MEDHA AI

APPSC PAPER I: GENERAL STUDIES & MENTAL ABILITY · INDIAN GEOGRAPHY

Location, extent and geological structure

Free study notes · 3 notes · 25 Oct 2026

Free study material from Medha AI. For notes, practice, mock tests and previous papers for your exam, start free at **app.medhaai.in**.

1. India's location and extent: latitudes, longitudes and the standard meridian
2. India and its neighbours: land boundaries and maritime neighbours
3. Geological structure of India: Archaean to Quaternary formations

medhaai.in

Notes · Practice · Mock tests · Previous papers

Start free at
app.medhaai.in

1 India's location and extent: latitudes, longitudes and the standard meridian

India lies wholly in the northern and eastern hemispheres, stretches about 30 degrees in both directions, and keeps one time, set on the 82°30′E meridian through Mirzapur.

Core facts

- **Mainland extent:** latitude **8°4′N to 37°6′N**; longitude **68°7′E to 97°25′E**.
- **Southernmost point of the Indian Union: Indira Point** (Great Nicobar) at about **6°45′N**. Southernmost point of the *mainland*: **Kanyakumari**.
- **Northernmost point:** Indira Col (Siachen region), 37°6′N. **Easternmost:** Kibithu (Arunachal Pradesh). **Westernmost:** Guhar Moti (Kachchh, Gujarat).
- **Tropic of Cancer (23°30′N)** passes through **8 states**: **Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura, Mizoram**. It divides India into two almost equal parts, the tropical south and the subtropical north.
- **Area:** about **3.28 million sq km** (3,287,263 sq km), roughly **2.4 per cent** of the world's land area. India is the **7th largest** country by area.
- **North–south extent:** about **3,214 km**. **East–west extent:** about **2,933 km**.
- **Standard meridian: 82°30′E**, passing near **Mirzapur** (Uttar Pradesh). **IST is 5 hours 30 minutes ahead of GMT (UTC)**.
- Meridian passes through **five states**: Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Odisha and Andhra Pradesh.
- **Coastline:** about **7,516.6 km** (NCERT figure, mainland about 6,100 km plus islands). **Land frontier:** about **15,200 km** (NCERT figure).

Explained

Reading the numbers

- The latitudinal and longitudinal spread is nearly equal, about **30 degrees** each. Yet the north–south distance is longer than the east–west distance because degrees of longitude shrink towards the poles, while degrees of latitude stay about the same length.
- Because the **Tropic of Cancer** crosses the middle, about half the country is in the tropics and half is outside them. The southern half gets high, even temperatures. The northern half has stronger seasonal swings.

Time and longitude

- The Earth turns 360 degrees in 24 hours. So **15 degrees = 1 hour** and **1 degree = 4 minutes**.
- Gujarat (west) and Arunachal Pradesh (east) differ by about **30 degrees**, so local sun time differs by almost **2 hours**. India nevertheless uses one time, **IST**, so the sun rises and sets earlier by clock in the east.

- India's central meridian was chosen so that the time difference with the extreme east and west is about an hour, and it is a whole multiple of half-hours from GMT.
- **Tea-garden time** is used informally in Assam's tea estates, one hour ahead of IST. It is not official.

Table: extreme points

Direction	Place	Note
North	Indira Col	37°6′N, Siachen area
South (Union)	Indira Point	Great Nicobar, 6°45′N
South (mainland)	Kanyakumari	8°4′N
East	Kibithu	Arunachal Pradesh
West	Guhar Moti	Kachchh, Gujarat

Location advantages

- India sits at the head of the **Indian Ocean**, in the centre of the Old World's trade routes between West Asia, Africa, Europe, and East and Southeast Asia.
- The **Suez Canal** (opened 1869) shortened the sea route between India and Europe by a great distance.
- The **Deccan Peninsula** projects far into the ocean. The Indian Ocean is named after the country.
- India is separated from **Sri Lanka** by the **Palk Strait** and the **Gulf of Mannar**.

AP angle

- Andhra Pradesh lies roughly between **12°41′N and 19°07′N**, so it lies wholly **north of the equator and within the tropics**, south of the Tropic of Cancer.
- The **82°30′E standard meridian passes through Andhra Pradesh** (coastal Godavari delta region), one of the five states it crosses.
- AP's coastline of about **974 km** (AP SCERT, traditional figure) is the **second longest among Indian states after Gujarat** on that count. The revised survey (about 11,098 km for India) gives AP about **1,053 km**, third after Gujarat and Tamil Nadu.

Common traps

✗ "India's southernmost point is Kanyakumari." ✓ Kanyakumari is the southernmost point of the **mainland**. The southernmost point of the Union is **Indira Point**.

✗ "The standard meridian is 82°30′W." ✓ It is **82°30′E**.

✗ "The Tropic of Cancer passes through nine states." ✓ It passes through **eight**.

✗ "The standard meridian passes through Allahabad (Prayagraj)." ✓ It is near **Mirzapur**, UP.

✗ "India is the 5th largest country." ✓ By area it is **7th**.

✗ "IST is 5 hours ahead of GMT." ✓ It is **5 hours 30 minutes** ahead.

Quick revision

- Mainland: 8°4′N to 37°6′N; 68°7′E to 97°25′E.
- Indira Point (6°45′N) is the Union's southern tip; Kanyakumari is the mainland's.
- Tropic of Cancer (23°30′N) crosses 8 states.
- Standard meridian 82°30′E, Mirzapur; 5 states including Andhra Pradesh.
- IST = GMT + 5:30.
- Area 3.28 million sq km; 7th largest; 2.4 per cent of world area.
- N–S about 3,214 km; E–W about 2,933 km.
- 15 degrees of longitude = 1 hour.

2 India and its neighbours: land boundaries and maritime neighbours

India shares land borders with seven countries and sea borders with Sri Lanka and the Maldives, and each border has its own named line, history and trouble spots.

Core facts

- **Seven land neighbours: Pakistan, Afghanistan, China, Nepal, Bhutan, Bangladesh, Myanmar**.
- **Maritime neighbours: Sri Lanka** and **Maldives**. (Indonesia, Thailand and Myanmar are neighbours across the Andaman Sea.)
- **Longest land border:** with **Bangladesh**. **Shortest:** with **Afghanistan**.
- Land boundary lengths (MHA, total 15,106.7 km):

Neighbour	Length (km)	Indian states/UTs touching it
Bangladesh	4,096.7	West Bengal, Assam, Meghalaya, Tripura, Mizoram
China	3,488	Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh
Pakistan	3,323	Gujarat, Rajasthan, Punjab, J&K, Ladakh
Nepal	1,751	Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Sikkim
Myanmar	1,643	Arunachal Pradesh, Nagaland, Manipur, Mizoram
Bhutan	699	Sikkim, West Bengal, Assam, Arunachal Pradesh
Afghanistan	106	Ladakh (the PoK-Wakhan stretch, as claimed by India)

- **Named lines: Radcliffe Line** (India–Pakistan, 1947), **Line of Control** (J&K, after the 1972 Simla Agreement), **McMahon Line** (eastern India–China, 1914), **Line of Actual Control** (India–China), **Durand Line** (Afghanistan–Pakistan).
- **Sri Lanka** is separated by the **Palk Strait** and **Gulf of Mannar**. The **Maldives** lies south of Lakshadweep, across the **Eight Degree Channel** (Minicoy–Maldives).

Explained

Pakistan and Afghanistan

- The **Radcliffe Line** marks the border with Pakistan along Gujarat, Rajasthan and Punjab. In J&K and Ladakh the border is the **Line of Control (LoC)**, and the northern extreme includes the Siachen glacier region.
- India's border with **Afghanistan** exists only if the whole of J&K, including Pakistan-occupied Kashmir (PoK), is counted. The common border runs along the narrow **Wakhan corridor**. In practice there is no usable access.

- **Sir Creek** in the Rann of Kachchh is a long-standing boundary dispute with Pakistan over how to draw the line in the creek.

China

- Three sectors: **western** (Ladakh/Aksai Chin), **middle** (Himachal Pradesh and Uttarakhand), **eastern** (Sikkim and Arunachal Pradesh, the **McMahon Line**).
- **Doklam** is the tri-junction area of India, China and Bhutan. **Lipu Lekh** is the tri-junction of India, Nepal and China.

Nepal and Bhutan

- Nepal: open border under the **1950 Treaty of Peace and Friendship**; Nepal's people have free movement and work rights in India. The **Kalapani–Lipu Lekh–Limpiyadhura** area is disputed.
- Bhutan: the **1949 treaty** was revised in **2007**. The **Siliguri Corridor** ("Chicken's Neck"), only about 20 to 22 km wide in West Bengal, joins the North-East to the rest of India, and is hemmed in by Nepal, Bhutan and Bangladesh.

Bangladesh

- The **1974 Land Boundary Agreement** and its **2011 Protocol** were implemented by the **100th Constitutional Amendment Act, 2015**. India transferred **111 enclaves** to Bangladesh and received **51**; the exchange took effect on **1 August 2015**.
- The **Tin Bigha corridor** gives Bangladesh access to its Dahagram-Angarpota enclave.

Myanmar

- The border has a **Free Movement Regime**, letting people living near the border travel a short distance across without a visa. In **February 2024** the Government of India announced that it would scrap the regime and fence the whole border; MHA guidelines of **December 2024** then cut the free-movement belt from 16 km to **10 km**, with QR-coded border passes issued at designated crossing points; the formal end of the regime had not been notified by early 2025.

Sri Lanka and Maldives

- *Katchatheevu* island in the Palk Strait was ceded to Sri Lanka under the **1974 and 1976 agreements**, a continuing issue for Tamil Nadu fishers.
- The sea boundary with the Maldives was settled by a **1976 agreement**.

Common traps

✗ "India's longest border is with China." ✓ It is with **Bangladesh** (about 4,097 km).

✗ "India shares a border with Sri Lanka by land." ✓ Sri Lanka is a **maritime** neighbour only.

✗ "The McMahon Line is the border with Pakistan." ✓ It is India–China (eastern sector). The Pakistan border is the **Radcliffe Line** (and the LoC in J&K).

✗ "Myanmar borders Sikkim." ✓ Myanmar borders **Arunachal Pradesh, Nagaland, Manipur and Mizoram**.

✗ "India shares a border with Bhutan through Manipur." ✓ Bhutan touches **Sikkim, West Bengal, Assam and Arunachal Pradesh**.

✗ "The Durand Line is an Indian border." ✓ It separates **Afghanistan and Pakistan**.

Quick revision

- Seven land neighbours: Pakistan, Afghanistan, China, Nepal, Bhutan, Bangladesh, Myanmar.
- Longest border Bangladesh; shortest Afghanistan.
- Total land boundary 15,106.7 km (MHA).
- Radcliffe (Pakistan), McMahon (China east), LoC (J&K), Durand (Afghanistan–Pakistan).
- 100th Amendment 2015: enclave exchange with Bangladesh (111 out, 51 in).
- Palk Strait and Gulf of Mannar separate India from Sri Lanka.
- Eight Degree Channel separates Minicoy from the Maldives.
- Siliguri Corridor is about 20 to 22 km wide.

3 Geological structure of India: Archaean to Quaternary formations

India's rocks span more than 2.5 billion years, from the ancient Archaean core of the Peninsula to the young alluvium of the Quaternary plains, and are grouped into four great systems.

Core facts

- India has **three geological divisions**:
  1. the **Peninsular Block**
  2. the **Himalaya and other peninsular mountains**
  3. the **Indo-Ganga-Brahmaputra Plain**
- Four major rock groups, oldest to youngest:

Group	Age	Key systems
Archaean	Oldest (before about 2.5 billion years)	Gneisses and schists, Dharwar
Purana	Precambrian	Cuddapah, Vindhyan
Dravidian	Palaeozoic (Cambrian to Carboniferous)	Marine rocks, mostly in the Himalaya
Aryan	Upper Carboniferous to present	Gondwana, Deccan Trap, Tertiary, Quaternary

- **Archaean** rocks are the oldest and cover large parts of the Peninsula. They include **granite and gneiss**. They are rich in minerals but have no fossils.
- **Dharwar system** (named after Dharwad in Karnataka) holds gold, iron ore, manganese and copper. It is the oldest sedimentary-metamorphic series with minerals.
- **Cuddapah system** is in **Andhra Pradesh** (the Cuddapah/Kadapa basin).
- **Vindhyan system** lies in Rajasthan, Madhya Pradesh and Bihar; it gives sandstone and limestone.
- **Gondwana system** holds most of India's **coal**.
- **Deccan Trap** is basalt from lava flows (fissure eruptions) at the end of the Cretaceous.
- **Quaternary** deposits form the northern plains' alluvium.

Explained

Peninsular Block

- The oldest and most stable part, made mainly of **igneous and metamorphic rocks**. It was part of **Gondwanaland**, which broke apart. The Indian plate then drifted north.
- Its northern boundary runs from Kachchh along the western flank of the Aravali near Delhi, then roughly parallel to the Yamuna and Ganga up to the Rajmahal hills.
- **Faults** matter. The **Malda fault** separates the north-eastern parts (Meghalaya and Karbi Anglong plateaus) from the Chotanagpur plateau. The **Bhima fault** is noted for repeated seismic activity.

The four groups in more detail

- **Archaean:** includes **Bengal, Bundelkhand and Nilgiri gneisses**. The **Dharwar** rocks are metamorphosed sediments laid on the gneiss. The **Aravali** range, among the oldest fold mountains of the world, is worn down from very ancient folding.
- **Purana:** Cuddapah and Vindhyan basins are mostly unmetamorphosed sediments (quartzite, slate, limestone, sandstone). The Vindhyan beds are a major source of building stone.
- **Dravidian:** marine Palaeozoic rocks, found mainly in the Himalayas, such as in Spiti and Kashmir.
- **Aryan** group:
  - **Gondwana system** (Upper Carboniferous to Jurassic): river and lake deposits in basins along the **Damodar, Mahanadi, Godavari and Wardha** valleys. Holds most of India's **coal**, and also fossil plants.
  - **Deccan Trap** (Late Cretaceous to Eocene): basalt covering the north-western Deccan; weathers into **black (regur) soil**.
  - **Tertiary** system: associated with the **upheaval of the Himalaya**; includes the **Shiwaliks**. Oil in Assam and Gujarat is found in Tertiary rocks.
  - **Quaternary** (Pleistocene and Holocene): the **alluvium** of the plains, divided into older **Bhangar** and newer **Khadar**.

Special rock names

- **Charnockite** is named after **Job Charnock**, the founder of Calcutta, whose tombstone is made of it.
- **Khondalite** is named after the Khond tribe of Odisha.

AP angle

- The **Cuddapah basin** in Andhra Pradesh (Kadapa and Kurnool region) gives its name to the **Cuddapah system**, a crescent-shaped basin of Precambrian sediments. It includes the **Nallamala** hills.
- Rocks of the **Eastern Ghats** around Visakhapatnam are **charnockite and khondalite**.
- The Cuddapah rocks are linked with minerals such as **barytes** (Mangampeta, Kadapa), limestone and asbestos (Pulivendula), and the diamond-bearing **Banaganapalle** conglomerates of the Kurnool group. The diamond-bearing **kimberlite** pipes of Wajrakarur (Anantapur) lie west of the basin, in older rocks.
- **Gondwana** rocks lie along the Godavari valley.

Common traps

✗ "The coastal plains are one of the three geological divisions." ✓ The three are the Peninsular Block, the Himalaya with other peninsular mountains, and the Indo-Ganga-Brahmaputra Plain. Coastal plains are a *physiographic* division.

✗ "Gondwana rocks are the oldest." ✓ **Archaean** is the oldest; Gondwana is much younger (Upper Carboniferous to Jurassic).

✗ "The Deccan Trap is sedimentary." ✓ It is **igneous** (basalt).

✗ "Cuddapah system is in Karnataka." ✓ It is in **Andhra Pradesh**; Dharwar is the Karnataka one.

✗ "Charnockite is named after a tribe." ✓ It is named after **Job Charnock**; khondalite is the tribal name.

Quick revision

- Three divisions: Peninsular Block, Himalaya and peninsular mountains, Indo-Ganga-Brahmaputra Plain.
- Order of age: Archaean, Purana, Dravidian, Aryan.
- Dharwar: gold, iron, manganese.
- Cuddapah basin: Andhra Pradesh.
- Gondwana: coal.
- Deccan Trap: basalt; black soil.
- Tertiary: Himalayan uplift, oil.
- Quaternary: alluvium (Bhangar, Khadar).