



## Earthquake

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# EARTHQUAKE



## ABOUT

- Shaking of the earth; caused due to release of energy, generating **seismic waves in all directions**

## HYPOCENTER

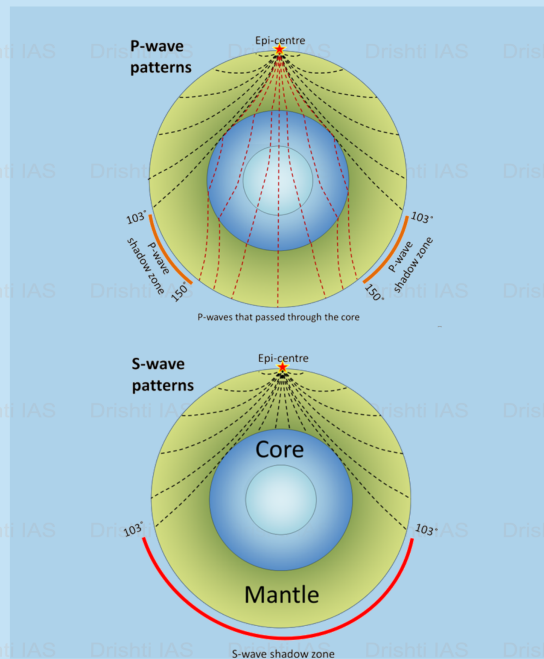
- Location where the earthquake starts (below earth's surface)

## EPICENTER

- Location right above the Hypocenter (on the earth's surface)

## EARTHQUAKE WAVES

- Body Waves:** Move in all directions travelling through the body of the earth
  - P Waves:** Move faster, First to arrive at surface, Similar to sound waves, Travel through gaseous, liquid and solid materials
  - S Waves:** Arrive at surface with some time lag, Travel only through solid materials
- Surface Waves:** Last to report on seismographs, More destructive, Cause displacement of rocks
  - Love Waves:** Same motion as S-waves (horizontal) without vertical displacement, Sideways motion perpendicular to the direction of propagation, Faster than Rayleigh waves
  - Rayleigh Waves:** Cause the ground to shake in an elliptical pattern, Spread out the most of all seismic waves, Move vertically and horizontally in a vertical plane



## CAUSES OF EARTHQUAKES

- Release of energy along a **Fault/Fault Zones** (break in the crustal rocks)
- Movement of **tectonic plates (most common)**
- Volcanic eruption** (stress changes in rock-injection/withdrawal of magma)
- Human activities** (mining, explosion of chemical/nuclear devices etc.)

## EARTHQUAKE IN INDIA

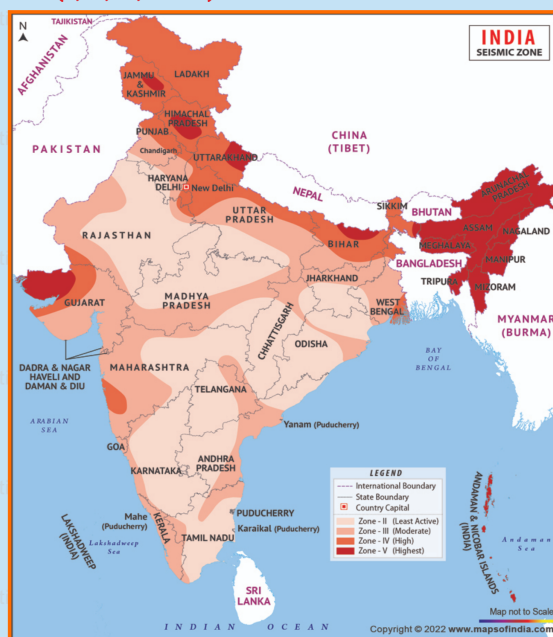
- India is **one of the highly earthquake affected countries** due to the presence of technically active mountains - the Himalayas.
- India has been divided into **4 seismic zones (II, III, IV, and V)**

## MEASURING EARTHQUAKE

- Seismometers** - Measures seismic waves
- Richter Scale** - Measures magnitude (energy released; range: 0-10)
- Mercalli** - Measures intensity (visible damage; range: 1-12)

## DISTRIBUTION

- Circum-Pacific Belt** - 81% of earthquakes
- Alpide Earthquake Belt** - 17% of the largest earthquakes
- Mid-Atlantic Ridge** - Mostly submerged underwater



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## SC Eases Norms for Passive Euthanasia

**For Prelims:** Passive euthanasia, National Health Digital Record, Article 21, Living Will.

**For Mains:** Major Changes in Guidelines of Passive Euthanasia, Euthanasia in India.

### Why in News?

The [Supreme Court in India](#) has made changes to the rules for [passive euthanasia](#) with the primary objective to make the process **less difficult and less time-consuming**.

### What are the Major Changes in Guidelines?

- The Supreme Court tweaked the previous judgement to do away with the **necessity of a [judicial magistrate](#)** to attest or countersign a living will.
  - SC held that an **attestation by a notary or a gazetted officer** would be **sufficient for a person to make a valid living will**.
- Instead of the living being in the custody of the district court concerned, SC said that the document will be a part of the National Health Digital Record which can be accessed by hospitals and doctors from any part of the country.
- If the **hospital's medical board denies permission** to withdraw medical treatment, the **family members of the patient can approach the relevant high court**, which forms a fresh board of medical experts to enable the court to take a final call.

# THE CHANGES BROUGHT

**NOW**

**EARLIER**

## Living will

An attestation by a notary or a Gazetted officer to be sufficient for a living will

It was necessary that a judicial magistrate attest or countersign a living will

## Access to the living will

Living will a part of national health record which can be accessed by Indian hospitals

Living will was kept in the custody of the district court concerned

## Primary board to examine patient's condition

Three doctors, including treating physician and two other doctors with five years of experience in the specialty, will comprise the primary board of doctors

Primary board of doctors needs at least four experts from general medicine, cardiology, neurology, nephrology, psychiatry or oncology with overall standing of at least 20 years

## Time taken to decide

Primary/secondary board to decide within 48 hours on withdrawal of further treatment

The 2018 judgment did not specify any outer limit on withdrawal of treatment

## Secondary board

Hospital must immediately constitute a secondary board of medical experts

The district collector had to constitute the second board of medical experts

## What is Passive Euthanasia?

### ▪ About:

- **Passive euthanasia** is the act of **withholding or withdrawing medical treatment**, such as withholding or withdrawing life support, with the **intention of allowing a person to die**.
  - This is in contrast to **active euthanasia**, which involves an active intervention to **end a person's life with substances or external force**, such as administering a lethal injection.

### ▪ Euthanasia in India:

- In a landmark judgement, the **Supreme Court of India** legalised passive euthanasia in 2018, stating that it was a **matter of 'living will'**.
- According to the judgement, **an adult in his conscious mind** is permitted to **refuse medical treatment or voluntarily decide not to take medical treatment** to embrace death in a natural way, under certain conditions.
  - It also laid down **guidelines for 'living will' made by terminally ill patients** who beforehand know about their chances of slipping into a permanent vegetative state.
- The court specifically stated that **"Dignity in the process of dying is as much a part of the right to life under Article 21**. To deprive an individual of dignity towards the end of life is to deprive the individual of a meaningful existence."

### ▪ Different Countries with Euthanasia:

- **Netherland, Luxembourg, Belgium** allows both euthanasia and assisted suicide for

- anyone who faces “unbearable suffering” that has no chance of improvement.
- **Switzerland** bans euthanasia but allows assisted dying in the presence of a doctor or physician.
  - **Canada** had announced that euthanasia and assisted dying would be allowed for mentally ill patients by March 2023; however, the decision has been widely criticised, and the move may be delayed.
  - **United States** has different laws in different states. Euthanasia is allowed in some states like Washington, Oregon, and Montana.

### UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q.** Right to Privacy is protected as an intrinsic part of Right to Life and Personal Liberty. Which of the following in the Constitution of India correctly and appropriately imply the above statement? **(2018)**

- (a)** Article 14 and the provisions under the 42<sup>nd</sup> Amendment to the Constitution.
- (b)** Article 17 and the Directive Principles of State Policy in Part IV.
- (c)** Article 21 and the freedoms guaranteed in Part III.
- (d)** Article 24 and the provisions under the 44th Amendment to the Constitution.

**Ans: (c)**

[Source: HT](#)

## Corals in Thailand Getting Destroyed

**For Prelims:** Coral Reefs, Overfishing, Pollution, Zooxanthellae, Ocean acidification, Coral Bleaching, International Coral Reef Initiative, Cryomesh, Biorock Technology.

**For Mains:** Types of Corals, Significance of Coral Reefs, Initiatives to Protect Corals.

### Why in News?

Recently, it is reported that a rapidly spreading disease, commonly known as **yellow band disease**, is killing [corals](#) over vast stretches of the sea floor of **Thailand**.

- Scientists believe [overfishing](#), [pollution](#) and **rising water temperatures** because of climate change may be making the reefs more vulnerable to **yellow-band disease**.

### What is Yellow Band Disease?

- Yellow-band disease - **named for the colour it turns corals before destroying them** -was first spotted decades ago and has caused widespread damage to reefs in the Caribbean. There is **no known cure**.
- The Yellow Band disease is caused by a **combination of environmental stressors, including**

**increased water temperatures, pollution, and sedimentation**, as well as increased competition for space from other organisms.

- These factors can weaken the coral and make it more susceptible to infection by pathogens, **such as bacteria and fungi**.
- The disease's impact **cannot be reversed, unlike the effects of [coral bleaching](#)**.

## What are Coral Reefs?

### ▪ About:

- **Corals** are marine invertebrates belonging to the class Anthozoa in the phylum **Cnidaria**.
  - They typically live in compact colonies of many identical individual polyps.
  - **Coral reefs** are underwater ecosystems made up of **colonies of coral polyps**.
- Coral polyps live in a **symbiotic relationship** with a variety of **photosynthetic algae** called **zooxanthellae**, which live within their tissues.
  - These algae provide the **coral with energy through photosynthesis**, while the **coral provides the algae with a protected environment** and compounds, they need for growth.

### ▪ Types of Corals:

- **Hard Corals:**
  - They extract **calcium carbonate** from seawater to build **hard, white coral exoskeletons**.
  - They are in a way the **engineers of reef ecosystems** and measuring the extent of hard coral is a widely-accepted metric for measuring the condition of coral reefs.
- **Soft Corals:**
  - They attach themselves to such **skeletons and older skeletons** built by their ancestors.
  - Soft corals are typically **found in deeper waters** and are less common than hard corals.

### ▪ Significance:

- **Ecological Importance:** Coral reefs are one of the most diverse and productive ecosystems on Earth, **providing habitat for a wide variety of plant and animal species**.
  - They also play a critical role in regulating the **planet's climate by absorbing carbon dioxide** and protecting coastlines from erosion and storm damage.
- **Economic Importance:** Coral reefs support a variety of industries, including **fishing, tourism, and recreation**. They also provide resources for medicine and biotechnology.
- **Climate Regulation:** Coral reefs act as natural buffers against the impact of climate change by **absorbing wave energy, protecting coastlines and reducing the impact of storms** and sea level rise.
- **Biodiversity:** Coral reefs are home to a vast array of marine life, including **fish, sharks, crustaceans, mollusks** and many more. They are considered as the **rainforests of the sea**.

### ▪ Threats:

- **Climate change:** Coral reefs are particularly vulnerable to the effects of climate change, which is **causing [ocean acidification](#) and [coral bleaching](#)**.
  - **Coral bleaching** occurs when coral polyps expel the algae (zooxanthellae) living in their tissues, causing the **coral to turn completely white**.
- **Pollution:** Coral reefs are also **threatened by pollution**, including sewage, agricultural runoff, and industrial discharge.
  - These pollutants can cause coral death and disease, as well as reduce the overall health of the reef ecosystem.
- **Overfishing:** Overfishing can disrupt the **delicate balance of coral reef ecosystems**, which can lead to the decline of coral populations.
- **Coastal Development:** Coastal development, such as the **construction of ports, marinas, and other infrastructure**, can damage coral reefs and reduce the overall health of the reef ecosystem.
- **Invasive Species:** Coral reefs are also threatened by invasive species, such as the **lionfish**, which can outcompete native species and disrupt the overall balance of the reef ecosystem.

▪ **Initiatives to Protect Corals:**

◦ **Technological Intervention:**

- **Cyromesh:** Storage of the coral larvae at  $-196^{\circ}\text{C}$  and can be later reintroduced to the wild
- **Biorock:** Creating artificial reefs on which coral can grow rapidly

◦ **Indian:**

- **National Coastal Mission Programme**

◦ **Global:**

- **International Coral Reef Initiative**
- **The Global Coral Reef R&D Accelerator Platform**



# Coral Reefs

(Rainforests of the seas)



## About

- ✦ **Large underwater structures** – made of skeletons of **colonial marine invertebrates** ‘coral’ – individually called **polyp**
- ✦ **Symbiotic** Relationship with **algae** ‘**zooxanthellae**’ (responsible for beautiful colours of corals)
- ✦ Support over 25% of marine biodiversity

## Hard Corals vs Soft Corals

- ✦ **Hard Corals** - Rigid skeleton **made of  $\text{CaCO}_3$**  - **reef-building** corals
- ✦ **Soft Corals** - Non reef-building

## Great Barrier Reef (Australia)

- ✦ Largest Coral Reef in the World
- ✦ World Heritage Site (1981)
- ✦ Endures Mass Coral Bleaching



## Corals in India

- ✦ Present in the areas of Gulf of Kutch, Gulf of Mannar, Andaman & Nicobar, Lakshadweep Islands and Malvan



## Significance

- ✦ Coral reefs **protect coastlines from storms/erosion**, provide jobs, offer opportunities for recreation
- ✦ Source of **food/medicines**

## Threats

- ✦ **Natural:** Temperature, Sediment Deposition, Salinity, pH, etc.
- ✦ **Anthropogenic:** Mining, Bottom Fishing, Tourism, pollution, etc.

## Coral Bleaching

- ✦ Corals under stress - expel algae – thus turning white (bleached)
- ✦ Bleached corals - not dead – but, more risk of starvation/disease



## Initiatives to Protect Corals

### Technology

- ✦ **Cyromesh:** Storage of the coral larvae at (-196°C) - Can be later reintroduced to the wild
- ✦ **Biorock:** Creating artificial reefs on which coral can grow rapidly

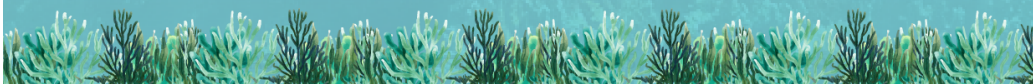


### Global

- ✦ International Coral Reef Initiative
- ✦ The Global Coral Reef R&D Accelerator Platform

### Indian

National Coastal Mission Programme





## UPSC Civil Services Examination, Previous Year Question (PYQ)

### **Prelims**

**Q. 1 "Biorock technology" is talked about in which one of the following situations?**

- (a) Restoration of damaged coral reefs
- (b) Development of building materials using plant residue
- (c) Identification of areas for exploration/extraction of shale gas
- (d) Providing salt licks for wild animals in forests/protected areas

**Ans: (a)**

**Q.2 Which of the following have species that can establish a symbiotic relationship with other organisms? (2021)**

- 1. Cnidarians
- 2. Fungi
- 3. Protozoa

**Select the correct answer using the code given below.**

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

**Ans: (d)**

**Q.3 Consider the following statements: (2018)**

- 1. Most of the world's coral reefs are in tropical waters.
- 2. More than one-third of the world's coral reefs are located in the territories of Australia, Indonesia and Philippines.
- 3. Coral reefs host far more number of animal phyla than those hosted by tropical rainforests.

**Which of the statements given above is/are correct?**

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

**Ans: (d)**

**Q.4 Which of the following have coral reefs? (2014)**

- 1. Andaman and Nicobar Islands
- 2. Gulf of Kachchh
- 3. Gulf of Mannar
- 4. Sunderbans

**Select the correct answer using the code given below:**

- (a) 1, 2 and 3 only

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

Ans: (a)

## **Mains**

**Q.** Assess the impact of global warming on the coral life system with examples. **(2019)**

**Source:** [TH](#)

## **India-Egypt Relations**

**For Prelims:** Non-Aligned Movement (NAM), Organization for Islamic Cooperation (OIC), Republic Day

**For Mains:** Relationship Between India and Egypt

### **Why in News?**

Recently, on the occasion of the 74<sup>th</sup> [Republic Day](#), the **President of Egypt was invited as the chief guest at the parade**, this is the first time that an Egyptian President has been accorded this honour.

- **A military contingent from Egypt also participated in the parade.**

**Note:** An invitation to be **Chief Guest is an important honour that is very high on symbolism**. New Delhi's choice of Chief Guest every year is **dictated by a number of reasons — strategic and diplomatic, business interest, and geopolitics.**



## What is the Status of the India-Egypt Relationship?

### ▪ History:

- The history of contact between India and Egypt, two of the world's oldest civilisations, **can be traced back to at least the time of [Emperor Ashoka](#)**.
  - Ashoka's edicts refer to his relations with Egypt under Ptolemy-II.
- In modern times, **[Mahatma Gandhi](#) and the Egyptian revolutionary Saad Zaghloul shared the common goal of [independence](#) from British colonial rule**.
  - The joint announcement of establishment of diplomatic relations at Ambassadorial level was made on 18 August 1947.
- India and Egypt **signed a friendship treaty in 1955**. In 1961, India and Egypt along with Yugoslavia, Indonesia and Ghana **established the [Non-Aligned Movement \(NAM\)](#)**.
- In 2016, the **joint statement between India and Egypt** identified political-security cooperation, economic engagement and scientific collaboration, and cultural and people-people ties **as the basis of a new partnership for a new era**.

### ▪ Recent Scenario:

- During this year's meeting, both India and Egypt **agreed to elevate the bilateral relationship to a "strategic partnership"**.
  - The strategic partnership will have **broadly four elements**: political, defence, and security; economic engagement; scientific and academic collaboration; cultural and people-to-people contacts.
- India and Egypt **signed a [Memorandum of Understanding \(MoU\)](#) for three years to facilitate content exchange, capacity building, and co-productions **between [Prasar Bharati](#) and the National Media Authority of Egypt****.
  - Under the pact, **both broadcasters will exchange their programmes of different genres** like sports, news, culture, entertainment on bilateral basis.

### ▪ A Partner within the OIC:

- India **views Egypt as a moderate Islamic voice among Muslim-majority countries, and as a partner within the [Organization for Islamic Cooperation \(OIC\)](#)**.

### ▪ Terrorism & Defence:

- During this Republic Day meeting, India and Egypt **expressed concerns about the spread of terrorism** around the world as it is the most serious security threat to humanity. Consequently, **the two countries agreed that concerted action is necessary to end [cross-border terrorism](#)**.

- The two countries are **looking at deepening defence and security cooperation**. Moreover, the two **Air Forces collaborated on the development of fighter aircraft in the 1960s**, and Indian pilots trained their Egyptian counterparts from the 1960s until the mid-1980s.
  - Both the [Indian Air Force \(IAF\)](#) and Egyptian air force fly the [French Rafale fighter jets](#).
- In 2022, a **pact was signed between the two countries** that have decided to also participate in exercises and cooperate in training.
- The first joint special forces exercise between **the Indian Army and the Egyptian Army, "Exercise Cyclone-I"** has been underway since 14 January 2023 in Jaisalmer, Rajasthan.
- **Cultural Relations:**
  - The **Maulana Azad Centre for Indian Culture (MACIC)** was established in Cairo in 1992. The centre has been promoting cultural cooperation between the two countries.
- **Difficult Time for Egypt:**
  - Egypt's economy has been in chaos over the past few years due to the pandemic and the [Russia-Ukraine war](#) which **impacted its supply of food as almost 80% of Egypt's grain** imported from Russia and Ukraine and impacted Egypt's [foreign exchange reserves](#).
    - In 2022, **despite [restrictions on the export of wheat](#), India allowed shipments of 61,500 metric tonnes to Egypt.**
  - **From India, Egypt is seeking investments in infrastructure** including Metro projects, a [Suez Canal](#) economic zone, a second channel of the Suez Canal, and a new administrative capital in Egypt.
    - **More than 50 Indian companies** have invested more than USD 3.15 billion in Egypt.
- **Geo-Strategic Concerns:**
  - China's bilateral trade with Egypt is currently at USD 15 billion, **double that of India's USD 7.26 billion in 2021-22**. During the past eight years, the President of Egypt has **traveled to China seven times to lure Chinese investments**.
  - Egypt, the most populous country in West Asia, **occupies a crucial geo-strategic location** — 12% of global trade passes through the Suez Canal and **is a key player in the region**.
    - It is a **major market for India and can act as a gateway to both Europe and Africa**. However, it also has bilateral trade pacts with important West Asian and African nations which is a cause of concern for India.

### UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q.** What were the events that led to the Suez Crisis in 1956? How did it deal a final blow to Britain's self-image as a world power? **(2014)**

[Source: IE](#)

## Revamping Monument Mitra Scheme

**For Prelims:** Monument Mitra Scheme, Corporate Social Responsibility, Adopt A Heritage, Archeological Survey of India (ASI), Indian National Trust for Art & Cultural Heritage (INTACH), National Mission on Monuments and Antiquities (NMMA), 2007, Project Mausam.

**For Mains:** Significance of Heritage, Issues Related to Heritage Management in India, Government

## Why in News?

**Private firms** will soon be able to partner with [Archaeological Survey of India](#) for the upkeep of **1,000 monuments under the Monument Mitra Scheme, which involves adopting and maintaining heritage sites.**

- Revamped scheme would be based on the [Corporate Social Responsibility](#) model and a new website having the **names of all the heritage sites**, would also be launched.

## What is the Monument Mitra Scheme?

- **Monument Mitra** is the term coined for an entity partnering with the government under the ['Adopt A Heritage'](#) project.
  - It was launched under the **Ministry of Tourism** earlier and then transferred to the **Ministry of Culture**.
- The project aims to **develop monuments, heritage and tourist sites** across India by inviting corporate entities, public sector companies or individuals to 'adopt' them

## What is a Heritage?

- **About:**
  - [Heritage](#) is deemed to mean those buildings, artefacts, structures, areas and precincts that are of **historic, aesthetic, architectural, ecological or cultural significance**.
    - It must be recognized that the **'cultural landscape' around a heritage site is critical for the interpretation of the site** and its built heritage and thus is very much its integral part.
  - The three key concepts that can be considered to determine whether a property can be listed as a Heritage are:
    - **Historic significance**
    - **Historic integrity**
    - **Historic context.**
  - In India, heritage comprises archaeological sites, remains, ruins. The **primary custodian of 'Monuments and Sites'** in the country, i.e. [Archeological Survey of India \(ASI\)](#) and their counterparts protect them.
- **Significance:**
  - **Storytellers of Indian History:** Heritage is a **legacy of physical artefacts and intangible attributes** through the generations that are inherited, preserved, and passed on.
    - Heritage has been woven into the fabric of Indian society with spiritual, religious, social, and political significance.
  - **Embracing Diversity:** India heritage is itself a museum of different types, communities, customs, traditions, religions, cultures, beliefs, languages, castes and social systems.
  - **Economic Contribution:** Heritage sites in India have significant economic significance.
    - These **sites attract millions of tourists every year, which generates revenue for the government and local communities** through tourism-related activities such as accommodation, transportation, and souvenir sales.
- **Issues Related to Heritage Management in India:**
  - **Lack of Centralised Database for Heritage Sites:** India lacks a complete national level database with state wise distribution of heritage structure.
    - However, [Indian National Trust for Art & Cultural Heritage \(INTACH\)](#) has inventoried about **60,000 buildings in around 150 cities** which is still only the tip of the iceberg.
  - **Heritage Encroachments:** Many ancient monuments have been encroached upon by local residents, shopkeepers, and souvenir sellers.

- There is **no harmony between these structures** and the architectural style of monuments or the surroundings.
- For instance, according to the **Comptroller and Auditor-General of India (CAG) Report, 2013**, there was encroachment on the Taj Mahal's premises near Khan-i-Alam's Bagh.
- **Lack of Human Resource:** Lack of adequate numbers of qualified and competent human resources to look after the monuments and carry out conservation activities is the **biggest problem faced by agencies like ASI.**
- **Other Government Initiatives Related to Heritage Management:**
  - **National Mission on Monuments and Antiquities (NMMA), 2007**
  - [Project Mausam](#)

## How can Heritage Sites in India be Further Revamped?

- **Smart City, Smart Heritage:** It is necessary to consider the **Heritage Impact Assessment** for all large infrastructure projects.
  - The **Heritage Identification and Conservation Projects** need to be adjoined to the city master plans and integrate with the Smart City Initiative.
- **Innovative Strategies for Increasing Engagement:** The use of monuments that do not attract a large number of visitors and not have cultural/religious sensitivity can serve as **venues for cultural and wedding programmes** that can fulfil twin objective:
  - The promotion of the associated intangible heritage.
  - Increasing visitor numbers to such sites.
- **Linking Heritage Conservation with Climate Action:** Heritage sites can serve as **opportunities for climate communication and education, and research** on historic sites and **practices to understand past responses to changing climate conditions can help adaptation** and mitigation planners develop strategies that integrate natural science and cultural heritage.
  - For example, **coastal and river communities such as the island of [Majuli](#)** in India have been living with and adapting to changing water levels for centuries.

## UPSC Civil Services Examination, Previous Year Question (PYQ)

### Mains

**Q.1** Safeguarding the Indian Art Heritage is the need of the moment. Discuss. **(2018)**

**Q.2** Indian Philosophy and tradition played a significant role in conceiving and shaping the monuments and their art in India. Discuss. **(2020)**

[Source: TH](#)

## Inner Core of the Earth

### Why in News?

Recently, new research suggested that Earth's inner core has **stopped spinning faster than its surface and might now be rotating slower** than it.

### What are the Highlights of the Research?

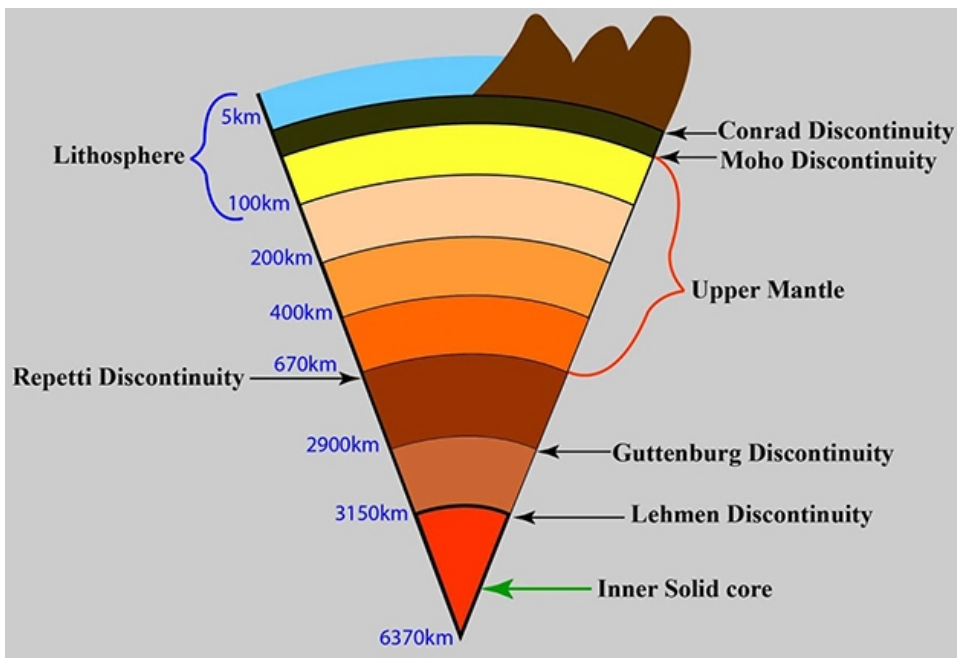
- **Methodology:**
  - The research analyzed [seismic waves from repeating earthquakes](#) over the last six decades.
  - By analysing changes in the time and propagation of these signals, they could estimate **the rotation of the inner core**, which is believed to move independently from the mantle and rest of the planet.
- **Findings:**
  - The inner core started rotating slightly faster than the rest of the planet in the early 1970s. But it had been slowing down before coming in sync with Earth's rotation around 2009.
  - There has been a "**negative trend**", meaning the inner core is now rotating slower than the surface. Next change may occur in the mid-2040s.
  - The results seem to indicate that **the Earth's inner core changes its speed of rotation every 60-70 years on average.**
- **Significance:**
  - The Study can motivate **some researchers to build and test models which treat the whole Earth as an integrated dynamic system.**
  - The slowdown could change how rapidly the entire planet spins, as well as influence how the core evolves with time.

## How is the Earth's Inner Core?

- **About:**
  - It is the innermost layer of the Earth. It is a hot iron ball of the size of Pluto.
  - The inner core is **solid due to the pressure caused by the weight put** on it by the Earth's other top layers.
  - It is distinct **from the outer core, which is a liquid.**
  - Roughly 5,000 kilometers (3,100 miles) below the surface we live on, the inner core **can spin independently because it floats in the liquid metal** outer core.
- **Radius:**
  - The inner core has an average radius of 1220 km.
  - The boundary between the inner and outer cores is located at approximately 5150 km below the surface of the Earth.
  - This boundary is called the **Lehman Seismic Discontinuity.**
- **Temperature:**
  - Between **7,200-8,500°F (4,000-4,700°C).**
- **Properties:**
  - It is predicted to have **very high thermal and electrical conductivity.**

## What are the Three Layers of Earth?

- **Crust:** This is the outside layer of the earth and is made of solid rock, mostly basalt and granite.
- **Mantle:** It lies below the crust and is up to 2900 km thick. It consists of hot, dense, iron and magnesium-rich solid rock.
- **Core:** It is the center of the earth and is made up of two parts: the liquid outer core and solid inner core. The outer core is made of nickel, iron and molten rock.



## UPSC Civil Services Examination, Previous Year Question (PYQ)

### Prelims

**Q. In the structure of planet Earth, below the mantle, the core is mainly made up of which one of the following? (2009)**

- (a) Aluminium
- (b) Chromium
- (c) Iron
- (d) Silicon

**Ans: (c)**

### Mains

**Q. Define mantle plume and explain its role in plate tectonics. (2018)**

[Source: TH](#)

## Open Market Sale Scheme

### Why in News?

The [Food Corporation of India \(FCI\)](#) will off load **30 LMT** wheat from the Central pool stock to the



market through various routes under the **Open Market Sale Scheme** (Domestic).

- Wheat will also be offered to State Governments/UTs for their schemes without e-auction.

### What is an Open Market Sale Scheme (OMSS)?

- FCI sells surplus stocks of wheat and rice at predetermined prices **through e-auction in the open market from time to time to enhance the supply of food grains.**
- The purpose of OMSS is to **dispose of surplus stocks of wheat and rice held by FCI**, and to regulate the prices of wheat in the open market.
- FCI conducts weekly auctions for the **OMSS** for wheat on the platform of the **National Commodity and Derivatives Exchange Limited (NCDEX)**.
  - NCDEX is a **commodity exchange platform in India** that provides a platform for trading in various agricultural and other commodities.

### What is the Food Corporation of India?

- The FCI is a government-owned corporation that manages the **food security system in India**.
  - It was established in **1965** under the Food Corporation's Act 1964 with the objective of ensuring **adequate availability of food grains** throughout the country, and to maintain price stability in the market.
- The **FCI also maintains buffer stocks** of food grains to ensure food security during times of scarcity or crisis.
- The FCI is also responsible for distributing foodgrains throughout the country for **public distribution system**.
- **FCI** also conducts **e-auction** as one of the methods to **dispose of its surplus food grains**.

## UPSC Civil Services Examination, Previous Year Question (PYQ)

### Prelims

**Q1. With reference to the provisions made under the National Food Security Act, 2013, consider the following statements: (2018)**

1. The families coming under the category of 'below poverty line (BPL)' only are eligible to receive subsidised food grains.
2. The eldest woman in a household, of age 18 years or above, shall be the head of the household for the purpose of issuance of a ration card.
3. Pregnant women and lactating mothers are entitled to a 'take-home ration' of 1600 calories per day during pregnancy and for six months thereafter.

**Which of the statements given above is/are correct?**

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

**Ans: (b)**

### Mains

**Q.1** In what way could replacement of price subsidy with Direct Benefit Transfer (DBT) change the scenario of subsidies in India? Discuss. **(2015)**

## 13th National Voters' Day

### Why in News?

[Election Commission of India](#) is celebrating **13<sup>th</sup> National Voters' Day (NVD)** on 25<sup>th</sup> January 2023.



### What are the Key Points of NVD 2023?

- **Theme:** Nothing Like Voting, I Vote for Sure.
- **Awards 2023:** National Awards for the Best Electoral Practices were presented to State and District level officers for their outstanding performance in the conduct of elections during 2022.
- **About NVD:**
  - The main objective behind the celebration is to encourage, **facilitate, and maximize enrolment, especially for new voters.**
  - The day has been celebrated every year **since 2011 across the country to mark the foundation of the Election Commission of India (25<sup>th</sup> January 1950).**
  - It not only encourages the youth to participate in the electoral process **but also focuses that the Right to vote as the basic right.**
  - NVD is a significant root of India as **the future of the country lies in the leader that we choose.**

### What is the Election Commission of India?

- The Election Commission of India (ECI) is **an autonomous constitutional authority responsible for administering** Union and State election processes in India.
  - ECI was established on 25<sup>th</sup> January 1950.
- The **body administers elections to the [Lok Sabha](#), [Rajya Sabha](#), State Legislative Assemblies**, and the offices of the **[President](#)** and **[Vice President](#)** in the country.
- **Structure of the Commission:**
  - Originally the commission had only one election commissioner but after the Election Commissioner Amendment Act 1989, it has been made a multi-member body.
  - The commission presently consists of one Chief Election Commissioner (CEC) and two Election Commissioners (ECs).
  - The secretariat of the commission is located in New Delhi.

## UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q1. Right to vote and to be elected in India is a (2017)**

- (a) Fundamental Right
- (b) Natural Right
- (c) Constitutional Right
- (d) Legal Right

**Ans: (c)**

**Q2. Under the Constitution of India, which one of the following is not a Fundamental Duty? (2011)**

- (a) To vote in public elections
- (b) To develop the scientific temper
- (c) To safeguard public property
- (d) To abide by the Constitution and respect its ideals

**Ans: (a)**

[Source: PIB](#)

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**Rapid Fire Current Affairs**

**Himachal Pradesh Statehood Day**

**Himachal Pradesh :-**

State Animal:	Snow Leopard
State Bird:	Western Tragopan
State Flower:	Pink Rhododendron
State Language:	Hindi & Local Dialects
Major Rivers and Dams:	Sutlej (Bhakra Dam, Gobind Sagar reservoir, Koldam Dam), Beas (Pandoh Dam, Maharana Pratap Sagar Reservoir), Ravi (Chamera Dam), Parbati
Major Lakes:	Renuka, Rewalsar, Khajjiar, Dal, Beas Kund, Dasaur, Brighu, Prashar, Mani Mahesh, Chander Tal, Suraj Tal, Kareri, Sreolsar, Gobind Sagar, Nako
National Parks	Great Himalayan National Park, Pin Valley National Park, Khirganga, Inderkila, Simbalbara

On **25<sup>th</sup> January**, Himachal Pradesh observed its Statehood Day.

Before independence, the **British territories in the hill came under the British Crown** after Queen Victoria's proclamation of 1858 and virtually **all rulers of the hill states remained loyal and contributed to the British war effort** in WW-1 (1914-18).

Post-independence, the **Chief Commissioner's province of HP** came into being on 15th April 1948. It became a **part C state (under Part VII)** on 26<sup>th</sup> January 1950. After recommendation of the **State Reorganisation Commission, HP became Union Territory** on 1<sup>st</sup> November 1956. Kangra and most of the other hill areas of Punjab were merged with HP on 1st November 1966 though its status remained that of a UT.

On 18<sup>th</sup> December 1970 the **State of Himachal Pradesh Act** was passed by Parliament and **HP became the 18th state of the Indian Union** on 25<sup>th</sup> January 1971.

**Read More -** [Statehood Day of Himachal Pradesh](#)

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**History of Republic Day and 26 January**

The **Constitution of India** was adopted officially by the Constituent Assembly on **Nov 26, 1949**, however, Republic Day is celebrated on 26 January. It is so because on 26/Jan/1930, the **historic "Poorna Swaraj" declaration was officially promulgated**, beginning the final phase of India's freedom struggle where the goal would be complete independence from British rule.

Opposing the **Motilal Nehru report 1927** which **demanded for a dominion status**, young leaders such as **SC Bose and JL Nehru wanted complete independence** for India. On 19 Dec 1929, "**Poorna Swaraj**" resolution was passed at the **Lahore session of INC** and officially promulgated on 26 Jan 1930. From 1930 till India finally won its independence in 1947, **January 26 was celebrated as "Independence Day"**.

Thus, when leaders had to decide on a day to promulgate India's new Constitution, January 26 was thought to be ideal.

**Read More - [Republic Day 2022](#)**

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## **Kuno Cheetah Detected with Hepatorenal Infection**

One of the 8 cheetahs that were introduced in **Kuno National Park (MP)** has been detected with a **hepatorenal infection**. Hepatorenal Infection is a condition in which there is **progressive kidney failure that occurs in a patient with poor functioning of the liver**.

In September 2022, 8 Cheetahs were **relocated from South Africa and Namibia** into the wild at Kuno Palpur National Park. It was the **world's first inter-continental large wild carnivore translocation project**.

**Read More - [Reintroduction of Cheetah](#)**

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## **T+1 Settlement**

Indian stock markets have embarked on a **shorter settlement cycle or T+1 regime** for the final list of large stocks - a move that will **help reduce margin requirements for clients and boost retail investment**.

T+1 (**trade plus one**) means that market **trade-related settlements will need to be cleared within one day of the actual transactions** taking place. Earlier, trades on the Indian stock exchanges were settled in **2 working days** after the transaction was done (**T+2**).

The stock exchanges - National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) - in Nov 2021 jointly announced plans to implement the T+1 settlement cycle in a phased manner with the bottom 100 stocks in terms of market value.

**Read More - [T+1 Settlement System for Shares: SEBI](#)**

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