

Factly Weekly

Compilation

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**For UPSC CSE Prelims
Exam**

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GRAIL Mission

News: A new NASA study, using data from the GRAIL mission, has revealed major differences between the two sides of the Moon. The nearside, visible from Earth, is hotter and more geologically active than the farside. This finding could explain the Moon's uneven surface. **GRAIL Mission.**



About GRAIL Mission

GRAIL (Gravity Recovery and Interior Laboratory) was a NASA mission launched in 2011 under the Discovery Program. It aimed to create a high-resolution map of the Moon's gravity to study its internal structure.

GRAIL Features

1. **Twin Spacecraft:** GRAIL used two identical spacecraft, *Ebb* and *Flow*, flying in tandem to detect small changes in the Moon's gravity.
2. **Gravity Mapping:** These measurements created the most detailed gravitational map of the Moon, revealing its deep interior.
3. **Launch and Management:** Launched in 2011 on a Delta II rocket, it was managed by NASA's JPL with MIT's support.
4. **Mission End:** The mission concluded with a planned impact on the lunar surface.
5. **Navigation Use:** Data supports future lunar GPS and landing systems.

Key Findings of GRAIL

1. **Interior Differences:** The Moon's nearside is geologically more active and about 100–200°C hotter than the farside.

2. **Surface Features:** The nearside has large, flat volcanic plains (called mare), while the farside is rugged and mountainous.
3. **Volcanic History:** Ancient volcanic activity led to the buildup of radioactive elements like thorium and titanium on the nearside. These elements produce heat as they decay.
4. **Tidal Deformation:** Earth's gravity pulls more on the nearside, causing it to flex more. This revealed asymmetry in the Moon's internal structure.
5. **Crustal Variation:** The nearside crust is thinner, allowing magma to rise easily, while the farside's thicker crust prevented similar activity.

International Atomic Energy Agency (IAEA)

News: On May 15, 2025 (IST), the International Atomic Energy Agency (IAEA) clarified that there was no radiation leak from any nuclear facility in Pakistan. The statement responded to social media and media claims following alleged Indian airstrikes during Operation Sindoor. **International Atomic Energy Agency (IAEA)**



About the IAEA

- The IAEA is the world's central intergovernmental organisation for scientific and technical cooperation in the nuclear field.
- It promotes the **safe, secure, and peaceful use** of nuclear science and technology globally.
- Established in **1957**, it is known as the **"Atoms for Peace and Development"** organisation.

Headquarters and Legal Status

- **Headquarters:** Vienna, Austria
- **Legal Status:** Autonomous organisation within the UN system
- **Reports to:** UN General Assembly and Security Council
- **Total Members:** 178 countries
- **Structure of the IAEA**

- **General Conference:**
 - All member states
 - Meets annually to decide on budgets and policies
- **Board of Governors:**
 - 35 members
 - Meets five times a year
 - Approves safeguards and appoints the Director General
- **Secretariat:**
 - Led by the Director General
 - Handles daily administration and implementation

Functions of the IAEA

- Verifies peaceful use of nuclear materials through:
 - On-site inspections
 - Monitoring
 - Data analysis
- Enhances national and international readiness for nuclear emergencies
- Promotes cooperation in nuclear applications in:
 - Energy
 - Health
 - Food and water security
 - Industry

Role Under the Non-Proliferation Treaty (NPT)

Though not a party to the NPT, the IAEA plays a **central verification role**

1. Under **Article III**, non-nuclear-weapon states must sign **Comprehensive Safeguards Agreements (CSAs)** with the IAEA
2. Purpose: Ensure nuclear energy is **not diverted to weapons**
3. As of May 2023, **182 states** have enforced CSAs
4. Under **Article IV**, the IAEA promotes peaceful nuclear cooperation to support development goals

Parasnath Hill

News: The Jharkhand High Court has recently directed the state government to increase deployment of home guard constables around the Parasnath Hills (Giridih district) to prevent the sale of non-vegetarian food and ensure the preservation of the sanctity of the area, amid renewed tension between the Jain and Adivasi communities. **Parasnath Hill**



About Parasnath Hill

- **Parasnath Hills** are located in **Giridih district, Jharkhand** and are among the highest peaks in the Chotanagpur Plateau.
- It was declared a **wildlife sanctuary** in **1978**.
- The hill is a site of deep religious and cultural significance for both the **Santal Adivasi community** and the **Jain community**.

Jain Beliefs and Claims

- The Parasnath Hills are known as *Sammed Shikharji* among Jains and are considered one of the most sacred pilgrimage sites in Jainism.
- According to Jain beliefs, 22 out of the 24 Tirthankaras attained *moksha* (liberation) on this hill. The 27-kilometre pilgrimage route on the hill features 20 *Tonks* (shrines), each dedicated to a Tirthankara.
- Today, the hill is dotted with **over 40 Jain temples and religious shrines**, making it a major pilgrimage site for Jains across the country.
- Jains follow a spiritually motivated vegetarian lifestyle and strongly object to activities such as hunting and the consumption or sale of meat and other non-vegetarian items in the area, as they consider such practices to be a violation of the sanctity of the holy site.

Santhal Beliefs and Practices

- The Parasnath Hills are revered by the Santhal community as *Marang Buru*, the supreme deity and a symbol of justice, protection, and spiritual strength in their animistic tradition.
- The hills are home to the *Jug Jaher Than*, the most sacred grove for the Santals, where important rituals are performed to honour their deities.
- Another significant site on the hill is the *Dishom Manjhi Than*, which serves as the ritual seat of tribal leadership and is central to the community's customary practices.
- Every year, during the month of *Baisakh* (April–May), the Santals celebrate the *Sendra Festival*, a traditional ritual hunt, during which men from the community enter the forest to participate in this culturally significant rite of passage.

- The hill also serves as a judicial and political space where the **Lo Bir Baisi**, a tribal council, gathers to resolve disputes. Historically, this council passed a resolution in 1855 that led to the **Santal Hul rebellion** against British colonial and feudal oppression.

Tsarap Chu Conservation Reserve

News: The Tsarap Chu Conservation Reserve was recently notified by the Himachal Pradesh government. **Tsarap Chu Conservation Reserve.**



About Tsarap Chu Conservation Reserve

- It is located in the remote and high-altitude region of **Spiti Valley in Himachal Pradesh**.
- It was officially notified on **May 7, 2025**, under **Section 36A(1) of the Wildlife (Protection) Act, 1972**, making it a legally recognized conservation area.
- It has become **India's largest conservation reserve** with an area of 1,585 square kilometres.
- It is also the **fifth conservation reserve** in Himachal Pradesh, joining the ranks of Darlaghat, Naina Devi, Potter Hill, and Shilli.
- The reserve is bordered by the Union Territory of Ladakh to the north, the Kibber Wildlife Sanctuary (extending up to Malang Nala and Lungar Lungpa) to the east, Kabjima Nala to the south, and the Chandratal Wildlife Sanctuary to the west.
- The area is ecologically significant as it lies in the **catchment of the Charap Nala** and serves as a vital **wildlife corridor** between the Kibber and Chandratal sanctuaries.
- Management will be overseen by a Conservation Reserve Management Committee, comprising representatives from local Panchayats as well.
- **Fauna:** The Tsarap Chu region hosts a **high population of snow leopards**, a key indicator species often referred to as the "ghost of the mountains."
 - Other important wildlife species found in the reserve include the **Tibetan wolf**, **bharal (blue sheep)**, **Himalayan ibex**, **kiang (wild ass)**, and **Tibetan argali**.

- Rare and ecologically important bird species such as the **Rose Finch**, **Tibetan Raven**, and **Yellow-billed Chough** also inhabit the region, enhancing its biodiversity value.

Campus Calling programme

News: On May 16, 2025, the **National Commission for Women (NCW)**, in collaboration with *Yuvamanthan*, launched the *Campus Calling* programme at Swami Vivekanand Subharti University (SVSU), Meerut. The initiative focuses on gender sensitivity, prevention of sexual harassment, and cyber safety in educational institutions. **Campus Calling programme.**



About the Programme

1. *Campus Calling* is an NCW initiative designed to promote safe and inclusive learning environments.
2. It aims to strengthen awareness on gender-related issues and online threats through structured student engagement.
3. The event was jointly organised by the IPR Cell, Women Empowerment Committee, Gender Sensitisation Cell, and Gender Equity and Equal Opportunity Cell of the SVSU.

Core Objectives and Scope

1. Targeting over 1,000 universities and colleges across India.
2. Enhancing awareness on:
 - Gender discrimination.
 - Sexual harassment.
 - Cyber crimes affecting students.
3. Building informed student communities to respond to these challenges.

Student Leadership and Participation

1. **Each institution will select:**

- Two female and two male ambassadors.
 - These students will lead campus-based sensitisation activities.
2. A collective pledge was taken by students to uphold:
- Gender sensitivity.
 - Respectful behaviour.
 - Cyber awareness.

e-Passports

News: India has formally joined over 120 countries—including the US, France, Japan, and Australia—in issuing biometric e-passports. This move aims to enhance national security, ease international travel, and align with ICAO global standards. A nationwide rollout is planned by mid-2025. **e-Passports.**



About e-Passports

A biometric e-passport is an upgraded version of the traditional passport. It contains a **Radio Frequency Identification (RFID) chip** embedded in the back cover, storing the holder's personal and biometric details, such as:

- Name, date of birth, passport number
- Facial image and fingerprints
- Digital signature for secure authentication
- A **gold rectangle symbol** on the cover indicates its electronic nature.

Why India Adopted Biometric E-Passports

India's decision is driven by the need to:

- Strengthen border and document security
- Simplify visa and immigration processes

- Combat identity fraud
- Meet international travel standards

The initiative falls under the Passport Seva Programme 2.0 and reflects India's digital transformation goals.

Security Features

To protect sensitive data and ensure global interoperability, e-passports include:

1. **Basic Access Control (BAC):** Restricts access to authorised readers
2. **Passive Authentication (PA):** Verifies stored data integrity
3. **Extended Access Control (EAC):** Secures biometric details
4. **Public Key Infrastructure (PKI):** Ensures data authenticity
5. **Encrypted RFID chip:** Prevents tampering and forgery

New Caledonia

News: A crucial mediation effort by French Overseas Minister Manuel Valls to establish a new political agreement for New Caledonia failed on May 8, throwing the French Pacific territory into deep political uncertainty. **New Caledonia.**



About New Caledonia

- New Caledonia is a **French unique collectivity** situated in the **southwestern Pacific Ocean**, approximately **900 miles (1,500 km)** east of **Australia**.
- It includes several islands: the main island of **Grande Terre** (where the capital, **Nouméa**, is located), the **Loyalty Islands**, the **Bélep Islands**, and the **Île des Pins**.
- These account for over **99% of the territory's landmass**.

- It comprises distant **uninhabited islets**, such as the **Chesterfield Islands, Bellona Reefs, Huon and Surprise Islands**, and **Walpole Island**. France's claim to **Hunter and Matthew Islands** is **disputed by Vanuatu**.

Physical Features

- The main island, **Grande Terre**, is a **long, narrow landmass**, approximately **310 miles (500 km)** long and **30 miles (50 km)** wide.
- It is **mountainous**, with two prominent peaks: **Mount Humboldt (1,617 m)** and **Mount Panié (1,628 m)**.
- The island is bordered by a **coral barrier reef**, forming a large **lagoon** designated as a **UNESCO World Heritage Site in 2008**.
- The nearby **Loyalty Islands**—Ouvéa, Lifou, and Maré—are made of coral limestone and have little surface water.
- New Caledonia experiences a **subtropical climate** with **year-round rainfall**, especially from **December to March** during the cyclone season.
- The **east coast** receives heavy rainfall (over **3,000 mm annually**), while the **west coast** is relatively drier (less than **1,000 mm annually**).
- Temperatures are generally **moderate**, averaging **22–24°C**, with **cyclonic winds** common late in the hot season.
- The island's vegetation includes **rainforests, mangroves, savannas** with **niaouli trees**, and **sclerophyll shrubs**.
- It is home to **Amborella trichopoda**, a rare plant linking conifers and flowering plants.
- There are **no native land mammals except bats**, and **no venomous reptiles or malaria-carrying mosquitoes**. The **kagu**, a rare flightless bird, is an endangered and iconic species of New Caledonia.

Presidential Reference

News: In May 2025, **President Droupadi Murmu** made a reference to the Supreme Court under **Article 143**, seeking its opinion on **14 specific legal questions**. This followed a recent Supreme Court judgment that prescribed **timelines for Governors and the President** to act on **State legislation**, and made such decisions **subject to judicial review**. **Presidential Reference**.



About Presidential Reference

- A **Presidential Reference** is a provision under **Article 143 of the Indian Constitution** that allows the **President of India** to refer questions of **law or fact of public importance** to the **Supreme Court** for its advisory opinion.
- This mechanism enables the executive to seek legal clarity on complex constitutional or legal matters.
- However, the opinion given by the Supreme Court in such a reference is **not binding**, although it carries significant **persuasive value** and is generally followed by both the executive and the judiciary.
- The advisory jurisdiction of the Supreme Court under Article 143 has its origins in the **Government of India Act, 1935**, which permitted the **Governor-General** to refer legal questions to the **Federal Court**.
- **Nature of the Supreme Court's Opinion:** The opinion rendered by the Supreme Court on a Presidential Reference is not legally binding on the President. It also does not have precedential value for future judicial decisions. However, the opinion usually has strong persuasive authority and is often followed by the government and the courts.
- The Supreme Court is **not obligated** to answer a Presidential Reference. It has the discretion to **decline** if it finds the question too vague, inappropriate, or beyond its advisory role. For instance, in **1993**, the Court **declined to answer the Ram Janmabhoomi Reference**, citing concerns over the political and religious sensitivity of the matter.

Constitutional Provisions

- Under **Article 143(1)** of the Indian Constitution, the President may refer to the Supreme Court any question of law or fact that is of **public importance**.
- Under **Article 143(2)**, the President may also seek the Court's opinion on disputes related to **pre-Constitutional treaties, agreements, or instruments**.
- According to **Article 145**, such matters are required to be heard by a bench consisting of **at least five judges** of the Supreme Court.

A-to-I mRNA Editing in Animals

News: Researchers from China recently reported that it's hard to make sense of the widespread persistence of A-to-I mRNA editing in animals.



About A-to-I mRNA Editing in Animals

- **mRNA:** Our cells use DNA as a guide to make proteins. First, they copy DNA into messenger RNA (mRNA).
- **A-to-I editing:** This is a process where the letter adenosine (A) in mRNA is changed to inosine (I) by special enzymes called ADARs.
 - The cell reads inosine as guanine (G), which can change the protein being made.

Importance

- It helps the cell make different versions of proteins without changing the DNA.
- It can remove early stop signals, allowing full proteins to be made.
- It helps the cell adapt to different conditions or stages of life.

Latest Discovery

- **Fungal Discovery:** Scientists found that the fungus edits over 26,000 mRNA sites during reproduction, not during normal growth.
- **Development Role:** This editing fixes early stop signals in key genes, helping the fungus develop and reproduce properly.
- **Stress Adaptation:** Some genes work better unedited under stress, showing the fungus edits only when needed for survival.

Association with Humans: Yes, A-to-I editing is common in humans:

- **In the brain:** It helps with brain growth, memory, and learning.

- **In the immune system:** It helps fight infections and control inflammation.
- **Health Implications:**
 - **Health Risks:** Faulty editing is linked to epilepsy and certain cancers.
 - **Therapeutic Potential:** Understanding this process can lead to new treatments and improve gene-editing technologies.

Overseas Citizen of India (OCI) Scheme

News: On May 20, 2025, recently revamped OCI services portal was launched. Overseas Citizen of India (OCI) Scheme.



About Overseas Citizen of India (OCI) Scheme

- The **Overseas Citizen of India (OCI) scheme** was introduced by the Government of India through an amendment to the **Citizenship Act, 1955**, in **2005**.
- This initiative was designed to strengthen India's engagement with the global Indian diaspora by granting certain privileges to foreign nationals of Indian origin, enabling them to maintain close ties with India.

Key Features of the OCI Scheme:

- **Eligibility:** Persons of Indian origin who were citizens of India on or after **January 26, 1950**, or were eligible to become citizens on that date, can register as OCI cardholders. However, those who are or had been citizens of **Pakistan or Bangladesh**, or whose parents, grandparents, or great-grandparents were citizens of these countries, are **not eligible** for OCI status.
- **Privileges Granted:** OCI cardholders enjoy several benefits, including:
 - Visa-free travel to India.
 - Exemption from registration with the Foreigners Regional Registration Office (FRRO) for any length of stay in India.

- Parity with NRIs in financial, economic, and educational fields (except for acquisition of agricultural or plantation properties).
- Permission to undertake activities such as employment, education, and residence in India.
- **Not a Dual Citizenship:** The OCI status does **not** confer political rights such as voting, holding constitutional posts, or contesting elections.

About Revamped OCI Portal

- **Aim:** To provide a more efficient, secure, and user-friendly experience
- The portal is operational in **over 180 Indian missions** worldwide and **12 FRROs**, processing around **2,000 applications daily**.

Key Features of the New Portal

- **Simplified Registration:** Enhanced user interface with intuitive navigation and a segmented registration menu.
- **Auto-Fill and Edit Options:** Automatically fills user profile details and allows editing before final submission.
- **Integrated Dashboard:** Displays both completed and partially filled applications.
- **Document Management:** Categorization of required documents based on application type, and an in-built image cropping tool for photos and signatures.
- **Online Payment & Reminders:** Integrated payment gateway and alerts to verify details before submission.
- **Informed Assistance:** Integrated FAQ section and display of eligibility and required documents.

e-Zero FIR

News: Union Home Minister Amit Shah on Monday announced that cyber fraud complaints above ₹10 lakh made via helpline 1930 or the NCRP will now be automatically converted into FIRs under the new **e-Zero FIR** system.



About e-Zero FIR

- **Launched by:** Indian Cybercrime Coordination Centre (I4C), under the Ministry of Home Affairs (MHA).
- **Pilot Project Location:** Delhi (initially implemented for testing).
- **Objective:** To expedite registration and investigation of **cyber financial crimes** by automating FIR generation, enabling swift recovery and legal action.
- **Legal Backing:** The Delhi Police, in collaboration with the **Indian Cyber Crime Coordination Centre (I4C)**, have established a procedure for registering cases in line with the **new provisions of Section 173(1) and 173(1)(ii) of the Bharatiya Nagarik Suraksha Sanhita (BNSS)**.
- **Integrated Platforms:** The new process integrates I4C's NCRP system with the Delhi Police's e-FIR platform and NCRB's Crime and Criminal Tracking Network & Systems (CCTNS).

Core Features

- **Automatic FIR Generation:** Complaints lodged through the **National Cybercrime Reporting Portal (NCRP)** and **Helpline 1930** will automatically be converted into **Zero FIRs**.
- **Threshold for Automation:** Currently applicable for cyber financial crimes involving amounts **above ₹10 lakh**.
- **e-Zero FIR Nature:**
 - Registered **irrespective of jurisdiction**.
 - Initially lodged with **Delhi's e-Crime Police Station**.
 - **Forwarded to local jurisdictional cybercrime police stations** for investigation.
- **Timeframe for Regular FIR:** Complainants must visit the relevant cybercrime police station within **3 days** to convert the **Zero FIR** into a **regular FIR**.

Tulare Lake

News– Tulare Lake in California, which had vanished over a century ago, made a comeback in 2023 due to a series of intense atmospheric river events that swept across the state. **Tulare Lake.**

Key Facts about Tulare Lake:



Source – ResearchGate

- **Location:** Situated in the San Joaquin Valley, California, USA.
- It was once recognized as the **largest freshwater lake** located **west of the Mississippi River**.
- It is replenished by the **Kern River**, which is fed by snowmelt from the **southern Sierra Nevada**.
- The lake **disappeared as a result of human-induced irrigation activities**.
- **Indigenous Connection**– The **Tachi Yokut tribe** historically depended on the lake. Its return has allowed the tribe to reconnect with their ancestral lands and traditions

Jayant Narlikar and Steady-State Theory of the Universe

News: Professor Jayant Narlikar, an astrophysicist, passed away recently, is best known for his work on an alternative model of the universe, separate from the Big Bang. **Jayant Narlikar and Steady-State Theory of the Universe**

About 'Steady State' Theory of the Universe

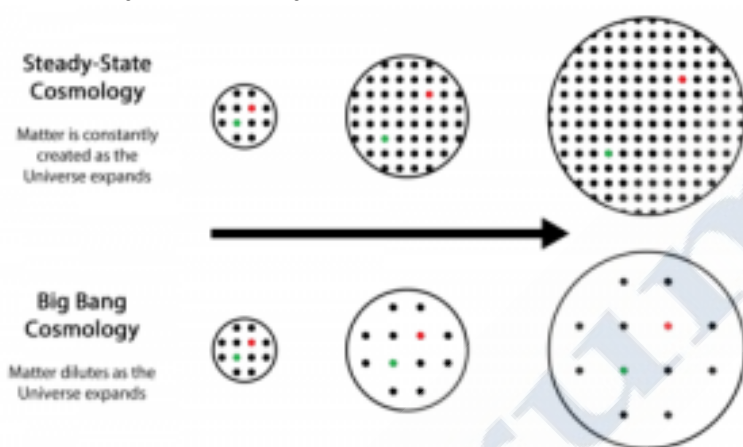


Figure 1 Source – Wikipedia

- It was jointly proposed by **Jayant Narlikar** and **Sir Fred Hoyle**, so also known as the **Hoyle-Narlikar theory**.

- It was a theory positing a **timeless cosmos in which matter is continuously created**, stood in **contrast to the dominant 'Big Bang' model**, which posits that the **universe began at a single point in time**.

- This theory maintains that the universe has always been, and would continue to be, the way it is — infinite in extent, **without a**

beginning or an end.

- Unlike the **Big Bang theory** that suggests a definite beginning, and possibly an end, to the universe.
- It **acknowledged an expanding universe**, which was experimentally verifiable, but proposed that the universe was **able to maintain a constant density by continuously creating new matter**.

Criticism of Einstein's general relativity equations

- In building this model, they also **sought to modify Einstein's general relativity**.
 - In general relativity, gravity arises out of local curvature of space-time caused by heavy objects.
- Hoyle and Narlikar proposed that **gravity at any location in the universe could also be affected by far-away objects**. In a way, all the matter everywhere in the universe contributes to gravity at any given place.
- In an expanding universe, the distribution of matter in the universe would change, and that would affect gravity at any given location.
- To keep **gravity unchanged**, Hoyle and Narlikar had to introduce **the idea of constant creation of matter**.

Decline of the theory

- The steady-state theory slowly lost out, with the emergence of **new observations** that fit the Big Bang model better e.g. the **Cosmic Microwave Background (CMB) radiation in 1965**.
 - CMB refers to the microwave radiation that fills the universe and is considered to be remnants of the Big Bang event.
- Some of the work of **Stephen Hawking and Roger Penrose on singularities**, piled more evidence in support of the Big Bang theory.

Institutional contributions of Professor Jayant Narlikar

- He played a pioneering role in establishing the **Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune**.

National recognitions

- Padma Bhushan in 1965
- Padma Vibhushan in 2004

International recognitions

- UNESCO Kalinga Prize for the popularisation of science in 1996
- Prix Jules Janssen from the French Astronomical Society in 2004

Literary contributions

- A science-fiction story **Dhoomaketu** (The Comet)
- His autobiography **Chaar Nagarantale Maze Vishwa (My Tale of Four Cities)** was awarded the **Sahitya Akademi Prize**.

Operation Olivia

News: Indian Coast Guard's 'Operation Olivia' protects 6.98 lakh Olive ridley turtles in Odisha. **Operation Olivia**

About Operation Olivia

- It is a vital initiative by the **Indian Coast Guard** aimed at **ensuring safe nesting grounds** for Olive Ridley turtles.
- It is conducted annually from **November to May**.
- **Focus areas:** The operation is conducted at the Odisha coast which has famous **arribada** beaches at **Rushikulya** by the mouth of the **river Devi** and **Gahirmatha**.
- The ICG adopted a diverse approach, involving Non-Governmental Organisations (NGOs) and local fishing communities by promoting the use of Turtle Excluder Devices (TEDs).

About Olive Ridley Turtles



Source-New Indian Express

- The Olive Ridley turtles are the **smallest and most abundant** of all sea turtles found in the world.
- They are found in warm waters of the Pacific, Atlantic, and Indian oceans.
- **Conservation status:**
 - IUCN Red List: **Vulnerable**
 - CITES: Appendix I (It prohibits trade in turtle products by signatory countries)
 - Indian Wildlife (Protection) Act, 1972: Schedule I

Note – Olive ridley turtles have a unique habit of mass nesting called Arribada.

Super-Fast Charging Sodium-Ion Batteries (SIBs)

News: A research team at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) has developed a super-fast charging sodium-ion battery (SIB).

About Super-Fast Charging Sodium-Ion Batteries (SIBs)



Source – DST

- The battery is based on a **NASICON-type cathode and anode material** that can charge up to **80% in just six minutes** and last over **3000 charge cycles**.
- **Innovations involved:** This new battery uses a **clever mix of chemistry and nanotechnology**.
 - The team engineered a **novel material for the anode**— $\text{Na}_{1.0}\text{V}_{0.25}\text{Al}_{0.25}\text{Nb}_{1.5}(\text{PO}_4)_3$ —and optimized it in **three critical ways** –
 - shrinking the particles to nanoscale
 - wrapping them in a thin carbon coat
 - improving the anode material by adding a small amount of aluminium
- These tweaks made **sodium ions move faster** and more safely, enabling both **speed and durability**.

Advantages of Sodium-Ion Batteries (SIBs)

- Sodium is **cheap** and **abundantly** available in India, unlike **lithium** which is **scarce** and largely **imported**.
- A battery built on sodium instead of lithium could **help the country to become self-reliant in energy storage technology**.

Sodium Ion Battery

- The sodium-ion battery (NIB or SIB) is a type of **rechargeable** battery that uses **sodium ions (Na^+) as its charge carriers**.
- They have a **similar design to their lithium-ion counterparts** and can be manufactured using related methods.
- Both battery types generate electricity through a chemical reaction and are made up of an **anode, cathode, separator and an electrolyte**.
- But in a sodium-ion battery, **lithium ions are replaced with sodium ions** in the battery's cathode, and **lithium salts swapped for sodium salts** in the electrolyte.

Shirui Lily Festival

News: The 2025 Shirui Lily festival is being held in the backdrop of ongoing ethnic tensions between the Meitei and Kuki-Zo communities that began in May 2023. **Shirui Lily Festival.**



About the Shirui Lily Festival

- The Shirui Lily Festival is a state-organised tourism festival held annually in **Ukhrul district, Manipur**.
- It is organised by the **Department of Tourism, Government of Manipur**.
- The festival was **first launched in 2017** as part of the state's efforts **to promote eco-tourism and showcase its cultural diversity**.
- The festival is **named after the Shirui Lily (*Lilium mackliniae*)**, which is the **official state flower of Manipur**.
- It aims to **raise awareness about the rare and endangered Shirui Lily and its natural habitat in the Shirui Hills**.
- Along with the Sangai Festival, **it is one of the two flagship tourism festivals** of the state.

About the Shirui Lily

- The Shirui Lily is a **rare and endangered species** that grows only in the **upper reaches of the Shirui Hills in Ukhrul district**.
- Locally known as "**Kashong Timrawon**," the flower is deeply **rooted in the folklore and spiritual beliefs of the Tangkhul Naga community**.
- Over the years, the natural habitat of the lily has been under **threat due to climate change, human encroachment, resource exploitation, and the invasion of wild bamboo species**.

Golden Dome' Missile Defence Shield

News: United States President Donald Trump announced that he has selected a \$175bn multilayered Golden Dome missile defence programme aimed at countering aerial threats. **Golden Dome' Missile Defence Shield.**

About Golden Dome' Missile Defence Shield

- The Golden Dome is a proposed, **next-generation missile defence system** unveiled by U.S. President Donald Trump in May 2025.
- It is designed as a **multi-layered shield** to protect the entire United States from a wide range of missile threats—including ballistic, hypersonic, cruise missiles, and even missiles launched from space—by

integrating both **terrestrial** and, for the first time, **space-based technologies**.



Figure 2. Source – Orbital Today

- **Background:** A space-based defence system was first envisaged by Ronald Reagan, the Republican US president from 1981 to 1989. Amidst the Cold War, Reagan proposed a barrier to nuclear weapons that included space-based technology, as part of his Strategic Defense Initiative, or Star Wars project.

- **Working:** The **Golden Dome** is envisioned to operate across **four major stages of missile flight**: pre-launch, boost phase, midcourse and terminal descent.

Components

- Components of the Golden Dome will be drawn from **existing American missile defence assets**, including **Patriot** missile batteries, **THAAD** (Terminal High Altitude Area Defence), **Aegis** Ballistic Missile Defence, and Ground-based Midcourse Defence (**GMD**).

Comparisons with Israel's Iron Dome

- **Israel's Iron Dome** is a missile defence system designed to intercept **short-range projectiles**, the US system would have to address **intercontinental and hypersonic threats** over the vast continental territory.

ULLAS – Nav Bharat Saaksharta Karyakram (New India Literacy Programme)

News: Mizoram has become the first state in India to be officially declared fully 'literate' under the ULLAS (Understanding Lifelong Learning for All in Society) initiative.

About ULLAS – Nav Bharat Saaksharta Karyakram (New India Literacy Programme)



Figure 3. Source – Ministry of Education

- ULLAS stands for **Understanding Lifelong Learning for All in Society**.
- It is also known as the **New India Literacy Programme (NILP)**.
- It is a **centrally sponsored initiative** that aligns with the National Education Policy (NEP) 2020.
- **Implementation duration:** 2022-27.
- **Aim:** It aims to empower adults **aged 15 and above from all backgrounds** who missed formal schooling, helping them integrate into society and contribute to the nation's growth.
- The **ULLAS User-Friendly Mobile Application** serves as a digital platform providing access to a wide range of learning resources via the **DIKSHA portal**.

Definition of Literacy and Full Literacy (as per ULLAS/NILP)

1. **Literacy:** Literacy encompasses the ability to read, write, and compute with comprehension. It also includes understanding, interpreting, creating, and critical life skills such as digital and financial literacy.
2. **Full Literacy:** Achieving 'full literacy' is defined as reaching a 95% literacy rate in a State or Union Territory.
3. **Criteria for Literacy Certification:** Under NILP, a non-literate person is considered literate if they pass the Foundational Literacy and Numeracy Assessment Test (FLNAT).

International Booker Prize 2025

News: Recently, the International Booker Prize 2025 was awarded to "**Heart Lamp**" written by **Banu Mushtaq** and translated by **Deepa Bhashti**. **International Booker Prize 2025**.

About International Booker Prize



Figure 4. Source – HT

- The International Booker Prize is a **prestigious literary award** that recognizes the **best translated work of fiction** from around the world.
- It was established in 2005.
- It was formerly known as the **Man Booker International Prize**.
- **Aim:** The prize aims to encourage more publishing and reading of **quality fiction** from all over the globe, and to **promote the work of translators** who bring these stories to an **English-speaking audience**.

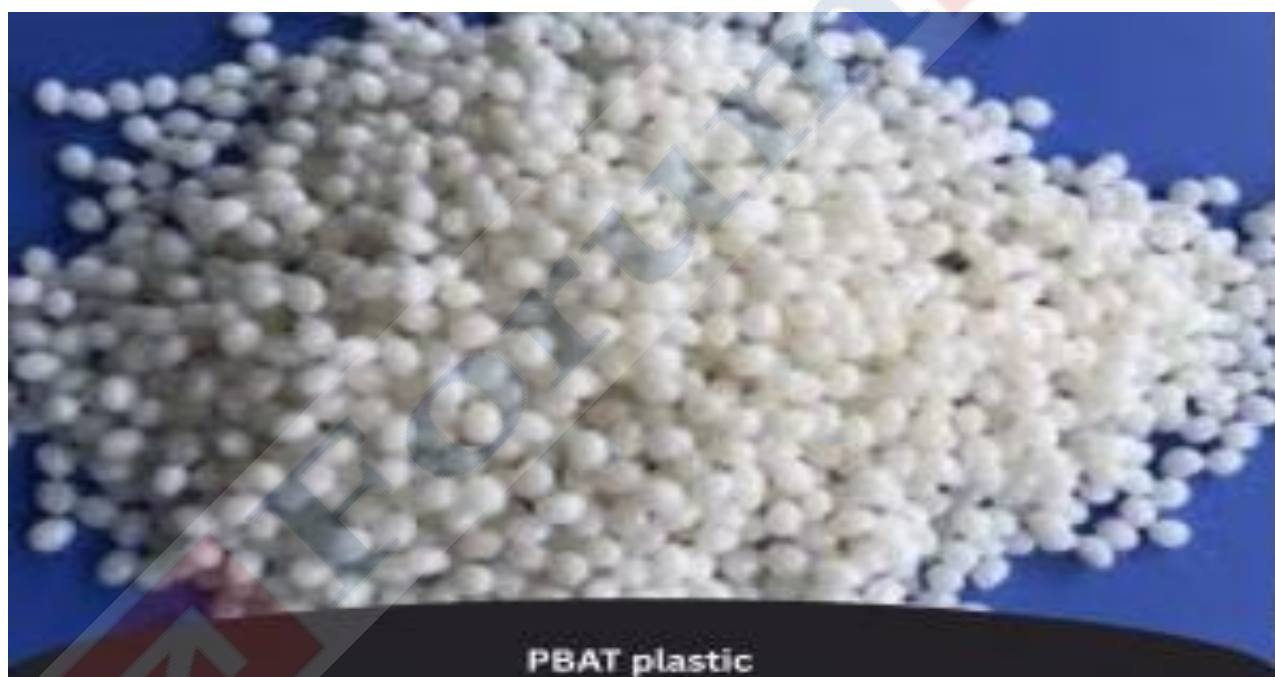
- **Eligibility and Selection:** Books eligible for the International Booker Prize must be translated into **English** and **published in the UK or Ireland**.
- **Equal Sharing of Prize Money**– The award comes with **50,000 pounds (USD 64,000)**, shared **equally** between the author and the translator.

About International Booker Prize, 2025

- **Banu Mushtaq**, an Indian writer, lawyer, and activist, has become the **first author writing in Kannada** to win the prestigious International Booker Prize for her **short story collection “Heart Lamp”**.
 - “Heart Lamp” is a portrayal of the struggles faced by Muslim women in southern India.
- The anthology is also the **first-ever short story collection to win the honour**.

PBAT plastic

News: Kamalpur Nagar Panchayat in Tripura has garnered national attention for its proactive step under the **Swachh Bharat Mission-Urban** by introducing **compostable PBAT bags** as a sustainable alternative to single-use plastic. **PBAT plastic**



About PBAT plastic

- **PBAT (Polybutylene Adipate Terephthalate)** is a **biodegradable, compostable polymer**.
- It is **synthetic** but behaves like **natural biodegradable materials**.
- It is designed to **decompose quickly in composting environments**.

Key Features of PBAT Plastic

- **Biodegradable:** Breaks down into non-toxic byproducts (CO₂, water, biomass) under industrial composting conditions.
- **Certified Compostable:** Approved by standards such as **CIPET** in India for eco-friendly applications.
- **Flexible and Durable:** Similar in strength and functionality to traditional plastics.
- **Chemical-Free:** Safe for packaging food and other sensitive materials.
- **Decomposes in ~180 days:** Much faster than conventional plastic (which takes 500+ years).
- **Heat-Sealable & Printable:** Makes it suitable for commercial use in bags, wraps, etc.

Environmental Benefits

- It reduces dependence on single-use plastic.
- It leaves no toxic residue in soil or water.
- It supports Swachh Bharat Mission-Urban and SDG goals.
- It promotes circular economy practices when used in municipal waste systems.

Applications

- They are increasingly used as **carry bags** for everyday shopping, providing a sustainable alternative to traditional plastic bags.
- In agriculture, **mulch films** made from compostable material help retain soil moisture and suppress weed growth, while being biodegradable and safe for the environment.
- These bags are also utilized in **packaging food and groceries**, ensuring both safety and environmental compliance without contributing to plastic pollution.
- They are employed as **waste disposal bags**, particularly for **biomedical and organic waste**, where safe decomposition is critical.

Limitations

- It needs **industrial composting facilities** for proper degradation (not ideal for open littering). It must be **used and disposed of correctly** for environmental benefits to materialize.

Financial Fraud Risk Indicator (FRI)

News: The Telecom Department introduces 'Financial Fraud Risk Indicator' to fight cyber fraud. **Financial Fraud Risk Indicator (FRI)**

About Financial Fraud Risk Indicator (FRI)



Source – NewsOnAir

- It is a **multi- dimensional analytical tool** to empower financial institutions with advance actionable **intelligence for cyber fraud prevention**.
- This initiative **aims** to bolster **cyber protection by identifying mobile numbers** linked to potential financial fraud before a transaction takes place.
- **Developed by:** Department of Telecommunications (DoT) under its **Digital Intelligence Platform (DIP)**
- **Working:** The FRI is a **risk-based metric** that classifies mobile numbers into **three categories** Medium, High, and Very High based on their likelihood of involvement in financial fraud.
 - The classification draws from a comprehensive analysis using inputs from various platforms, including the **Indian Cybercrime Coordination Centre's National Cybercrime Reporting Portal (NCRP)**, **DoT's Chakshu platform**, and **intelligence** shared by banks and financial institutions.
- It empowers **stakeholders**-especially **banks, Non-Banking Financial Companies, and UPI service providers** to prioritize enforcement and take **additional customer protection** measures in case a mobile number with high risk.

Asian Productivity Organization (APO)

News: India has assumed the **chairmanship** of the **Asian Productivity Organization (APO)** for the 2025–26 term during the 67th Session of the **Governing Body Meeting (GBM)** of the APO, held in Jakarta. **Asian Productivity Organization (APO)**



About Asian Productivity Organization (APO)

- It is an **intergovernmental organization** established in **1961** to increase productivity in the Asia-Pacific region through mutual cooperation.
- The APO contributes to the **sustainable socioeconomic development** of the region through policy advisory services, acting as a think tank, and undertaking smart initiatives in the industry, agriculture, service, and public sectors.
- **Members:** 21 (India being a founding member)
- **The Governing Body is the APO's** highest decision-making authority **and** meets
- The **67th GBM (2025)** is being hosted by the Indonesia.

National Productivity Council (NPC)

- It is an **autonomous organization** under the **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry**.
- It was set up in **1958**.
- It is a constituent of the **Tokyo-based Asian Productivity Organisation (APO)**.
- The **Union Minister for Industry** is the **President** of the NPC and the **Secretary** (Industrial Policy and Promotion) is its **Chairman**.
- India has reaffirmed its commitment to **APO Vision 2030 and Green Productivity 2.0** as future chairman of the Organisation.

INSV Kaundinya

News: The traditionally built 'ancient stitched ship' inducted into the Indian navy as **INSV Kaundinya**.

About INSV Kaundinya



Figure 5. Source – PIB

- INSV Kaundinya is a stitched sail ship, based on a 5th century CE ship depicted in the **paintings of Ajanta Caves**.
- **Project:** The project was initiated through a **tripartite agreement** signed in Jul 2023 between the **Ministry of Culture**, the **Indian Navy**, and Goa-based **shipbuilding company Hodi Innovations (OPC) Private Ltd.**
- **Funding:** The Project was funded from the **Ministry of Culture**.
- Inducted as an Indian Naval Sailing Vessel (INSV), Kaundinya will be **based at Karwar**.
- **Naming:** The ship is **named after Kaundinya**, the legendary **Indian mariner** who sailed across the Indian Ocean to Southeast Asia.
- **Building technique:** The ship has been recreated using **ancient stitching techniques** and constructed by artisans from Kerala, led by master **shipwright Shri Babu Sankaran**, using **coconut fibre stitching**, traditional wooden joinery, coir rope and natural resins and powered by cotton sails.
- **Cultural significance:** Her sails display **motifs of the Gandabherunda** and the **Sun**, her bow bears a sculpted **Simha Yali**, and a **symbolic Harappan style stone anchor** adorns her deck, each element evoking the **rich maritime traditions of ancient India**.
 - The ship serves as a tangible symbol of India's long-standing traditions of maritime exploration, trade, and cultural exchange.

Chagos Archipelago

News: India Welcomes UK's Decision To Hand Over Chagos Islands To Mauritius. **Chagos Archipelago**

About Chagos Archipelago

Source – BBC

- **Location:** It is an **island group** located in the central Indian Ocean, about 1,600 km south of India's southern tip.
- **Key Islands:** Includes atolls like **Diego Garcia**, Peros Banhos, Solomon Islands and Danger Island.
- **Climate:** Tropical marine climate, with weather moderated by trade winds.
- **Disputed Nations:** The primary parties involved in the dispute are the **U.K.** (current administrator) and **Mauritius** (claimant), with the **U.S.** involved due to the **military base on Diego Garcia**.

- **Colonial Background:** The Chagos Archipelago was claimed by Britain along with Mauritius in 1814. Before Mauritius' independence in 1968, the U.K. separated the islands in 1965 to create the British Indian Ocean Territory (BIOT).
- In 2019, the **International Court of Justice (ICJ)** dismissed the **UK's right to govern** the Chagos Islands and called on its government to **withdraw** from the archipelago.

Keezhadi Excavations

News: The Archaeological Survey of India (ASI) has asked archaeologist Amarnath Ramakrishna, who unearthed an ancient civilisation in Keezhadi near Madurai, to resubmit his report about the excavation after making necessary corrections for taking further action. **Keezhadi Excavations**

About Keezhadi Excavations



Source – TN Gov

- **Location:** This site is located near the town of **Keezhadi in Sivaganga district, Tamil Nadu**, about 12 km southeast of Madurai, closer to the erstwhile capital of Pandya kingdom.
 - It lies on the bank of the **Vaigai River** and it reflects the **ancient culture** of Tamil Nadu.
- **Excavations and Findings:** The excavation took place in 2013-14 at Pallichanthai Thidal of Keezhadi site.
 - Almost **48 square pits** have been cut and various **structures and artifacts** have been found, including **frosts, brick walls, roof tiles, pottery, mimic accessories, skeletal tools, iron Vel, and Tamil-Brahmi letter-etched plates**.
 - Carbon dating of charcoal, through **Accelerator Mass Spectrometry (AMS)**, found at the Keezhadi site in 2017 established that the settlement there **belonged to 200 BC**.
 - The excavations thus proved that **urban civilisation** had existed in Tamil Nadu since the Sangam age.

About Sangam Age

- The Sangam Age constitutes an important chapter in the **history of South India**.

- The term '**Sangam**' is derived from the **Sanskrit word 'Sangha'**, meaning an **assembly or association**, and refers to Tamil literary academies under the **Pandya kings**.
- According to Tamil legends, there existed **three Sangams** (Academy of Tamil poets) in ancient Tamil Nadu popularly called **Muchchangam**.
- **Sangam literature** provides vital insights into ancient Tamil society, covering aspects like governance, economy, trade, war, social life, and agriculture.
- **Sangam literature**
 - Tolkappiyam authored by Tolkappiyar
 - The Ettutogai or Eight Anthologies consist of eight works
 - The Pattuppattu or Ten Idylls consist of ten works
 - Silappathigaram written by Elango Adigal
 - Manimegalai by Sittalai Sattanar
 - Tirukkural authored by Thiruvalluvar

Dual Taxation on Broadcasting Services

News: The Supreme Court has held in a judgment that broadcasting through television for the purpose of entertainment of subscribers can be separately taxed by the Centre and the State concerned. **Dual Taxation on Broadcasting Services**



About Dual Taxation on Broadcasting Services

- In a recent Judgment, the Supreme Court of India has clarified that the **Centre can impose service tax on the broadcasting service** while the **State concerned** can, on the other hand, make **cable operators and entertainment providers liable to pay entertainment tax**.
 - As broadcasting service being a **taxable service under the provisions of the Finance Act, 1994**.

- The **State Legislatures** having the legislative competence to **levy entertainment tax** on those who provide entertainment to the recipients [television viewers].
- **No overlapping taxation**
 - **Seventh Schedule:** This is because the **activity of broadcasting** is a service and liable to service tax imposed by the Parliament (**Entry 97 – Union List**) and the **activity of entertainment** is a subject falling under (**Entry 62 – State List**).
- **'Aspect Theory' in place**
 - Central to the Court's decision was the "**aspect theory**", which permits different levels of government to tax separate components of the same transaction.
- **Background**
 - **Kerala Vs Asianet Satellite Communications Case:** The top court dismissed appeals filed by major DTH providers, including Tata Sky (now Tata Play), Dish TV, and Sun Direct.
 - These companies had **challenged various state entertainment tax laws**, arguing that the tax was unconstitutional since the Centre already levied a service tax on broadcasting.