Today's Prelims Topics

Akash Prime

Context

India successfully tested the Akash-Prime in Ladakh and Prithvi-2 & Agni-1 from Odisha.

About Akash Prime Missile

- It is an enhanced version of the Akash missile system, specifically optimized for operations in high-altitude regions (above 4,500 metres).
- It is a **medium-range surface-to-air missile** (SAM) system designed to defend mobile, semi-mobile, and static military assets against various aerial threats.
- Major Upgrades:
    - **Indigenous Radio Frequency (RF) seeker**: Enabling it to emit radio signals and accurately track and engage targets during the final phase of its flight.
    - **Performance:** To ensure **reliable performance in low-temperature and high-altitude conditions**.
- The missile can **engage targets within a range of approximately 25 to 30 kilometers**.

About Agni-1 Missile

- It is a **medium-range ballistic missile (MRBM)** with a range of **700 to 900 km**.
- It is a **single-stage, solid-fuel missile**.
- **Recent Upgrades:**
    - An **advanced guidance system** for enhanced accuracy.
    - A **new warhead** to improve its destructive capability.
- **Inducted by the Indian Army's Strategic Forces Command in 2007** for operational deployment.
- Agni-1 is a product of India's **Integrated Guided Missile Development Program (IGMDP)**, which began in **1983**.

About Prithvi-II Missile

- **Prithvi-II** is a **surface-to-surface, nuclear-capable short-range ballistic missile** (SRBM).
- It has a **strike range of 350 km**.
- Powered by **liquid-propelled twin engines**, offering high thrust and flexibility.
- Equipped with an **advanced inertial guidance system** and a **maneuvering trajectory**, ensuring **high-precision targeting**.
- It is a **proven and reliable missile system** of the Indian armed forces.
- **Inducted into service in 2003**, it has since been part of India's strategic arsenal.
- **Prithvi-II was one of the first missiles** developed under the **Integrated Guided Missile Development Programme (IGMDP)** launched by the Government of India.

Source: TheHindu

CARA

Context

CARA has directed State Adoption Agencies to intensify structured counselling at all stages of adoption to ensure emotional preparedness and well-being, as per the Juvenile Justice Act and Adoption Regulations, 2022.

About Central Adoption Resource Authority (CARA)

- It is a **statutory body under the Ministry of Women & Child Development**, Government of India.
- Initially established in **1990 as an autonomous body**, it became a **statutory body under Section 68 of the Juvenile Justice Act, 2015**.
- It acts as the **nodal agency for the adoption of Indian children**, both within the country and internationally.
- CARA handles adoptions of **orphaned, abandoned, and surrendered children** through recognized adoption agencies.
- It is also the **Central Authority for inter-country adoptions** under the **Hague Convention on Intercountry Adoption (1993)**, which India ratified in 2003.
- In India, legal adoption can occur under:
    - **Hindu Adoption and Maintenance Act, 1956**
    - **Guardians and Wards Act, 1890**
    - **Juvenile Justice Act, 2000 (and amended 2015)**.
- **JJ Act 2015** mandates registration of **Child Care Institutions (CCIs)** and linking them with CARA.
- **Functions of CARA:**
    - **Monitor and regulate** the entire in-country adoption process.
    - Process adoption applications from:
        - **NRIs, OCIs, and foreigners living abroad** through authorized agencies or Indian diplomatic missions.
        - **Foreigners or OCIs residing in India** for over a year.
    - **Issue No Objection Certificate (NOC)** for all inter-country adoption cases.
    - **Issue Conformity Certificate** under **Article 23 of the Hague Convention** for inter-country adoptions.
    - **Inform immigration authorities** (India and receiving country) about inter-country adoptions.
    - **Monitor and regulate** State Adoption Resource Agencies (SARAs), District Child Protection Units (DCPUs), and Specialised Adoption Agencies (SAAs).
    - **Conduct trainings, workshops, and awareness programmes** to build capacity of stakeholders involved in adoption.
    - **Maintain a centralized database** through the **Child Adoption Resource Information and Guidance System (CARINGS)**.

Source: TheHindu

Question Hour

Context

Trinamool Congress (TMC) leader Derek O'Brien said that 'Question Hour is one of the few tools still available to the opposition to hold the government accountable'.

Question Hour in Indian Parliament

- Question Hour is the **first hour of a sitting of the Parliament** (when in session) during which **Members of Parliament (MPs) ask questions to ministers** regarding the functioning of their ministries.
- It is a crucial tool for **ensuring government accountability and transparency**.
- The **first question in Parliament was asked in 1893**, during the pre-independence era under British rule.
- **Timing:**
    - **Lok Sabha**: Usually begins with Question Hour each day of sitting.
    - **Rajya Sabha**: Held from **11:00 AM to 12:00 Noon** (since 2014).
    - **Not held** on:
        - The day the **President addresses Parliament**.
        - The day the **Union Budget** is presented.
- **Rules & Procedure:**
    - **Governed by:**
        - **Rules 32–54** of *Rules of Procedure and Conduct of Business in Lok Sabha*.
        - **Directions 10–18** of *Directions by the Speaker, Lok Sabha*.
    - Questions must usually be **submitted 15 days in advance**.
    - **Maximum 5 questions** (including oral and written) can be submitted by an MP per day.
    - Additional notices are deferred to subsequent days of the session.
    - Questions are **submitted either online** (through the Members' Portal) or **in printed forms** from the Parliamentary Notice Office.
    - The **Speaker (Lok Sabha)** or **Chairman (Rajya Sabha)** has final discretion on the admissibility of questions.

Types of Questions

Type	Response	Supplementary Allowed	Submission Time	Daily Limit
Starred	Answered **orally**	✅ Yes	15 days in advance	20 per day
Unstarred	Answered in **written** form	❌ No	15 days in advance	230 per day
Short Notice	Answered **orally**	✅ Yes	Less than 10 days (urgent issues)	No fixed limit
Questions to Private Members	Addressed to MPs who are not Ministers (e.g. on Private Member's Bills)	Depends	Varies	Rarely used

Source: IndianExpress

RDI Scheme

Context

The Indian government approved the **Research Development and Innovation (RDI) Scheme** to bolster India's research and innovation ecosystem.

About RDI Scheme

- **Corpus**: ₹1 Lakh Crore
- **Nodal Ministry**: Department of Science and Technology (DST)
- **Objectives:**
  - **Boost Private Sector RDI**: Encourage investments in **sunrise sectors**, strategic technologies, and sectors relevant to **self-reliance** and **economic security**.
  - **Finance High-TRL Projects**: Support R&D projects at higher **Technology Readiness Levels (TRL)**.
  - **Acquire Critical Technologies**: Enable acquisition of **strategic technologies** important for national interests.
  - **Establish Deep-Tech FoF**: Facilitate a **Deep-Tech Fund of Funds** for startups and innovation-led enterprises.
- **Two-tiered system Funding Mechanism:**
  - **Special Purpose Fund (SPF)** under ANRF → custodian of funds.
  - **2nd-Level Fund Managers** → disburse funds via:
    - **Long-term concessional loans**
    - **Equity investments** (esp. for startups)
    - **FoF contributions** (e.g. Deep-Tech FoF)
- **Significance:**
  - Bridges the **funding gap in private R&D**.
  - Promotes **technology-led economic growth**.
  - Aims to make India **globally competitive** in innovation.
  - Accelerates India vision to achieve 500 GW of non-fossil fuel capacity by 2030 and net-zero emissions by 2070.

Global Comparison of R&D Spending (as % of GDP)

- **United States:** Spends approximately **3.5% of its GDP** on Research and Development.
- **China:** Allocates around **2.4% of GDP** to R&D.
- **India:** Spends only about **0.65% to 0.7% of GDP** on R&D.

Source: PIB, EconomicTimes

News in Short

Zimislecel

News? In a study published in New England Journal of Medicine, Zimislecel enabled insulin production and improved blood sugar in 12 Type 1 diabetes patients within one year.

What is Zimislecel?

- It is an **experimental therapy** for **Type 1 diabetes** that involves **infusing stem cell-derived islet cells into the liver** to restore the body's natural insulin production.
- **How It Works?**
  - **Type 1 diabetes** destroys the body's islet cells (in the pancreas), which produce insulin.
  - Zimislecel uses **pluripotent stem cells**, grown in a lab and matured into **functioning insulin-producing islet cells**.
  - These cells are then **infused into the hepatic portal vein**, aiming to settle in the liver and **resume insulin production**.

What are Stem Cells?

- Stem cells are unique cells in the body that have two key properties:
  - **Self-renewal:** They can divide and make more copies of themselves over long periods.
  - **Differentiation:** They are unspecialized cells that have the potential to develop into many different types of specialized cells in the body, such as muscle cells, blood cells, brain cells, and more.
- **Types of Stem Cells:**
  - **Embryonic Stem Cells** – Pluripotent; can become any cell type.
  - **Adult Stem Cells** – Limited types; found in tissues like bone marrow.
  - **Induced Pluripotent Stem Cells (iPSCs)** – Adult cells reprogrammed to behave like embryonic stem cells.

Swachh Survekshan Award

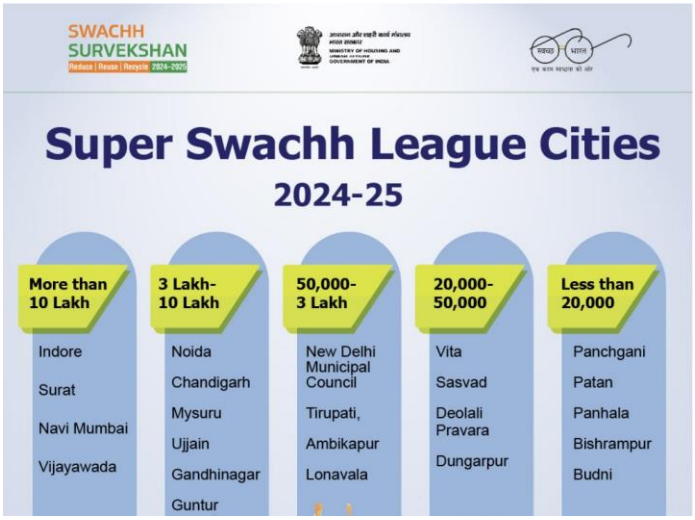
News? Recently the President of India awarded the Swachh Survekshan Awards.

About Award

- It is a part of India's **Swachh Bharat Mission**, aimed at encouraging cities and towns to **improve urban sanitation and cleanliness** through healthy competition.
- **Swachh Survekshan 2024–25 Awards:**

Super Swachh League (SSL)

- It is a **special recognition category** under the **Swachh Survekshan Awards**, introduced by the Ministry of Housing and Urban Affairs (MoHUA).
- To **honour top-performing cities** that have shown **consistent excellence** in urban cleanliness and sanitation.



Source: [PIB]

Places in News

Senegal

News? Former colonial ruler France hands over its last military bases in Senegal.

About Senegal

- **Location:** Western Africa.
  - Positioned just south of the **Tropic of Cancer**.
- **Bordering Countries: 5**
  - **Mauritania** – to the **north**
  - **Mali** – to the **east**
  - **Guinea** – to the **southeast**
  - **Guinea-Bissau** – to the **south**
  - **The Gambia** – almost entirely surrounded by Senegal, cutting through the country along the Gambia River
- **Major Cities:**
  - **Dakar** – Capital and largest city.
  - **Thiès**
  - **Touba**
  - **Saint-Louis** – Historic colonial city and former capital.
  - **Ziguinchor**.

Source: The Hindu

Editorial Summary

How is China leading the green energy sector?

Context

China is leading the global green energy sector race.

Some Facts

- **Installed More Than All Nations Combined (2024):** In 2024, China installed more wind turbines and solar panels than every other country combined.
- **$940 Billion Investment in 2024 Alone:** China's renewable sector saw a record investment of **$940 billion**, compared to **$3.4 billion** in India (2024–25).
- **Supply Chain Control:** Dominates manufacturing and supply chain in **solar panels, wind turbines, and batteries**, along with upstream raw materials like **polysilicon and lithium**.
- **55% of Global Renewable Energy Investment:** Chinese State-Owned Enterprises (SOEs) account for **55% of all global green energy investments** (Bloomberg).

China's Journey to Green Energy Superpower

- **Crisis as Catalyst:** Severe **air pollution** and **energy insecurity** in early 2000s sparked a green transition.
    - Reliance on coal made major cities nearly unlivable, triggering public pressure.\
- **Policy & Planning:**
    - **Renewable Energy Law (2005):** Guaranteed grid access and pricing incentives for renewables.
    - **11th Five-Year Plan (2006–10):** Made renewables a national priority.
    - Provinces like **Gansu, Inner Mongolia, and Jiangsu** were used for pilot projects.\
- **Role of SOEs and Banks:** SOEs (State Grid, Huaneng, Genertec) executed mega projects.
    - Public banks provided **low-interest loans** to scale renewables.
- **R&D and Manufacturing Scale:**
    - Massive government subsidies and R&D investment reduced costs.
    - **Vertical integration** enabled scale and global exports (e.g. Belt and Road Initiative).
- **Infrastructure Investment:**
    - Overcame curtailment issues by investing in **ultra-high-voltage transmission**.
    - State Grid's investment doubled from **$33.3 billion (2010)** to **$88.7 billion (2024)**.

Implications of China's Green Energy Leadership

- **Global Energy Power Shift:** China has **set the rules of the game** by dominating not just manufacturing, but innovation and deployment too.
    - It now exports energy infrastructure globally—**61 countries** engaged via BRI.
- **Strategic Control:** China's control over critical materials (lithium, rare earths) and component production (solar wafers, batteries) makes many nations **dependent on Chinese supply chains**.
- **Diplomacy & Statecraft Tool:** Renewable technology has become part of China's **geopolitical toolkit**, used to strengthen relations with Africa, Southeast Asia, and Latin America.
- **Western Reaction:** Countries like the U.S. are now trying to "reshore" green energy through acts like the **Inflation Reduction Act**, but **face higher costs and slower deployment**.

Key Lessons for India & the World

- **Strategic Long-Term Planning Pays Off:** China's two-decade lead came from consistency in planning, starting from small pilot projects to national scaling.

- **SOEs as Enablers:** State-owned enterprises can drive rapid deployment when supported with **mandates, capital, and policy alignment**.
- **Build Infrastructure Alongside Capacity:** Curtailment problems in mid-2010s show that generation without transmission infrastructure creates inefficiencies.
- **Balance Speed with Oversight:** Over-subsidisation led to wastage and overcapacity; later corrected by better **planning and monitoring**.
- **Global Vision is Key:** China's export-oriented strategy and alignment with global markets (via BRI) helped it **scale and influence** globally.
- **Integration of Innovation:** Future-ready investments in **AI-powered grids**, **green hydrogen**, and **nuclear tech (thorium reactors)** show how China blends R&D with deployment.

Source: The Hindu