

CBSE CLASS 9 SOCIAL SCIENCE

Geography — Contemporary India – I

CHAPTER 4: CLIMATE

ULTIMATE IMPORTANT QUESTIONS BANK WITH MODEL ANSWERS

Strictly Aligned with the Latest NCERT Textbooks & CBSE Secondary School
Syllabus Standards



HIGH-VALUE DELIVERABLES INSIDE THIS EDITION:

- **Comprehensive Content Matrices:** Focused 1-Mark, structured 3-Mark, and thematic 5-Mark long-form answers detailing core climatic systems.
- **Meteorological & Wind Logic:** Clear breakdowns of the Intertropical Convergence Zone (ITCZ), Jet Streams, El Niño, and the Monsoonal mechanism.
- **Seasonal & Spatial Outlines:** Complete structural overviews of all four major seasons and the physical factors governing Indian rainfall distribution.
- **Correction Portals:** Specialized callouts designed to permanently rectify confusion between Weather vs Climate and Advancing vs Retreating wind dynamics.

Premium Digital Resource Guide • Optimized for High-Scoring Revision & Website Delivery

SECTION 1: FREQUENTLY ASKED QUESTIONS (FAQS)

Q1. What are the six primary climatic controls that govern the climate of any given region globally? Explain each briefly.

FREQUENTLY REPEATED

The climate of any locality is regulated by six fundamental climatic controls, which function as follows:

1. **Latitude:** Due to the curvature of the Earth, the amount of solar energy received varies according to latitude. Air temperature generally decreases from the equator toward the poles.
2. **Altitude:** As one ascends from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases. Hills and mountains are therefore cooler during summers.
3. **Pressure and Wind System:** The pressure and wind system of an area depend on its latitude and altitude. This system directly influences the temperature and rainfall patterns of the region.
4. **Distance from the Sea (Continentality):** The sea exerts a moderating influence on climate. As the distance from the sea increases, this moderating influence decreases and the people experience extreme weather conditions (very hot during summers and very cold during winters).
5. **Ocean Currents:** Ocean currents along with onshore winds affect the climate of coastal areas. For instance, any coastal area with warm or cold currents flowing past it will be warmed or cooled if the winds are onshore.
6. **Relief Features:** High mountains act as barriers for cold or hot winds. They may also cause precipitation if they are high enough and lie in the path of moisture-bearing winds. The leeward side of mountains remains relatively dry.



EXAM BOOSTER: METEOROLOGICAL DISCRIMINATION

Weather vs Climate: Weather refers to the state of the atmosphere over an area at any point in time (fluctuates daily). 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).

Q2. Explain the core mechanism and factors that give rise to the Indian Monsoon system. ANNUAL EXAM CLASSIC

The mechanism of the monsoon is driven by several specific atmospheric and thermal factors:

- **Differential Heating and Cooling:** The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around it experience comparatively high pressure.
- **Shift of the ITCZ:** The shift of the position of the Intertropical Convergence Zone (ITCZ) in summer over the Ganga plain. This is the equatorial trough normally positioned about 5°N of the equator, also known as the monsoon-trough during the monsoon season.
- **High-Pressure East of Madagascar:** The presence of a high-pressure area east of Madagascar, approximately at 20°S over the Indian Ocean. The intensity and position of this high-pressure area affect the Indian Monsoon.
- **Tibetan Plateau Heating:** 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.
- **Jet Stream Transitions:** The movement of the westerly jet stream to the north of the Himalayas and the introduction of the tropical easterly jet stream over the Indian peninsula during summer.

SECTION 2: PREVIOUS YEAR QUESTION COLLECTION

Q3. Describe the features and impacts of the 'Retreating Monsoon' season in India. CBSE PAST YEAR FOCUS

The transition season occurring during October and November is known as the Retreating Monsoon:

- **Apparent Movement of the Sun:** During October-November, with the apparent movement of the sun towards the south, the monsoon trough or the low-pressure trough over the northern plains becomes weaker. This is gradually replaced by a high-pressure system.
- **Clear Skies and Temperature Rise:** The retreat of the monsoon is marked by clear skies and a rise in temperature. While day temperatures are high, nights are cool and pleasant. The land is still moist.
- **October Heat:** Owing to the conditions of high temperature and humidity, the weather becomes rather oppressive during the day. This is commonly known as 'October Heat'.
- **Cyclonic Depressions:** The low-pressure conditions over northwestern India move to the Bay of Bengal by early November. This shift is associated with the occurrence of cyclonic depressions which originate over the Andaman Sea. These cyclones frequently cross the eastern coast of India (such as the deltas of the Mahanadi, Godavari, and Krishna), causing widespread destruction.

SECTION 3: VERY SHORT ANSWER QUESTIONS (1 MARK)

Q4. What is the literal meaning of the word 'Monsoon'?

The word monsoon is derived from the Arabic word 'mausim', which literally translates to 'season'. It refers to the seasonal reversal in the wind direction over an area over the course of a year.

Q5. Define the 'Intertropical Convergence Zone' (ITCZ).

The ITCZ is a broad trough of low pressure in equatorial latitudes where the northeast and the southeast trade winds converge.

Q6. What are Jet Streams?

Jet streams are a narrow belt of high-altitude (above 12,000 meters) westerly winds in the troposphere, with speeds varying from about 110 km/h in summer to about 184 km/h in winter.

Q7. What is the 'Loo'?

The 'Loo' refers to the striking, hot, dry, and gusty winds that blow during the daytime over northern and northwestern India during the summer season.

Q8. Explain the term 'Burst of Monsoon'.

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

Q9. What are 'Mango Showers'?

Pre-monsoon showers that occur towards the end of summer in Kerala and Karnataka, which help in the early ripening of mangoes.

Q10. Define the phenomenon of 'Kal Baisakhi'.

Violent thunderstorms accompanied by torrential downpours and hail that occur in West Bengal during the month of Baisakh (summer).

Q11. What is El Niño?

A warm ocean current that flows past the Peruvian coast every 2 to 5 years in place of the cold Peruvian current, temporarily altering global pressure and wind structures.

Q12. Which location in India (and the world) receives the highest average annual rainfall?

Mawsynram, located in the southern ranges of the Khasi Hills in Meghalaya.

Q13. Why do the Coromandel coast regions receive rainfall during winter months?

Due to the picking up of moisture by the Northeast trade winds as they blow across the Bay of Bengal, hitting the Tamil Nadu coast onshore.

SECTION 4: SHORT ANSWER QUESTIONS (2–3 MARKS)

Q14. Why does India experience a distinctive monsoonal type of climate? Explain.

India's climate is classified as a monsoon type because its wind systems undergo a complete reversal twice a year. During the summer, intense heating of the northern landmass creates a low-pressure zone that pulls in moisture-laden winds from the high-pressure area over the southern Indian Ocean (Southwest Monsoon). In winter, a high-pressure system develops north of the Himalayas, causing cold, dry winds to blow outward toward the seas (Northeast Monsoon). This seasonal cycle regulates temperatures and supplies the bulk of the country's annual rainfall.

Q15. Explain the concept of 'Breaks in Monsoon' and why they occur.

The monsoon does not bring continuous rain; instead, it has wet spells interspersed with dry intervals. These rainless periods are known as 'breaks in the monsoon'. They occur because the monsoon trough moves north or south over the plains. When the axis of the trough lies over the plains, the region receives good rainfall. When the trough moves closer to the Himalayas, heavy rains shift to the mountain catchment areas, leading to dry spells over the plains and devastating floods in the river valleys.



MONSOON BRANCH MATRIX

- **Arabian Sea Branch:** Hits the Western Ghats first, causing heavy rainfall along the western coast before crossing into central India.
- **Bay of Bengal Branch:** Moves up toward northeastern India and is deflected westward by the mountains, bringing rainfall to the Ganga plains.

SECTION 5: LONG ANSWER QUESTIONS (5 MARKS)

Q16. Provide a detailed description of the Cold Weather Season (Winter) in India, highlighting its duration, temperature profiles, pressure systems, and rainfall patterns.

The cold weather season in India is characterized by specific atmospheric developments:

- 1. Duration and Temperature:** The cold weather season begins in mid-November in northern India and stays until February. December and January are the coldest months in the northern parts of India. The temperature decreases from the south to the north. The average temperature of Chennai, on the eastern coast, is between 24°–25°C, while in the northern plains, it ranges between 10°–15°C. Days are warm and nights are cold. Frost is common in the north and the higher slopes of the Himalayas experience snowfall.
- 2. Pressure and Wind Orientation:** During this season, a high-pressure area develops over northern India due to the low temperatures. Light winds blow outward from this area, moving down the Ganga valley from the west and northwest. The weather is generally clear with low temperatures, low humidity, and feeble, variable winds.
- 3. The Role of Western Cyclonic Disturbances:** A characteristic feature of the cold weather season over the northern plains is the inflow of **Western Cyclonic Disturbances** from the west and northwest. These low-pressure systems originate over the Mediterranean Sea and Western Asia and move into India with the westerly jet stream. They cause much-needed winter rains over the plains and snowfall in the mountains. Although the total amount of winter rainfall, locally known as *mahavat*, is small, it is vital for the growth of rabi crops, especially wheat.

SECTION 6: MAP-BASED QUESTIONS

Q17. Outline the core identification metrics for mapping rainfall distribution variations across India on the standard map.

For map work evaluations, master these key environmental zones:

- **Heavy Rainfall Zones (Above 400 cm):** Locate the narrow strip along the Western Coast, the Western Ghats slopes, and the northeastern states, especially the Meghalaya region (Garó, Khasi, and Jaintia hills).
- **Low Rainfall Zones (Below 600 mm):** Identify western Rajasthan, parts of Gujarat (Kachchh), and the rain-shadow area of the Deccan Plateau lying east of the Western Ghats, along with the high-altitude desert of Leh in Ladakh.

SECTION 7: CASE-BASED QUESTIONS

SOURCE TEXT: THE UNIFYING BOND OF THE MONSOONS

"The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons. Even the uncertainties of rain and unequal distribution are very much characteristic of the monsoons. The Indian landscape, its animal and plant life, its entire agricultural calendar and the life of the people, including their festivities, revolve around this phenomenon. Year after year, people of India from north to south and from east to west, eagerly await the arrival of the monsoon. These monsoon winds bind the whole country by providing water to set agricultural activities in motion."

Q18. Based on the source provided, answer the following questions:

(i) Why is the Indian agricultural calendar described as revolving entirely around the monsoon?

Because Indian agriculture depends heavily on the arrival of monsoon rains to provide water for crops. The timing of sowing and harvesting is planned around the seasonal arrival and departure of these winds.

(ii) Explain how the monsoon acts as a unifying bond for the Indian subcontinent.

The monsoon acts as a unifying force because it brings the entire country into a shared cycle of seasons. Communities across India eagerly await the rains, which feed rivers and provide the water needed for agriculture, linking different regions through a shared economic and cultural rhythm.

SECTION 8: ASSERTION AND REASON QUESTIONS

STANDARD EVALUATION DIRECTIONS

Evaluate the statements and select the correct option:

- A:** Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
- B:** Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
- C:** Assertion is true, but Reason is false.
- D:** Assertion is false, but Reason is true.

Q19. Assertion (A): Mawsynram receives the highest average rainfall in the world.

Reason (R): The Khasi hills are funnel-shaped, forcing moisture-laden winds from the Bay of Bengal to compress and rise rapidly, causing heavy rainfall.

Answer: A

Explanation: Both statements are true. Mawsynram's record rainfall is directly caused by the steep, funnel-shaped layout of the Khasi Hills, which traps moisture-bearing winds from the Bay of Bengal branch and forces them to rise rapidly, cooling and releasing heavy precipitation.

SECTION 9: COMPETENCY-BASED QUESTIONS

Q20. If global warming leads to a permanent shift in the position of the Intertropical Convergence Zone (ITCZ), how could this impact India's food security and economy?

A permanent shift in the ITCZ would have severe consequences for India:

- **Disrupted Monsoon Timing:** The ITCZ drives the low-pressure system that pulls monsoon winds into India. A shift in its position could alter the arrival and departure dates of the rains, disrupting traditional planting calendars.
- **Altered Rainfall Distribution:** Some agricultural regions could face chronic droughts, while others experience severe flooding. This unpredictable weather would lead to crop failures, threatening food security and harming the broader economy, which depends heavily on agricultural production.

SECTION 10: MOST IMPORTANT EXAM QUESTIONS

★ **HIGHEST PROBABILITY QUESTION:** Detail the four distinct seasons recognized in India, providing the calendar duration and core features of each.

India experiences a distinct cycle of four main seasons, classified as follows:

1. **The Cold Weather Season (Winter):** Lasts from mid-November to February. It features clear skies, low temperatures, and light winds from the northwest, with winter rains (mahavat) brought by Western Cyclonic Disturbances.
2. **The Hot Weather Season (Summer):** Spans from March to May. Characterized by rising temperatures and falling air pressure across the country. It features strong, hot winds called the 'Loo' and pre-monsoon storms like 'Kal Baisakhi' and 'Mango Showers'.
3. **The Advancing Monsoon (The Rainy Season):** Runs from June to September. During this period, moisture-laden winds from the Southwest Monsoon sweep across the country, supplying over 75% of India's annual rainfall.
4. **The Retreating Monsoon (Transition Season):** Occurs during October and November. Marked by a shift from hot, humid conditions to a cooler winter climate, clear skies, the appearance of 'October Heat', and cyclonic storms over the eastern coast.

SECTION 11: CHAPTER QUICK REVISION

INSTANT REVISION SUMMARIES

- **Coriolis Force:** An apparent force caused by the Earth's rotation that deflects winds to the right in the northern hemisphere and to the left in the southern hemisphere (Ferrel's Law).
- **Mahavat:** Small amounts of winter rainfall brought by western cyclonic disturbances, vital for rabi crops like wheat.
- **October Heat:** The oppressive, humid heat experienced during the day in October, caused by a combination of high temperatures and moist soils during the monsoon retreat.
- **Leeward Side:** The dry, sheltered side of a mountain range that faces away from incoming wind, remaining in a rain shadow.

SECTION 12: COMMON MISTAKES STUDENTS MAKE

COMMON EXAM ERRORS TO AVOID:

1. **Confusing Wind Branches:** Students often mix up the paths of the two monsoon branches. Remember that the *Arabian Sea Branch* drops its moisture along the Western Ghats and central India, while the *Bay of Bengal Branch* enters through the northeast and turns west up the Ganga Valley.
2. **Misunderstanding Wind Deflection:** When writing about the monsoons, students sometimes forget to mention that the Southeast trade winds cross the equator and are deflected to the right by the *Coriolis Force*, turning into the Southwest Monsoon winds that strike India.

SECTION 13: LAST-MINUTE REVISION SHEET

THE ULTIMATE CLIMATE CHEAT SHEET

Essential Factor: The Himalayas protect India from freezing continental winds from Central Asia, keeping the subcontinent warmer than other regions at the same latitudes.

Rainfall Trends: Monsoon rainfall generally decreases as the winds move from east to west up the Ganga Valley, causing Kolkata to receive far more rain than Delhi or Rajasthan.