1. **Collegium System** : Recently, the Supreme Court Collegium, headed by Chief Justice of India (CJI), recommended the appointment of 39 judges to nine High Courts across the country.
   - **About Collegium System :** Used for the appointment and transfer of judges in the Supreme Court and High Courts.
     - **Not Constitutionally Enshrined**: The system is not mentioned in the Constitution. It has evolved through Supreme Court judgments (notably the Three Judges Cases).
     - **Composition – Supreme Court Collegium**: Headed by the CJI , it includes the four senior-most judges of the Supreme Court.
     - **Composition – High Court Collegium**: Led by the Chief Justice of the respective High Court and includes the two senior-most judges of that court.
     - **Role of the Government**: The central government can seek clarifications or raise objections. However, if the Collegium reiterates a recommendation, the government is bound to accept it.
   - **Constitutional Provisions Related to Judicial Appointments :**
     - **Article 124**: Judges of the Supreme Court are appointed by the President.
       - ✓ Consultation is required with judges of the Supreme Court and High Courts as deemed necessary. The CJI must be consulted in all appointments (except their own).
     - **Article 217**: Judges of a High Court are appointed by the President.
       - ✓ Consultation must be done with the CJI, the Governor of the state, and the Chief Justice of the concerned High Court.
2. **Dalai Lama :** Recently, in its first official response to the Dalai Lama's succession announcement, the Ministry of External Affairs (MEA) clarified that the Government of India does not take a position on religious matters.
   - **About Dalai Lama :** The spiritual head of Tibetan Buddhism and a globally respected figure.
     - **Reincarnation Belief**: Each Dalai Lama is believed to be the reincarnation of his predecessor and a manifestation of Avalokiteshvara (Chenrezig), the Bodhisattva of Compassion.
     - **Lineage**: There have been 14 Dalai Lamas in history. The first and second were given the title posthumously

- **Political and Spiritual Role**: Traditionally, the Dalai Lama was both the political and spiritual leader of Tibet. However, after China's occupation of Tibet in 1950, this role became primarily spiritual.
- **Exile in India**: The current and 14th Dalai Lama, Tenzin Gyatso (born in 1935 in Tibet), fled to India during the 1959 Tibetan uprising and has lived in exile in India since then.
- **School of Buddhism**: The Dalai Lama belongs to the **Gelugpa** school of Tibetan Buddhism, which is the largest and most influential tradition.

- **About Tibetan Buddhism:** Evolved by the 9th century AD from Mahayana and Vajrayana traditions, integrating tantric and indigenous shamanic practices.
  - **Major Schools**: Tibetan Buddhism has four main schools: **Nyingma**, **Kagyu**, **Sakya** and **Gelug** (to which the Dalai Lama belongs)
  - **Dominance of Gelug School**: Since 1640, the Gelug school has been the predominant tradition in Tibet, led by the Dalai Lamas.

3. **Ham Radio** : Recently, in a landmark moment for India's space outreach, astronaut Shubhanshu Shukla connected with students in India directly from the International Space Station (ISS) via **ham radio (amateur radio).**
   - The interactive session was designed to inspire young minds and ignite interest in science and space exploration.

- **About Ham Radio :** A licensed form of radio communication used for educational, emergency, and experimental purposes.
  - **How it Works**: It operates using radio frequency waves through a transceiver and antenna, enabling local, international, and even space-based communication between licensed users.
  - **Eligibility in India**: Individuals aged 12 and above can apply for a ham radio licence, issued by the **Ministry of Electronics and Information Technology**.
  - **Use in space :** Began in **1983**, when astronauts aboard a space shuttle used it to connect with Earth.
    - ✓ The ISS currently houses a dedicated ham radio station called **Amateur Radio on the International Space Station (ARISS)**.
    - ✓ Used for **educational outreach**, for live interactions between students & astronauts.

- This initiative is supported by space agencies from **the US, Russia, Europe, Japan, and Canada**, and relies on **non-interference protocols**—radio activity is paused during sensitive operations like docking.
- Despite modern advancements in digital communication, **ham radio remains one of the most dependable alternatives**, especially during emergencies when conventional systems fail.

- In **India,** ham radio has proven critical in several disaster scenarios: **2001 Bhuj Earthquake**, **2004 Indian Ocean Tsunami** and **2013 Uttarakhand Floods.**

4. **New Pocket-Sized SO_2 Sensor :** A team of Indian scientists has developed a **compact, cost-effective sensor** capable of detecting **sulfur dioxide (SO_2)**—a toxic air pollutant—at extremely low concentrations.
   - This innovation marks a major step in public health and environmental monitoring, particularly in **industrial and urban settings**.
   - **About SO_2 :** A toxic gas primarily released from **vehicular emissions** and **industrial processes** such as power plants and oil refineries.
     - **Health Risks**: Even low-level exposure can lead to **respiratory problems**, **asthma attacks**, and **chronic lung damage**.
     - **Invisible Threat**: SO_2 is often **odorless and invisible** at harmful concentrations, making its effects noticeable **only after symptoms appear**.
     - **Need for Monitoring**: Its undetectable nature highlights the importance of **real-time air quality monitoring** to protect public health.
   - **About SO_2 Sensor :** Created by researchers at the **Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru**, an autonomous institute under the **Department of Science and Technology (DST)**.
     - **Key Features : Material Composition**: **Nickel Oxide (NiO)** – Functions as the **gas receptor** and **Neodymium Nickelate ($NdNiO_3$)** – Acts as the **signal transducer**.
     - **High Sensitivity**: Detects **Sulfur Dioxide (SO_2)** at levels as low as **320 parts per billion (ppb)**, outperforming most commercial sensors.

- **User-Friendly Portable Prototype**: Compact, pocket-sized device with a **color-coded alert system** for easy interpretation : 🟢 **Green** – Safe 🟡 **Yellow** – Warning 🔴 **Red** – Danger

5. **Biomass Mortality :** Recently, a study published in **Ecology Letters** revealed that short-lived yet intense convective storms are significantly accelerating tree mortality in tropical regions, especially in the Amazon.
   - **About Convective Storms:** Small, localized weather events marked by vertical instability, strong winds, and frequent lightning.
     - Though they cover relatively small areas compared to hurricanes or typhoons, their **high wind speeds and lightning strikes** can cause disproportionate destruction:
       - ✓ **Wind damage**: Uproots or breaks trees, which often crash into and damage neighboring trees.
       - ✓ **Lightning strikes**: A single bolt can damage up to 24 trees and kill five, even without fire.
   - **Key Findings :** Amazon forest inventory data shows that **51% of all trees die from being broken or uprooted**, largely due to high winds.
     - These storms may account for **12% to 118%** of the observed rise in **biomass mortality.**
     - Wind and lightning from these storms are estimated to be responsible for **30–60%** of total tropical tree mortality.
     - **Lethal Role of Lightning**: A single lightning strike can affect **24 trees** and **kill five**, even without causing fire. Tropical forests face **35–67 million lightning strikes annually**, killing billions of trees.
     - Thunderstorm activity in the tropics has increased by **5–25% per decade** over the past 50 years, a trend expected to worsen with global warming.
     - **Carbon Sink at Risk**: Rising storm-related tree deaths are weakening the **carbon absorption capacity** of tropical forests, making storms as destructive as droughts and heat stress in terms of forest carbon balance.
6. **Facciolella Smithi** : Recently, a new species of deep-sea eel, **Facciolella smithi (commonly known as Smith's Witch Eel)**, was discovered by researchers from the ICAR–National Bureau of Fish Genetic Resources (NBFGR), Lucknow. The eel was found in the **Arabian Sea** off the Kerala coast, at depths between 260 and 460 meters.



- **About Facciolella Smithi :** Belongs to the **Nettastomatidae** family.
  - **Habitat and Behavior**: Likely inhabits the **seafloor** or **burrows into soft sediments**, navigating the dark deep-sea environment using **sensory adaptations** rather than vision.
  - **Name Dedication**: Named in honour of **Dr. David G. Smith**, a renowned ichthyologist known for his work in eel taxonomy.
  - **Body Structure**: Has an **elongated, ribbon-like body**, reaching just over **two feet** in length, allowing smooth movement in deep-sea waters.
  - **Coloration**: Features a **two-tone body**: **Upper half**: Rich brown and **Underside**: Milky white
    ✓ This contrast may help in **camouflage** in low-light oceanic conditions.
  - **Head and Snout**: Possesses a **large head** with a **duckbill-like snout**, giving it a distinctive and somewhat prehistoric appearance.
  - **Eyes and Vision**: Despite the large head, the **eyes are small**, adapted to the **low-light deep-sea environment** where vision plays a limited role.

7. **Terbium :** Recently, scientists at the Indian Institute of Science (IISc) developed a glowing paper sensor that uses **terbium**, to enable the early detection of **liver cancer**. The sensor emits a **green glow**, providing a simple and visual method for diagnosis.
   - **About Terbium:** A **rare-earth metal** belonging to the **lanthanide series** of the periodic table.
     - **Sources**: Found in rare-earth minerals such as **bastnasite**, extracted from **ion-exchange clays** (laterites) and also produced as a byproduct of **nuclear fission**.
   - **Properties :** A **moderately hard, silvery-white metal**. It forms a **protective oxide layer** (Tb_2O_3 and TbO_2), which keeps it stable even at high temperatures.
     - Terbium **reacts easily with diluted acids**. It is **insoluble in hydrofluoric acid (HF)** because it forms a protective **TbF_3 layer** that prevents further reaction.
   - **Uses of Terbium: Display Technology**: Used in **green phosphors** for **fluorescent lamps**, **TVs**, and **computer monitors** (especially CRTs).
     - **Magnetostrictive Alloys**: Combined with **dysprosium** and **iron** to form **Terfenol-D**, a material that converts **magnetic energy into mechanical motion**, useful in sonar, sensors, and actuators.