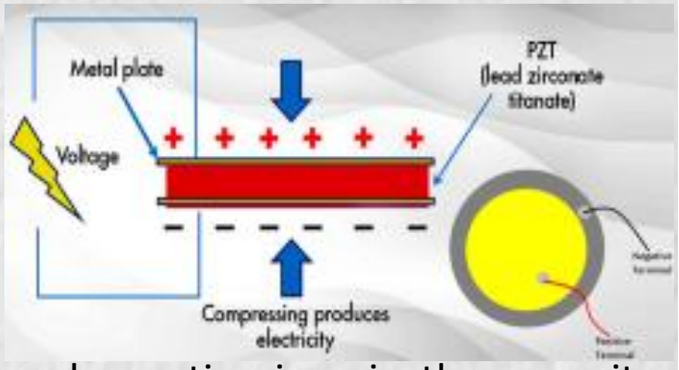
1. **Teesta-3 dam:** An expert committee of the Environment Ministry has recently recommended reconstruction of Teesta-3 dam in Sikkim.
   - **About Teesta River:** It is a tributary of the Jamuna River (Brahmaputra) in India and Bangladesh.
   - Originates as Chhombo Chhu from glacial lake Khangchung Chho at 5,280 m elevation.
   - **Course**: Flows south, cutting through Siwalik Hills near Darjeeling (West Bengal).
     - Turns southeast through Sivok Khola pass onto West Bengal plains.
     - Previously flowed into Padma River (Ganga), but since 1787 flows eastward, joining Jamuna River near Chilmari (Bangladesh).
   - **Tributaries**:
     - **Left-Bank**: Lachung Chhu, Chakung Chhu, Dik Chhu, Rani Khola, Rangpo Chhu.
     - **Right-Bank**: Zemu Chhu, Rangyong Chhu, Rangit River.

2. **Lateral Entry Scheme:** Govt's lateral entry scheme faces delays due to political opposition and an unresolved legal case.
   - **Later entry meaning:** Lateral entry into bureaucracy is a practice that involves recruiting individuals from outside the traditional government service cadres to fill mid and senior-level positions.
   - **Introduction in India:** Announced in 2018.
   - **Origin:** Concept was **introduced under the 2004-09** and was **endorsed by the 2nd Administrative Reforms Commission (ARC) - chaired by Veerappa Moily** established in 2005.
   - **In 3-year action agenda by the NITI Aayog (2017),** recommended the induction of personnel at middle and senior management levels, and bring in expertise and fresh perspectives.



3. **Piezoelectric Materials:** The pressure applied to the piezoelectric material in the lighter generates a spark.
   - **About:** The piezoelectric effect is the ability of certain materials to generate an electric charge in response to applied mechanical stress.
   - **Reason:** Atoms in these materials are arranged in a periodic pattern with alternating positive and negative ions.



   - **Effect of Pressure:** Positive ions move in one direction, and negative ions in the opposite, creating a charge imbalance.
   - **Result:** The material acts like a battery, generating an electric spark.
   - **Importance of Piezoelectric Materials:** Enable sparks in lighters and similar devices.
     - Their unique atomic structure is responsible for charge creation.
4. **Organophosphate:** Organophosphate, a chemical in pesticides and insecticides, is suspected to be behind the 17 deaths in Baddal village, J&K.
   - **About:** Organophosphates are chemical compounds formed through the esterification process involving phosphoric acid and alcohol.
     - These chemicals serve as primary components in **herbicides, pesticides, and insecticides** and have extensive application in manufacturing plastics and solvents.
     - Organophosphates can undergo **hydrolysis** and release **alcohol** from the **ester bond**.
     - Organophosphates are also the primary constituents of **nerve gas**.
     - They can be toxic and can harm the nervous systems of humans and animals.
   - **Symptoms**: Victims exhibited **fever, breathing issues, and sweating**.
   - **Treatment Response**: Improvement seen in patients after administering **atropine injections**, used to treat organophosphate toxicity.
   - **Organophosphate Use**: Protects crops from pests and controls disease spread by insects but disrupts nerve signal transmission with fatal results.
5. **Microplastics**: A new study has reveled that **microplastics can block blood flow in mouse brains**, causing cerebral thrombosis and neurobehavioral issues.

- **About effect of microplastics in Mouse Brain:** Immune cells like **neutrophils and phagocytes** ingest microplastics, leading to blockages in brain blood vessels (cortex area).
  - Some blockages cleared, while others persisted for days, causing **reduced mobility in mice**.
- **Microplastics in Human Body:** Research has detected **microplastics in various human body parts** (lungs, testicles, bone marrow, etc.).
  - A **2022 study** in Environment International confirmed **microplastics in human blood**.
- **Daily Human Exposure:** People consume or inhale **78,000–211,000 microplastic particles annually** (**World Economic Forum report**).
- **About Microplastics:** It is a tiny plastic particles that measure less than 5mm in diameter, about the size of a pencil eraser. The **sources of microplastics includes:**
  - **Primary Microplastics:** Intentionally manufactured small plastics, such as microbeads used in health and beauty products like cleansers and toothpastes.
  - **Secondary Microplastics:** Result from the breakdown of larger plastic debris into smaller fragments due to environmental factors.

6. **Enhanced Certificate of Origin (eCoO) 2.0 System:** The Directorate General of Foreign Trade (DGFT) has recently launched the enhanced Certificate of Origin (eCoO) 2.0 System.
   - **About the eCoO 2.0:** It is an upgraded system to simplify certification for exporters and enhance trade efficiency.
   - **Key Features:**
     - **Multi-user Access:** Exporters can authorize multiple users under a single Importer Exporter Code (IEC).
     - **e-Signing Options:** Supports Aadhaar-based e-signing and digital signature tokens for flexibility.
     - **Integrated Dashboard:** Provides access to eCoO services, Free Trade Agreement (FTA) details, trade events, and resources.
     - **In-lieu Certificate of Origin:** Allows exporters to correct previously issued certificates via an online application.
   - **Significance:** Reinforces DGFT's commitment to **trade facilitation** and **exporter support**.
   - **About:** The Directorate General of Foreign Trade (DGFT) is an agency under the Ministry of

- Commerce and Industry, Government of India, responsible for regulating and promoting foreign trade.
- **Primary Functions**:
  - **Formulation and Implementation of Foreign Trade Policy**: DGFT formulates and implements the Foreign Trade Policy with the main objective of promoting India's exports.
  - **Issuance of Authorizations**: Issues scrips/authorizations to exporters and monitors their corresponding obligations through a network of 24 regional offices.

7. **Draft Legal Metrology (Indian Standard Time) Rules, 2025:** The Department of Consumer Affairs, GOI, has recently issued the Draft Legal Metrology (Indian Standard Time) Rules, 2025, aimed at synchronizing time across India.
   - **About the provisions of the Draft Rules:**
     - **Mandatory Use of IST**: Standard time reference for legal, administrative, and commercial activities.
     - **Synchronization Protocols**: Adoption of **NTP** and **PTP** by public institutions and government offices.
     - **Cybersecurity Measures**: Ensure resilience against cyber-attacks/disruptions.
     - **Exceptions**: Allowed for scientific, astronomical, and navigational purposes with prior approval.
     - **Monitoring and Compliance**: Regular audits, penalties for violations.
   - **Objective:**
     - Ensure **"One Nation, One Time"** by standardizing **Indian Standard Time (IST)** across all sectors.
     - Achieve **precision in IST** dissemination with millisecond to microsecond accuracy.
   - **Importance of IST Synchronization**
     - **Critical sectors**: Navigation, telecommunications, banking, power grids, digital governance, scientific research (e.g., deep space navigation, gravitational wave detection).
     - **Current Challenge:** Many **TSPs/ISPs** rely on foreign time sources like **GPS**, impacting **national security** and critical infrastructure operations.

8. **Storm Éowyn:** It has unleashed strong and damaging winds over the British Isles, and particularly over Ireland and Scotland.
   - **About the storm:** It is **classified as** a "bomb cyclone" due to rapid and severe intensification.
   - **Causes of Explosive Development:**
     - **Strong Jet Stream**: Winds >200 mph over the North Atlantic due to temperature contrast between cold air (eastern US) and warm ocean air.
     - **Warm Ocean Temperatures**: Record-high sea surface temperatures provided energy.
     - **Cloud Condensation**: Deep clouds generated energy, fueling storm intensity.
     - **Ideal Track**: Crossed jet stream from south to north.
   - **About Bomb Cyclone:** A **mid-latitude storm** where central pressure drops rapidly at **1 millibar/hour** for at least **24 hours**.
     - Pressure readings vary based on the storm's formation location.
     - Rapid intensification process is called **bombogenesis**.
9. **Great Irish Potato Famine and Phytophthora Infestans:** A new study has found that pathogen responsible for **the Great Irish Potato Famine** that killed thousands evolved thousands of miles away from the **Emerald Isle, in the Andes mountain** range of South America.
   - **About:** A pathogen is a microorganism, virus, toxin, or ionizing radiation that causes disease. Pathogens can affect humans, animals, plants, and other microorganisms.
   - **Key Finding:**
     - The **Great Irish Potato Famine** (1840s) was caused by Phytophthora infestans.
     - Originated in the **Andes Mountains**, South America, not Ireland.
     - Still causes **late blight** in tomatoes and potatoes worldwide.
   - **Migration Patterns**
     - P. infestans spread from **South America to North America**, then to Ireland.
     - Data shows **more migrations** into and out of South America compared to Mexico.
     - Gene flow occurred **between the Andes and Mexico**, both historically and recently.
   - **Trade Influence:** Modern global trade mixes **pathogen populations** in South America and Mexico.