

GEOGRAPHY

Previous Year Question Analysis
2021-2023





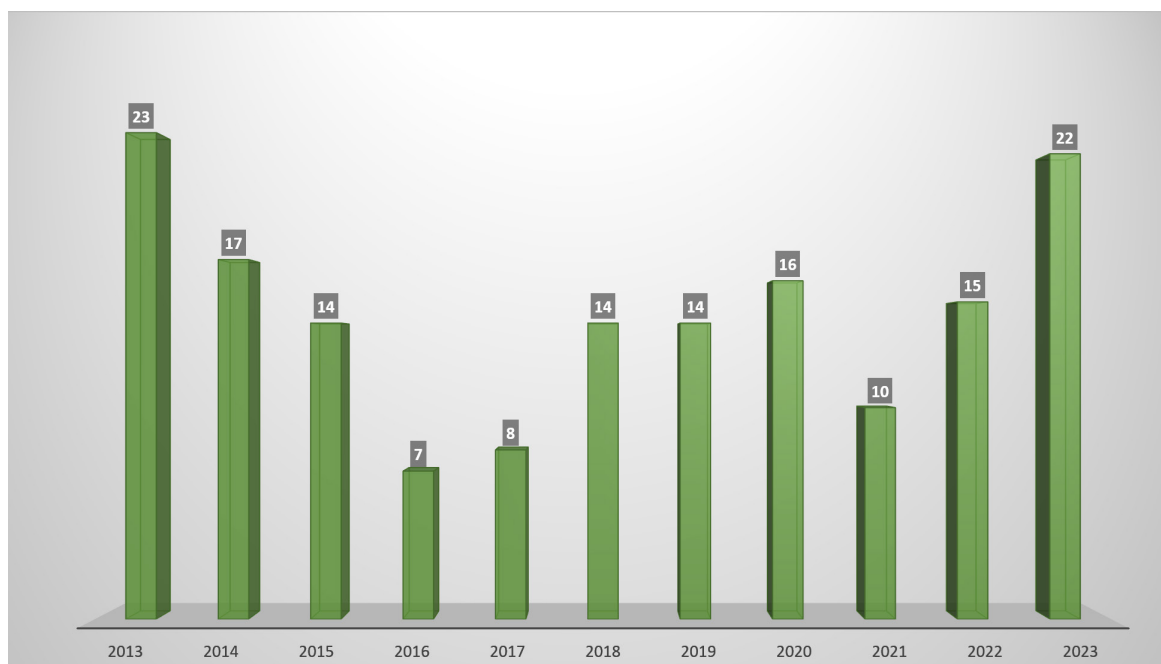
PREFACE

FORTUNE IAS ACADEMY is presenting an in-depth analysis of past year's questions (from 2021 to 2023) and providing comprehensive explanations of the key terms and concepts essential for prelims preparation.

TREND ANALYSIS



The following graph examines the pattern of questions from Geogrpahy spanning from 2013 to 2023:



Topic wise analysis of previous year questions:

TOPICS/ YEARS	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Climatology	3	1	2	-	1	-	2	2	1	2	2
Oceanography	1	-	2	-	-	-	-	-	-	-	-
Geomorphology	2	1	-	-	-	2	-	-	1	-	2
Agriculture	1	-	-	1	-	2	2	8	1	2	1
Soils	2	-	-	-	-	1	-	-	1	-	-
Earth & Universe	-	-	-	-	-	-	-	-	1	-	-
Human Geography	3	3	1	2	-	-	-	1	-	1	3
Places in news	1	5	2	-	3	4	2	2	-	4	8
Key terms	-	-	-	-	-	-	1	-	-	2	-
Flora and Fauna	2	-	-	-	-	-	1	-	-	-	-
Indian Physiography	3	3	3	3	4	2	3	-	2	2	2
Minerals	2	1	-	1	-	1	1	2	-	1	1
Vegetation	3	2	3	-	-	2	2	-	2	-	2
Renewable energy	-	-	-	-	-	-	-	1	-	1	-
Miscellaneous	-	1	1	-	-	-	-	-	1	-	1

STRATEGIC ANALYSIS



THE QUESTIONS FROM THE PAST THREE YEARS ARE DIVIDED INTO FOUR CATEGORIES:

Factual questions

It demands basic facts from static sources like NCERT, class notes, and other standard materials.

Current affairs questions

Current affairs questions demands general awareness about current events of National and International importance.

Conceptual questions

Such questions require knowledge of fundamental concepts along with conceptual clarity.

Application questions

It demands application of factual and conceptual knowledge to current events.

THE QUESTIONS ARE CLASSIFIED BASED ON ITS DIFFICULTY LEVEL:

EASY

The questions which can be answered from basics (NCERTs, and class notes) and does not need deep knowledge. Such questions are typically cracked by aspirants.

MODERATE

Moderate questions require decent level of conceptual clarity along with cognitive analysis. It can be solved through constant practice and revision.

HARD

Hard questions demand deeper understanding of concepts with critical thinking skills. Most of the aspirants leave such questions due to its increased difficulty.

2021-PRELIMS PREVIOUS YEAR QUESTIONS

Type of the questions: Factual

1. With reference to the Indus River system, of the following four rivers, three of them pour into one of the which joins the Indus direct. Among the following, which one is such river that joins the Indus direct?

- a) Chenab
- b) Jhelum
- c) Ravi
- d) Sutlej ✓

Difficulty level: Hard

EXPLANATION

- **Satluj is joined by the Chenab** in Pakistan. Thus, the Satluj receives the combined drainage of the **Ravi, Chenab and Jhelum rivers**. It joins the Indus a few kilometres above Mithankot.

The Indus System

- The Indus, also known as the **Sindhu**, ranks among the world's largest river basins, with a total **length of 2,880 km**, including 1,114 km within India.
- **Originating from the Bokhar Chu glacier** in the Tibetan region of the **Kailash Mountain range**, it is referred to as '**Singi Khamban**' or **Lion's mouth** in Tibet.



- Initially flowing northwest **between Ladakh and Zaskar ranges**, it traverses Ladakh and Baltistan, carving a spectacular gorge near **Gilgit** in Jammu and Kashmir before **entering Pakistan near Chilas in the Dardistan region**.
- The Indus receives numerous Himalayan **tributaries** such as the **Shyok, Gilgit, Zaskar, Hunza, Nubra, Shigar, Gasting, and Dras**. Emerging near Attock, it merges with the **Kabul River** on its right bank. Other significant right bank tributaries, originating in the **Sulaiman ranges**, include the **Khurram, Tochi, Gomal, Viboa, and Sangar**.
- Flowing southward, it encounters '**Panjnad**' just above Mithankot, where it assimilates the **five rivers of Punjab—Satluj, Beas, Ravi, Chenab, and Jhelum**.
- Notably, the Indus only traverses **Ladakh and Jammu and Kashmir** within India.

Jhelum

- The Jhelum, a crucial tributary, rises from a spring at **Verinag**, located at the foot of the **Pir Panjal** in the southeastern part of the Kashmir valley.
- It courses through **Srinagar** and the **Wular Lake** before entering Pakistan through a deep, narrow gorge and **merging with the Chenab near Jhang**.

Chenab

- The Chenab is the **largest tributary** of the Indus.
- It is formed by two streams, the **Chandra** and the **Bhaga**, which join at **Tandi** near Keylong in **Himachal Pradesh**. Hence, it is also known as Chandrabhaga.
- The **Bara Shigri Glacier** in the Chandra Valley of Lahaul in Himachal Pradesh also feeds the Chenab River.

Ravi

- The Ravi, originates in the west of the **Rohtang Pass** in the Kullu hills of Himachal Pradesh.

- It winds through the **Chamba valley**, then **joins the Chenab near Sarai Sidhu** after draining the area between the southeastern part of the Pir Panjal and the Dhauladhar ranges.

Beas

- The Beas, arising from **Beas Kund** near the Rohtang Pass at 4,000 m above sea level, traverses the **Kullu valley**, forming gorges at Kati and Largi in the Dhauladhar range before meeting the Satluj near Harike in the Punjab plains.

Satluj

- The Satluj begins in '**Raksas tal**' near Mansarovar at an altitude of 4,555 m in Tibet, named **Langchen Khambab**.
- After **flowing parallel to the Indus** for around **400 km** before entering India, it emerges from a gorge at Rupar, passing through Shipki La in the Himalayan ranges before reaching the Punjab plains. It's a crucial tributary, providing water for the **Bhakra Nangal project's canal system**.

RELATED PYQs

Q1. Consider the following pairs:

Glacier	River
Bandarpunch	Yamuna
Bara Shigri	Chenab
Milam	Mandakini
Siachen	Nubra
Zemu	Manas

Which of the pairs given above are correctly matched?

- 1, 2 and 4
- 1, 3 and 4
- 2 and 5
- 3 and 5

[2019]


- “Leaf litter decomposes faster than in any other biome and as a result the soil surface is often almost bare. Apart from trees, the vegetation is largely composed of plant forms that reach up into the canopy vicariously, by climbing the trees or growing as epiphytes, rooted on the upper branches of trees.” This is the most likely description of

- coniferous forest
- dry deciduous forest
- mangrove forest
- tropical rainforest ✓

Difficulty level: Easy

EXPLANATION

Tropical rain forests (Tropical wet forests)

- This biome is found in **equatorial regions** (South America, Africa, South East Asia). 
- It is described as '**nature's pharmacy**' being the potential source for new drugs.
- Average temperatures ranging from **20 degree celsius to 34 degree celsius** (68oF to 93oF) and daily amount of sunlight is 11–12 hours per day.
- Lack of temperature seasonality** leads to **year-round plant growth**, rather than the seasonal growth seen in other biomes.
- The **annual rainfall** in tropical rainforests ranges from **250 cm to more than 450 cm**.
- Flora**: Rosewood, mahogany, teak, orchids etc.
- The high rainfall results in **leaching** which makes the soil low in nutrients.

(Leaching: Loss of water soluble plant nutrients from the soil).

Coniferous forest (Boreal forest or Taiga)

- Roughly **between 50 degree and 60 degree north latitude**



- across most of **Canada, Alaska, Russia**, and northern Europe.
- Boreal forests are also found above a certain elevation in mountain ranges.
- **Temperature** ranges from **-40 degree celsius to 20 degree celsius** the annual **precipitation** is from **40 cm to 100 cm**. Little evaporation occurs because of the cold temperatures.
- **Species diversity is less than that seen in temperate forests and tropical rainforests.**
- **Flora**- these are evergreen coniferous trees like pines, spruce, and fir, which retain their needle-shaped leaves year-round.
- In addition, soils in boreal forest regions tend to be **acidic** with little available nitrogen.

Dry deciduous forest

- Tropical deciduous forests are the **most widespread forests in India**. They



- are also called **monsoon forests** and spread over the region receiving rainfall between **200 cm and 70 cm**.
- On the basis of availability of water, these forests are further divided into **moist** (rainfall: 200cm-100cm) and **dry deciduous** (100cm - 70cm).
- The dry deciduous forests are found in the rainier parts of the Peninsular plateau and the plains of Bihar and Uttar Pradesh.
- **Flora**- Teak, sal, peepal, neem etc.

Mangrove forest

- Mangroves are a group of trees and shrubs that live in the **coastal intertidal zone**.
- Mangrove forests **only grow at tropical and subtropical latitudes** near the equator because they cannot withstand freezing temperatures.
- They **stabilise the coastline, reducing erosion** from the storm surges and tides.



The **Sundarbans** mangrove forest, one of the largest such forests in the world, lies on the delta of Ganges, Brahmaputra and Meghna rivers on the Bay of Bengal.

RELATED PYQs

- Q1. Which one of the following is the correct sequence of ecosystems in the order of decreasing productivity?
- a) Oceans, lakes, grasslands, mangroves
 - b) Mangroves, oceans, grasslands, lakes
 - c) Mangroves, grasslands, lakes, oceans
 - d) Oceans, mangroves, lakes, grasslands

[2013]

- Q2. In India, in which one of the following types of forests is teak a dominant tree species?
- a) Tropical moist deciduous forest
 - b) Tropical rainforest
 - c) Tropical thorn scrub forest
 - d) Temperate forest with grasslands

[2015]

- Q3. With reference to 'Red Sanders', sometimes seen in the news, consider the following statements:
1. It is a tree species found in a part of South India
 2. It is one of the most important trees in the tropical rainforest areas of South India

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

[2016]

3. The vegetation of savannah consists of grassland with scattered small trees, but extensive areas have no trees. The forest development in such areas is generally kept in check by one or more or a combination of some conditions. Which of the following are such conditions?

- 1) Burrowing animals and termites
- 2) Fire
- 3) Grazing herbivores
- 4) Seasonal rainfall
- 5) Soil properties

Select the correct answer using the code given below.

- a) 1 and 2
- b) 4 and 5
- c) 2, 3 and 4 ✓
- d) 1, 3 and 5

Difficulty level: Moderate

EXPLANATION

Savannah or Tropical grasslands

Savannas are grasslands with scattered trees, and they are found in Africa, South America, and northern Australia.



- Savannas are hot, tropical areas with temperatures averaging from 24 degree celsius to 29 degree celsius.
- These regions receive annual rainfall between 51–125 cm.
- Savannas have an extensive dry season and are more prone to fires.
- Since fire is an important source of disturbance in this biome, plants have evolved well-developed root systems that allow them to quickly re-sprout after a fire.

The forest development in such areas is generally kept in check by one or more or a combination of some conditions.

- » Fire
- » Grazing herbivores
- » Seasonal rainfall

- Soil properties influence the type and vegetation of savannah but don't contribute to checking forest development. Burrowing animals and termites also don't contribute to the same.

RELATED PYQs

Q1. "Climate is extreme, rainfall is scanty and the people used to be nomadic herders."

The above statement best describes which of the following regions?

- a) African Savannah
- b) Central Asian Steppe
- c) North American Prairie
- d) Siberian Tundra

[2013]

Q2. "Each day is more or less the same, the morning is clear and bright with a sea breeze; as the Sun climbs high in the sky, heat mounts up, dark clouds form, then rain comes with thunder and lightning. But the rain is soon over."

Which of the following regions is described in the above passage?

- a) Savannah
- b) Equatorial
- c) Monsoon
- d) Mediterranean

[2015]

4. With reference to the water on the planet Earth, consider the following statements:

- 1) The amount of water in the rivers and lakes is more than the amount of groundwater.
- 2) The amount of water in polar ice caps and glaciers is more than the amount of groundwater.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only ✓
- c) Both 1 and 2
- d) Neither 1 nor 2

Difficulty level: Easy

EXPLANATION

- About **71 per cent** of the planetary water is found in the oceans. The remaining is held as fresh water in glaciers and icecaps, groundwater sources, lakes, soil moisture, atmosphere, streams and within life.
- Nearly 59 per cent of the water that falls on land returns to the atmosphere through evaporation** from over the oceans as well as from other places. The remainder runs-off on the surface, infiltrates into the ground or a part of it becomes glacier.

Water on the Earth's surface

Reservoir	Volume (Million Cubic km)	Percentage of the Total
Oceans	1,370	97.25
Ice Caps and Glaciers	29	2.05
Groundwater	9.5	0.68
Lakes	0.125	0.01
Soil Moisture	0.065	0.005
Atmosphere	0.013	0.001
Streams and Rivers	0.0017	0.0001
Biosphere	0.0006	0.00004

5. The black cotton soil of India has been formed due to the weathering of
- brown forest soil
 - fissure volcanic rock ✓
 - granite and schist
 - shale and limestone

Difficulty level: Easy

EXPLANATION

Black soil (Regur/ Black cotton soil)

- About **13 %** of India's soil.
- Region- **Most of Deccan plateau** and **parts of Tamil Nadu**.
- Formation- from the disintegration of **igneous rocks of the Deccan trap region**. **Black soil in India is formed by the weathering of fissure volcanic rock**.
- It is **argillaceous**, that is having a **clayey texture** and are also **impermeable**.



- They **swell and become extremely sticky in the wet season**. Hence, the soil is prepared for agriculture before the 1st rain.
- Slow rate of absorption of water** and **slow rate of loss of moisture**. Thus, they have better moisture content even in dry months.
- Self ploughing**- In summers, they develop deep and wide cracks and get mixed with less fertile lower layers- resulting in poor soil profile (as almost all layers have similar soil texture and nutrition). It is self-aerating as well.
- The soil is **rich in lime, potash, iron, magnesia, alumina** and **lacks- nitrogen, phosphorus and organic matter**.
- Its color ranges from **deep black to grey**.

RELATED PYQs

Q1. Consider the following crops

- Cotton
- Groundnut
- Rice
- Wheat

Which of these are Kharif crops?

- 1 and 4
- 2 and 3 only
- 1, 2 and 3
- 2, 3 and 4

[2013]

Q2. "The crop is subtropical in nature. A hard frost is injurious to it. It requires at least 210 frost free days and 50 to 100 centimeters of rainfall for its growth. A light well-drained soil capable of retaining moisture is ideally suited for the cultivation of the crop." Which one of the following is that crop?

- Cotton
- Jute
- Sugarcane
- Tea

[2020]

Type of the questions: Current Affairs

1. Consider the following statements:

- 1) The Global Ocean Commission grants licences for seabed exploration and mining in international waters.
- 2) India has received licences for seabed mineral exploration in international waters.
- 3) 'Rare earth minerals' are present on the seafloor in international waters.

Which of the statements given above are correct?

- a) 1 and 2 only
- b) 2 and 3 only ✓
- c) 1 and 3 only
- d) 1, 2 and 3

Difficulty level: Hard

Relevance: The Union Cabinet has approved a five-year plan worth over Rs 4,000 crores to explore the deep ocean for resources and develop deep-sea technologies for the sustainable utilization of oceanic resources.

EXPLANATION

- The **authority responsible for granting licences for seabed exploration** and mining in International waters is **International Seabed Authority**.
- India has been allotted a **site of 75,000 square kilometres in the Central Indian Ocean Basin** by the International Seabed authority for the **exploitation of Polymetallic Nodules**.
- In 2002, India signed a contract with the **International Seabed Authority (ISA)** for exploration of **Polymetallic Nodules (PMN)** in the Central Indian Ocean Basin. The contract was initially signed for a period of 15 years and was later extended twice by the authority for 5-year periods in 2017 and 2022. After complete resource analysis of the seabed, India surrendered 50% of the area and retained an area of 75,000 sq km.
- The deep seabed **contains rare earth elements** and polymetallic nodules such as manganese, nickel, copper, cobalt etc.

Global Ocean Commission

- Global Ocean Commission is an international initiative to raise **awareness** and promote **action to address the degradation of the ocean** and help **restore it to full health and productivity**.
- Its **focus** was mainly towards **high seas**, the vast ocean areas that lie beyond the Exclusive Economic Zones of individual states.

International Seabed Authority (ISA)

- The ISA is an **autonomous international organization** established under the **1982 United Nations Convention on the Law of the Sea (UNCLOS)**.
- It **organize and control all mineral-resources-related activities**.
- ISA has the mandate to ensure the **effective protection of the marine environment** from harmful effects that may arise from deep-seabed-related activities.
- Contains **168 members**
- **India is a member** in the International Seabed Authority.

Polymetallic nodules

- Polymetallic nodules, also known as **manganese nodules**, are rock concretions formed from concentric layers of iron and manganese hydroxides around a core.
- The core might be **microscopically small** and is occasionally entirely transformed into manganese minerals through crystallization.
- These nodules, **largely porous and potato-shaped**, are abundant and **carpet the seafloor in the deep sea** of world oceans.
- They also contain **nickel, copper, cobalt, lead, molybdenum, cadmium, vanadium**, and other elements.

Rare earth elements

- Rare earth elements comprise a **group of 17 elements** abundant in the **Earth's crust**.
- The rare earths occur in many other minerals and are recoverable as **by-products from phosphate rock** and **from spent uranium leaching**.
- They are **lustrous silvery-white soft heavy metals**.

- These minerals have **unique magnetic, luminescent and electrochemical properties** and thus are **used in many modern technologies** including consumer electronics, computer and networks, communication, health care etc.
- **China** is the **largest producer** of world's rare earth elements. The other major producers are Australia, USA, Russia, Malaysia and Vietnam.

Type of the questions: Conceptual

1. Consider the following statements:

- 1) In the tropical zone, the western sections of the oceans are warmer than the eastern sections, owing to the influence of trade winds.
- 2) In the temperate zone, westerlies make the eastern sections of oceans warmer than the western sections.

Which of the statements given above is/are correct?

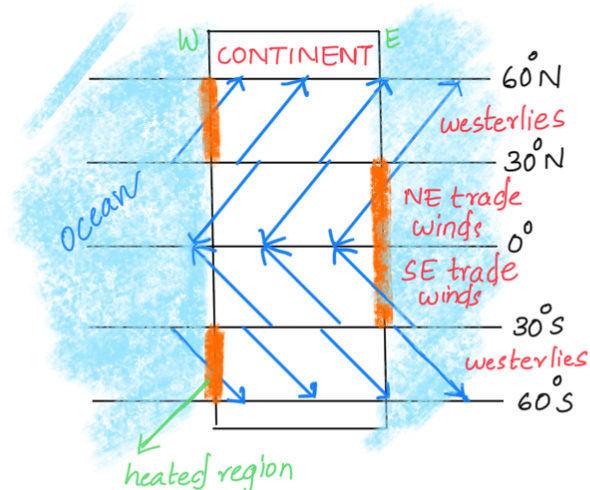
- a) 1 only
- b) 2 only
- c) Both 1 and 2 ✓
- d) Neither 1 nor 2

Difficulty level: Moderate

EXPLANATION

Trade Winds

- They are the **most regular of the planetary winds** (winds that are almost global in extent).
- In the tropical zone, trade winds **blow from the east towards west**. This **pushes surface water towards the western sections of the oceans**.
- It leads to the **piling up of warm surface water** in the western sections of the oceans, **making them warmer than the eastern sections**.
- In their passage across the oceans, they **gather moisture and bring heavy rainfall to the east coast of the continent**.
- Thus, in the tropical zone, the western sections of the oceans are warmer than the eastern sections, owing to the influence of trade winds.
- As they are offshore* on the west coast, these regions **suffer from great aridity** and form the **hot deserts** of the world.
 - » Eg: Sahara, Atacama (Chile), Mojave (USA) etc.



*an offshore wind moves from land to the waterbody.

Westerlies

- They are much **less constant and persistent** than the trade winds.
- They play a valuable role in carrying the **warm tropical waters to the western coast of temperate latitudes**.
- In the temperate zone, **westerlies blow from the west towards the east, pushing the surface water towards the eastern sections of the oceans**.
- This results in the **piling up of warm surface water** in the eastern sections, **making them warmer** than the western sections.
- Therefore, in the temperate zone, westerlies make the eastern sections of oceans warmer than the western sections.
- In the **southern hemisphere, westerlies blow with great force and regularity** because of the **larger oceanic expanse** and continuous pressure belts.
- It is usual for sailors to refer the westerlies as;
 - » **Roaring forties** (40 degree south)
 - » **Furious fifties** (50 degree south)
 - » **Shrieking sixties** (60 degree south)

RELATED PYQs

Q1. Consider the following statements:

1. The winds which blow between 30 N and 60 S latitudes throughout the year are known as westerlies.
2. The moist air masses that cause winter rains in the NorthWestern region of India are part of westerlies.

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

[2015]

2. With reference to India, Didwana, Kuchaman, Sargol and Khatu are the names of

- a) glaciers
- b) mangrove areas
- c) Ramsar sites
- d) saline lakes ✓

Difficulty level: Moderate

EXPLANATION

Saline lakes

- Saline lakes are found in the **hydrographically lowest areas of arid environments** within **closed drainage basins**. They are bodies of water that have **salinities in excess of 3 grams per litre**.
- Saline lakes include the **largest lake in the world, the Caspian Sea** and the **lowest lake, the Dead Sea**.
- They can be categorized into several types: **ephemeral, perennial, acidic, and alkaline**. These lakes exhibit various **depositional sub-environments** such as **alluvial fans, sandflats, dry mudflats, and dune fields**.
- Some salt lakes may contain a higher salt concentration than ocean water, earning them the designation of **hypersaline lakes**.
- **Playas** are **small lakes with flat floors and undrained basins** where water collects and evaporates quickly.
- Examples of Saline lakes: **Didwana, Kuchaman, Sambhar, and the Khatu**.
- Other notable saltwater lakes in India
 - » **Sambhar Lake in Rajasthan** is the largest inland salt lake in India and is designated as a Ramsar site.
 - » **Lonar Lake in Maharashtra** is part of the Deccan Plateau, a vast expanse of volcanic basalt rock formed by eruptions.



- Salt lakes form when water containing salt or minerals flows into a lake but cannot exit due to the **endorheic nature** of the lake.

A **glacier** is a **large perennial accumulation of crystalline ice, snow, rock, sediment, and water** that originates on land and moves downslope under the influence of its own weight and gravity.

- **Didwana**: Town in the Nagpur district of Rajasthan
- **Sargol**: Village in Tehran province in Iran
- **Kuchaman**: Situated near Kuchaman city in the Nagpur district of Rajasthan

3. Consider the following rivers:

- 1) Brahmani
- 2) Nagavali
- 3) Subarnarekha
- 4) Vamsadhara

Which of the above rise from the Eastern Ghats?

- a) 1 and 2
- b) 2 and 4 ✓
- c) 3 and 4
- d) 1 and 3

Difficulty level: Hard

EXPLANATION

Nagavali River

- **Originates** from the **Eastern Ghats** in the Kalahandi district of **Odisha**.
- Also known as **Langulya**.
- Drains into the **Bay of Bengal**.
- **Important tributaries** included Jhanjavati, Satnala, Suvarnamukhi, Vegavati.
- One of the main rivers of southern Odisha and northern Andhra Pradesh.

Vamsadhara River

- **East-flowing** river **originating** in the Kalahandi district of **Odisha, Eastern Ghats**.
- Drains into the **Bay of Bengal**.
- Main river of the northeastern Andhra region.
- The **Boddepalli Rajagopala Rao Project** was constructed to meet the irrigation needs of the region.



- **Important tributaries:** Poladi, Gungudu, Mahendranaya, Bellagedda.

Brahmani River

- Major **seasonal** river in **Odisha**.
- Formed by the **confluence of rivers Sankh and South Koel** at Rourkela in the **Chhattisgarh-Jharkhand border**.
- Both these rivers originate in the **Chotanagpur Plateau**.
- **Important tributaries:** Koel, Mankara, Samakoi, Karo, Rukura, etc.
- **Rengali dam** in Odisha is built across the Brahmani river.

Subarnarekha River

- Originates in the Ranchi Plateau of **Jharkhand**.
- Drains into the **Bay of Bengal**.
- **Runs eastward** across West Bengal and Orissa before entering the Bay of Bengal.
- **Important tributaries:** Kharkai, Roro, Kanchi, Kodia, etc.
- **Hundru Falls** is formed along the Subarnarekha river.
- **Getalsud reservoir** is located across the Subarnarekha.

RELATED PYQs

Q1. Consider the following rivers:

1. Vamsadhara
2. Indravati
3. Pranahita
4. Pennar

Which of the above are tributaries of Godavari?

- a) 1, 2 and 3
- b) 2, 3 and 4
- c) 1, 2 and 4
- d) 2 and 3 only

[2015]

Type of the questions: Application

1. Among the following, which one is the least water efficient crop?
 - a) Sugarcane ✓
 - b) Sunflower
 - c) Pearl millet
 - d) Red gram

Difficulty level: Easy

Relevance: Due to acute water shortage a large number of Marathwada farmers shifted away from sugarcane and cultivated tur.

EXPLANATION

- **Water use efficiency (WUE)** is defined as the amount of carbon assimilated as biomass or grain produced per unit of water used by the crop.
- **Water intensive crops** (or **least water efficient crops**) are those crops referred to as the **crops that require a large amount of water for their cultivation**.
- Some of the **most water intensive crops** that are popularly grown by Indian farmers includes- **rice, cotton, sugarcane, soya, and wheat**.

Sugarcane

- Grows in **tropical** and **subtropical** climates.
- **Brazil is the largest sugarcane producer** in the world.



- Thrives in **well-drained loamy soil**.
- Considered a **Kharif crop**.
- Requires **temperatures** averaging **21°C to 27°C**.
- Ideal rainfall: **75 - 150 cm**; irrigation needed in low rainfall areas.
- Highly **sensitive to drought** conditions and one of the least water efficient crop.
- Traditionally, the **terai region** of northern plains was the most important location for sugarcane cultivation.

- Over the years, the **sugarcane belt shifted to south (Western Maharashtra, northern Karnataka and Kaveri valley)** due to favourable Argo-climatic conditions.

Sunflower

- Sunflower, popularly known as “Surajmukhi” (it follows the sun by day) is an **annual flowering plant, native to North and Central America** but is now cultivated worldwide for its versatile uses.



- Significant **oilseed crop** in India.
- Ukraine leads in global sunflower** production.
- Majorly cultivated in **Karnataka, Maharashtra, Andhra Pradesh, Punjab, and Haryana** in India.

Pearl Millet

- Also known as **Bajra**.
- Primarily cultivated in **semiarid tropics**.
- Notably **resilient to high temperatures**, exceeding 40°C.
- Gaining importance as a **climate-resistant and nutritious crop**.
- Rajasthan is the leading producer of Bajra(Pearl Millet)**. Other producing states- **Gujarat, Uttar Pradesh, Haryana** etc.



Red Gram

- Commonly referred to as **pigeonpea**.
- Mainly grown in **semi-arid regions** of India.
- Thrives in temperatures ranging from **26°C to 30°C**.
- Considered a **rabi crop**.
- Maharashtra, Karnataka, Madhya Pradesh** are the important red gram producing Indian states.



RELATED PYQs

- Q1. With reference to the cultivation of Kharif crops in India in the last five years, consider the following statements:
- Area under rice cultivation is the highest.
 - Area under the cultivation of jowar is more than that of oilseeds.
 - Area of cotton cultivation is more than that of sugarcane.
 - Area under sugarcane cultivation has steadily decreased.

Which of the statements given above are correct?

- 1 and 3 only
- 2, 3 and 4 only
- 2 and 4 only
- 1, 2, 3 and 4

[2019]

- Q2. With reference to the current trends in the cultivation of sugarcane in India, consider the following statements:

- A substantial saving in seed material is made when ‘bud chip settings’ are raised in a nursery and transplanted in the main field.
- When direct planting of setts is done, the germination percentage is better with single budded setts as compared to setts with many buds.
- If bad weather conditions prevail when sets are directly planted, single-budded setts have better survival as compared to large setts.
- Sugarcane can be cultivated using settings prepared from tissue culture.

Which of the statements given above is/are correct?

- 1 and 2 only
- 3 only
- 1 and 4 only
- 2, 3 and 4 only

[2020]

2022-PRELIMS PREVIOUS YEAR QUESTIONS

Type of the questions: Factual

1. Gandikota canyon of South India was created by which one of the following rivers ?

- a) Cauvery
- b) Manjira
- c) Pennar ✓
- d) Tungabhadra

Difficulty level: Moderate

EXPLANATION

- Gandikota village, situated in the Kadapa district of **Andhra Pradesh**, is home to a stunning canyon along the **Pennar River**.



- Often referred to as the Gandikota Canyon, this natural wonder is often **compared to Grand Canyon of Arizona, USA**.
- Over time, the Pennar River has intricately carved the **pink granite rock formations of the Erramala Hills**, giving rise to the majestic Gandikota Canyon.
- Gandikota Canyon has been an important part of Andhra Pradesh' history. From the **Kakatiyas and Vijayanagaras to the Qutub Shahis**, everyone knew that the massive canyon needed to be under their control for better administration of the kingdom.
- Near to the Canyon lies **India's second-largest cave system – the Belum Caves** in Kurnool district. These caves were formed millions of years ago when a persistent flow of water gradually eroded through the black limestone deposits in the region.

Pennar River

- The Pennar River is a southern Indian river that traverses the states of **Karnataka** and **Andhra Pradesh**, eventually emptying **into the Bay of Bengal** in the Nellore district of Andhra Pradesh.

- It is also referred to as **Pinakini, Penneru, Penner, Pennar, and Pennai**.
- The river spans a length of **597 kilometers** and boasts a drainage basin covering 55,213 square kilometers.
- **Originating from the Nandi Hills** in the Chikkaballapur District of **Karnataka** state, the Pennar River holds a unique distinction worldwide. After its inception in the Nandi Hills, **it diverges into two separate streams, flowing in both northern and southern directions, a rarity in river formations globally**.

2. Consider the following pairs:

	<i>Peak</i>	<i>Mountains</i>
1)	Namcha Barwa	– Garhwal Himalaya
2)	Nanda Devi	– Kumaon Himalaya
3)	Nokrek	– Sikkim Himalaya

Which of the pairs given above is/are correctly matched?

- a) 1 and 2
- b) 2 only ✓
- c) 1 and 3
- d) 3 only

Difficulty level: Hard

EXPLANATION

Namcha Barwa

- It is a mountain in the **Tibetan Himalaya**.
- The traditional definition of the Himalaya extending from the Indus River to the Brahmaputra would make it the **eastern anchor of the entire mountain chain**, and it is the **highest peak of its own section** as well as **Earth's easternmost peak over 7,600 metres**.
- Stands within the **Great Bend of the Yarlung Tsangpo River** as it enters its notable gorge across the Himalaya.

Nanda Devi

- **Second highest mountain** in India and the **highest entirely within the country** (Kangchenjunga being on the border of India and Nepal).

- It is part of the **Kumaon Himalayas**, and is located in the state of Uttarakhand, between the Rishiganga valley on the west and the Goriganga valley on the east.
- Its name means **Bliss-Giving Goddess**. The peak is regarded as the patron-goddess of the Uttarakhand Himalaya.
- The surrounding **Nanda Devi National Park** was declared a **UNESCO World Heritage Site in 1988**.

Nokrek Peak

- Nokrek Peak is a prominent mountain peak located in the **Garo Hills of Meghalaya**, India.
- It is part of the **Nokrek National Park**, which is known for its biodiversity and unique flora and fauna.
- The peak stands at an elevation of around **1,412 meters (4,633 feet)** above sea level.
- Nokrek National Park recognized for conservation efforts, especially for the preservation of the endangered species, the **Hoolock Gibbon**.

RELATED PYQs

Q1. Consider the following pairs:

1. Nokrek Biosphere Reserve : Garo Hills
2. Logtak (Loktak)Lake : Barail Range
3. NamdaphaNationalPark : Daffla Hills

Which of the above pairs is/are correctly matched?

- a) 1 only
- b) 2 and 3 only
- c) 1, 2 and 3
- d) None

[2013]

3. In the northern hemisphere, the longest day of the year normally occurs in the :

- a) First half of the month of July
- b) First half of the month of June ✓
- c) Second half of the month of June
- d) Second half of the month of July

Difficulty level: Moderate

EXPLANATION

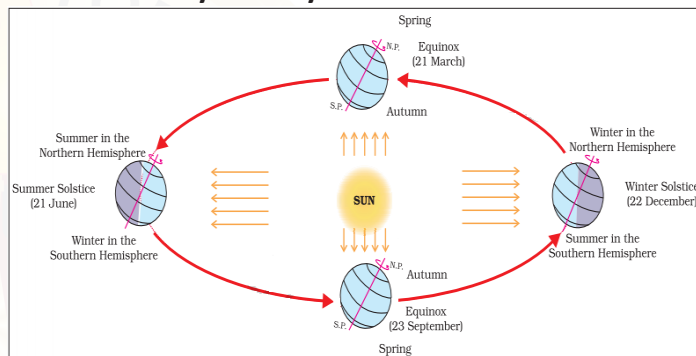
Summer Solstice

- Occurs when the **North Pole is tilted toward the sun**.

- Primarily in the **middle of June**.
- Brings the **longest day in the northern hemisphere** as it is tilted towards the sun.
- The **southern hemisphere experiences the shortest night**.
- **Sun rays fall directly over the Tropic of Cancer**.
- Marks the **year's longest and brightest day**.

Winter Solstice

- Occurs when the **North Pole is tilted farthest away from the sun**.
- Mainly in the **middle of December**.
- Brings the **longest night in the northern hemisphere** as it is tilted away from the sun.
- The **southern hemisphere experiences the longest days**.
- **Sun rays fall directly over the Tropic of Capricorn**.
- The winter solstice represents the **shortest and darkest day of the year**.



RELATED PYQs

Q1. On 21st June, the Sun

- a) does not set below the horizon at the Arctic Circle
- b) does not set below the horizon at Antarctic Circle
- c) shines vertically overhead at noon on the Equator
- d) shines vertically overhead at the Tropic of Capricorn

[2019]

4. Consider the following States:

- 1) Andhra Pradesh
- 2) Kerala
- 3) Himachal Pradesh
- 4) Tripura

How many of the above are generally known as tea producing States?

- a) Only one State
- b) Only two States
- c) Only three States ✓
- d) All four States

Difficulty level: Moderate

EXPLANATION

Tea

- Tea is the most popular and low-cost beverage consumed by many people. Tea is one of the world's **oldest beverages**, and is the **most consumed drink in the world, after water**.
- It grows in **warm and humid conditions** with a lot of rainfall, typically thriving in **humidity between 80-90%**.
- The **annual rainfall** required for tea cultivation ranges between **150-300 cm**. It flourishes in slightly **acidic soil** types.
- Major tea-producing states in India include **Assam, West Bengal, Tamil Nadu, Kerala**, etc.
- **India is the second-largest producer** of tea in the world, **after China**.
- **China, Korea and Japan have four tea cultivation sites** designated as **Globally Important Agricultural Heritage Systems (GIAHS)** by **FAO**.

Type of the questions: Current Affairs

1. Which one of the following statements best describes the 'Polar Code'?
 - a) It is the international code of safety for ships operating in polar waters. ✓
 - b) It is the agreement of the countries around the North Pole regarding the demarcation of their territories in the polar region.
 - c) It is a set of norms to be followed by the countries whose scientists undertake research studies in the North Pole and South Pole.
 - d) It is a trade and security agreement of the member countries of the Arctic Council.

Difficulty level: Moderate

Relevance: India recently unveiled its Arctic policy.

EXPLANATION

- The Polar Code is the **first mandatory, international maritime agreement** developed for the **polar region**.
- It aims to ensure **safe shipping and avoid environmental damage** in the remote and sensitive polar regions.
- It covers **design, construction, equipment, operational, training, search and rescue and environmental matters** relevant to polar shipping.
- It was **adopted by the members of the International Maritime Organization (IMO)** under the auspices of the United Nations, the Polar Code entered into force in January 2017.
- The Polar Code introduced **legally-binding safety and pollution-prevention measures** for **cruise ships and large cargo ships (over 500 gross tons)** in polar waters.
- It requires ships to apply for a **Polar Ship Certificate**.
- **The Polar Code assigns a ship to one of three categories – Category A, B or C – based on the type of ice for which it is designed to operate, if any.**
 - » A **Category-A ship** is made for **operating in medium first-year ice** in polar waters, possibly including old ice.
 - » A **Category-B ship** is designed for operating in polar waters with **at least thin first-year ice**, which might also have old ice.
 - » A **Category-C ship** means a ship designed to **operate in open water or in ice conditions less severe** than those included in Categories A and B.

2. Consider the following countries :

- 1) Azerbaijan
- 2) Kyrgyzstan
- 3) Tajikistan
- 4) Turkmenistan
- 5) Uzbekistan

Which of the above have borders with Afghanistan?

- a) 1, 2 and 5 only
- b) 1, 2, 3 and 4 only
- c) 3, 4 and 5 only ✓
- d) 1, 2, 3, 4 and 5

Difficulty level: Moderate

Relevance: Afgahanisation was in news for the regional tensions due to Taliban attack and US withdrawal.

EXPLANATION



- Afghanistan is a **landlocked country** situated at the crossroads of Central Asia and South Asia.
- It is **bounded to the east and south by Pakistan**, to the **west by Iran**, and to the **north by the Central Asian states of Turkmenistan, Uzbekistan, and Tajikistan**.
- **Kabul** serves as the **capital**.
- The country is **rich in natural resources**, including lithium, iron, zinc, and copper.
- Afghanistan **experiences extremely cold winters and hot summers**, characteristic of a **semi-arid steppe climate**.

RELATED PYQs

Q1. Consider the following pairs:

Town sometime mentioned in news	Country
Aleppo	Syria
Kirkuk	Yemen
Mosul	Palestine
Mazar-i- Sharif	Afghanistan

Which of the pairs given above are correctly matched?

- 1 and 2
- 1 and 4
- 2 and 3
- 3 and 4

[2018]

Q2. Consider the following pairs :

Regions sometimes mentioned in news	Country
Catalonia	Spain
Crimea	Hungary
Mindanao	philippines
Oromia	Nigeria

Which of the pairs given above are correctly matched ?

- 1, 2 and 3
- 3 and 4 only
- 1 and 3 only
- 2 and 4 only

[2018]

Q3. Consider the following pairs:

Sea	Bordering country
Adriatic Sea	Albania
Black Sea	Croatia
Caspian Sea	Kazakhstan
Mediterranean Sea	Morocco
Red Sea	Syria

Which of the pairs given above are correctly matched?

- 1, 2 and 4 only
- 1, 3 and 4 only
- 2 and 5 only
- 1, 2, 3, 4 and 5

[2019]

3. Consider the following statements:

- 1) Gujarat has the largest solar park in India.
- 2) Kerala has a fully solar powered International Airport.
- 3) Goa has the largest floating solar photovoltaic project in India.

Which of the statements given above is/are correct?

- 1 and 2
- 2 only ✓
- 1 and 3
- 3 only

Difficulty level: Moderate

Relevance: World's largest solar park in Bhadla, India was in news.

EXPLANATION

Solar energy

- Solar energy is the most **abundant & cleanest energy resource** on earth.
- The amount of solar energy that hits the earth's surface in an hour is almost the same as the amount required by all human activities in a year.

Three primary ways of using Solar energy

- **Photovoltaic (PV) cells:** These cells **convert sunlight directly into electricity**. They are commonly **used in solar panels** installed on rooftops or in large solar farms. The electricity generated can be used to power homes, businesses, and even electric vehicles.
- **Concentrating Solar Power (CSP):** This technology uses **mirrors or lenses to concentrate sunlight onto a small area**, which **heats up a fluid**. The heated fluid is then used to generate electricity through a steam turbine. CSP is often used in **large-scale power plants**.
- **Solar Thermal Collectors for Heating and Cooling (SHC):** These collectors **use sunlight to heat a fluid**, which is then used to provide hot water, space heating, or cooling. SHC systems can be used in residential, commercial, and industrial settings.

Floating Solar



- It refers to any solar array that **floats on top of a water body**. Solar panels are **affixed on buoyant structures**, keeping them afloat on the water body surface. These floating solar panels are **mostly found on lakes and dams** as they are generally calmer than oceans.

- The electricity is sent from this **floating body through underwater cables to a transmission tower**.
- They have certain **advantages** over land-based systems, including **utilization of existing electricity transmission infrastructure** at hydropower sites, **close proximity to demand centers** (in the case of water supply reservoirs), and **improved energy yield** due to the **cooling effects of water** and the **decreased presence of dust**.

- Solar energy holds a central position in India's **National Action Plan on Climate Change**, notably through the **National Solar Mission (NSM)**, a key initiative.
- The government has implemented various measures to promote solar energy, including allowing **Foreign Direct Investment (FDI) up to 100 percent under the automatic route**.

Key Stats

- As of November 30, 2022, **India ranked fourth globally in solar photovoltaic (PV) deployment** with an installed solar capacity of 61.97 gigawatts (GW). **Solar tariffs** in India have become **highly competitive, achieving grid parity**.
- By July 2023, the installed solar energy capacity had increased dramatically to **70.10 GW**, marking **a 30-fold increase in the last nine years**.

Rank	State	Solar Capacity	Prominent Solar Plant
1	Rajasthan	16.06 GW	Bhadla Solar Park
2	Gujarat	8 GW	Charanka Solar Park
3	Karnataka	7.8 GW	Pavagada Solar Park
4	Tamil Nadu	6.2 GW	Kamuthi Solar Power Project
5	Telangana	4.6 GW	Ramagundam Floating Solar Project

- Rajasthan have the largest Solar capacity among Indian states. The **Bhadla Solar Park in Rajasthan stands as India's largest solar park**, contributing to an operational **capacity of 2245 MW**.

- **Cochin International Airport Ltd (CIAL) in Kerala** made history by becoming the **world's first airport to run entirely on solar power**. The airport commissioned a 12 MW solar project in 2015.
- Furthermore, **India's largest floating Solar Power Project, the Ramagundam Floating Solar PV Project in Telangana**, reached full operational capacity, with NTPC declaring Commercial Operation of the final part capacity of 20 MW out of 100 MW on July 1, 2022.

4. Which one of the following statements best reflects the issue with Senkaku Islands, sometimes mentioned in the news?

- It is generally believed that they are artificial islands made by a country around South China Sea.
- China and Japan engage in maritime disputes over these islands in East China Sea. ✓
- A permanent American military base has been set up there to help Taiwan to increase its defence capabilities.
- Though International Court of Justice declared them as no man's land, some South-East Asian countries claim them.

Difficulty level: Moderate

Relevance: Sino-Japanese controversy over the Senkaku/Diaoyu/Diaoyutai Islands as an imminent flashpoint in the Indo-Pacific.

EXPLANATION



- It is a group of uninhabited islands in the **East China Sea**.
- **Japan, China and Taiwan claim these islands**.
- The island groups were formally claimed by Japan in 1895. After Japan's defeat in World War II, the island chain was controlled by the US until 1971 before its return.
- Since 1972, Japan has administered them.
- China claims the region by raising some historic rights, but Japan does not recognise that.

5. Consider the following pairs:

Country	Important reason for being in the news recently
1) Chad	– Setting up of permanent military base by China
2) Guinea	– Suspension of Constitution and Government by military
3) Lebanon	– Severe and prolonged economic depression
4) Tunisia	– Suspension of Parliament by President

How many pairs given above are correctly matched?

- Only one pair
- Only two pairs
- Only three pairs ✓
- All four pairs

Difficulty level: Moderate

EXPLANATION

Guinea

- Guinea is a **west African nation**. The country was seen in the news because, **President was detained after a successful military coup**. Military suspended the constitution and government.

Lebanon

- Lebanon is a country **in West Asia** located in the **Eastern Mediterranean and the Levant**. Over two years, around 78 percent of the Lebanese population has fallen into **poverty**. The **World Bank** says it is one of the **sharpest depressions** of modern times.

Tunisia

- Tunisia is the **northernmost country in Africa**.

Tunisian President Kais Saied's decision to sack the Prime Minister and suspend Parliament, amid widespread anti-government protests, has triggered the worst political crisis in the country since the Arab Spring protests.

Equatorial Guinea

- **China has overarching strategic interests** in Africa. Recently, Beijing plans to establish a **permanent military installation** in Equatorial Guinea (not in Chad).

RELATED PYQs

Q1. Recently, a series of uprisings of people referred to as 'Arab Spring' originally started from

- Egypt
- Lebanon
- Syria
- Tunisia

[2014]

Q2. Which one of the following countries of South-West Asia does not open out to the Mediterranean Sea?

- Syria
- Jordan
- Lebanon
- Israel

[2015]

Q3. Mediterranean Sea is a border of which of the following countries?

- Jordan
- Iraq
- Lebanon
- Syria

Select the correct answer using the code given below:

- 1, 2 and 3
- 2 and 3 only
- 3 and 4 only
- 1, 3 and 4 only

[2017]

6. Consider the following pairs:

<i>Region often mentioned in the news</i>		<i>Country</i>
---	--	----------------

- | | | |
|-----------------|---|----------|
| 1) Anatolia | – | Turkey |
| 2) Amhara | – | Ethiopia |
| 3) Cabo Delgado | – | Spain |
| 4) Catalonia | – | Italy |

How many pairs given above are correctly matched?

- Only one pair
- Only two pairs ✓
- Only three pairs
- All four pairs

Difficulty level: Moderate

EXPLANATION

Anatolia

- Anatolia, or Asia Minor Turkish Anadolu, Peninsula forming the **western extremity of Asia**.
- It is bounded by the **Black Sea to the north, the Mediterranean Sea to the south, and the Aegean Sea to the west**.
- Its eastern boundary is generally marked by the southeastern **Taurus Mountains**.
- Anatolia is roughly contiguous with the Asian portion of the **modern Republic of Turkey**.
- Recently, **Turkey's Lake Tuz** in the Central Anatolian region was in the news. The Lake was dried up due to climate change and farming.

Amhara

- **Continued human rights violations and abuses**, including arbitrary arrests, in **Ethiopia's** north-western Amhara region and other parts of the country are deeply concerning.
- They undermine any ongoing efforts by the Government of Ethiopia on the peace process, including transitional justice.

Cabo Delgado

- **WHO's HeRAMS** has been deployed in Cabo Delgado, **Mozambique** since January 2022, and has allowed for the **assessment of 135 health facilities** across the province.
- The fifth report of the HeRAMS Cabo Delgado Baseline Report 2022 series focusing on the **availability of sexual and reproductive health services**.

[WHO's Health Resources and Services Availability Monitoring System (HeRAMS) aims to provide decision-makers and health stakeholders at large with vital and up-to-date information on the availability of essential health resources and services, help them to identify gaps, and determine priorities for intervention.]

Catalonia

- Catalonia is a region in **Spain**.
- The region was in news for the **arrest of Catalan regional head**, claiming he helped organise a 2017 independence referendum deemed illegal by Spanish courts.

7. Consider the following statements:

- 1) **Bidibidi is a large refugee settlement in north-western Kenya.**
- 2) **Some people who fled from South Sudan civil war live in Bidibidi.**
- 3) **Some people who fled from civil war in Somalia live in Dadaab refugee complex in Kenya.**

Which of the statements given above is/are correct?

- a) 1 and 2
- b) 2 only
- c) 2 and 3 ✓
- d) 3 only

Difficulty level: Moderate

Relevance: After weeks of tension, Sudan's military seized power in a coup.

EXPLANATION

- **Uganda hosts the largest number of refugees in Africa** – more than 1.45 million, mostly from South Sudan but also from the Democratic Republic of the Congo and Burundi.
- **Bidibidi is a large refugee settlement in Uganda.** It alone **hosts 235,000 people.**
- The country has one of the **most progressive refugee policies** in the world, **allowing refugees to use land for housing and farming, work, and move around the country freely.**
- **Drought and conflict force people to flee Somalia for Kenya's Dadaab refugee camps.**

World's five largest refugee camps

✦ Kakuma Refugee Camp

- » Located in northwest **Kenya**.
- » Hosts refugees mainly from South Sudan and Somalia.

✦ Dadaab Refugee Complex

- » Southeast of Kakuma is the Dadaab refugee complex, which comprises three large refugee camps: Hagadera, Dagahaley and Ifo.
- » **These camps primarily host Somali refugees.**

✦ Za'atari

- » Ten years ago at the start of the war in Syria, thousands of Syrian refugees began fleeing to Jordan.
- » In response to the influx of refugees, the Za'atari refugee camp was opened in 2012, in **Jordan** which later became the **largest camp for Syrian refugees in the world.**

✦ Kutupalong

- » In the Cox's Bazar region of **Bangladesh**.
- » **Hosts Rohingya refugees** from Myanmar.

✦ Um Rakuba

- » The Um Rakuba refugee camp in **Sudan** is just one of the many camps responding to the growing crisis in the Tigray region of Ethiopia.

Type of the questions: Conceptual

1. With reference to India, consider the following statements:

- 1) **Monazite is a source of rare earths.**
- 2) **Monazite contains thorium.**
- 3) **Monazite occurs naturally in the entire Indian coastal sands in India.**
- 4) **In India, Government bodies only can process or export monazite.**

Which of the statements given above are correct ?

- a) 1, 2 and 3 only
- b) 1, 2 and 4 only ✓
- c) 3 and 4 only
- d) 1,2, 3 and 4

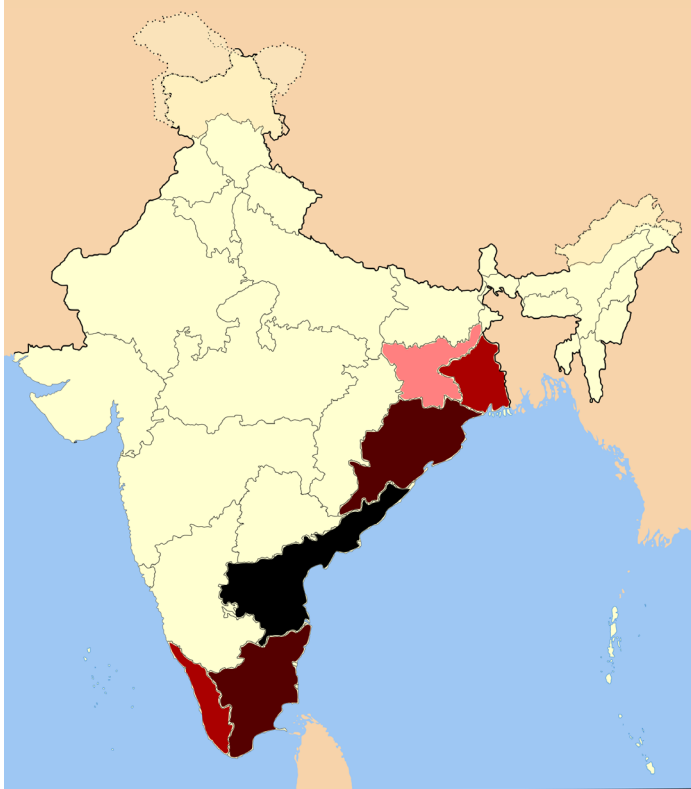
Difficulty level: Moderate

EXPLANATION

Monazite

- Monazite is a **reddish-brown phosphate mineral containing rare earth metals**.
- It is an **important source of thorium, cerium**, and other rare elements and finds use in construction and casting.
- The **largest deposits** of monazite sand are found in **India, Madagascar, and South Africa**.
- **In India, monazite doesn't occur naturally throughout the entire Indian coastal sands.** It's a **radioactive atomic mineral** utilized in the production of thorium and has the potential to be used as fuel in the nuclear power system.
- **Indian Rare Earths Ltd., wholly owned by the Government of India** and administratively controlled by the **Department of Atomic Energy**, primarily employs monazite for the production of rare earth compounds and thorium required by the Department of Atomic Energy.
- Among Indian states, **Tamil Nadu holds the highest monazite reserves, followed by Kerala, Andhra Pradesh, and Odisha.**

Monazite reserves in India



2. Consider the following statements :

- 1) High clouds primarily reflect solar radiation and cool the surface of the Earth.
- 2) Low clouds have a high absorption of infrared radiation emanating from the Earth's surface and thus cause warming effect.

Which of the statements given above is/are correct?

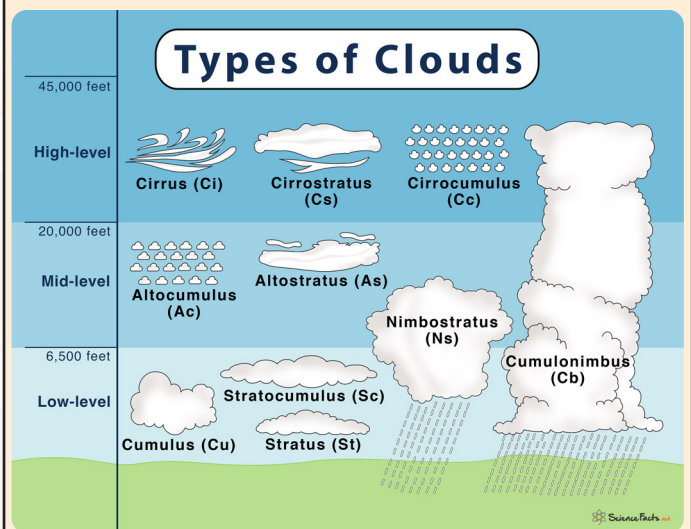
- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2 ✓

Difficulty level: Moderate

EXPLANATION

- Cloud is a **mass of minute water droplets** or **tiny crystals of ice** formed by the condensation of the water vapour in free air at considerable elevations.

According to their height over the surface of earth, clouds are classified into four types:



a) High Clouds (>6 km):

i. **Cirrus (Ci)**: This looks **fibrous** and **appears like wisps in the blue sky**; it is often called 'mares' tails'. It indicates fair weather, and often gives a brilliant sunset.

ii. **Cirrocumulus (Cc)**: This appears as **white globular masses**, forming ripples in a 'mackerel sky'.

iii. **Cirrostratus (Cs)**: This resembles a **thin white sheet or veil**; the sky looks milky and the sun or moon shines through it with a characteristic 'halo'.

RELATED PYQs

Q1. During a thunderstorm, the thunder in the skies is produced by the:

1. meeting of cumulonimbus clouds in the sky
2. lightning that separates the nimbus clouds
3. violent upward movement of air and water particles

Select the correct answer using the codes given below.

- a) 1 only
- b) 2 and 3
- c) 1 and 3
- d) None

[2013]

Q2. Why are dewdrops not formed on a cloudy night?

- a) Clouds absorb the radiation released from the Earth's surface.
- b) Clouds reflect back the Earth's radiation.
- c) The Earth's surface would have a low temperature on cloudy nights.
- d) Clouds deflect the blowing wind to ground level.

[2019]

Type of the questions: Application

1. With reference to the "Tea Board" in India, consider the following statements:

- 1) The Tea Board is a statutory body.
- 2) It is a regulatory body attached to the Ministry of Agriculture and Farmers Welfare.
- 3) The Tea Board's Head Office is situated in Bengaluru.
- 4) The Board has overseas offices at Dubai and Moscow.

Which of the statements given above are correct?

- a) 1 and 3
- b) 2 and 4
- c) 3 and 4
- d) 1 and 4 ✓

Difficulty level: Moderate

Relevance: The 70-year-old Tea Act was proposed for an amendment aimed at revamping the Tea Board of India in response to declining tea exports worsened by the situation in Ukraine.

» High clouds have a **high absorption of infrared radiation** emanating from the Earth's surface and thus cause a **warming effect**. They are thin and do not reflect very much.

b) Middle Clouds (2-6 km):

i. Altocumulus (Alt-Cu) - These are **woolly, bumpy clouds** arranged in **layers** and appearing like waves in the blue sky. They normally indicate **fine weather**.

ii. Altostratus (Alt-St) - These are **denser, greyish clouds** with a 'watery' look. They have a fibrous or striated structure through which the sun's rays shine faintly.

c) Low Clouds (<2 Km):

- Mainly stratus or sheet clouds

i. Stratocumulus (St-Cu)- This is a **rough, bumpy cloud** with the waves more pronounced than in altocumulus. There is great contrast between the bright and shaded parts.

ii. Stratus (St)- This is a **very low cloud, uniformly grey and thick**, which appears like a low ceiling or highland fog. It brings dull weather with light drizzle. It reduces the visibility of aircraft and is thus a danger.

iii. Nimbostratus (Ni-St) - This is a dark, dull cloud, clearly layered, and is also known as a 'rain cloud'. It brings continuous rain, snow or sleet.

» **Low clouds** primarily **reflect solar radiation and cool the surface of the Earth**.

d) Clouds with great vertical extent:

i. Cumulus (Cu): This is a **vertical cloud** with a **rounded top and horizontal base**, typical of humid tropical regions, associated with uprising convectional currents. Its great white globular masses may look grey against the sun but it is a '**fair weather cloud**'.

ii. Cumulonimbus (Cu-Ni): This is, in fact, an **overgrown cumulus cloud**, extending for a **tremendous vertical height** from a base of 2,000 feet to over 30,000 feet. Its black and white globular masses take a fantastic range of shapes. Its cauliflower top often spreads out like an **anvil**. This is frequently **seen in tropical afternoons**. It is also referred to as a '**thunder-cloud**' and brings convectional ram, **accompanied by lightning and thunder**.

EXPLANATION

Tea Board of India

- The Tea Board of India was established on April 1st, 1954, by the **Tea Act of 1953**. It functions as a **statutory body** under the **Ministry of Commerce** and is **headquartered in Kolkata**.
- The primary role of the board is to **promote and export tea both within and outside the country**.
- It comprises **31 members** drawn from various sectors, including members of parliament, tea producers, traders, brokers, consumers, and representatives of government from principal tea-producing states and trade unions. The board is **reconstituted every three years**.
- Additionally, the Tea Board of India has **two overseas offices located in Dubai and Moscow**.

Functions

- Providing **financial and technical assistance** for the cultivation, manufacture, and marketing of tea.
- Promoting **tea exports**.
- Supporting **research and development** activities to increase tea production and improve its quality.
- Encouraging and providing financial and technical **assistance to the unorganized small growers' sector**.

2. The term "Levant" often heard in the news roughly corresponds to which of the following regions ?
- a) Region along the eastern Mediterranean shores ✓
 - b) Region along North African shores stretching from Egypt to Morocco
 - c) Region along Persian Gulf and Horn of Africa
 - d) The entire coastal areas of Mediterranean Sea

Difficulty level: Moderate

Relevance: Syria, Lebanon and Palestine have been hot topics for a long period.

EXPLANATION

- The Levant is an **ancient term** referring to the **countries of the eastern Mediterranean**. Its name is derived from the **French word 'lever,'** meaning 'to rise.'
- Levant countries: **Israel, Lebanon, Syria, Palestine and Jordan**.



- The defining feature of the Levant is its representation as a **land bridge connecting Africa and Eurasia**.

2023-PRELIMS PREVIOUS YEAR QUESTIONS

Type of the questions: Factual

1. Consider the following trees:

- 1) Jackfruit (*Artocarpus heterophyllus*)
- 2) Mahua (*Madhuca indica*)
- 3) Teak (*Tectona grandis*)

How many of the above are deciduous trees?

- a) Only one
- b) Only two ✓
- c) All three
- d) None

Difficulty level: Easy

EXPLANATION

Tropical deciduous forest:

- **Most widespread forest in India.**
- Also called **Monsoon forest.**
- **Rainfall** between: **70-200 cm**
- They are found in the northeastern states along the **foothills of Himalaya, eastern slopes of the Western Ghats** and **Odisha.**
- On the basis of availability of water the **forest is divided into moist and dry deciduous.**

Moist deciduous forest:

- Areas with **rainfall** between **100-200 cm.**
- Mainly found in the northeastern states along the **foothills of the Himalayas, Jharkhand, West Orissa and Chhattisgarh** and on the eastern slopes of the **Western Ghats.**
- Trees such as **teak, sal, shisham, hurra, mahua, amla, semul, kusum, and sandalwood** are commonly found in moist deciduous forests.

Dry deciduous forest:

- Areas with **rainfall** ranging **between 70-100 cm.**
- Mainly found in the **peninsular region** and the **plains of Uttar Pradesh** and **Bihar.**
- As the **dry season** begins, the **trees shed their leaves completely**, giving the forest the appearance of a vast grassland with bare trees all around.

- **Tendu, Palas, Amaltas, Axlewood, Khair** etc. are the trees grown in this forest.

Jackfruit (*Artocarpus heterophyllus*)

- It is an **evergreen tree**, (not a deciduous tree) meaning it retains its leaves throughout the year and does not shed them seasonally.
- **India is the largest producer of jackfruit** in the world.
- It **grows in the Western Ghats** in the south.
- It is the **state fruit of Kerala and Tamil Nadu.**
- Major producers in the world include **India, Thailand, Indonesia, and Nepal.**

Teak

- A **tropical hardwood tree species native to South and Southeast Asia.**
- It **prefers well-drained soils and can tolerate a range of soil types**, including clayey and sandy soils.
- It is **drought-resistant** but benefits from regular watering.

Mahua

- A species of **tropical tree native to India** and also found in Myanmar, Nepal, and Sri Lanka.
- It grows sporadically in **semi-evergreen woods**, along riverbanks, pastures, and crop fields in central India.
- **Mahua's bark can be used to treat leprosy** using a medicinal extract made from the bark.
- The oil extracted from the seeds is utilized in the **treatment of a variety of skin conditions.**

RELATED PYQs

- Q1. In India, in which one of the following types of forests is teak a dominant tree species?
- a) Tropical moist deciduous forest
 - b) Tropical rainforest
 - c) Tropical thorn scrub forest
 - d) Temperate forest with grasslands

[2015]

2. Consider the following statements :

- 1) Amarkantak Hills are at the confluence of Vindhya and Sahyadri Ranges.
- 2) Biligirirangan Hills constitute the easternmost part of Satpura Range.
- 3) Seshachalam Hills constitute the southernmost part of Western Ghats.

How many of the statements given above are correct?

- a) Only one
- b) Only two
- c) All three
- d) None ✓

Difficulty level: Moderate

EXPLANATION

Amarkantak Hills

- The hill is located in the **Anuppur** district of **Madhya Pradesh**.
- It is a **natural heritage area** and the **meeting point of the Vindhya and Satpura ranges** with the **Maikal Hills**. It is **not situated at the confluence of the Vindhya and Sahyadri Ranges**.
- Rivers like the **Narmada, Son, Mahanadi, and Johila** originate from here.
- The forest belt in Amarkantak is part of the **Achanakmar-Amarkantak biosphere reserve**.

Biligirirangan Hills

- This hill range is situated in **southwestern Karnataka**.
- It marks the **starting point of the Eastern Ghats** and **borders the Western Ghats**.
- Designated as a **protected area** under the **Wildlife Protection Act of 1972**.
- It was declared as a **tiger reserve** by the Karnataka government in January 2011.
- **It is not a part of the Satpura range.**

Seshachalam Hills

- These hilly ranges are **part of the Eastern Ghats** in southern Andhra Pradesh, **not the Western Ghats**.
- They **contain minerals** like sandstone and shale interbedded with limestone.
- In **2010**, they were designated as a **Biosphere reserve**.

- The tributaries of the **Penneru River** drain this region.
- The hills are home to a number of **endemic species**, including the famous **Red Sanders** and **slender loris**.

Vindhya Range

- It is a **fragmented range of hills** forming the southern escarpment of India's central highland.
- These **non-tectonic mountains** were generated by the **downhill faulting of the Narmada Rift valley** to their south.
- With **elevations ranging from 1500 to 3500 meters**, the Vindhya Range gives rise to the primary southern tributaries of the Ganges-Yamuna basin, including the **Chambal, Betwa, Ken** etc.
- The mountain range is primarily covered with **dry-deciduous forests**, blocking the course of winds and making the region inhospitable and harsh.

Satpura Range

- This hill range is situated **in central India**, beginning in eastern Gujarat and running through Maharashtra and Madhya Pradesh before ending in Chhattisgarh.
- It comprises the **Mahadeo Hills to the north, Maikala Range to the east**, and the **Rajpipla Hills to the west**.
- **Deciduous forests** cover the range.
- Various national parks such as **Kanha, Pench, Gugamal, and Satpura**, along with biosphere reserves like **Pachmarhi, Melghat Tiger Reserve, and Bori Reserve Forest**, have been designated as protected areas in this region.

Sahyadri Ranges

- The **Western Ghats**, also known as Sahyadri in Maharashtra, are recognized as a **UNESCO World Heritage Site**.
- These mountains are **block mountains** formed due to the **downward wrapping of a part of land into the Arabian Sea**.
- Rivers originating in the Western Ghats and **flowing west** include **Periyar, Bharathappuzha, Netravati, Sharavati, Mandovi**, etc. Those **flowing east** include **Godavari, Krishna, and Kaveri**.

RELATED PYQs

Q1. The Narmada River flows to the west, while most other large peninsular rivers flow to the east. Why?

1. It occupies a linear rift valley.
2. It flows between the Vindhyas and the Satpuras.
3. The land slopes to the west from Central India.

Select the correct answer using the codes given below.

- 1 only
- 2 and 3
- 1 and 3
- None

[2013]

Q2. From the ecological point of view, which one of the following assumes importance in being a good link between the Eastern Ghats and the Western Ghats?

- Sathyamangalam Tiger Reserve
- Nallamala Forest
- Nagarhole National Park
- Seshachalam Biosphere Reserve

[2017]

Q3. Consider the following statements:

1. In India, the Himalayas are spread over five states only.
2. Western Ghats are spread over five states only.
3. Pulicat Lake is spread over two States only.

Which of the statements given above is/are correct?

- 1 and 2 only
- 3 only
- 2 and 3 only
- 1 and 3 only

[2017]

3. Consider the following statements :

- 1) In a seismograph, P waves are recorded earlier than S waves.
- 2) In P waves, the individual particles vibrate to and fro in the direction of wave propagation whereas in S waves, the particles vibrate up and down at right angles to the direction of wave propagation.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2 ✓
- Neither 1 nor 2

Difficulty level: Moderate

EXPLANATION

Earthquake Waves

- All natural earthquakes **occur in the lithosphere**, which refers to the portion of the Earth's surface extending up to 200 km in depth.
- A **seismograph** is an instrument that records the waves reaching the surface during an earthquake.

These earthquake waves can be categorized into two types:

- » **Body Waves**
- » **Surface Waves**

Body Waves

- It originates from the **release of energy at the earthquake's focus** and **travel in all directions** through the Earth's interior, hence their name.
- It moves through the **solid body** of the earth
- **There are two types of body waves:**
 - » **P-Waves**
 - » **S-Waves**

P-Waves, Primary Waves (Compressional/ Push-Pull Waves)

- **Travel faster** and are the **first to arrive at the surface**.
- They are **similar to sound waves** and can **traverse through gaseous, liquid, and solid materials**.
- It **moves the material forward and backward in the direction** in which waves are moving (longitudinal waves), i.e. the material gets expanded and compressed as the wave passes through it and returns to its original size and shape, after the wave passes by. As a result, **the individual particles vibrate to and fro in the direction of wave propagation**.

S- Waves, Secondary Waves (Shear Waves)

- **Slower** than P- waves.
- It can **only travel through solid materials**.
- The unique characteristic of S-waves traveling only through solids has been instrumental in helping scientists **understand the Earth's interior structure**.
- S- Waves are transverse waves, where **particle motion occurs perpendicular** (at right angles) to the direction of wave propagation. These waves cause the particles to move up and down or side to side perpendicular to the direction of the wave.

Therefore, in S waves, the particles vibrate up and down at right angles to the direction of wave propagation.

Surface Waves

- Body waves **on interaction with surface rocks** to generate the new set of waves called Surface Waves
- They **move along the surface** and **cause the most surface destruction**.
- There are **two types** of Surface waves:
 - » **L Waves (Love Waves)**
 - » **R Waves (Rayleigh Waves)**

L Waves (Love Waves)

- **Individual particles of the material move back and forth in a horizontal plane** perpendicular to the wave direction.
- Very damaging to building foundations.

R Waves (Rayleigh Waves)

- They are more **like water waves**- as they move forward, the individual particles of the **material move in a circular path**.

Type of the questions: Current Affairs

1. Consider the following countries:

- 1) Bulgaria
- 2) Czech Republic
- 3) Hungary
- 4) Latvia
- 5) Lithuania
- 6) Romania

How many of the above-mentioned countries share a land border with Ukraine?

- a) Only two ✓
- b) Only three
- c) Only four
- d) Only five

Difficulty level: Easy

Relevance: Ukraine is a hot topic due to the Russia-Ukraine war.

EXPLANATION

Ukraine

- Ukraine, country located in **eastern Europe**, the second largest on the continent after Russia.

- The capital is **Kyiv**, located on the **Dnieper River** in north-central Ukraine.



- Ukraine is **bordered by Belarus to the north, Russia to the east, the Sea of Azov and the Black Sea to the south, Moldova and Romania to the southwest, and Hungary, Slovakia, and Poland to the west**.
- In the far southeast, Ukraine is **separated from Russia by the Kerch Strait**, which **connects the Sea of Azov to the Black Sea**.

Rivers flows through Ukrainian territory

- Dnieper
- Dniester
- Donets (tributary of Don)
- Danube

Major cities

- Kharkiv
- Donetsk
- Odessa
- Zaporizhzhya
- Lyiv

2. With reference to coal-based thermal power plants in India, following statements:

- 1) None of them uses seawater.
- 2) None of them is set up in water-stressed district.
- 3) None of them is privately owned.

How many of the above statements are correct?

- a) Only one
- b) Only two
- c) All three
- d) None ✓

Difficulty level: Easy

Relevance: Coal based thermal power plants have been in news for the overconsumption of water by the plants and its pollution.

EXPLANATION

- More than **65% of India's electricity generation capacity comes from thermal power plants**, with **85% of the country's thermal power generation being coal-based**.
 - **Coal thermal power plants** account for about **70 per cent of the industrial water withdrawal** in India (the Delhi-based non-profit Centre for Science and Environment (CSE) report, 2021).
 - **48 per cent of the existing coal-power fleet was located in water-scarce regions**. Eg: Giral Lignite Thermal Power Plant (Rajasthan).
 - **Even India's most efficient coal power plant consumes twice the amount of water than the world's average**.
 - Due to the country's limited water availability, researchers suggest **usage of sea water instead of river water for thermal power generation in India**.
 - » For example, the **Mundra Thermal Power Station (Gujarat) uses seawater for cooling**. The plant's water source is the seawater from the Gulf of Kutch.
 - With 27 coal-based power stations, **NTPC** (National Thermal Power Corporation) is the **largest thermal power generating company** in the country. The company has a coal-based installed capacity of 52,610 MW.
 - But, the **private players also play a significant role in India's power generation sector**. They own many coal based thermal plants. For eg:
 - » **Adani Power** (Mundra Thermal Power Station, Gujarat)
 - » **Tata Power** (Mundra Ultra Mega Power Plant, Gujarat)
 - » **Reliance Power** (Sasan Ultra Mega Power Plant, Madhya Pradesh).
3. Which one of the following countries has been suffering from decades of civil strife and food shortages and was in news in the recent past for its very severe famine?
- a) Angola
 - b) Costa Rica
 - c) Ecuador
 - d) Somalia ✓

Difficulty level: Moderate

Relevance: A new report of UNICEF says an estimated 43,000 people died amid the longest drought on record in Somalia last year and half of them likely were children.

EXPLANATION

Somalia

- Somalia, officially the Federal Republic of Somalia, is a country located in the **Horn of Africa**.
- It is a nation of **extreme geographic conditions**, characterized by a mainly **dry and hot climate**, with landscapes dominated by **thornbush savannas** and **semi-desert regions**.
- **Decades of civil hostilities** have severely impacted Somalia's economy and infrastructure, leading to the fragmentation of the country into areas controlled by various entities.
- Recently, Somalia has risen to the top of the **International Rescue Committee's Emergency Watchlist** for the first time. This is due to a devastating **drought** exacerbating the effects of three decades of conflict, resulting in a **catastrophic food crisis**.
- While famine has been averted, for now, in Somalia, the food security situation remains critical.

Why is Somalia facing famine?

- **Climate change**- Somalia and parts of neighbouring Ethiopia and Kenya are facing the **fifth failed rainy season in a row**.
- **Insurgency** by Islamist insurgents al Shabaab.
- Loss of income due to the **COVID-19** pandemic
- Experiencing its longest **drought** in over 40 years.
- The combined **damage to Somalia's domestic food production** has made the country dangerously reliant on **imported grains**—specifically from Ukraine and Russia.

What is a famine?

- Famine is declared in an area when **severe hunger** is already widespread, and when **people have started dying of starvation** because they do not have enough nutritious food. According to the **United Nations**, the affected area must meet **three conditions**:
 1. **At least 20% of the population is facing extreme food shortages.**

2. At least 30% of children are suffering from acute malnutrition.
3. At least two people out of every 10,000 inhabitants are dying each day due to starvation, or a combination of severe hunger and illness.

4. Consider the following pairs:

<i>Region often mentioned in the news</i>	<i>Reason for being in news</i>
1) North Kivu and Ituri	: War between Armenia and Azerbaijan
2) Nagorno-Karabakh	: Insurgency in Mozambique
3) Kherson and Zaporizhzhia	: Dispute between Israel and Lebanon

How many of the above pairs are correctly matched?

- a) Only one
- b) Only two
- c) All three
- d) None ✓

Difficulty level: Easy

EXPLANATION

North Kivu and Ituri (Democratic Republic of the Congo)

- The eastern provinces of North Kivu and Ituri in the **Democratic Republic of Congo** have been marked by escalating **violence**, prompting President Felix Tshisekedi to declare a "**State of Siege**." The violence has resulted in the deaths of over a hundred people and the displacement of more than 1.5 million individuals.

Nagorno-Karabakh

- The Nagorno-Karabakh conflict is an **ethnic and territorial conflict between Armenia and Azerbaijan** over the disputed area of Nagorno-Karabakh.
- Although this conflict has its roots in the early 20th century, the current conflict started in 1988.
- It intensified by the 2021–2022 Armenia–Azerbaijan

border crisis.

- **Lachin Corridor** is in Azerbaijan that links Armenia and Nagorno-Karabakh.

Kherson and Zaporizhzhia

- Kherson, with a pre-war population of only a million, lies just **north of Russian-annexed Crimea**, and Russian forces control almost the entire region.
- **Zaporizhzhia** became the centre of world attention after fighting in the vicinity of its **nuclear power plant**, the biggest in Europe, disrupted power supplies to the facility and raised fears of a radiation disaster.

5. Consider the following statements :

Statement-I :

According to the United Nations 'World Water Development Report, 2022', India extracts more than a quarter of the world's groundwater withdrawal each year.

Statement-II :

India needs to extract more than a quarter of the world's groundwater each year to satisfy the drinking water and sanitation needs of almost 18% of world's population living in its territory.

Which one of the following is correct in respect of the above statements?

- a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- c) Statement-I is correct but Statement-II is incorrect ✓
- d) Statement-I is incorrect but Statement-II is correct

Difficulty level: Hard

Relevance: Groundwater over extraction is a major issue faced by the country. It has been frequently seen in news regarding its usage and regulation.

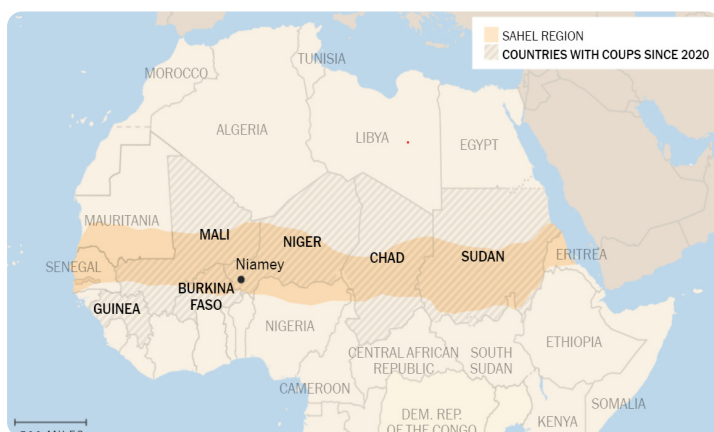
EXPLANATION

- The **2022 edition of the United Nations World Water Development Report (UN WWDR 2022)**, titled '**Groundwater: Making the Invisible Visible**,' delineates the challenges and opportunities linked with the development, management, and governance of groundwater worldwide.

- According to the report, **99% of the Earth's running freshwater is groundwater**. Among other critical points, the report underscores the **overexploitation** of this invaluable resource and emphasizes the urgent necessity for proper management.
 - Approximately **50% of the volume of water withdrawn globally for domestic use is sourced from groundwater**. Moreover, **25% of all water withdrawn for irrigation**, covering 38% of the world's irrigated land, is reliant on groundwater.
 - The **Asia-Pacific region** stands as the **largest extractor of groundwater** globally, with seven out of the top ten countries in groundwater extraction being from this region (**India, China, Pakistan, Iran, Indonesia, Bangladesh, Saudi Arabia, and Turkey**). Together, they account for roughly **60% of the world's total groundwater withdrawal**.
 - **India**, serving as the **largest user of groundwater** on a global scale, abstracts an estimated **251 km³ per year, utilizing 89% of this groundwater for irrigation purposes**. (Therefore option 2 is incorrect)
 - Notably, **60% of the electricity consumed in India's water sector is utilized for groundwater abstraction**.
 - **India alone accounts for nearly 26% of the world's total groundwater abstracted**.
6. In the recent years Chad, Guinea, Mali and Sudan caught the international attention for which one of the following reasons common to all of them?
- a) Discovery of rich deposits of rare earth elements
 - b) Establishment of Chinese military bases
 - c) Southward expansion of Sahara Desert
 - d) Successful coups ✓

Difficulty level: Moderate

EXPLANATION



- In recent years, in similar scenes, **military leaders have toppled the governments of Mali, Chad, Guinea, Sudan and recently Burkina Faso**.
- These five nations that have recently **experienced military coups** form a broken line that stretches across the wide bulge of Africa, from Guinea on the west coast to Sudan in the east.
- First came **Mali**, in **August 2020**. The military took advantage of public anger at a stolen parliamentary election and the government's failure. Mali actually had two coups in a nine-month span.
- An unusual coup unfolded in **Chad in April 2021**. A president who had ruled for three decades was killed on the battlefield, and his son was quickly installed in his place — a violation of the Constitution.
- In **September 2021, it was Guinea's** turn: A high-ranking officer trained by the United States overthrew a president who had tried to cling to power.
- Then in **October, it was Sudan's**: The country's top generals seized power, tearing up a power-sharing deal that was supposed to lead to the country's first free election in decades.

7. Ilmenite and rutile, abundantly available in certain coastal tracts of India, are rich sources of which one of the following?

- a) Aluminium
- b) Copper
- c) Iron
- d) Titanium ✓

Difficulty level: Hard

Relevance: Beach minerals were in news. The Union Ministry of Mines has proposed to amend the Mines and Minerals (Development and Regulations) Act, 1957, to remove certain atomic minerals including beach sand minerals from Part B of the act.

EXPLANATION

- India possesses a vast reserve of heavy minerals that are situated along its coastal stretches.
- Heavy mineral sand comprises minerals such as **ilmenite, leucoxene, rutile, zircon, sillimanite, garnet, and monazite**.

Ilmenite and Rutile

- They are classified as heavy minerals, form integral components of beach sand deposits along India's coastal stretches.
- These minerals, abundant in titanium, hold significant industrial applications, particularly in titanium metal production, aerospace, and various industrial uses.

Ilmenite and Rutile deposits are concentrated in five distinct zones along the Indian coastline, namely:

1. Chavara deposit in Kerala
2. MK deposit in Tamil Nadu
3. OSCOM deposit in Odisha
4. Brahmagiri deposit in Odisha
5. Bhavanapadu coast in Andhra Pradesh

Titanium

- Titanium, a **lustrous silver-colored transition metal**, is predominantly **found as the mineral ilmenite and rutile**.
- Due to its **strength and lightweight** nature, titanium is highly regarded for **aircraft applications**.
- It stands as the **most abundant element in the Earth's crust**, primarily existing as oxides in igneous rocks and the lithosphere.
- Notably, titanium powder can **instigate fire and explosions**.

Copper

- Copper, extensively used in the **electrical industry for producing wires**, electric motors, transformers, and generators.
- They mainly found in **Singhbhum district in Jharkhand, Balaghat district in Madhya Pradesh, and Alwar district in Rajasthan**.
- This soft brown metal is present in **igneous and metamorphic rocks**, with chalcopyrite, copper sulfide, and basic carbonates being its main primary ores.

Iron Ore

- Iron ore, naturally occurring solid materials extracted for commercial purposes, is typically **rich in iron oxides like hematite and magnetite**.

- The majority of iron ore deposits are located in **Odisha, Chhattisgarh, Jharkhand, Karnataka, and Goa**.
- They find extensive usage in **steel production**, infrastructure development, the automotive industry, and energy production.

Aluminium

- Aluminium, whose **principal ore is bauxite**, is known for its excellent **electrical conductivity and high malleability**.
- **Odisha** leads as the largest bauxite-producing state, followed by Jharkhand, Maharashtra, Chhattisgarh, and Madhya Pradesh.

8. Consider the following statements :

- 1) **India has more arable areas than China.**
- 2) **The proportion of irrigated area is more in India as compared to China.**
- 3) **The average productivity per hectare in Indian agriculture is higher than that in China.**

How many of the above statements are correct?

- a) **Only one**
- b) **Only two ✓**
- c) **All three**
- d) **None**

Difficulty level: Hard

Relevance: The question was inspired by various studies conducted on the low agricultural productivity in India.

EXPLANATION

- According to a recent geological survey **India has the largest cropland compared to other countries**.
 - » **India has a total area of 179.8 million hectares, second by US 167.8 million hectares followed by China 165.2.**
- **India's irrigation cover is 48% of cultivated area and China's 41%.**
- **Even under much lesser land under cultivation china's agricultural output is valued more than three times that of India.**
- The **productivity** of various crops and legumes in India is **less as compared to that of some countries in Europe, US and China.**

Features of Indian Agriculture:

- **Seasonal pattern:** Mainly three types of seasonal pattern- **kharif, rabi and zaid**. For example rice is a kharif crop and wheat is a rabi crop.
- **Variety of crops:** India has both tropical and temperate climate so crops of the climate are practised.
- **Monsoon dependency:** Two-third cropped areas of India are dependent on Monsoon patterns.
- **Population depended on agriculture:** About 70% of the population of India is still directly or indirectly dependent upon the monsoon.
- **As of 2018, the contribution of agriculture to the Indian economy was around 17% to 18%. In 2021 it has come down to around 14%.** The contributions from other sectors have gone ahead.
- **There are 30.33% of total cultivators and 40.67% of agriculture labours are women.**

RELATED PYQs

Q1. With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following fall under Conservation Agriculture?

1. Avoiding the monoculture practices
2. Adopting minimum tillage
3. Avoiding the cultivation of plantation crops
4. Using crop residues to cover the soil surface
5. Adopting spatial and temporal crop sequencing/crop rotations

Select the correct answer using the code given below:

- a) 1, 3 and 4
- b) 2, 3, 4 and 5
- c) 2, 4 and 5
- d) 1, 2, 3 and 5

[2018]

Q2. What is/are the advantages/advantages of zero tillage in agriculture?

1. Sowing of wheat is possible without burning the residue of the previous crop.
2. Without the need for nursery of rice saplings, direct planting of paddy seeds in the wet soil is possible.

3. Carbon sequestration in the soil is possible.

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 2 and 3 only
- c) 3 only
- d) 1, 2 and 3

[2020]

Q3. In the context of India, which of the following is/are considered to be of practice(s) of eco-friendly agriculture?

1. Crop diversification
2. Legume intensification
3. Tensiometer use
4. Vertical farming

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 3 only
- c) 4 only
- d) 1, 2, 3 and 4

[2020]

Q4. What are the advantages of fertigation in agriculture?

1. Controlling the alkalinity of irrigation water is possible.
2. Efficient application of Rock Phosphate and all other phosphatic fertilizers is possible.
3. Increased availability of nutrients to plants is possible.
4. Reduction in the leaching of chemical nutrients is possible.

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 1, 2 and 4 only
- c) 1, 3 and 4 only
- d) 2, 3 and 4 only

[2020]

9. Which one of the following is a part of the Congo Basin?

- a) Cameroon ✓
- b) Nigeria
- c) South Sudan
- d) Uganda

Difficulty level: Hard

Relevance: UNEP on Peatlands of Congo Basin was in news.

EXPLANATION



- The Congo Basin, situated in **west-central Africa**, encompasses the **basin of the Congo River** and is home to the world's second-largest rainforest.
- Spanning **six countries—Cameroon, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea, and Gabon**—the region does not include Nigeria, South Sudan, or Uganda.
- Nigeria is located in West Africa, while South Sudan and Uganda are situated in East Africa.
- The Congo Basin hosts the **world's largest tropical peatland**, alongside Brazil and Indonesia, and stands as one of the last regions globally that absorbs more carbon than it emits.

10. About three-fourths of world's cobalt, a metal required for the manufacture of batteries for electric motor vehicles, is produced by
- a) Argentina
 - b) Botswana
 - c) The Democratic Republic of the Congo ✓
 - d) Kazakhstan

Difficulty level: Hard

Relevance: The mention of Critical minerals as a key to green transition in Economic Survey.

EXPLANATION

- Cobalt is a **silver-white, lustrous, and brittle ferromagnetic hard element**.

- Some of the most common **cobalt ores** include **Cobaltite** and **Skutterudite**.
- Cobalt can be **found in plants, animals, air, water, and soil**.
- It is used to **manufacture parts for aircraft engines, gas turbines, high-speed steels, corrosion-resistant alloys**, and is also utilized in the petroleum and chemical industries as a catalyst.
- Additionally, it is an **essential mineral used for batteries** in electric cars, computers, and cell phones.
- The main cobalt-producing states in India are **Jharkhand, Odisha, Rajasthan, Nagaland, and Madhya Pradesh**.
- The **Democratic Republic of Congo is the world's largest producer of cobalt, followed by Russia and Australia**. Congo accounts for more than half of the global cobalt mine output.

11. Consider the following statements :

Statement-1:

India, despite having uranium deposits, depends on coal for most of its electricity production.

Statement-2

Uranium, enriched to the extent of at least 60%, is required for the production of electricity.

Which one of the following is correct in respect of the above statements?

- a) Both Statement-1 and Statement-2 are correct and Statement-2 is the correct explanation for Statement-1
- b) Both Statement-1 and Statement-2 are correct and Statement-2 is not the correct explanation for Statement-1
- c) Statement-1 is correct but Statement-2 is incorrect ✓
- d) Statement-1 is incorrect but Statement-2 is correct

Difficulty level: Moderate

Relevance: The International Atomic Energy Agency has found 84% enriched Uranium at Iran's nuclear site and also huge deposit of Uranium were found in Rajasthan.

EXPLANATION

- India is the **9th largest producer of Uranium** with about 600 tonnes produced in 2022.

- The **major uranium deposits** of the country occur in geological basins of the **Singhbhum shear zone** (Jharkhand), **Cuddapah basin** (Andhra Pradesh and Telangana), **Mahadek basin** (Meghalaya), **Delhi Supergroup of rocks** (Rajasthan) and **Bhima basin** (Karnataka).

Installed electricity generation capacity of each fuel as a percentage share of total electricity generation capacity:

FOSSIL FUEL:

- » Coal : 48.6%
- » Gas : 5.9%
- » Lignite : 1.6%
- » Diesel : 0.9%

NON-FOSSIL FUEL:

- Hydro : 42.1%
- Solar : 16.9%
- Wind : 10.4%
- Biomass : 2.4%
- Nuclear : 1.8%
- Small Hydro : 1.2%

- However in 2022-23, **2.8% of India's electricity generation was from nuclear sources** whereas **68% (approx.) of electricity generation was from coal based thermal power plants.**
- Coal due to its abundant availability, low cost of production and option to scale up production if required still remains the major source of energy generation in India. (Thus statement 1 is correct)

Uranium enrichment

- It is the process of **increasing the percentage of uranium-235 (U-235) isotope** in relation to others.
- Natural uranium contains 0.7% of the U-235 isotope** while the **remaining 99.3% is mostly the U-238 isotope** which does not contribute directly to the fission process.
- Uranium enrichment of **3 to 5 percent is required for use in fuel** for nuclear reactors. **20% enrichment is required for research purposes** and **90% enrichment is required to create weapon grade uranium.** Therefore, for producing electricity, uranium does not required to be enriched to atleast 60% instead only 3- 5% only required for use it in civil nuclear power plants.
- Enrichment can be done through gaseous diffusion, gas centrifuges, or laser isotope separation.**

12. Consider the following pairs:

<i>Areas of conflict mentioned in news</i>		<i>Country where it is located</i>
1) Donbas	:	Syria
2) Kachin	:	Ethiopia
3) Tigray	:	North Yemen

How many of the above pairs are correctly matched?

- a) Only one
- b) Only two
- c) All three
- d) None ✓

Difficulty level: Easy

Relevance: Regions often seen in news

EXPLANATION

Donbas

- The Donbas region, situated in **Eastern Ukraine** (not in Syria).
- It comprises two main provinces: **Donetsk** and **Luhansk**.
- It is known for its **industrial significance** due to **coal** mining, steel production, and heavy industries.
- However, it's also been the focal point of conflict between **Ukrainian government forces and pro-Russian separatists** since 2014. The region has recently been in the news due to the **ongoing conflict between Russia and Ukraine.**



Kachin

- "Kachin" refers to a region situated in **Northern Myanmar** (not located in Ethiopia).
- The area is primarily inhabited by the **Kachin people, an indigenous ethnic group** in the region.
- The area has been characterized by **ethnic tension and armed conflicts between the Kachin Independence Army and the Myanmar government forces**.



13. Consider the following statement :

- 1) **Recently, all the countries of the United Nations have adopted the first-ever compact for international migration, the 'Global Compact for Safe, Orderly and Regular Migration (GCM)'.**
- 2) **The objectives and commitments stated in the GCM are binding on the UN member countries.**
- 3) **The GCM addresses internal migration or internally displaced people also in its objectives and commitments.**

How many of the above statements are correct?

- a) **Only one**
- b) **Only two**
- c) **All three**
- d) **None ✓**

Difficulty level: Hard

Relevance: 163 countries approved the new Global compact for safe, orderly and regular migration which was the first comprehensive international agreement to address global human mobility.

Tigray

- It is the **northernmost regional state in Ethiopia**, located in the **Horn of Africa**.
- The region is **bordered by Eritrea to the north, Sudan to the west, Amhara to the south, and the Afar region to the east**.
- Tigray has been in the news recently due to the ongoing **conflict between the Ethiopian government and the Tigray People's Liberation Front (TPLF)**.
- The conflict has also led to a **famine-like situation** in the region, with hundreds of thousands of people being pushed into conditions of famine.



EXPLANATION

Global Compact for Safe, Orderly and Regular Migration (GCM)

- **First inter-governmentally negotiated agreement**, prepared under the auspices of the **United Nations**.
- It comprises 23 objectives for better **managing migration at local, national, regional and global levels**. It covers **all dimensions of international migration** in a holistic and comprehensive manner.
- It was **adopted by the majority of the UN states** in the **Intergovernmental Conference in Marrakesh, Morocco and formally endorsed by UNGA** in December 2018.
- **152 countries voted in favour** of the resolution while **5 countries including the US voted against it**.
- It is a **non-binding** document that respects states' sovereign right.
- Aims to **achieve target 10.7 of the 2030 Agenda for Sustainable Development** in which Member States committed to cooperate internationally to facilitate **safe, orderly and regular migration**.

GCM GUIDING PRINCIPLES

- PEOPLE-CENTERED
- INTERNATIONAL COOPERATION
- NATIONAL SOVEREIGNTY
- RULE OF LAW AND DUE PROCESS
- SUSTAINABLE DEVELOPMENT
- HUMAN RIGHTS
- GENDER-RESPONSIVE
- CHILD-SENSITIVE
- WHOLE-OF-GOVERNMENT APPROACH
- WHOLE-OF-SOCIETY APPROACH

- Countries also agreed to **review the progress made in implementing the Global Compact at an International Migration Review Forum (IMRF)** with the participation of all relevant stakeholders at the UN General Assembly.
- However GCM is focused on international migration and **does not explicitly include internal migration or internally displaced people** in its objectives and commitments.

14. With reference to India's projects on connectivity, consider the following statements :

- 1) East-West Corridor under Golden Quadrilateral Project connects Dibrugarh and Surat.
- 2) Trilateral Highway connects Moreh in Manipur and Chiang Mai in Thailand via Myanmar.
- 3) Bangladesh-China-India-Myanmar Economic Corridor connects Varanasi in Uttar Pradesh with Kunming in China.

How many of the above statements are correct?

- a) Only one
- b) Only two
- c) All three
- d) None ✓

Difficulty level: Hard

Relevance: These connectivity projects are frequently discussed in news

EXPLANATION

The Golden Quadrilateral Project

- It connects four metropolitan cities of Delhi, Mumbai, Kolkata and Chennai, forming a quadrilateral.
- The Golden Quadrilateral is **India's longest highway network** with a total length of **5,846 kilometres**.
- It ranks **fifth in the list of longest highways** in the world.
- The Golden Quadrilateral **passes through 12 states and a union territory**.
- The project is managed by the **National Highways Authority of India**.
- It consists of national highways like 2, 4, 5, 8 and 60.
- It stretches from Kolkata to Delhi at 1,563 kilometres, Delhi to Mumbai at 1,419 kilometres, Mumbai to Chennai at 1,290 kilometres and Kolkata to Chennai at 1,684 kilometres.
- The 7300-km **North-South and East-West Corridors (NSEW)**, connecting **Srinagar in the north to Kanyakumari in the south** and **Assam's Silchar in the east to Gujarat's Porbandar in the west**, respectively.



India- Myanmar- Trilateral Highway

- The highway which was initially conceptualised some 15 years ago **connects India's Moreh in the northeast of the country to Mae Sot in Thailand, via Myanmar**.

- The highway is **part of India's Look East policy**, which was replaced by the **Act East policy** by Prime Minister Modi's government in 2014, as a way to **improve relations with ASEAN** and boost trade in the **ASEAN–India Free Trade Area**.
- The **connectivity to Cambodia, Laos, and Vietnam** is also seen as a counter to **China's Belt and Road Initiative**.



Bangladesh-China-India-Myanmar Economic Corridor (BCIM EC)

- The **2800 km** BCIM corridor proposes to **link Kunming in China's Yunnan province with Kolkata**, passing through nodes such as **Mandalay in Myanmar and Dhaka in Bangladesh** before heading to Kolkata.
- It would provide **vital connectivity and trade linkages to the underdeveloped regions** of India and China.
- The implementation will provide the member countries to exploit the complementarities that exist amongst them in trade.



Type of the questions: Conceptual

1. With reference to the Earth's atmosphere, which one of the following statements is correct?
 - a) The total amount of insolation received at the equator is roughly about 10 times of that received at the poles.
 - b) Infrared rays constitute roughly two-thirds of insolation.
 - c) Infrared waves are largely absorbed by water vapour that is concentrated in the lower atmosphere. ✓
 - d) Infrared waves are a part of visible spectrum of electromagnetic waves of solar radiation.

Difficulty level: Hard

EXPLANATION

Insolation

- Insolation can be described as the **incoming solar energy** that reaches the Earth's atmosphere and surface.
- This **energy is released from the sun in short waves** and travels through space until it **reaches the earth's outer atmosphere** (the **Thermosphere**) from where **it can either be absorbed, reflected or pass directly** through to the Earth's surface.
- **Some absorbed radiation reaches the Earth's surface as diffuse radiation** but in total **only 46% of the energy received at the outer atmosphere is received by the Earth's surface**.
- The total **amount of insolation at the equator is greater than that of poles**, but **it is not as large as ten times**.
- **Insolation includes various wavelengths** such as infrared rays, ultraviolet rays, and visible light which constitute different parts of the electromagnetic wave spectrum.

Infrared rays

- Infrared waves are **largely absorbed by water vapour** that is concentrated in the lower atmosphere.
- Even though infrared radiation constitutes a significant part of insolation, **it does not account for two-thirds of insolation**.

- Infrared rays are **not part of visible spectrum** of electromagnetic waves of solar radiation.

2. Consider the following statements:

Statement-I:

The soil in tropical rain forests is rich in nutrients.

Statement-II:

The high temperature and moisture of tropical rain forests cause dead organic matter in the soil to decompose quickly.

Which one of the following is correct in respect of the above statements?

- Both Statements-I and Statement-II are correct and Statement-II is the correct explanation for Statement -I
- Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- Statement-I is correct but Statement-II is incorrect
- Statement-I is incorrect but Statement-II is correct ✓

Difficulty level: Moderate

EXPLANATION

Tropical Rainforests

- Tropical evergreen forests, also known as tropical rainforests, thrive in regions **near the equator and close to the tropics**.
- These areas experience **high temperatures** and **heavy rainfall** throughout the year.
- In India, regions such as the **Andaman and Nicobar Islands**, the **Western Ghats** bordering the Arabian Sea, the **coastal areas of peninsular India**, and notably the **Assam district in the northeast** are home to tropical rainforests.

Soil of Tropical Rainforests

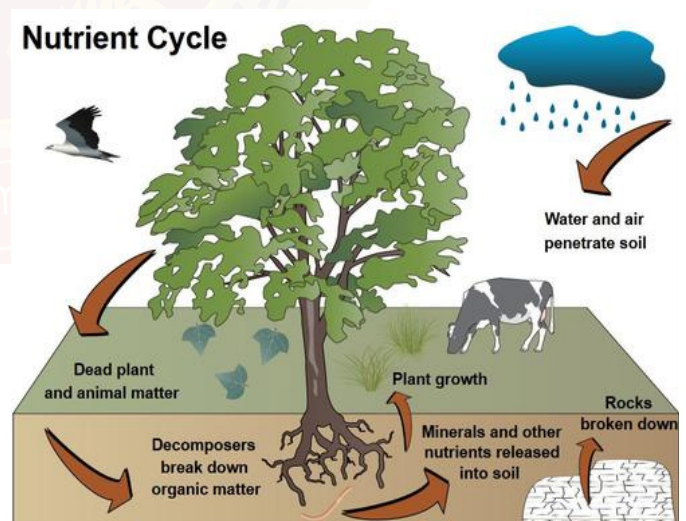
- Over **two-thirds of the world's rainforests**, and three-fourths of the Amazonian rainforest can be considered "**wet-deserts**" in that they **grow on red and yellow clay-like laterite soils** which are **acidic and low in nutrients**.
- **Torrential downpours wash out most of the top soil** nutrients like potassium, phosphorus, calcium etc. (**Leaching**)
- Therefore, **fertility of topsoil** in rainforest regions is **very poor** and **soil is acidic** in nature.

- The soil deteriorates rapidly with subsequent **soil erosion** and **soil impoverishment**. It takes decades to replenish the soil of lost nutrients. But rainforests are tremendously **vegetated**.
- The **reason for luxuriant growth of Tropical Rainforest in such a poor soil** is the rapid **nutrient cycling** in the rainforest.

Nutrient cycle

- The nutrient cycle in tropical rainforests is **very rapid**.
- The **high temperature and moisture** cause the **dead organic matter to decompose quickly**, releasing nutrients back into the ecosystem.
- **Decaying matter** (dead wood and leaf litter) is processed so efficiently because of the **abundance of decomposers** including bacteria, fungi, and termites.
- These organisms take up nutrients, which are released as wastes when organisms die. **As vegetation dies, the nutrients are rapidly broken down and almost immediately returned to the system** as they are taken up by living plants.
- **Uptake of nutrients by plant roots** is facilitated by a unique relationship between the **roots and a fungi, mycorrhizae**.

The **mycorrhizae** attach to plant roots and are specialised to **increase the efficiency of nutrient uptake from the soil**. In return, **plants provide the fungi with sugars** and shelter among their roots.



RELATED PYQs

Q1. Consider the following States:

1. Arunachal Pradesh
2. Himachal Pradesh
3. Mizoram

In which of the above States do 'Tropical Wet Evergreen Forests' occur?

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

[2015]

3. Consider the following statements :

Statement-I :

The temperature contrast between continents and oceans is greater during summer than in winter.

Statement-II :

The specific heat of water is more than that of land surface.

Which one of the following is correct in respect of the above statements?

- a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I ✓
- b) Both Statement-I and Statement-II is not the correct explanation for Statement-I
- c) Statement-I is correct but Statement-II is incorrect
- d) Statement-I is incorrect but Statement-II is correct

Difficulty level: Moderate

EXPLANATION

- Water exhibits very different thermal properties from those displayed by the rocks and soil of land.
- These differences in thermal properties cause oceans and land to warm and cool at different rates, leading to significant temperature variations between oceans and land.

Specific heat capacity

- It is the **quantity of heat required to raise the temperature of one gram of a substance by one Celsius Degree.**

- The units of specific heat are usually **calories or joules per gram per Celsius degree**. For example, the specific heat of water is 1 calorie (or 4.186 joules) per gram per Celsius degree.

Specific heat and Temperature contrast

- The **specific heat of water is greater than that of land surface**, therefore water, both absorbs and releases heat more slowly than land.
 - This temperature difference between land and water creates a contrast, with the **continents experiencing hotter conditions during summer while the oceans remain relatively cooler.**
 - In **winter**, the **temperature contrast is reduced because both land and water cool down**, but the **land loses heat more quickly than the water**, leading to a smaller temperature difference.
 - Therefore, the **temperature contrast between continents and oceans is greater during summer than in winter.**
4. Which one of the following is the best example of repeated falls in sea level, giving rise to present-day extensive marshland?
- a) Bhitarkanika Mangroves
 - b) Marakkanam Salt Pans
 - c) Naupada Swamp
 - d) Rann of Kutch ✓

Difficulty level: Hard

EXPLANATION

Rann of Kutch

- The Rann of Kutch is a **salt marsh** located in the Thar desert within the Kutch district of **Gujarat**.



- Comprising the **Great Rann** and **Little Rann**, this region transforms during the **monsoon, filling with water to create a wetland**. However, in the **summer**, this **water evaporates, leaving behind a bed of white salty land**.

- The area experiences a **subtropical climate**, characterized by scorching summers, with temperatures soaring up to 50 degrees during the day. It's renowned for the **Kutch Desert Wildlife Sanctuary**.
- **Once a part of the Arabian Sea**, geological shifts over time severed its connection with the sea, eventually turning it into a seasonal marshy salt desert.
- The water body known as the Rann of Kutch is **shared by Pakistan and India**.
- The water discharged by the **Left Bank Outfall Drain (LBOD)** exacerbates flooding in India and degrades water bodies crucial for providing water to salt farms across a vast area.
- Although the LBOD water is intended for Indian land, its route aims to reach the sea through the contentious **Sir Creek**.

Bhitarkanika Mangroves

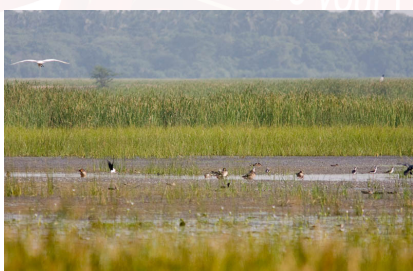
- Bhitarkanika Mangroves is a mangrove wetland in **Odisha**, covering an area of 650 km² in the **Brahmani River** and **Baitarani River** deltas.



- It is the **second largest mangrove ecosystem in India** and is home to about **62 mangrove species** including **Avicenna, Bruguiera, Heritiera, and Rhizophora**.
- The mangroves are also the **breeding place for saltwater crocodiles** and the **largest colony of the Olive Ridley Sea Turtles in the world (Gahirmatha Beach)**.

Naupada Swamp

- Naupada swamp is a **freshwater swamp** located in Srikakulam district of **Andhra Pradesh**, India.



- It is formed by the **inflow of freshwater from rivers and receives seasonal rainwater**.
- The swamp is home to a variety of flora and fauna, including the **spot-billed pelican (Pelicanus philippensis)**.

- Thousands of spot-billed pelicans and a few hundred **painted storks** migrate from the Siberian region to breed in the **Telineelapuram** Important Bird Area (IBA) in Naupada swamp.

However, a **nematode infestation** has led to mass mortality of spot-billed pelicans at Telineelapuram IBA since December 2021. Over 150 spot-billed pelicans have succumbed to the infestation. Aquaculture management practices surrounding the habitat are said to be the source for the parasite.

Marakkanam Salt Pans

- Marakkanam Salt Pans is a salt pan located in Viluppuram district of **Tamil Nadu**, India.



- It is spread over an area of 4,000 acres and is the **third largest producer of salt in Tamil Nadu**.
- Formed in **low-lying coastal areas** where **seawater is allowed to evaporate** leaving behind salt crystals.

- **Mangroves:** They are tropical and subtropical intertidal plants that are salt-tolerant. with their roots submerged in water, mangrove trees thrive in hot, muddy, salt condition.
- **Swamp:** Type of wetland ecosystem characterised by mineral soils with poor drainage and plant life dominated by trees.

5. Consider the following statements:

- 1) **Jhelum River passes through Wular lake.**
- 2) **Krishna River directly feeds Kolleru Lake.**
- 3) **Meandering of Gandak River formed Kanwar Lake.**

How many of the Statements given above are correct?

- a) **Only one**
- b) **Only two ✓**
- c) **All three**
- d) **None**

Difficulty level: Hard

EXPLANATION

- The Jhelum River, a tributary of the **Indus**, originates from a deep spring at **Verinag** in the western part of the Jammu and Kashmir union territory, situated within the Indian-administered area of the **Kashmir** region.
- Known as **Vyeth** in Kashmiri, **Vetesta** in Sanskrit, and **Hydaspes** in Greek, the Jhelum stands as the primary waterway of the Kashmir Valley.
- Flowing northwestward from the northern slopes of the Pir Panjal Range, it meanders through the Vale of Kashmir until it reaches **Wular Lake** at **Srinagar**, where its flow is controlled. Upon traversing the Pir Panjal Range, the Jhelum is joined by the Kishanganga River. Then it merge with the **Chenab River** near Trimmu.
- Its total length spans about **725 km**.

Major Tributaries:

- The **largest tributary of the Jhelum** is the **Kishenganga (Neelum) River**. The **Kunhar River** stands as the second largest tributary.
- Other notable tributaries include the **Sandran River, Bringi River, Arapath River, Watlara River, Lidder River, and Veshaw River**.

Wular Lake

- Wular Lake, situated at the foothills of **Haramuk Mountain**, stands as the **second largest freshwater lake in Asia**, covering a total area of 200 square kilometers.
- It spans approximately 24 kilometers in length and 10 kilometers in breadth, lying **between the towns of Sopur and Bandipore**, near Baramula Road in Sangrama.
- The primary source of water for Wular Lake is the River **Jhelum**.
- Within the lake, there exists a small island at its center known as '**Zaina Lank**,' which was constructed by King **Zainul-Abi-Din**.
- It is believed that Wular Lake is a **remnant of the ancient Satisar Lake** that existed in ancient times.

Krishna River

- The Krishna River, **the second largest river in peninsular India**, originates in the **Western Ghats** at the village of Jor in **Maharashtra** near **Mahabaleshwar**.
- It traverses the entire width of the peninsula, **flowing from the Western Ghats and merging into the Bay of Bengal**.
- Approximately **75% of its basin comprises agricultural land**.
- Prior to merging into the Bay of Bengal, the river forms a large delta that extends up to 35 kilometers into the Bay.
- Major tributaries: **Bhima and Tungabhadra** rivers



Kolleru Lake

- Kolleru Lake, located **between the deltas of the Krishna and Godavari rivers** in Andhra Pradesh, stands as the **largest shallow freshwater lake in Asia**.
- The lake is **fed directly by water from the seasonal Budameru and Tammileru streams**, and is **connected to the Krishna and Godavari systems** by over 68 inflowing drains and channels.
- The lake serves as a crucial habitat for **numerous resident and migratory bird species**, including the Grey or Spot-billed Pelican, Siberian crane, Ibis, and more.
- **Designated as a Wildlife Sanctuary in 1999** under India's **Wild Life Protection Act, 1972**, it was also declared a **wetland of international importance in 2002** under the **Ramsar Convention**.

- Unfortunately, the **quality of the lake's water has degraded due to water pollution**, leading to a reduction in its size.
- Human activities such as **aquaculture, agricultural practices, and industrial runoff** have contributed to a decrease in the lake's water holding capacity.
- In efforts to safeguard the lake, the Ministry of Environment, Forest, and Climate Change, along with the Ministry of Finance, established the '**Operation Kolleru**' committee.

Gandak River

- The Gandak River, a **tributary of the Ganga**, stands as one of the major rivers in **Nepal and India**.
- It serves as a **north bank tributary of the Ganga** in India.
- Originating at 7,620 meters **in Tibet** near the Nepal border, it overlooks the **Dhualagiri peak**.
- Notably, it is distinguished by the **deep gorge** through which it flows and hosts a **large hydroelectric facility** in Nepal.
- Referred to as the **Kali Gandaki and Narayani** after merging with the **Trisuli river** in **Nepal**, the river harbors a diverse range of flora and fauna, including several endangered species such as the **Gharial** and the **Gangetic dolphin**.
- Despite its significance, the Gandak River faces numerous challenges today. The river suffers from **severe pollution due to the discharge of untreated sewage and industrial waste**, posing threats to both human health and the ecosystem.

Kanwar Lake

- Once a haven for migratory birds, Kanwar Lake in **Bihar, Asia's largest freshwater oxbow lake**, is now a deteriorating wetland ecosystem.
- Situated 22 km northwest of Begusarai town in **Bihar, Kanwar Lake is a residual oxbow lake formed due to the historical meandering of the Gandak**, a tributary of the Ganga.
- Also known as **Kabartal Jheel**, Kanwar Lake was declared a notified area under the **Wildlife (Protection) Act of 1972**.
- It holds significant importance as a stopover along the **Central Asian Flyway**, providing resting and refueling spots for 58 migratory waterbirds.

- This site hosts **five critically endangered species, including three vulture species—the red-headed vulture**, white-rumped vulture, and Indian vulture—and two waterbirds, the sociable lapwing and Baer's pochard.

RELATED PYQs

- Q1. Recently, linking of which of the following rivers was undertaken?
- Cauvery and Tungabhadra
 - Godavari and Krishna
 - Mahanadi and Son
 - Narmada and Tapi

[2016]

- Q2. Which one of the following is an artificial lake?

- Kodaikanal (Tamil Nadu)
- Kolleru (Andhra Pradesh)
- Nainital (Uttarakhand)
- Renuka (Himachal Pradesh)

[2018]

Type of the questions: Application

1. Consider the following activities :

- Spreading finely ground basalt rock on farmlands extensively
- Increasing the alkalinity of oceans by adding lime
- Capturing carbon dioxide released by various industries and pumping it into abandoned subterranean mines in the form of carbonated waters

How many of the above activities are often considered and discussed for carbon capture and sequestration?

- Only one
- Only two
- All three ✓
- None

Relevance:

- IPCC's Sixth Assessment Report (AR6) was released on March 20, 2023 highlighted some of the barriers for implementing carbon capture and storage (CCS).
- A new study claims logged tropical forests can emit carbon into the atmosphere. This study challenges the earlier assumption that logged forests are 'carbon sinks'.

Difficulty level: Moderate

EXPLANATION

Carbon Capture and Sequestration

- Carbon Capture and Storage (CCS) - a **three step process**, is a way of **reducing carbon emissions**, which could be key to **tackle global warming**.
- CCS involves the **capture of carbon dioxide (CO₂) emissions from industrial processes**, such as steel and cement production, or from the burning of fossil fuels in power generation.
- This carbon is then **transported** from where it was produced, via ship or in a pipeline, and **stored deep underground in geological formations**.
- Possible **storage sites** for carbon emissions include **saline aquifers or depleted oil and gas reservoirs**, which typically need to be **0.62 miles (1km)** or more under the ground.
- **Carbon sequestration** is a crucial part of the global carbon cycle, as it is the process of **capturing and storing atmospheric carbon dioxide**.
- According to industry body the Global CCS Institute, CCS is 'a proven technology that has been in safe operation for over 45 years'.
- **India is committed to increasing its carbon sink by 2.5 - 3 billion tonnes of CO₂ equivalent by 2030.**

Carbon Dioxide Removal (CDR) Method includes:

- ✕ **Geological Carbon Sequestration**
 - » To **inject captured CO₂ into reactive rocks** such as basalt (known as **enhanced weathering**).
- ✕ **Biological Carbon Sequestration**
 - » **Ocean alkalisation**- Increasing the alkalinity of oceans by adding lime.
 - » Forests and other land vegetation **absorb carbon dioxide during photosynthesis**.
 - » **Grasslands can sequester carbon underground** and when they burn, the carbon stays fixed in the roots and soil instead of in leaves and woody biomass.

» **Biochar** has safely reduced contamination and stored carbon. (Biochar is a charcoal-like substance that burns organic material from agricultural and forestry wastes in a controlled process called pyrolysis).

✕ Industrial Carbon Sequestration

- » Pure oxygen is blown into the furnaces to purify the exhaust, so the fuel burns completely, producing relatively pure steam and carbon dioxide gas.
- » Once the steam is removed by cooling and condensation, making it into water (carbonated waters), the carbon dioxide can be safely stored.

2. Consider the following Statements :

Statement-1 :

Switzerland is one of the leading exporters of gold in terms of value.

Statement-2 :

Switzerland has the second largest gold reserves in the world.

Which one of the following is correct in respect of the above statements?

- a) Both Statement-1 and Statement-2 are correct and Statement-2 is the correct explanation for Statement-1
- b) Both Statement-1 and Statement-2 are correct and Statement-2 is not the correct explanation for Statement-1
- c) Statement-1 is correct but Statement-2 is incorrect ✓
- d) Statement-1 is incorrect but Statement-2 is correct

Difficulty level: Hard

Relevance: Switzerland became the largest global gold exporter and its one of the major destination is India.

EXPLANATION

- Switzerland is the **largest exporter of gold in terms of value**, exporting gold worth \$86.7 Billion.
- India is the **second largest jewellery market** and **one of the largest importers of gold from Switzerland** (\$29.3 Billion).

- Gold is considered a **stable** and **reliable** store of value. By **holding gold reserves**, countries can **instil confidence in their economic stability**, especially during financial uncertainty.

As per the World Gold Council estimates, the top 10 countries with largest gold reserves are;

- ¶ USA : 8133 tonnes
- ¶ Germany : 3352 tonnes
- ¶ Italy : 2451 tonnes
- ¶ France : 2436 tonnes
- ¶ Russia : 2329 tonnes
- ¶ China : 2113 tonnes
- ¶ **Switzerland : 1040 tonnes**
- ¶ Japan : 846 tonnes
- ¶ India : 797 tonnes
- ¶ Netherlands : 612 tonnes

3. Consider the following pairs:

<i>Port</i>	<i>Well known as</i>
1) Kamarajar Port	: First major port in India registered as a company
2) Mundra Port	: Largest privately owned port in India
3) Visakhapatnam Port	: Largest container port in India

How many of the above pairs are correctly matched?

- a) Only one
- b) Only two ✓
- c) All three
- d) None

Difficulty level: Hard

Relevance: Ports are most often seen in news.

EXPLANATION

- Kamarajar Port, formerly known as **Ennore Port**, is situated on the **Coromandel Coast**, approximately 24 km north of Chennai Port.

- It stands as the **12th major port of India** and holds the distinction of being the **first port in India operated as a public company**.
- The port attained its **status as a major port under the Indian Ports Act of 1908 in March 1999** and was formally incorporated as Ennore Port Limited under the Companies Act of 1956 in October 1999.
- Kamarajar Port stands as the **only corporatized major port, operating as a registered company**.

Mundra Port

- Mundra Port stands as the **largest private and largest container port in India**, situated on the north shores of the **Gulf of Kutch near Mundra** in the Kutch district of **Gujarat**.
- Notably, it operates as a **deep-draft, all-weather port** and functions as a **Special Economic Zone (SEZ)**.
- Approximately **33% of India's container traffic passes through this port**, managed by **Adani Ports and Special Economic Zone Limited (APSEZ)** which is **India's largest commercial ports operator**, responsible for nearly one-fourth of the country's cargo movement.
- This state-of-the-art port boasts the largest coal import terminal, ensuring faster cargo evacuation and minimal turnaround time, enhancing its status as the largest commercial port in India.
- It has a **handling capacity of 260 MMT**, managing over 155 MMT in FY 2022-23, contributing nearly 11% of India's maritime cargo.
- Moreover, the **port's rail connectivity** to the national rail network allows cargo to be efficiently distributed across India, making it an essential hub for national cargo logistics.

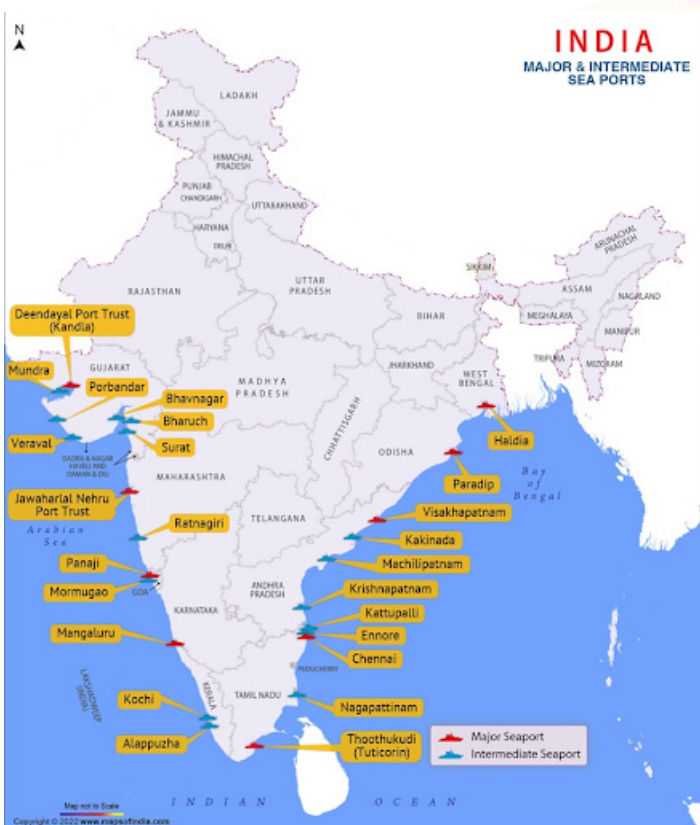
Visakhapatnam Port

- Visakhapatnam Port, also known as **Vizag Port**, is situated in Visakhapatnam city, **Andhra Pradesh**. Positioned between Chennai Port and Kolkata Port, it holds significant importance as a **maritime hub**.
- Vizag Port is a **natural harbor** and stands as **one of India's oldest ports**, known for its **depth and safety**.
- It ranks as the **country's second-largest port for cargo handling** and **comprises three harbors: inner, outer, and fishing**.



- This port plays a crucial role in **transporting essential commodities such as iron ore, oil, coal, alumina, and pellets.**
- Particularly notable is its handling of a **substantial portion of the country's iron exports**, cementing its position as a vital trade and commerce center.

- **Jawaharlal Nehru Port Trust – Nhava Sheva (JNPT)** is the **largest container port in India (not Visakhapatnam)** and one of the most essential subcontinents harbours on the Western coast.
- **East of Mumbai**, in the state of Maharashtra, JNPT **handles the majority of India's containerized trade**, and is the focal point of long-haul calls to and from the emerging market economy.



SUMMARY

Analyzing the trends in previous years' UPSC Prelims questions from 2021 to 2023 provides valuable insights into the distribution of questions across syllabus topics, the varying levels of question difficulty, and the extent to which current affairs play a significant role in the examination.

SUBJECT EMPHASIS:

- Indian Physiography
- Human Geography
- Climatology
- Vegetation
- Agriculture
- Geomorphology
- Minerals

CURRENT AFFAIRS FOCUS:

- Greater attention should be directed towards topics that have remained in the news for an extended period and are closely related to both the syllabus and the foundational aspects of Geography.
 - » Places in news and its related physiography can be asked (India and World)
 - » Eg: Levant region, Ukraine
 - » Initiatives taken by global organisations for addressing key issues like Climate change, Pollution, Migration etc.
 - » Eg: Polar Code, GCM
 - » Key terms in news
 - » Glaciers, Lakes etc. seen in news
 - » Eg: Kolleru Lake, Kanwar Lake
 - » Agriculture and related topics
 - » Eg: Fertigation, Sugar cane
 - » Renewable energy
 - » Eg: Solar energy

SUMMARY

TREND ANALYSIS:

- Certain topics are gaining relevance due to their current significance, and there is a possibility that these topics might be repeated in the forthcoming exams. Number of questions are increasing from Geography in last three years.
- Examples:
 - » Minerals and their importance Eg: Coal, Uranium
 - » Protected Areas and their physical features like mountain peaks, rivers passing through them etc
 - » Agricultural Crops Kharif and Rabi crops, Special focus on Cotton
 - » Climate change and issues
 - » Connectivity, Migration, Population
 - » Natural disasters and significant natural events Eg: Earthquake, Cyclone

Prelims preparation acts as the initial gateway to our aspirations of a career in civil services. As the saying goes, the first step is often the most challenging. To reach our desired destination, it's crucial to make the right, and most importantly, smart choices. At **Fortune IAS Academy**, we aim to simplify this challenging exam stage through our test series program, leading you along the correct path to achieve your goals.