1. **Prohibition of Unlawful Conversion of Religion Bill, 2025:** The Rajasthan government has recently introduced the **Prohibition of Unlawful Conversion of Religion Bill, 2025** in the State Assembly to prevent **religious conversions by force, fraud, or inducement**.
   - **Anto coversion law at national level:** There is **no national anti-conversion law** in India, but many states have enacted their own laws.
   - **Constitutional provisions: Article 25 of the Indian Constitution:** Guarantees the fundamental right to freedom of religion and encompasses various aspects related to the freedom to profess, practice, and propagate religion.
     - However, there is **no mention of conversion** in the Constitution anywhere.
   - **Anti-Conversion Laws Related SC Judgements**
     - Rev. Stanislaus v. State of Madhya Pradesh and Orissa (1977)
     - Sarla Mudgal v. Union of India (1995)
     - Lata Singh v. State of Uttar Pradesh (2006)
     - Hadiya vs. Ashokan K.M. (2018)

2. **International Big Cat Alliance (IBCA):** The IBCA Framework Agreement officially came into force on January 23, 2025, making it a **treaty-based inter-governmental international organization**.
   - **About:** The IBCA was established by GOI **on April 9, 2023**, during the **50 years of Project Tiger** event, through the nodal organisation viz., National Tiger Conservation Authority (NTCA), Ministry of Environment, Forest & Climate Change (MoEFCC).
   - **Recent Development: Five countries—Nicaragua, Eswatini, India, Somalia, and Liberia**—have ratified/accepted/approved the agreement under **Article VIII (1)**.
   - **Membership: 27 countries, including India**, have expressed consent to join IBCA, with **several international and national wildlife conservation organizations** partnering with it.
   - **Conservation Aim:** IBCA focuses on **seven big cats—Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma**—with membership open to **UN range and non-range countries** interested in conservation.
   - **Objective:** IBCA aims to **enhance global collaboration** by consolidating successful conservation practices, financial support, and expertise to **halt and reverse big cat population decline**.

- **Collaborative Approach:** It promotes **synergy** through→ **Gold standard conservation practices** and a **central repository** of knowledge→ **Species-specific intergovernmental platforms** and **transnational conservation initiatives→ Securing the ecological future** and **mitigating climate change impacts**.

3. **Grammy Award:** Recently, the **Prime Minister** congratulated **Chandrika Tandon** on winning the **Grammy Award** for her album **Triveni**.
   - **About:** The award presented annually in the **United States** by the **National Academy of Recording Arts & Sciences (NARAS)** and the **Latin Academy of Recording Arts & Sciences (LARAS)**.
   - **Purpose:** Recognizes **achievements in the music industry** across **various genres** like **pop, rock, rap, R&B, country, reggae, classical, gospel, and jazz**, as well as **production and postproduction work**.
   - **Major Categories:** Includes **four general awards—Record of the Year, Album of the Year, Song of the Year, and Best New Artist**.
   - **First Grammy Awards (1959):** Held in **Los Angeles**, with **28 prizes** awarded to artists like **Ella Fitzgerald, Frank Sinatra, and the Kingston Trio**.

4. **GARBHINI-DRISHTI:** The dedication of India's First Ferret Research Facility called 'GARBHINI-DRISHTI' has recently launched.
   - **About India's First Ferret Research Facility: State-of-the-art facility** adhering to **high biosafety and research standards**.
     - Focus on **vaccine development, therapeutic testing**, and research on **infectious diseases**.
     - Strengthens **India's pandemic preparedness** and global scientific standing.
   - **About the launch of GARBH-INi-DRISHTI:** Developed under **GARBH-INi program**, collecting data from **12,000+ pregnant women, newborns & postpartum mothers**.
     - One of **South Asia's largest maternal & child health databases→** Aims to **improve maternal & neonatal health outcomes** through collaborative research.
   - **Agreement: THSTI signed an agreement with Sundyota Numandis Probioceuticals Pvt. Ltd.**

- Facilitates commercialization of **THSTI's synthetic microbial consortium (Lactobacillus crispatus)**.
- Derived from **GARBH-INi cohort**, holds promise for **nutraceutical applications & microbiome-based interventions**.
- **Significance:** These initiatives **advance biomedical research, data-driven healthcare, and industry partnerships →** Propel **India towards a healthier and more prosperous future**.

5. **High Entropy Alloys (HEAs):** Scientists in Bengaluru have recently developed a new **alloy-based catalyst** for improved **hydrogen production** through water electrolysis.
   - **About HEA:** The catalyst uses **HEA**, reducing reliance on expensive materials like **platinum** for clean energy.
   - **HEA Properties**: Alloys usually contain two or more elements, while **HEAs** have five or more in almost equal concentrations.
     - HEAs are stabilized by **entropy** (disorder), overcoming **enthalpy** (internal energy + pressure-volume product).
     - They show high versatility and potential for **water-splitting applications**.
   - **Development of HEA Catalyst**: **Developed by** Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru (autonomous institute under **DST**).
   - **Metals Used**: Platinum (Pt), Palladium (Pd), Cobalt (Co), Nickel (Ni), Manganese (Mn).
   - **Guided by**: Dr. Prashant Singh, AMES National Laboratory, USA.
   - **Two Synthesis Methods**: **Electrodeposition** (room temperature, atmospheric pressure) & **Solvothermal Process** (high temperature & pressure, optimized solvent & reducing agent).
   - **Performance & Benefits**: HEA catalyst produced **efficient hydrogen with minimal energy loss**.
     - **Higher durability & stability** compared to commercial catalysts.
     - Used **7x less platinum** while offering better catalytic efficiency than pure platinum.
     - Stable & efficient for **100+ hours in alkaline seawater** without degradation.
   - **Impact & Future Prospects**: **Cost-effective & sustainable** alternative for green hydrogen production **→Potential applications** in industries & renewable energy technologies.
6. **Amplifiers and Sound Amplification:** It is used in **entertainment, astronomy, search & rescue, medical diagnostics**, and various fields converting **physical changes into electric signals**.

- **About Microphone:** A **transducer** that converts **sound waves** into **electrical signals**.
  - **Types of Microphones**: **Condenser Microphones** (used in **telephones & recorders**) use **capacitors** for audio transduction.
  - **Working of a Condenser Microphone**: Contains a **capacitor with two plates** separated by a dielectric → One plate is replaced with a **vibrating diaphragm** → When sound waves strike the diaphragm, **capacitance changes**, generating an **audio signal**.
- **How Sound is Amplified?**
  - **Preamplifier (Preamp)**: **Acquires the audio signal** (voltage form) and **boosts it** using external power while **minimizing noise** → **Gain** = (Output/Input ratio) → **Impedance matching** is crucial to avoid signal noise.
  - **Amplification Process**: **Transistors** are used as active components to amplify voltage.
- **Voltage Amplification via Transistors**
  - **Bipolar Junction NPN Transistor**: Has three terminals: **Base, Collector, and Emitter**.
  - **Small voltage at the base** → triggers large electron flow from emitter to collector → generates **high collector current**.
  - **Collector supplied with high voltage** → produces **strong output voltage**.
  - **Amplified Signal**: Maintains the same **waveform** but with a **larger voltage swing**.
  - **Stages of Amplification: Driver Stage** (Uses **transistors** to **maintain voltage while increasing current**) → **Power Stage** (Further **increases both voltage & current** before signal reaches the loudspeaker).

7. **Bhopal bans begging:** The district collector issued an order prohibiting begging in all public places after Indore.
   - **Reason for the ban:** Increasing issue of begging at traffic signals, religious sites, and tourist spots → Begging disrupts public movement, traffic, and involves individuals from other states, some with criminal records.
   - **Top 3 states with highest beggars:** West Bengal tops the chart followed by Uttar Pradesh and Bihar (Census 2011).
   - **National Gov. Scheme:** SMILE SCHEME.
   - **About SMILE scheme:** Launched in 2021-22, it is a Central Sector Scheme.

- **Objective of SMILE scheme:** To provide welfare measures to the Transgender community and the people engaged in the act of begging.
  - **Nodal Ministry:** Ministry for Social Justice and Empowerment.
  - **Implementation period:** 2021-22 to 2025-26.
  - **Target Beneficiaries:** Beggars and Transgenders.
  - **It includes two sub-schemes:** Central Sector Scheme for Comprehensive Rehabilitation for Welfare of Transgender Persons + Central Sector Scheme for Comprehensive Rehabilitation of engaged in the act of Begging.

8. **Asteroid 2024 YR4:** It is being closely monitored by **UN planetary defence organisations** due to a chance of impact in **2032**.
   - **About the impact probability:** Estimated **1.3%** chance of hitting Earth on **22 December 2032**.
   - **ESA assessment: 99% chance** of a safe pass, but **impact cannot be entirely ruled out**.
   - **Expert opinion:** Royal Astronomical Society stated that such threats usually **disappear with refined calculations**.
   - **Need for monitoring: Tracking resources** for astronomers to **take timely action**.
   - **Size & impact:** Asteroid is estimated to be **40m–90m across**, with **impact energy comparable to a nuclear bomb** if it hits a populated area.
   - **Expected impact zone:** Likely to **fall into a remote location or ocean** if it collides with Earth.
   - **Risk rating:** Currently rated **level 3 out of 10** on the **Torino Impact Hazard Scale**.
9. **Extra-Long Staple (ELS) Cotton:** Union Finance Minister recently announced a **five-year Cotton Mission** to improve **productivity & sustainability** of cotton farming to promote **Extra-Long Staple (ELS) cotton** varieties.
   - **About:** Cotton is classified based on **fibre length**: **Short, Medium, Long, and Extra-Long Staple (ELS)**. **Medium staple (Gossypium hirsutum):** Constitutes **96%** of India's cotton (fibre length: **25–28.6 mm**). **ELS cotton (Gossypium barbadense):** Fibre length **30 mm & above** (Known as **Egyptian or Pima cotton**). **Main Producers:** China, Egypt, Australia, Peru.
   - **India's ELS cotton cultivation:** Rainfed parts of Atpadi taluka (Maharashtra) & Coimbatore (Tamil Nadu). India's productivity is lower than Brazil & China.