one of the following characterises the cold weather season in India?

- (a) Warm days and warm nights (b) Warm days and cold nights
(c) Cool days and cold nights (d) Cold days and warm nights

Short Answer Questions(3 Marks)

Q.1 Define Climate. What are the elements of climate?

Ans:

- Climate refers to the sum of total weather conditions and their variations over a large area for a long period of time (more than thirty years).
- The elements of weather and climate are the same i.e. temperature, atmospheric pressure, wind, humidity and precipitation.

Q.2 What are the controlling elements of the climate of India?

Ans India's climate is controlled by latitude, altitude, pressure and winds, distance from the sea, ocean currents and physiography.

Q.3 Discuss the unifying role of the Indian monsoon.

Ans There is great diversity of the climatic conditions in India due to different locations and land relief patterns. But these diversities are subdued by the monsoon, which blow over the whole country. The arrival of the monsoon is welcomed all over the country.

- Several festivals are celebrated welcoming the monsoonal rainfall in India.
- The monsoonal rainfall provides water for agricultural activities.
- Monsoon gives relief from the scorching heat. The entire life of the Indian people revolves around the monsoon.

Q.4 Distinguish between weather and Climate.

Ans

Weather	Climate
i. Weather refers to the state of the atmosphere at any point of time and place.	i. Climate refers to the sum of total weather conditions and variations over an area for a long period of time (more than 30 years).
ii. Weather conditions may vary at intervals of a few hours or a few days.	ii. Climate does not change so frequently.
iii. Weather data are the observations recorded at a specific time.	iii. Climate refers to the average value of several elements of weather, relating to a period of more than 30 years.

Q.5 Give three characteristics of monsoonal rainfall in India.

Ans Characteristics of monsoon rainfall are:-

- i. Early in the season, the windward side of the Western Ghats receives heavy rainfall i.e. more than 250 cm.
- ii. The rain shadow areas of Deccan Plateau and parts of Madhya Pradesh receive scanty rainfall. The maximum rainfall is recorded in the north eastern part of the country.
- iii. The frequency and intensity of tropical depressions determine the amount and duration of monsoon rains.

Q.6 What are the western disturbances?

Ans Western Disturbance is the term used in India, Pakistan, Afghanistan and Nepal to describe an extra tropical storm originating in the Mediterranean that brings sudden winter rain and snow to the northwestern parts of the Indian subcontinent. This is a non-monsoonal precipitation pattern driven by the Westerly. The moisture in these storms usually originates over the Mediterranean Sea and the Atlantic Ocean.

Q.7 What is El Nino? Mention any of its two effects.

Ans El Nino is a warm ocean current that flows over Peru in an interval of two to five years. The term El Nino, derived from Spanish, means 'the child', i.e. baby Christ. It flows in the month of December.

Its effects are :-

- i. Surface temperature in sea is increased.
- ii. Trade winds in the region are weakened.

Q.8 What are the six controlling elements of the climate of India?

Ans India's climate is controlled by

1. Latitude
2. Altitude
3. Pressure and winds
4. Distance from the sea
5. Ocean currents
6. Physiography

Q.9 What is a monsoon?

Ans The term Monsoon is derived from the Arabic word 'mausim', meaning season, applied by the Arabs to the seasonal winds of the Arabian Sea. Monsoon winds mean a complete reversal in the direction of wind over a large part of the land, causing seasons.

Q.10 What do you understand by the term 'burst of monsoon'? What are the two branches of

Indian monsoon?

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

Monsoon gets divided into two branches-

- (i) The Arabian Sea branch: The Arabian Sea branch reaches Mumbai, as the name suggests it strikes India from Arabian Sea side.
- (ii) The Bay of Bengal branch: The Bay of Bengal branch also advances rapidly and arrives in Assam in the first week of June. This branch is responsible for giving Meghalaya the highest rainfall in the world.

Q.11 What is Inter Tropical Convergence Zone? Write two features.

Ans

1. Intertropical Convergence Zone (ITCZ) is the area encircling the earth near the equator where winds originating in the northern and southern hemispheres come together. This is a low-pressure tropical trough.
2. In summer it is over the Ganga plain. This equatorial trough is normally positioned about 5°N of the equator. It is also known as the monsoon trough during the monsoon season.
3. This trough keeps on changing its position according to the time of the year.

Q.12 Explain any three factors that affect the climate of a place?

(Ans) Factors that affect the climate of a place are:

1. Latitude: Due to the curvature of the earth, the amount of solar energy received varies according to the latitude. As a result, air temperature decreases from the equator towards the poles.
2. Altitude: As one goes from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases. The hills are therefore cooler during summers.
3. Distance from the sea: The sea exerts a moderating influence on climate. As the distance from the sea increases, its moderating influence decreases and the people experience extreme weather conditions.

Q.13 Write any three features of western cyclonic disturbances?

Ans Three features of western cyclonic disturbances are:

1. The western cyclonic disturbances are weather phenomena of the winter months brought in by the westerly flow from the Mediterranean region.
2. They usually influence the weather of the north and north-western regions of India.
3. Tropical cyclones 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.

Long Answer Questions (5 Marks)

Q.1 Discuss the mechanisms of the Indian monsoons.

Ans The mechanism of Indian Monsoons:-

- (i) The different heating and cooling of land and water: At the end of May, due to high

temperature, low pressure is created on the landmass of India while seas around experience comparatively high pressure. It fixes the direction of the moisture laden wind from sea to land.

- (ii) The shift of the position of Inter Tropical Convergence Zone (ITCZ) : In summer, low pressure trough is positioned over the Ganga plain, making the region suitable for the occurrence of rain.
- (iii) The intensity and position of the high atmospheric pressure over the Indian Ocean affects the Indian monsoon.
- (iv) The Tibetan plateau gets intensely heated during summer which results in strong vertical air currents and formation of high pressure over the plateau at about 9km above the sea level.
- (v) The movements of the westerly Jet Streams to the north of the Himalayas and the presence of the tropical easterly Jet Streams over the Indian Peninsula during the summer affects monsoon.

Q.2 Distinguish between South-west monsoon and North-east monsoon.

Ans

South-West Monsoon	North-East Monsoon
i) The season is from June to September.	i) This season starts from December and ends in February.
ii) It does not rain continuously. There are rainless intervals in this season.	ii) It does not possess any rainless intervals.
iii) It blows in India in two branches namely the Arabian Sea branch and Bay of Bengal branch.	iii) It does not have any branches.
iv) Major portion of annual rainfall in India is due to this type of monsoon.	iv) Minor portion of the annual rainfall in India is due to this type of monsoon.

Q.3 Distinguish between Equable climate and Continental climate.

Ans

Equable Climate	Continental Climate
i) Area which are neither too warm in summers nor too cold in winters (with low range of temperature) are said to have an equable climate.	i) Places with higher range of temperature (extremes of temperature) Experience extreme climate, it is known as continental climate.
ii) Equable climates are characterized by well distributed rainfall throughout the year.	ii) Rainfall in extreme climate is restricted to summer months.
iii) This type of climate is found in places located close to the sea having the moderating influence of the sea.	iii) Interiors of continents/countries which have the least influence of the sea experience have this type of climate.

iv) Chennai, Cochin, Mumbai etc.

iv) Delhi, Kanpur, Bhopal etc.

HOTS

1. Why the houses in Rajasthan have thick walls and flat roofs?
2. Why is it that the houses in the Tarai region and in Goa and Mangalore have sloping roofs?
3. Why houses in Assam are built on stilts?
4. How the location and relief are important factors in determining the climate of India ?

Map Questions (4 Marks)

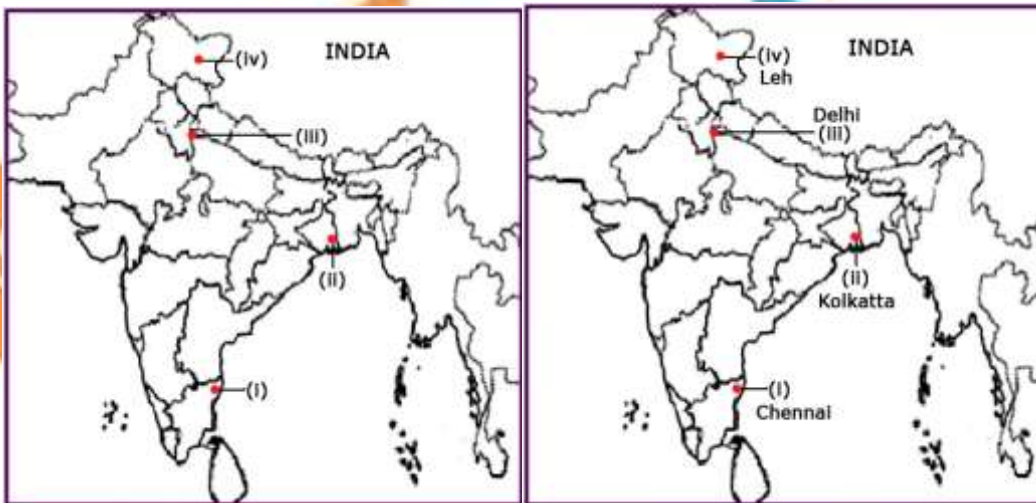
Q.1 Four features from (i) to (iv) are shown in the given outline political map of India. Identify these features with the help of the following information and write their correct names in your answer book:

(i) Capital of Tamil Nadu

(ii) Capital of West Bengal

(iii) India's capital

(iv) Main city of cold desert



Q.2 Locate and label the following on the given outline political map of India:

(i) Chennai

(iii) Area receiving more than 400 cms of rainfall in Arabian Sea

(ii) Leh

(iv) Area receiving less than 20 cms of rainfall in Rajasthan

Ans

Q.3 Locate and label the following on the given outline political map of India:

(i) Jaipur

(ii) Area receiving less than 20 cms of rainfall in Jammu & Kashmir

(ii) Mumbai

(iv) Area receiving more than 400 cms of rainfall in Western coast of India

Ans

Q.4 Locate and label the following on the given outline political map of India:

(i) Shillong

(ii) An area receiving rainfall less than 20 cms in western region

(iii) Nagpur

(iv) An area receiving rainfall over 400 cms in Bay of Bengal

Ans

Q.5 Four features from (i) to (iv) are shown in the given outline political map of India. Identify these features with the help of the following information and write their correct names in your answer book:

(i) Capital of Rajasthan

(ii) Tourist place in Ladakh

(iii) Capital of West Bengal

(iv) Capital of India