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India’s Geographic Coordinates and Standard Time

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India’s Geographic Coordinates and Standard Time

The sun rises in Arunachal Pradesh nearly two hours before it does in Gujarat. Yet both run on one clock. This article explains India’s coordinates, Standard Time and the debate over a second zone.

At a glance

Four key facts on this topic

01 **82.5°E** Standard Meridian.

02 **UTC+5:30** Indian Standard Time.

03 **~2 hrs** East-west sunrise gap.

04 **1905** One clock adopted.

Where does India lie?

1 India's Latitude and Longitude Span

1.1 Where does India lie on the globe?

India lies between 8°4’N and 37°6’N latitude. It lies between 68°7’E and 97°25’E longitude. That is a spread of nearly 30 degrees in both directions.

The country covers 3.28 million sq km. That is 2.4% of the world’s area, and it makes India the seventh largest country.



The 82.5°E standard meridian, which fixes Indian Standard Time, runs through Mirzapur in Uttar Pradesh. Base map: India location map by Uwe Dedering, Wikimedia Commons, CC BY-SA 3.0. Boundaries shown as per the Government of India.

1.2 How long are the distances and borders?

The north-south stretch is about 3,200 km, from Kashmir to Kanyakumari. The east-west stretch is about 2,900 km, from Arunachal Pradesh to Kachchh.

The land boundary is about 15,200 km. The coastline is about 7,516.6 km, counting the Andaman and Nicobar Islands and Lakshadweep.

1.3 Who are the neighbours?

India has seven land neighbours. Sri Lanka lies across the Palk Strait. The Maldives lies to the south-west in the Indian Ocean.

The Tropic of Cancer (23.5°N) runs roughly through the middle of the country. It splits India into a northern and a southern half.

> 4. **Think it through:** Why is the east-west gap a time problem?
> See answer ↓

> **Quick check 1.** True or false: India's longitudinal spread of nearly 30 degrees causes a sunrise gap of about two hours. *(True or False?)* See answer ↓

Sources: downtoearth.org.in

Which line sets Indian time?

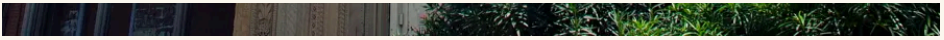
2 The Standard Meridian and IST

2.1 Which line sets Indian time?

The Standard Meridian of India is 82.5°E, also written 82°30’E. It passes near Mirzapur in Uttar Pradesh.

Indian Standard Time is the time at that line. It is UTC+5:30, or 5 hours 30 minutes ahead of GMT. The whole country runs on this one clock.





The Clock Tower at Mirzapur, Uttar Pradesh, the town nearest the 82.5°E longitude that defines Indian Standard Time. Photo: Rangan Datta Wiki, Wikimedia Commons, CC BY-SA 4.0.

2.2 Why 82.5°E?

The line lies near the middle of India's longitude range. The sum is simple. 82.5 divided by 15 gives 5.5 hours.

Down To Earth describes IST as a single zone based on the longitude passing through about 82°33'E.

2.3 How was time kept before IST?

Before 1906 India had no official time zone. Three presidencies kept their own local times at Bombay, Calcutta and Madras.

John Goldingham set up Madras Time in 1802 at the Madras Observatory. In 1870 the British set Railway Mean Time equal to Madras time. They chose it because Madras lay midway between Calcutta and Bombay.

2.4 When did IST become official?

The British placed the central meridian at 82.5°E. IST became the official time on 1 January 1906.

Calcutta and Bombay still kept their own times for decades. Calcutta Time ended in 1948. Bombay Time ended in 1955.

Timeline of Indian time

Year	Event
1802	Madras Time set up by John Goldingham

Year	Event
1870	Railway Mean Time, same as Madras time
1884	Calcutta (90°E) and Bombay (75°E) fixed as two official zones
1 Jan 1906	IST becomes the official time
1948	Calcutta Time ends
1955	Bombay Time ends

2.5 Who keeps the clock today?

CSIR-National Physical Laboratory (CSIR-NPL) is the custodian of IST. PIB describes it as the national timekeeper.

So the standard is not set by a city. A national laboratory keeps it.

Sources: dailyo.in; pib.gov.in

Why one clock for all?

3 One Clock, Eight States

3.1 Why one clock for the whole country?

India adopted a single time in 1905. It replaced the separate Bombay and Calcutta times. One clock keeps railways, courts, banks and broadcasts simple.

The cost is the sunrise gap. The east sees dawn long before the west, yet office hours are the same.

3.2 What is the 15-degree rule?

The Earth turns 360 degrees in 24 hours. That is 15 degrees every hour. Time zones are normally 15 degrees wide.

India is about 30 degrees wide, so it could fit two such zones. It uses one.

3.3 Which states does the Tropic of Cancer cross?

The Tropic of Cancer crosses eight states. They are Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram.

Only Gujarat and West Bengal touch the sea. The other six are landlocked.

> 5. **Think it through:** Where does the Tropic of Cancer meet IST?
>
> See answer ↓

Quick check 2. True or false: Most of the eight states crossed by the Tropic of Cancer are coastal. *(True or False?)* See answer ↓

Where is India’s centre?

4 Finding India's Centre

4.1 What is the Zero Mile Stone?

The Zero Mile Stone stands in Nagpur. It is a sandstone pillar from the British period. A claim that it marks the exact geographic centre of India remains debated.

The British treated Nagpur as the centre because it was the capital of the Central Provinces and Berar.

4.2 What does the inscription say?

The vertical face reads G.T.S. Standard Bench Mark, 1907. The horizontal stone records the height of the pillar top as 1020.171 feet above mean sea level.

The Great Trigonometrical Survey used the stone to measure distances. That survey ran from 1802 to 1871.

4.3 Is it the same as the Standard Meridian?

No. The Standard Meridian runs near Mirzapur. The Zero Mile Stone is in Nagpur. Madhya Pradesh villages such as Karaundi and Barsali make a rival claim to the centre.

6. **Think it through:** Why do two places claim the centre? See answer ↓

Sources: thebetterindia.com; incredibleindia.gov.in

How does China compare?

5 China's Single Clock

5.1 How does China compare?

China spans about 60 degrees of longitude. That would fit five natural time zones. Yet it uses one clock, Beijing Time, at UTC+8, since 1949.

In western Tibet a January sunrise comes after 9:30 AM. In the north-east a July sunrise is near 3 AM.

5.2 How does India's gap compare?

The gap from Dwarka to Dibrugarh is about 1 hour 45 minutes. That is far smaller than China’s gap of roughly six hours at the extremes.

So India’s one-clock choice is a smaller trade-off than China’s.

Does India need two zones?

6 The Two-Time-Zone Proposal

6.1 Who proposed it, and why?

CSIR-NPL scientists studied sunrise and sunset at ten locations from Dong to Ghuar Mota. They found an east-west gap close to two hours. The study was published in Current Science.

They argued that the sun rises and sets ahead of official working hours in the east. That hurts productivity and raises electricity use.

The IST-I and IST-II split

Zone	Offset	Longitudes	Covers
IST-I	UTC+5:30	68°7'E to 89°52'E	Most of India
IST-II	UTC+6:30	89°52'E to 97°25'E	North-east states and the Andaman and Nicobar Islands

6.2 Does the idea already exist in practice?

Yes, in Assam's tea gardens. Their local 'chaibagaan time' runs one hour ahead of IST. It was also called Bagan Time, near UTC+6:30.

6.3 Was it adopted?

No. The idea was not adopted. Concerns about administrative complexity and national unity stood in the way.

A National Institute of Advanced Studies study estimated savings of about 2.7 billion electricity units a year. That figure is a study's estimate, not a policy fact. Some sources place the split east of 89.85°E.

Which other countries use odd offsets?

7 The World's Half-Hour Club

7.1 Which countries use odd offsets?

India’s UTC+5:30 is a half-hour offset. A few other places also use one or a quarter hour.

- Nepal uses UTC+5:45. Some also read it as an assertion of independence from India’s clock.
- Afghanistan uses UTC+4:30.
- Iran uses UTC+3:30.

What is new in 2026?

8 The 2026 IST Rules

8.1 What changed in 2026?

The Department of Consumer Affairs notified the Legal Metrology (Indian Standard Time) Rules, 2026 on 27 August 2026. The Rules were gazetted two days later.

They come into force 180 days after Gazette publication. So compliance becomes mandatory around March 2027.

8.2 Who must follow it?

Banking, payments, stock markets, telecom, railways, airports, power grids and emergency services must use the official time. UTC(NPLI) is the national reference.

Time reaches users through Regional Reference Standards Laboratories and ISRO's NavIC.

8.3 Is this a new time zone?

No. The Rules do not create a new zone. They make one official source of time the legal reference everywhere.

Sources: gktoday.in; tribuneindia.com; pib.gov.in

What do exams ask?

9 Exam Traps and PYQs

9.1 Which facts do students mix up?

- Standard Meridian: 82.5°E near Mirzapur. Zero Mile Stone: Nagpur.
- IST is UTC+5:30. Nepal is UTC+5:45.
- Sunrise gap: about two hours across India.
- Only Gujarat and West Bengal on the Tropic of Cancer are coastal.

9.2 What have exams asked?

> **Quick check 3.** True or false: The Zero Mile Stone and the Standard Meridian are at the same place. *(True or False?)* See answer ↓

Remember this

- **Meridian:** 82.5°E, near Mirzapur.
- **IST:** UTC+5:30, official from 1906.
- **Gap:** about two hours, east to west.
- **2026 Rules:** mandatory around March 2027.

Explain it back: Why does India run one clock though the sun rises two hours earlier in the east?

Practice MCQs

1. Which institution is the official custodian of Indian Standard Time?

A. Indian Meteorological Department

B. Survey of India

C. CSIR-National Physical Laboratory

D. ISRO Satellite Centre

See answer ↓

2. In Assam's tea gardens, the old local clock called 'chaibagaan time' runs how far ahead of IST?

A. Two hours

B. One hour

C. Ninety minutes

D. Thirty minutes

See answer ↓

3. Under the NPL two-zone proposal, which regions would fall in the second zone, IST-II at UTC+6:30?

A. Kerala and Tamil Nadu

B. Only Arunachal Pradesh

C. Only Assam

D. The north-eastern states plus the Andaman and Nicobar Islands

See answer ↓

4. When do the Legal Metrology (Indian Standard Time) Rules, 2026 come into force after Gazette publication?

A. After one year

B. After 90 days

C. On the day of notification

D. After 180 days

See answer ↓

5. The Zero Mile Stone at Nagpur carries an inscription that reads which of these?

A. Indian Standard Meridian 82.5 E

B. G.T.S. Standard Bench Mark, 1907

C. Survey of India Base Point 1802

D. Central Provinces Capital Stone, 1861

See answer ↓

6. For which colonial survey was the Zero Mile Stone at Nagpur used to measure distances?

A. Geological Survey of India

B. Settlement Survey of Bengal

C. Census of India

D. Great Trigonometrical Survey

See answer ↓

Answer Key

1. **C.** The answer is **CSIR-National Physical Laboratory (NPL)**. PIB records that NPL realises, maintains and disseminates IST. Why the others fail: the IMD forecasts weather. The Survey of India makes maps. ISRO's NavIC helps spread the time signal but does not keep the standard. Memory hook: NPL keeps the clock. ↑ Q1
2. **B.** The answer is **one hour**. Tea gardens kept this local time, also called Bagan Time, at about UTC+6:30. Why the others fail: half an hour is the offset of Nepal, not Assam. Two hours is roughly the full east-west sun gap, not the garden clock. Memory hook: tea garden, one hour early. ↑ Q2
3. **D.** The answer is **the north-eastern states plus the Andaman and Nicobar Islands**. IST-II would cover longitudes between 89 degrees 52 minutes E and 97 degrees 25 minutes E. Why the others fail: Assam and Arunachal are only part of the northeast. Kerala and Tamil Nadu lie far to the west of that line. Memory hook: IST-II is the far east. ↑ Q3
4. **D.** The answer is **after 180 days**. The Rules were notified on 27 August 2026 and bind banking, railways, telecom and power from about March 2027. Why the others fail: they do not apply on day one. The wait is also shorter than one year. Memory hook: 180 days, so March 2027. ↑ Q4
5. **B.** The answer is **G.T.S. Standard Bench Mark, 1907**. The pillar also records its height above mean sea level. Why the others fail: the 82.5 degree E meridian passes near Mirzapur, not Nagpur. The 1802 date marks the start of the Great Trigonometrical Survey, not this stone. Memory hook: Zero Mile equals a GTS bench mark. ↑ Q5
6. **D.** The answer is **the Great Trigonometrical Survey (GTS)**. The sandstone pillar served as a reference point for measuring distances. Why the others fail: the Census counts people. The Geological Survey studies rocks. Memory hook: Zero Mile belongs to the GTS. ↑ Q6

Quick-check answers

1. **True.** Each degree is 4 minutes of time, so 30 degrees is about two hours. ↑ 1
2. **False.** Only Gujarat and West Bengal are coastal. Six of the eight are landlocked. ↑ 2

3. **False.** The meridian passes near Mirzapur. The Zero Mile Stone is in Nagpur. ↑ 3
4. **Think it through.** The Earth turns 15 degrees every hour, so each degree of longitude is 4 minutes. India spans nearly 30 degrees. The sun reaches the east about two hours before the west. ↑ 4
5. **Think it through.** They cross near the middle of India. Both are used to split the country into halves, one by latitude and one by time. ↑ 5
6. **Think it through.** A country's centre can be defined in several ways, such as by area, by population or by survey points. Each rule points to a different spot. ↑ 6

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