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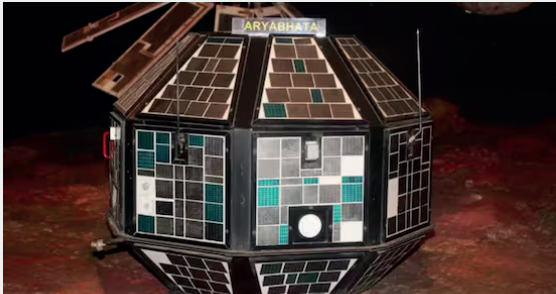
April 2025

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Prelims UPSC CSE 2025

Monthly Magazine



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PREFACE

Current Affairs UPSC CSE Prelims 2025

This high-quality monthly compilation of Current Affairs for Civil Services Exam Prelims 2025 is designed to help Civil Services Exam aspirants by:

1. **Saving preparation time:** Consolidates key current affairs from multiple sources for CSE Prelims.
2. **Reinforcing static concepts:** Links static concepts with current affairs
3. **Enhancing revision:** Combines important current affairs and static concepts for effective revision.

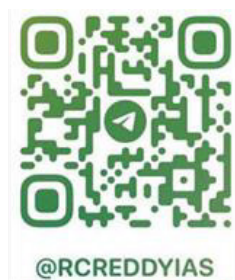
After reading this Current affairs magazine, you can test your concepts by taking our Current Affairs Test Series in Multiple Choice Question format which helps in the following ways:

- Aligns with the CSE prelims exam pattern.
- Aids understanding and recall by offering multiple perspectives on current affairs.
- Saves time, consolidates and aids quick revision

Details of our Current Affairs Test Series are on the back cover and inside this magazine.

Our team of content developers have worked rigorously to create this high-quality compilation, and we hope that all Civil Services and other competitive exam aspirants will make the best use of it. All the Best!

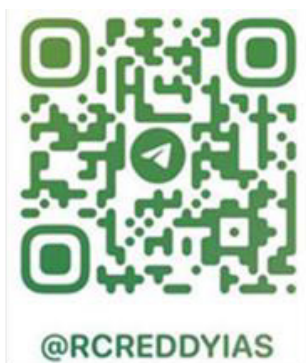
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POLITY

1. Inter-Parliamentary Union

Context: Lok Sabha Speaker, Shri Om Birla is leading a Parliamentary Delegation to the 150th Assembly of Inter-Parliamentary Union (IPU), being held in Tashkent from 5 to 9 April, 2025.

About

- The theme of the assembly will focus on “Parliamentary action for social development and justice,” addressing issues like poverty eradication, decent work promotion, social inclusion, and the participation of marginalized groups in decision-making.

The Inter-Parliamentary Union (IPU)

- It is a global organization of national parliaments, founded in 1889 with 181 Members and 15 Associate Members.
- It promotes peace, democracy, and sustainable development by facilitating parliamentary diplomacy and empowering parliaments to address global issues.
- Its mission is to support democratic governance, human rights, gender equality, youth empowerment, climate action, and sustainable development through political dialogue and cooperation.
- It is funded mainly by its members and has headquarters in Geneva, Switzerland, with offices in New York and Vienna.
- The IPU is known for tracking gender equality in parliaments and publishes the “Women in Politics” report in collaboration with UN Women.

Note: India is not a founding member. The IPU’s original members were limited to a few European countries.

2. 22nd Amendment to the U.S. Constitution

Context: On March 30, the 78-year-old U.S. President Donald Trump said he’s “not joking” about serving a third term in the White House. He further claimed that a legal loophole could make it possible.

22nd Amendment to the U.S. Constitution

- The **22nd Amendment** to the US Constitution says that **no one can be elected more than twice as President**.
 - The Amendment was ratified in **1951**, after President **Franklin D Roosevelt** had been elected **four consecutive times**, from **1932 to 1944**.
 - If someone has served as President for more than two years of another’s term (for example, a Vice President who became President due to the President’s death or resignation), they can only be elected once.
 - Thus, effectively, the maximum U.S. Presidential tenure can be 10 years (two years as a successor plus two full terms).

3. Justice Kurian Joseph Committee

Context: The Tamil Nadu Chief Minister has set up a high-level committee to recommend measures on state autonomy with a view to protect state governments’ rights and improve working relations with the union government.

About the Committee

- It is a three-member committee headed by former Supreme Court judge Justice Kurian Joseph.
- The committee is expected to submit its interim report by **January 2026** and the final report within two years.

- **The mandate of the committee includes:**

- to review the Constitutional provisions, laws, rules and policies with respect to Centre-State relations;
- to recommend ways to restore subjects moved from the State List to the Concurrent List;
- to propose measures for States to overcome administrative challenges;
- to suggest reforms to ensure maximum autonomy for States without compromising the unity and integrity of the nation;
- and to consider the recommendations of the Rajamannar Committee and subsequent commissions formed by the Union government on the Centre-State relations.

4. Operation CHAKRA

Context: The CBI arrested four people in connection with a 'Digital Arrests' fraud, as part of 'Operation Chakra V,' after searches at 12 locations.

Operation CHAKRA

- It is an initiative of the Central Bureau of Investigation (CBI) which was launched in 2022.
- It is a global initiative supported by INTERPOL to combat and dismantle organized cyber-enabled financial crime networks.

- These crimes, including impersonation, phishing, romance, and lottery scams, involve sophisticated tactics such as data harvesting, customized messaging, money mules, and call center operations.

Objectives and Need

- The criminals operate globally, targeting victims across various jurisdictions and causing significant financial losses.
- The operation aims to coordinate law enforcement efforts internationally to address the growing threat of cyber-enabled financial crimes.



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- **Mode** : Online/Offline
- **Location** : R.C.Reddy IAS Study Circle,
Himayatnagar and Ashok Nagar

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SCHEDULE

TEST	TEST DATE & TIME	SUBJECT
GRAND TEST - 2 (OPEN FOR ALL)	04 th May 2025 GS 10:00 AM to 12:00 PM CSAT 2:00 PM to 4:00 PM	Complete Syllabus
GRAND TEST - 3 (OPEN FOR ALL)	11 th May 2025 GS 10:00 AM to 12:00 PM CSAT 2:00 PM to 4:00 PM	Complete Syllabus



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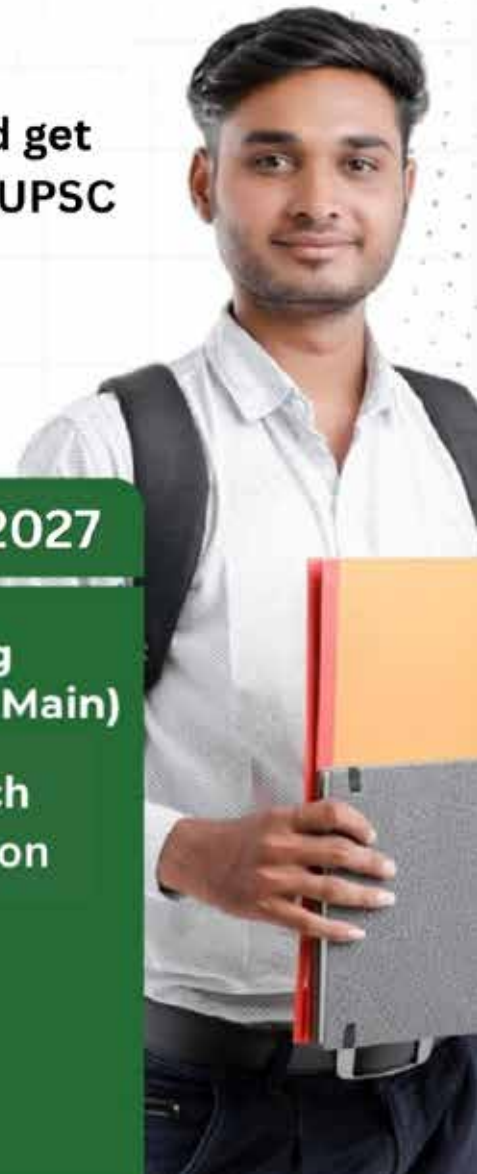
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ECONOMY

1. NITI NCAER States Economic Forum

Context: Finance Minister Nirmala Sitharaman launched the “NITI NCAER States Economic Forum” portal.

About

- **Portal Launch:** Developed by NITI Aayog and National Council of Applied Economic Research (NCAER).
- It is a **comprehensive repository of data on state finances** covering the **period 1990-91 to 2022-23**.
- **Purpose:** The portal will act as a **research hub**, offer a historical and real-time data analysis to track state progress, identify trends, and help formulate evidence-based policies for development.
- **Main Components:**
 - **State Reports:** Summarizes macro and fiscal data of 28 states, covering demography, economic structure, and fiscal indicators.
 - **Data Repository:** Provides access to a complete database categorized across five verticals: Demography, Economic Structure, Fiscal, Health, and Education.
 - **State Fiscal and Economic Dashboard:** Offers graphical representations of key economic variables and quick access to data through appendices and summary tables.
 - **Research and Commentary:** Includes extensive research on state finances and fiscal policy at both state and national levels.

2. FAO's RENO FARM Initiative

Context: A new study led by the Food and Agriculture Organization of the United Nations (FAO) and research partners highlights that improving livestock productivity is key to achieving substantial reductions in global antibiotic use.

FAO's RENO FARM Initiative

- **Full Form:** RENO FARM stands for **REsilieNt FOod And agRifood systeMs**
- **Launched by:** Food and Agriculture Organization (FAO) of the United Nations
- **Launched in:** 2024, as a response to the growing climate threats to global food systems.

Primary Objectives of the RENO FARM Initiative

1. **Build Resilient Agrifood Systems**
 - Help countries **adapt** and **transform** their agricultural and food systems to withstand **climate shocks, natural disasters, and energy disruptions**.
2. **Promote Renewable Energy in Agriculture**
 - Replace diesel-based farming tools with solar-powered irrigation, renewable drying systems, and clean energy cold storage.
 - Reduce greenhouse gas emissions from the agriculture sector.
3. **Enable Digital Transformation**
 - Use **digital tools** like AI, remote sensing, and blockchain to:
 - Improve supply chain efficiency
 - Forecast crop yields and risks
 - Enhance climate-smart decision-making
4. **Support Policy and Capacity Building**
 - Aid governments and local bodies in creating **policy frameworks, training, and technical capacity** to sustain the initiative in the long run.
5. **Ensure Food Security & Climate Adaptation**
 - Improve the productivity and livelihoods of small-scale farmers
 - Make food systems more **inclusive, sustainable, and climate-resilient**

3. Indian Bond Yields

Context: India's benchmark 10-year bond yields fell sharply by nine basis points (bps) to 6.49% year-on-year after the RBI announced it would buy Rs 80,000 crore worth of bonds in April.

More about the news:

- **Indian Bond Yields:** Indian bond yields fell by 24 bps since March.
 - The 10-year yield has dropped 62 bps so far in FY 2024-25, its largest drop in five years.
- **Indian Banking Sector Liquidity:** Improved liquidity in India has led to falling bond yields, with Treasury bill cut-offs nearing 6.30%.
 - The 10-year bond yield is expected to drop further depending on liquidity.

What is Bond Yield?

- **Bond yield** is the return an investor can expect to earn from a bond, expressed as an annual percentage.
- **Types of Bond Yields:**
 - **Current Yield:** Annual coupon payment divided by the bond's current market price.
 - **Yield to Maturity (YTM):** Total return if the bond is held until maturity, including coupon payments and any capital gain/loss.
 - **Yield to Call (YTC):** Yield assuming the bond is called (redeemed early) before maturity.
 - **Yield to Worst (YTW):** Lowest yield possible if the bond is called or matures early.
- **Bond Price Relation:** Price and yield are inversely related and as the price of a bond goes up, its yield goes down.
- **Indicator:** Bond yields reflect the return on investment and are influenced by interest rates and economic conditions.

Note: Bond yields and prices have an inverse relationship. When demand for bonds rises (due to FIIs buying more), bond prices go up and yields fall. 'Increased foreign institutional investment in government securities' (option c) represents a demand surge in the bond market, especially for long-term bonds, driving yields down.

4. India's Remittances

Context: Findings of the Reserve Bank of India's (RBI's) latest Remittances Survey show a significant shift in India's remittance sources.

India's Remittances

- **India's remittances have more than doubled from \$55.6 billion in 2010-11 to \$118.7 billion in 2023-24.**
- **U.S. and U.K. Contribution:** Remittances from the U.S. and U.K. nearly doubled to 40% of total inward remittances in FY24, up from 26% in FY17.
- **U.S. as Leading Contributor:** The U.S. became the top source of remittances in FY21, contributing 23.4%. This increased to nearly 28% in FY24.
- **UAE's Role:** UAE is still the second-largest remittance source, contributing 19.2%, with Indian migrants in blue-collar jobs like construction, healthcare, hospitality, and tourism.
- **Singapore's Rising Share:** Singapore's share reached 6.6% in FY24, up from 5.5% in FY17, marking its highest share since then.
- **State-wise Distribution:** Half of the remittances went to Maharashtra, Kerala, and Tamil Nadu. Other states like Haryana, Gujarat, and Punjab had smaller shares (below 5%).
- **Size of Remittances:** Remittances above ₹5 lakh accounted for 28.6% of total remittances, while 40.6% of the remittances were ₹16,500 or less.

Shift in Remittance Sources (2023-24):

- **Advanced Economies (AEs)** now account for over half of India's remittances, overtaking Gulf Cooperation Council (GCC) countries.
- **Key AE contributors:** United States, United Kingdom, Singapore, Canada, Australia.
- **GCC countries' contribution has declined**, partly due to economic downturns and nationalisation policies.
- **Decline in GCC Remittances:**
 - GCC countries are historically major contributors (Saudi Arabia, UAE, Qatar, Oman, Bahrain, Kuwait).

- Impact of Covid-19, job losses, salary cuts, and “Saudisation” policies.
- UAE share fell from 26.9% (2016-17) to 19.2% (2023-24); Saudi Arabia and Kuwait’s shares also decreased.
- **Growth of AE Remittances:**
 - The US remains the largest contributor, accounting for 27.7% in 2023-24 (up from 22.9% in 2016-17).
 - Other AEs (UK, Canada, Singapore) also showed steady increases in remittance share.
 - Higher wages and purchasing power in AEs lead to higher per capita remittances.



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5. North American Free Trade Agreement

Context: In an effort to advance a trade agreement with the United States and avoid 26% reciprocal tariffs, India’s Ministry of Commerce and Industry has expanded its NAFTA division.

North American Free Trade Agreement (NAFTA)

- The North American Free Trade Agreement (NAFTA) was a trilateral trade pact among the **United States, Canada, and Mexico**, effective from **1994 to 2020**.
- It created one of the world’s largest free trade zones, eliminating tariffs and reducing trade barriers to promote economic integration.
- In **2020**, NAFTA was replaced by the **United States-Mexico-Canada Agreement (USMCA)** with updated provisions on digital trade, labor standards, and environmental regulations.
- While NAFTA aimed to eliminate most tariffs **gradually, not all** tariffs were removed **immediately in 1994**.
- NAFTA **significantly expanded supply chains**, particularly in **automotive, electronics, and agriculture**, linking production across borders.
- NAFTA was **replaced in 2020 by the United States-Mexico-Canada Agreement (USMCA)**, which introduced new rules on **digital trade, intellectual property, and stronger labor protections**.

6. Pradhan Mantri Mudra Yojana (PMMY)

Context: Pradhan Mantri Mudra Yojana (PMMY) celebrated its 10th anniversary in April, 2025. Prime Minister of India and key ministers hailed the scheme’s role in financial inclusion and grassroots entrepreneurship.

About Pradhan Mantri Mudra Yojana (PMMY):

- Pradhan Mantri Mudra Yojana (PMMY) is a flagship initiative by the Government of India that was launched in 2015 and aimed at providing affordable credit to micro and small enterprises.

- It focuses on integrating underserved enterprises into the formal financial system by offering them easy access to credit.
- **Objective:** The scheme is designed to "fund the unfunded," enabling small borrowers to secure loans from various financial institutions including **Public Sector Banks (PSBs), Regional Rural Banks (RRBs), Cooperative Banks, Private Sector Banks, Foreign Banks, Micro Finance Institutions (MFIs), and Non-Banking Financial Companies (NBFCs).**

Loan details:

- **Loan amount:** Up to ₹10 lakh for non-farm income-generating activities in sectors such as manufacturing, processing, trading, and services.
- **Eligibility:** Any Indian citizen with a viable business plan for a non-farm sector income-generating activity requiring credit below ₹10 lakh can apply for a MUDRA loan through banks, MFIs, or NBFCs.

Categories of Loans:

- **Shishu:** Loans up to ₹50,000, aimed at new and micro enterprises.
- **Kishore:** Loans ranging from ₹50,000 to ₹5 lakh, for businesses in the growth phase.
- **Tarun:** Loans from ₹5 lakh to ₹10 lakh, for businesses looking to expand further.
- **Subsidy:** There is no direct subsidy under PMMY. However, if a loan is linked to a government scheme that provides capital subsidies, the loan can be availed under PMMY with the associated benefits. .

7. Four Betters Courses Initiative

Context: The Food and Agriculture Organization (FAO) has launched the "Four Betters Courses" Initiative to integrate agrifood systems education with global academic partnerships and "Commit to Grow Equality" Initiative to close the gender gap in agrifood systems.

Four Betters Courses Initiative:

- **Launched:** October 2024, World Food Forum

- **Objective:** Transform agrifood education through academic integration of FAO resources
- **Strategic Link:** Aligned with FAO's Strategic Framework 2022–2031

Key Features:

- **Promotes the "Four Betters" vision:**
 - **Better Production:** Efficient, inclusive, sustainable food systems
 - **Better Nutrition:** Access to safe, nutritious, and affordable diets
 - **Better Environment:** Climate action and ecological restoration
 - **Better Life:** Reduced inequality and improved rural livelihoods
- **Delivery Mechanism:** FAO eLearning Academy
 - Over 600+ multilingual, certified courses accessible globally
 - Focused on skilling professionals and students in agrifood domains

Commit to Grow Equality (CGE) Initiative:

- **Launched:** 2024 at the United Nations General Assembly (UNGA)
- **Objective:** Bridge the gender gap in agrifood systems by empowering rural women
- **Potential Reach:** 54 million women, particularly in agrarian economies

Key Features:

- **Financial Commitment:** Mobilizes \$1 billion for gender-responsive agrifood projects
- **Monitoring Tools:** Offers strategic reporting frameworks for governments and businesses
- **Policy Integration:** Aligns national agriculture policies with **gender equality targets**
- **Stakeholder Engagement:** Encourages collaboration among governments, NGOs, private sector

8. India Skills Accelerator

Context: Recently, the Ministry of Skill Development and Entrepreneurship (MSDE), in collaboration with

the World Economic Forum (WEF), has launched the India Skills Accelerator to drive innovation and reforms in India's skilling ecosystem.

India Skills Accelerator

- India Skills Accelerator is a national-level public-private platform designed to promote collaborative solutions for India's evolving skill development needs.
- **It aims to build a future-ready workforce in alignment with emerging industry demands. .**

Core Objectives

- Raising Awareness on future skill requirements
- Promoting Knowledge Sharing and inter-sectoral collaboration
- Institutional & Policy Reforms to build a responsive and flexible skilling ecosystem

Strategic Focus Areas

- Inclusive Upskilling for all demographics, especially women and marginalized communities
- Promoting lifelong learning as a culture
- Alignment of training programs with high-growth sectors such as:
 - **Artificial Intelligence (AI)**
 - **Robotics**
 - **Green energy and sustainability sectors. .**

Significance

- Helps bridge the skills gap in India's rapidly transforming job market
- Enhances India's global competitiveness by promoting a future-ready workforce
- Strengthens cooperation between government, private sector, and civil society

9. Regional Rural Banks

Context: The Ministry of Finance has notified the amalgamation of 26 Regional Rural Banks (RRBs) across 10 states and 1 union territory under the "One State, One RRB" policy, effective from May 1, 2025, reducing the total number of RRBs to 28.

About Regional Rural Banks (RRBs)

- RRBs are banks formed in collaboration by the Central Government, State Governments, and Sponsoring Commercial Banks to give loans to rural areas.
- Their mission is to fulfill the credit needs of the relatively unserved sections in rural areas: small and marginal farmers, agricultural labourers, and socio-economically weaker sections.
- The RRBs mobilize financial resources from rural / semi-urban areas and grant loans and advances mostly to small and marginal farmers, agricultural labourers, and rural artisans.
- **Origin:**
 - **The Narasimham Committee on Rural Credit (1975) recommended the establishment of RRBs.**
 - The establishment of RRBs finds its route in the ordinance passed on 26th September 1975, and the RRB Act of 1976.
 - Rathama Grameen Bank was the first RRB bank and was established on 2nd October 1975.
- RRBs were configured as hybrid micro banking institutions, combining the local orientation and small-scale lending culture of the cooperatives with the business culture of commercial banks.
- RRBs perform various functions in the following heads:
 - **Providing banking facilities to rural and semi-urban areas.**
 - Carrying out government operations like the disbursement of wages of MGNREGA workers, distribution of pension, etc.
 - Providing Para-Banking facilities like locker facilities, debit and credit cards, mobile banking, internet banking, UPI etc.
- The RBI has set a Priority Sector Lending (PSL) target of 75% of total outstanding advances for RRBs as against 40% for Scheduled Commercial Banks.
- **Ownership:** The shareholding pattern of RRBs among the three sponsoring entities is 50:35:15

among the central government, sponsoring bank, and state government, respectively. .

- The area of operation of RRBs is limited to the area as notified by the Government of India, covering one or more districts in the State.
- **Regulation:** Regional Rural Banks are regulated by the RBI and supervised by the National Bank for Agriculture and Rural Development (NABARD).
- **Sources of Funds:** It comprise of owned funds, deposits, borrowings from NABARD, Sponsor Banks and other sources, including SIDBI and the National Housing Bank.
- **Management:** The Board of Directors manages these banks, overall affairs, which consists of one Chairman, three Directors as nominated by the Central Government, a maximum of two Directors as nominated by the concerned State Government, and a maximum of three Directors as nominated by the sponsor bank.

10. Revised classification for industries

Context: The Central Pollution Control Board (CPCB) has introduced a new “Blue Category” in its industrial classification system, aimed at recognizing and incentivizing essential environmental service industries.

Revised classification for industries

- The Blue Category was created under the “precautionary principle,” based on the potential environmental impact of industries.
- The Blue Category includes industries such as Waste-to-energy plants, some compressed biogas (CBG) plants, and other utilities involved in managing environmental concerns (e.g., waste management).
- These industries, although potentially high on the Pollution Index (PI), are recognized for their positive environmental externalities.
- Industries classified under the Blue Category will receive an additional two years of validity for their Consent to Operate (CTO), based on their Pollution Index (PI).

11. National Bank for Financing Infrastructure and Development

Context: The National Bank for Financing Infrastructure and Development (NaBFID) signed a strategic MoU with the New Development Bank (NDB) to boost cooperation in long-term infrastructure and clean energy financing in India.

About National Bank for Financing Infrastructure and Development (NaBFID)

- It is a specialized Development Finance Institution in India aimed at supporting the country's infrastructure sector, which can significantly gain from an enabling credit flow by means of attractive instruments and channelized investment.
- **NaBFID was set up in 2021, by an Act of the Parliament (The National Bank for Financing Infrastructure and Development Act, 2021).**
- **Objectives:** Addressing the gaps in long-term non-recourse finance for infrastructure development, strengthening the development of bonds and derivatives markets in India, and sustainably boosting the country's economy.
- **Regulated by:** It shall be regulated and supervised by RBI as an All-India Financial Institution (AIFI).
- The principal idea behind the setup of NaBFID is to provide a dedicated and specialized institution focused on addressing the long-term financing needs of the infrastructure sector in India.

12. Bombay Stock Exchange (BSE)

Context: The Bombay Stock Exchange (BSE) is celebrating its 150th anniversary on April 17, 2025, in Mumbai, with Finance Minister of India attending the celebrations.

What it is?

- BSE Ltd. is Asia's oldest stock exchange and a major platform for trading equities, debt, mutual funds, derivatives, and commodities in India.

- Established in: 1875, originally as “The Native Share & Stock Brokers’ Association” founded by cotton merchant Premchand Roychand.

History:

- Began informally under a banyan tree near Mumbai Town Hall.
- Shifted to Dalal Street in 1874 and formalized in 1875.
- Became the first exchange to be recognized under the Securities Contract Regulation Act, 1956.
- Introduced electronic trading in 1995, replacing the open outcry system.
- Partnered with the United Nations Sustainable Stock Exchanges Initiative in 2012.
- Launched India INX (first international exchange) in 2016.
- Listed itself on National Stock Exchange in 2017.
- The correct name of BSE’s SME platform is BSE SME, not BSE SMEX. It is designed to help small and medium enterprises raise capital and get listed in a more relaxed regulatory environment.
- BSE introduced BOLT (BSE OnLine Trading) in 1995, one of the earliest automated trading systems in India, revolutionizing how trades were executed.
- The SENSEX is indeed a free-float market capitalization-weighted index comprising 30 large and actively traded stocks, chosen to represent various sectors of the Indian economy.
- BSE’s regulatory and surveillance operations are conducted in compliance with SEBI regulations. SEBI (Securities and Exchange Board of India) is the statutory body that regulates all stock exchanges and participants in India’s capital markets.

13. Agricultural and Processed Food Products Export Development Authority

Context: In a major boost to India’s fresh fruit exports, the first commercial sea shipment of Indian Bhagwa Pomegranates successfully arrived in New York.

About Agricultural and Processed Food Products Export Development Authority

- APEDA was established by the Government of India under the **Agricultural and Processed Food Products Export Development Authority Act** passed by the Parliament in December, 1985.
- The Authority replaced the Processed Food Export Promotion Council (PFEPIC).**
- It works under the **Ministry of Commerce and Industry**.
- Objective:** To develop and promote the export of scheduled products.
- The products specified under the APEDA ACT are called scheduled products, and **exporters of such scheduled products are required to register under APEDA.**
 - Examples of scheduled products:** Fruits, Vegetable, Meat, Poultry Products, Dairy Products, Confectionery, Biscuits, Bakery Products, Honey, Jaggery, etc.
- It provides financial assistance, information, and guidelines for the development of scheduled products.
- APEDA also functions as the **Secretariat to the National Accreditation Board (NAB)** for the implementation of accreditation of the Certification Bodies under National Programme for Organic Production (NPOP) for Organic exports.
- Headquarters: New Delhi.**

14. PM Vishwakarma Yojana

Context: Chief Minister M.K. Stalin on Saturday launched the Kalaigal Kaivinai Thittam, an artisan development scheme, which would serve as the State government’s alternative to the Centre’s PM Vishwakarma scheme.

About PM Vishwakarma Yojana:

- It is a central sector scheme launched by the Ministry of Micro, Small, and Medium Enterprises.
- It offers services like market linkage support, skill training, and incentives for digital transactions to

artisans and craftspeople engaged in specified trades.

- **Time period:** Five years (FY 2023-24 to FY 2027-28).
- **Aim:**
 - To strengthen and **nurture the Guru-Shishya parampara**, or family-based practice of traditional skills by artisans and craftspeople working with their hands and tools.
 - The scheme also aims at improving the quality as well as the reach of the products and services of artisans and craftspeople and to ensure that the Vishwakarmas are integrated with the domestic and global value chains.
- **Eligibility & coverage:**
 - It is available for rural and urban artisans and craftsmen across India.
 - It covers 18 traditional crafts such as Boat Maker; Armourer; Blacksmith; Hammer and Tool Kit Maker; etc.
 - Five lakh families will be covered in the first year and 30 lakh families over five years.
- **Key Benefits**
 - **Enhanced Access to Tooling Facilities:** Improves MSMEs' access to tooling

resources, boosting their efficiency and productivity.

- **Industry-Ready Manpower:** Provides training programs to equip participants with skills that meet industry standards.
- **Support for Process and Product Development:** Facilitates development initiatives within relevant sectors to enhance competitiveness.
- **Consultancy and Job Work Services:** Offers tailored consultancy and job work to address the specific needs of various industries.
- **The scheme offers a stipend of Rs 500 for skill training per day and Rs 15,000 grant for the purchase of modern tools.**



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Launching

01

STRATEGIC REVISION FOR UPSC CSE MAIN 2025

(Revision + Test Series and More)

02

MAINS MARATHON FOR UPSC CSE MAIN 2026

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UPSC CSE PRELIMS 2025 **GRAND TESTS**

- **Medium** : English
- **Mode** : Online/Offline
- **Location** : R.C.Reddy IAS Study Circle,
Himayatnagar and Ashok Nagar

**OPEN
FOR ALL**

SCHEDULE

TEST	TEST DATE & TIME	SUBJECT
GRAND TEST - 2 (OPEN FOR ALL)	04 th May 2025 GS 10:00 AM to 12:00 PM CSAT 2:00 PM to 4:00 PM	Complete Syllabus
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INTERNATIONAL RELATIONS

1. Border crossings between Afghanistan and Pakistan

Context: Authorities in Karachi have so far rounded up around 300 illegal Afghans to move them to a holding camp after it launched an operation to repatriate them to their country.

Border crossings between Afghanistan and Pakistan:

- **Torkham (Khyber Pakhtunkhwa - Nangarhar):** This is one of the most well-known and busiest crossings, with international status. It is operational 24/6 for miscellaneous purposes (excluding Saturdays for pedestrians only).
- **Chaman (Balochistan - Kandahar):** Another major crossing with international status, also operational 24/6 for miscellaneous purposes (excluding Saturdays for pedestrians only). It is also referred to as Spin Boldak on the Afghan side.
- **Ghulam Khan (Khyber Pakhtunkhwa - Khost):** This crossing is operational 24/6 for miscellaneous purposes.
- **Kharlachi (Khyber Pakhtunkhwa - Paktia):** This crossing is operational during the day for trade.
- **Angur Ada (Khyber Pakhtunkhwa - Paktika):** This crossing is operational during the day for trade.
- **Badini (Balochistan - Zabul):** This crossing is operational during the day for trade.
- **Arandu (Khyber Pakhtunkhwa - Kunar):** This crossing is operational during the day for trade.
- **Bin Shahi (Khyber Pakhtunkhwa - Kunar):** This crossing is operational during the day for trade.

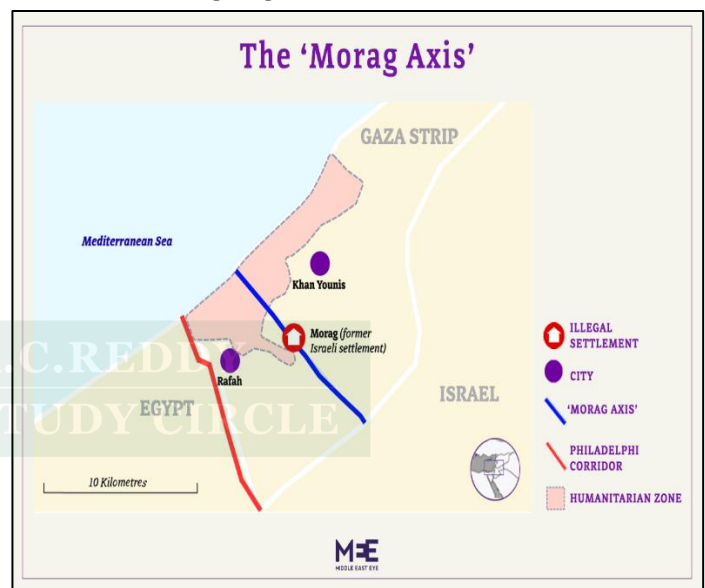
2. Morag Axis

Context: Israel announced on April 12 that its military had completed the takeover of a new corridor in southern Gaza, advancing its efforts to seize large parts of the war-battered Palestinian territory. "The IDF (military) has completed its takeover of the Morag axis," Defence Minister Israel

Katz said in a statement addressed to residents of Gaza.

What is Morag Axis?

- The **Morag Axis** refers to a strip of agricultural land in southern Gaza, situated between Khan Younis and Rafah. This area has been the focus of Israeli military operations due to its strategic significance in the ongoing conflict.



3. PEN-Plus approach

Context: The WHO African Region released a report, highlighting that 20 African countries have expanded access to critical services for severe non-communicable diseases (NCDs) by adopting the PEN-Plus approach.

What it is?

- PEN-Plus stands for Package of Essential Non-communicable Disease interventions Plus.
- It is an integrated healthcare model aimed at managing severe and chronic NCDs at secondary-level health facilities.
- Nations using it: Successfully implemented in Rwanda, Liberia, Malawi, and now expanded to 20 African countries.

Aim:

- To decentralize diagnosis and management of severe NCDs like type-1 diabetes, rheumatic heart disease, sickle-cell disease, severe hypertension, and persistent asthma.
- Ensure access to care for children and young adults living in extreme poverty.

How it works?

- Training nurses and clinical officers to deliver essential services like diagnosis, treatment, symptom management, and psychosocial support.
- Expanding healthcare delivery to secondary-level health centers, close to rural and underserved communities.
- PEN-Plus (Package of Essential Noncommunicable Disease Interventions Plus) is an extension of WHO's PEN strategy. It is specifically designed to provide integrated care for severe chronic NCDs (such as type 1 diabetes, rheumatic heart disease, and sickle cell disease) at first-level referral hospitals (e.g., district hospitals) in low-resource settings. These diseases require specialized, continuous care that is often unavailable at the primary care level.
- The PEN-Plus initiative builds on WHO's broader efforts to tackle NCDs through the PEN (Package of Essential NCD interventions) strategy. PEN-Plus is tailored for low- and middle-income countries (LMICs) and aims to close the care gap for severe chronic NCDs in underserved rural regions, where specialized care is usually scarce. It was endorsed by WHO's African region and partners like Partners In Health and the NCDI Poverty Network.
- While decentralization is part of broader health strategies, PEN-Plus does not focus on community health posts. Instead, PEN-Plus is about upgrading first-level hospitals (district or referral hospitals) to provide specialized care for severe NCDs. Community health posts may offer basic screening or referrals, but the actual PEN-Plus model is focused on hospital-level care with trained clinical officers or nurses.
- Training mid-level health professionals (e.g., clinical officers, nurse practitioners) is a core part

of PEN-Plus. These providers are trained to diagnose, treat, and manage complex NCDs like type 1 diabetes, chronic heart conditions, and sickle cell disease. The goal is to bridge the human resource gap and bring life-saving care closer to patients in rural and underserved areas.

4. EUNAVFOR ATALANTA

Context: Commander of EUNAVFOR ATALANTA (Operation Atalanta), proposed a joint naval exercise with the Indian Navy to strengthen maritime security cooperation in the Western Indian Ocean and Red Sea.

About EUNAVFOR ATALANTA (Operation Atalanta):
What is Operation Atalanta?

- Operation Atalanta is the European Union's maritime security operation, launched in 2008, aimed at protecting international shipping routes off the coast of Somalia and the Western Indian Ocean.
- It operates under the Common Security and Defence Policy (CSDP)

Nations Involved:

- **Core participants:** EU member states including Spain, Italy, Germany, France, and others.
- Supported by associated partners like Norway and Serbia at different points.

Objectives:

- Protect World Food Programme (WFP) vessels delivering aid to Somalia.
- Deter, prevent, and repress piracy and armed robbery at sea.
- Monitor fishing activities and support other EU missions in the region.



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ENVIRONMENT

1. Nagarahole National Park

Context: Concerns have been raised over the proposed land grants within the core area of Nagarahole National Park (Nagarahole Tiger Reserve), specifically in its ecologically sensitive swampy grasslands.

Nagarahole National Park:

- It is located in **Karnataka**. It derives its name from the **Nagarahole River**, which means 'Serpent River'.
- It connects to the **Western Ghats** through **Brahmagiri Wildlife Sanctuary**. It extends towards the Eastern Ghats through Bandipur Tiger Reserve.
- It shares its borders with **Wayanad Wildlife Sanctuary** in Kerala to the south and **Bandipur Tiger Reserve** to the southeast.
- The **Kabini Reservoir**, located in the western part of the park, and the **Taraka Reservoir**, situated in the southeastern region, are the two major water bodies within the park.
- The park is known for its **high-density tiger population**, ranking third in the country after Corbett and Kaziranga Tiger Reserves (As per All India Tiger Estimation -2022).
- **Flora:** It consists mainly of moist deciduous forests with predominating trees of teak and rosewood.
- **Fauna:** The park is home to a wide range of wildlife, including **tigers, leopards, Asiatic wild dogs, and sloth bears, Asiatic elephant, gaur, sambar, chital, muntjac, four-horned antelope, wild pig, and mouse deer** and the South-western langur.

2. Biochemical Oxygen Demand

Context: March 29, 2025, test reports revealed that the appearance of the water samples was grey in colour with suspended particles (solid materials that do not dissolve in water) in marine life in Navi Mumbai.

1. Biochemical Oxygen Demand (BOD):

- **Definition:** The amount of dissolved oxygen required by aerobic microorganisms to biologically decompose organic matter in a water sample over a specific time (usually 5 days at 20°C).
- **Indicates:** Biodegradable organic pollution.
- **Ideal Level in Clean Water:** Less than 1 mg/L.
- **Acceptable Level in Treated Sewage (CPCB Norms):**
 - < 20 mg/L before discharge into inland surface waters.

2. Chemical Oxygen Demand (COD):

- **Definition:** The total quantity of oxygen required to chemically oxidize both biodegradable and non-biodegradable organic matter in water. .
- **Indicates:** Overall organic pollution (including industrial pollutants).
- **Typically, Higher Than BOD** due to the inclusion of non-biodegradable substances.

3. BOD/COD Ratio as an Indicator:

- **High Ratio (>0.5):** Predominantly **biodegradable** waste (e.g., domestic sewage).
- **Low Ratio (<0.3):** Indicates presence of **non-biodegradable or recalcitrant pollutants**, often from industrial waste.

3. Fluoride

Context: The incidents of fluoride poisoning seen in groundwater of Sonbhadra district of Uttar Pradesh.

About Fluoride

- Fluoride is a naturally occurring, non-biodegradable pollutant found in minerals, soil, water, and air.
- It is also released during the burning of coal bricks.

- The World Health Organization sets the maximum safe level of fluoride in drinking water at 1.5 mg/liter. .
- In safe doses, fluoride helps prevent tooth decay and supports bone health.
- In excessive amounts, it causes dental and skeletal fluorosis, joint pain and stiffness & bone deformities. It also poses risks to wildlife and ecosystems.
- Chronic fluoride exposure interferes with calcium-phosphate homeostasis, resulting in skeletal fluorosis, which includes joint stiffness, pain, and deformities.
- Dental fluorosis is one of the earliest signs, especially in children. It causes mottled, discolored, or pitted enamel due to hypomineralization during tooth development. .
- Some populations show higher vulnerability due to long-term exposure, nutritional deficiencies, and genetic factors, even at fluoride levels near or slightly below 1.5 mg/L. .

4. Baku to Belém Roadmap

Context: India, at the 11th BRICS Environment Ministers' Meeting in Brazil, urged all 11 BRICS nations to support the 'Baku to Belem Roadmap', which aims to mobilise \$1.3 trillion annually by 2035 for climate action.

What is the Baku to Belém Roadmap?

- The **Baku to Belém Roadmap** is a strategic framework adopted at COP29 (2024) to guide negotiations and actions on:
 - Defining a new collective quantified goal (NCQG) on climate finance post-2025.
 - Ensuring greater predictability, adequacy, and accessibility of climate finance.
 - Supporting low-carbon and climate-resilient development pathways in developing countries.
 - Enabling the implementation of Nationally Determined Contributions (NDCs).

Why BRICS Matters for Climate Action?

- The **BRICS bloc**—Brazil, Russia, India, China, and South Africa (recently expanded to include 6 new members)—represents **47% of the global population and 36% of the global GDP (PPP)**.
- These emerging economies face similar environmental challenges and developmental aspirations, making their cooperation vital for achieving a just and equitable climate transition globally.

5. National Centre for Polar and Ocean Research

Context: National Centre for Polar and Ocean Research (NCPOR) Goa, has observed the 25th foundation day.

About the National Centre for Polar and Ocean Research:

- It is an autonomous research institute established in 1998.
- It is India's premier R&D institution responsible for the country's research activities in **the Polar and Southern Ocean realms**.
- It is tasked with planning and executing polar expeditions and scientific research in **Antarctica, Arctic, Himalayas and the Southern Ocean**.
- It is the nodal agency for planning, promoting, coordinating, and executing the entire gamut of polar and Southern Ocean scientific research in the country and the associated logistics activities.
- It also undertakes research on some of the country's strategically vital projects like mapping of Exclusive Economic Zone (EEZ), continental shelf margins and the Deep Ocean Mission.
- The Center maintains a Research Advisory Committee (RAC) to help guide and concentrate the research activities.
- **Location:** It is located in Vasco da Gama, Goa, and was formerly known as the **National Center for Antarctic and Ocean Research (NCAOR)**.
- **Nodal Ministry:** Ministry of Earth Sciences (MoES), Government of India.

6. Agasthyamalai Biosphere Reserve

Context: The Supreme Court has ordered the Central Empowered Committee (CEC) to conduct a comprehensive survey of the Agasthyamalai biosphere reserve to identify encroachments and non-forestry activities.

Agasthyamalai Biosphere Reserve (ABR):

- The **Agasthyamalai Biosphere Reserve (ABR)** is a significant protected area in India, established in 2001, located at the southernmost end of the Western Ghats. It spans a total area of approximately **3,500.36 sq km**, with about **1,828 sq km** in Kerala and **1,672.36 sq km** in Tamil Nadu.

Location and Geography

- The reserve straddles the border districts of **Pathanamthitta, Kollam, Thiruvananthapuram** in Kerala and **Tirunelveli, Kanyakumari** in Tamil Nadu.
- Coordinates roughly between **8°8' to 9°10' N** latitude and **76°52' to 77°34' E** longitude.
- It includes adjoining forest divisions such as **Achencoil, Thenmala, Konni, Punalur, Thiruvananthapuram**, and the **Agasthyavanam Special Division** in Kerala, along with the **Kalakkad Mundanthurai Tiger Reserve** in Tamil Nadu.

Ecological Significance

- The reserve encompasses diverse Indian ecoregions: **tropical wet evergreen forests, South Western Ghats moist deciduous forests, montane rain forests, and Shola forests**.
- It is home to around **2,000 varieties of medicinal plants**, including at least **50 rare and endangered species**, and about **400 red-listed plants** and over **125 orchid species**.
- Fauna includes **Bengal tiger, Asian elephant, Nilgiri tahr, lion-tailed macaque, slender loris, great pied hornbill, Malabar spiny dormouse, Nilgiri marten, gaur (Indian bison), and sloth bear**.
- The region supports many endemic species: about **79 mammal species (20 endemic)**, **88**

reptiles (45 endemic), 45 amphibians (30 endemic), 46 fishes (10 endemic), and 337 birds (20 endemic).

- It is also a habitat for the **Kani tribe**, one of the oldest surviving indigenous communities, who depend on the forest resources.

Conservation and Management

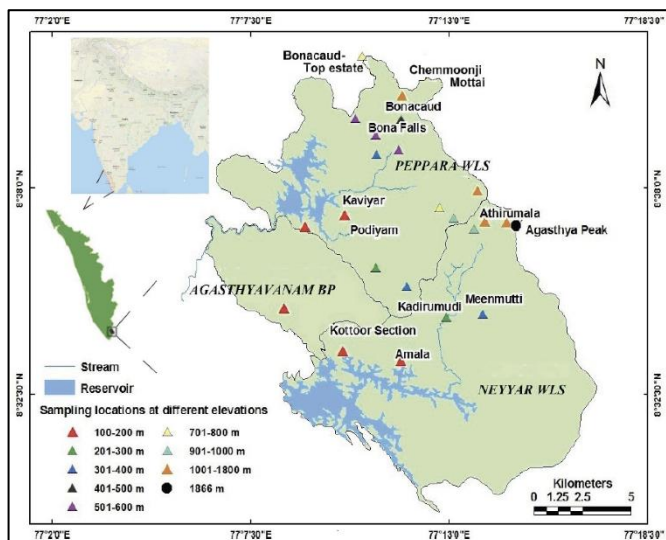
- The reserve is divided into three zones for conservation and sustainable use:
 - Core Zone** (strictly protected, no human interference),
 - Buffer Zone** (limited activities like research, education, eco-tourism),
 - Transition Zone** (sustainable economic activities permitted).
- Protected areas within ABR include **Shendurney, Peppara, Neyyar Wildlife Sanctuaries** in Kerala and **Kalakkad Mundanthurai Tiger Reserve** in Tamil Nadu.
- A local committee and a state-level Biosphere Management Committee coordinate management activities following guidelines from the Indian Ministry of Environment and Forests.
- The reserve was designated part of the **UNESCO World Network of Biosphere Reserves in 2016**.

Cultural and Environmental Importance

- The reserve is named after **Sage Agastya**, a revered figure in Indian mythology.
- It is considered a **cradle of traditional Indian medicine** due to its rich medicinal plant diversity.
- Major rivers originating here include **Thamirabarani, Karamana, and Neyyar**.
- The Supreme Court of India recently directed a detailed survey of the area to identify non-forestry activities and encroachments to ensure better protection.



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7. Bottom Trawling

Context: Sri Lanka's Tamil political leaders on April 5 urged India to ban bottom trawling in order to decisively resolve the fisheries conflict affecting the fishermen of northern Sri Lanka and Tamil Nadu.

What is Bottom Trawling?

- Bottom trawling is a fishing technique where a large, heavy net is dragged along the **sea floor** to catch **bottom-dwelling (demersal) fish and seafood** such as cod, haddock, flounder, and shrimp.

Perceived Benefits:

- **High Catch Volume:** Allows efficient harvesting of large quantities of fish in a single trip.
- **Economic Efficiency:** Increases short-term economic returns for commercial fisheries.
- **Access to Demersal Species:** Targets species that are otherwise difficult to catch.

Environmental & Ecological Disadvantages:

- **Seabed Damage:** Destroys delicate marine habitats like coral reefs and sponge beds.
- **Disruption of Ecosystems:** Sediment clouds reduce light and disrupt nutrient cycles.
- **High Bycatch Rates:** Catches **non-target species**, including juveniles and endangered marine life.
- **Biodiversity Loss:** Long-term use can **reduce species diversity** and degrade marine ecosystems.

8. De-Extinction

Context: A U.S.-based biotech firm, Colossal Biosciences, claimed the birth of three genetically engineered wolf pups, marking the first-ever attempt at “de-extinction” of the extinct dire wolf species after 12,500 years.

What is De-Extinction?

- De-extinction refers to the process of reviving extinct species using advanced biotechnological methods such as:
 - Gene editing (e.g., CRISPR-Cas9).
 - Ancient DNA sequencing and reconstruction.
 - Cloning and synthetic biology.

Dire Wolf (*Canis dirus*)

- The **Dire Wolf** was one of the most formidable predators of the Ice Age. Often confused with the modern gray wolf due to its similar appearance, the Dire Wolf was a distinct species with unique adaptations suited to its environment.

Key Facts:

- **Scientific Name:** *Canis dirus*
- **Time Period:** Lived during the Late Pleistocene epoch (~250,000 to 10,000 years ago)
- **Habitat:** Primarily in North America, ranging from present-day Canada to South America
- **Size:** Larger and more heavily built than the modern gray wolf (*Canis lupus*)

What Made the Dire Wolf Special?

- **Bigger and Bulkier:** The Dire Wolf was more robust than the modern gray wolf, with a heavier build and stronger jaw — ideal for hunting large Ice Age herbivores like bison and horses.
- **Native to the Americas:** Unlike gray wolves, Dire Wolves were confined to the Western Hemisphere and did not inhabit Europe or Asia.
- **Ice Age Neighbor:** They coexisted with megafauna like mammoths, saber-toothed cats, and early humans. Competition for food and changing climates contributed to their extinction.

- **Not Our Dog's Ancestor:** Despite their wolf-like appearance, Dire Wolves are not direct ancestors of domestic dogs. Genetic studies show they belonged to a now-extinct lineage distinct from *Canis lupus*.
- **Fossil Fame at La Brea:** Thousands of Dire Wolf fossils have been discovered in the La Brea Tar Pits (Los Angeles, California), making them one of the most well-documented Ice Age predators.

9. Eravikulam National Park

Context: Kerala and Tamil Nadu will jointly conduct a Nilgiri Tahr census in April, across 265 census blocks to mark 50 years of Eravikulam National Park.

Eravikulam National Park:

Location

- Eravikulam National Park is a renowned protected area located along the Western Ghats in the Idukki and Ernakulam districts of Kerala, India. Spanning an area of 97 square kilometers, the park is situated near the popular hill station of Munnar and is perched at an average elevation of about 2,000 meters above sea level. The park is famous for its rolling grasslands, shola forests, and dramatic mountain scenery, including the iconic Anamudi Peak—the highest point in South India at 2,695 meters

History and Conservation

- Originally a hunting preserve for British planters, Eravikulam was declared a wildlife sanctuary in 1975 to protect the endangered Nilgiri Tahr. It was upgraded to national park status in 1978 due to its ecological and zoological significance. The park is managed by the Kerala Department of Forests and Wildlife.

Key Features and Attractions

- **Nilgiri Tahr Sanctuary:** Eravikulam is globally significant for hosting the largest population of the endangered Nilgiri Tahr (*Nilgiritragus hylocrius*), a mountain goat endemic to the Western Ghats. The park's rugged terrain provides a safe haven for this

species, with an estimated 750 individuals residing here.

- **Anamudi Peak:** The highest peak in South India, Anamudi is a major attraction for trekkers and offers panoramic views of the Western Ghats.
- **Neelakurinji Bloom:** The park is celebrated for the Neelakurinji (*Strobilanthes kunthiana*), a rare shrub that blooms en masse once every 12 years, carpeting the hillsides in blue-purple flowers. The next bloom is expected in 2030.
- **Eco-Tourism:** The Rajamalai region is the main tourism zone, offering guided treks, wildlife safaris, and educational tours while minimizing environmental impact.

Biodiversity

- **Flora:** The park features a mosaic of montane grasslands and shola forests, home to unique plant species such as orchids, wild balsams, and epiphytes. The shola-grassland ecosystem is one of the least disturbed in the Western Ghats.
- **Fauna:** In addition to the Nilgiri Tahr, the park supports populations of gaur, sambar, Indian muntjac, leopards, tigers, golden jackals, Nilgiri langur, lion-tailed macaques, and more. Over 26 species of mammals, 132 species of birds (including several endemics), 101 species of butterflies, and 19 species of amphibians have been recorded here.
- **Birds and Butterflies:** The park is a haven for birdwatchers and lepidopterists, with rare and endemic species such as the Nilgiri pipit, Nilgiri wood pigeon, and Palani fourring butterfly

10. One-Horned Rhinoceros

Context: The Wildlife Institute of India has proposed a national action plan for translocation of one-horned rhinoceroses to reduce habitat pressure in Assam's Kaziranga and Pobitora, through reintroduction in new protected areas across five states.

About One-Horned Rhinoceros:

- **Scientific Name:** *Rhinoceros unicornis*

- **IUCN Status:** Vulnerable
- **Habitat:** Terai grasslands, alluvial floodplains, swamps, and subtropical savannahs.

Key Features:

- Largest of all Asian rhino species with a height of 5.75–6.5 ft and weight up to 6,000 pounds.
- Recognisable by its single black horn (8–25 inches) and armour-plated skin folds.
- Solitary grazers that feed on grasses, aquatic plants, shrubs, and fruits.

Key Protected Areas for One-Horned Rhinos as of now in India:

- Kaziranga National Park (Assam) – Largest population (~2,613 as of 2022).
- Pobitora Wildlife Sanctuary (Assam) – Highest rhino density (107 rhinos in 16 sq. km).
- Jaldapara National Park (West Bengal)
- Gorumara National Park (West Bengal)
- Dudhwa National Park (Uttar Pradesh)

While,

- Valmiki Tiger Reserve (Bihar): Known for tigers, not rhinos.
- Katarniaghat Wildlife Sanctuary (Uttar Pradesh): Focus is on gharials, tigers, elephants, but not rhinos.

11. National Oceanic and Atmospheric Administration (NOAA's) 2024 Arctic Report Card.

Context: According to a new study published in Nature, the increasing ferocity of wildfires means that more than 30% of the Arctic Boreal Zone (ABZ) has now stopped capturing carbon and is instead releasing it.

More about the news:

- The findings align with the **National Oceanic and Atmospheric Administration (NOAA's) 2024 Arctic Report Card**.
 - It also highlighted that the Arctic tundra, a treeless region, is becoming a net carbon

source, largely due to warming temperatures and escalating wildfire activity in the Northern polar region.

The Arctic Boreal Zone (ABZ)

- ABZ is a critical region in the northern hemisphere, characterized by its unique ecosystems and significant role in regulating global carbon cycles.
- The ABZ consists largely of coniferous forests underlain by permafrost, where slow decomposition rates and peat accumulation contribute significantly to global carbon sequestration.
- **Geographical Location:**
 - The ABZ spans across the Arctic Circle, including parts of Alaska, northern Europe, and Siberia.
 - It includes tundra, coniferous forests, wetlands, and permafrost regions.
- **Carbon Sink:** The ABZ has historically acted as a significant carbon sink, absorbing large amounts of carbon dioxide (CO₂) from the atmosphere through its forests, soil, and permafrost.
 - The tundra and wetlands in the ABZ sequester carbon in the form of organic material frozen in permafrost, which helps mitigate global warming.

12. Indian Star Tortoise

Context: A total of 340 Indian Star Tortoises were successfully rehabilitated and released into the wild in Jogapur Reserve Forest, Chandrapur, marking a major milestone under the Turtle Rehabilitation Project (TRP).

About Indian Star Tortoise:

- Its name comes from the star-like patterns that feature on its high-domed shell.
- It has very distinctive patterns and its highly rounded shell makes it popular in the world's trade in exotic pets.
- **Habitat**
 - They occupy a wide variety of habitats, including semi-arid lowland forests, thorn

scrub forests, semi-desert and arid grasslands.

- This species has a high tolerance for habitats that are seasonally wet or dry, with many populations inhabiting areas with a monsoon or rainy season followed by a long hot and dry period.
- **Distribution:** It is endemic to the subcontinent and resides in arid pockets of northwest India (bordering Pakistan), South India, and Sri Lanka. However, members of the species have also been found in people's homes as far afield as Canada and the U.S.
- It is **generally crepuscular**, which means they are active in the early morning and the late afternoon during dry, hot weather.
- **Diet:** Indian star tortoises are **mainly herbivores** and mostly eat grasses, herbaceous leaves, flowers etc.
- **Conservation status**
 - **IUCN:** Vulnerable.
 - **CITES:** Appendix I
 - **Wildlife (Protection) Act 1972:** Schedule I
- **Threats:** The highly fragmented habitat of the species, is greatly influenced by an increased level of urbanisation and agricultural practices throughout its range.

13. Golden Tiger

Context: A rare golden tiger, also known as a golden tabby tiger, was recently sighted and photographed in Kaziranga National Park, Assam

Golden Tiger:

- **Golden tigers (also known as golden tabby tigers) are a colour form, not a separate subspecies, like white and black tigers.**
 - They are exceptionally rare in the wild and even rarer in captivity.
 - **They have orange-yellow with black stripes and whitish abdominal region.**
- Golden tiger spotted in KNP are a **color variation of Bengal tigers** caused by a presence of recessive gene called "**wideband**".

- The wideband gene reduces melanin production during the cycle of hair growth. Thus, the **agouti mutation (production of a protein that is usually expressed in the skin) is responsible for the blond or golden skin**, while the orange stripes appear due to the '**tabby**' mutation'.
- The Tabby gene responsible for most tabby patterns (coat pattern) in domestic cats.
- Black and golden tigers basically exist as they **both possess a recessive gene** which is expressed due to the **absence of a dominant gene to suppress it**. When two individuals with dominant traits breed, recessive genes are masked, but **when two individuals with recessive genes breed, the recessive gene is expressed** and such is the case for these two tigers (Black and golden) mutants.
- **IUCN status: endangered.**

14. Phawngpui National Park

Context: Nearly one-ninth of Mizoram's Phawngpui National Park was affected by forest fires that originated from a jhum cultivation site in March 2025.

About Phawngpui National Park

- Phawngpui National Park, also known as the **Blue Mountain National Park**, is located in the **southeastern corner of Mizoram**, near the India-Myanmar border.
- It is the **highest peak in the state**, rising to an altitude of 2,157 meters above sea level.
- It **overlooks the Chhimtuipui River** and the **hill ranges of Myanmar**.
- The national park covers an area of 50 sq.km.
- The **local Mizo people consider** the national park as a **sacred place**, and believe that it is **inhabited by the spirits of their ancestors**.
- The national park is often **enveloped by clouds**, and appears **blue from a distance**.
- **Flora:** The thick forests are interspersed with small patches of grassy glades and are replete with diverse fauna typical of **Montane Subtropical**

forests including oak, rhododendrons, and rare species of bamboos.

- **Fauna:** It is home to an amazing variety of birdlife, including the rare Blyth's Tragopan, Dark Rumped Swift, and Mrs. Hume's Pheasant, the Mizoram state bird, and endangered mammals like the Slow Loris, Tiger, Leopard, Leopard Cat, Serow, Goral, Asiatic Black Bear, Stump-tailed Macaque, and Capped Langur.

15. Plastic Park

Context: The Plastic Parks scheme is promoting industrial growth and environmental sustainability in India's plastics sector.

Plastic Park

- It is an industrial zone specifically designed for plastic-related businesses and industries.
- It aims to consolidate and synergize the capacities of the plastic processing industry, promoting investment, production, and exports while generating employment.
- These parks also focus on achieving environmentally sustainable growth through waste management and recycling initiatives.

Importance and Progress

- Plastic Parks have emerged as an integral part of India's strategy for managing plastic waste, promoting recycling, and supporting the chemical industry.
- India ranks 12th globally in plastic exports, with exports growing from \$8.2 billion in 2014 to \$27 billion in 2022, driven by government efforts like the Plastic Parks scheme.
 - 10 Plastic Parks have been approved so far in different States.

16. Future Conservationist Award

Context: A team of researchers from Kerala has been awarded the Future Conservationist Award by the Conservation Leadership Programme (CLP) for their project on conserving the Malabar Grey Hornbill.

About

- The Malabar grey hornbill is a keystone species, endemic to the Western Ghats in India.
- **Physical characteristics:** The bird is characterized by its large, curved bill, lack of a prominent casque (horn-like structure), and grey plumage.
 - It's known for its loud and distinctive calls.



- **Habitat:** Found in evergreen forests, plantations (coffee, rubber, arecanut), and other modified habitats.
 - Some specific locations include Mudumalai Wildlife Sanctuary, Anamalai Tiger Reserve, and Dandeli National Park.
- **Conservation Status:**
 - IUCN Red List: Vulnerable (VU).
 - Wildlife Protection Act, 1972 (India): Schedule I





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SCIENCE AND TECHNOLOGY

1. Asbestos

Context: The Global Asbestos Awareness Week (GAAW) is observed annually during the first week of April.

About Asbestos

- **Chrysotile**, also known as white asbestos, is the most commonly used form and belongs to the serpentine group due to its curly fibers.
- Asbestos refers to a group of six naturally occurring fibrous minerals known for their resistance to heat, fire, and chemicals, and their durability.
- Asbestos was widely used in numerous industrial, residential, and commercial applications due to its unique physical properties.
- When asbestos fibers are inhaled or ingested, they can lodge in the lungs and tissues, leading to chronic health conditions like Asbestosis (respiratory disease), Mesothelioma, lung cancer etc. .

Note: Asbestos types like crocidolite and amosite are hazardous, but they are not listed under the Stockholm Convention, which deals with Persistent Organic Pollutants (POPs)—asbestos is a mineral, not an organic compound.

2. Future Circular Collider (FCC)

Context: CERN has unveiled the final blueprint for the Future Circular Collider (FCC) to succeed the Large Hadron Collider (LHC).

Future Circular Collider (FCC) – Key Information Summary

Project Overview

- FCC is a proposed next-generation particle collider with a circumference of 90.7 km,

potentially succeeding the 27-km Large Hadron Collider (LHC) by the 2040s. .

- The project is led by **CERN** and involves over a thousand global experts.
- The goal is to address **outstanding questions in fundamental physics**, especially following the discovery of the **Higgs boson** in 2012.

Scientific Motivation

- The **Higgs boson** plays a central role in the Standard Model; its discovery drives further inquiry.
- It helps explain how **particles gained mass** after the Big Bang.
- The Higgs may also be connected to the **fate of the universe** and other **unsolved mysteries**.

Research Programme (Two Stages)

1. **Electron–positron collider:**
 - Focus: Higgs, electroweak interactions, and **top-quark** studies.
 - Will operate at **various centre-of-mass energies**.
2. **Proton–proton collider:**
 - Will follow later.
 - **Operate at an unprecedented energy of ~100 TeV. .**

Feasibility and Design

- The collider ring is proposed to be **90.7 km** in circumference at **~200 m depth**.
- 100+ scenarios were studied before choosing this layout.
- It includes **8 surface sites** and **4 major experiments**.

Cost and Infrastructure

- Estimated cost for **electron–positron stage: 15 billion Swiss francs**.
- Spread over **12 years**, starting in the **early 2030s**.
- Funded largely through **CERN's annual budget**.

Governance and Decision Timeline

- The **Feasibility Report** is under review.
- Will be assessed by expert bodies and then the **CERN Council** in **November 2025**.
- A **final decision on construction** is **expected around 2028**.

Broader Impact and Applications

- Colliders like the FCC contribute to:
 - **Medical technologies**
 - **Superconducting materials**
 - **Fusion energy**
 - **Electricity transmission**
 - **Advanced accelerator tech**

3. Silicon carbon batteries

Context: Bigger capacities are great, but are there any trade-offs with these new silicon carbon batteries?

- Pure **silicon anodes** have a **theoretical specific capacity of ~3579 mAh/g**, much higher than **graphite (~372 mAh/g)**.
- Silicon undergoes **~300% volume expansion** during lithiation, leading to **cracking** and **capacity fading**. It also has **low intrinsic electrical conductivity**, necessitating **carbon composites** or **nanostructuring**.
- **Voltage window** isn't necessarily reduced with silicon-carbon. In fact, the integration may **introduce additional challenges** in **voltage hysteresis** and **thermal management**.
- Companies like **Tesla**, **Sila Nanotechnologies**, and **Amprius** are actively integrating **silicon-rich anodes** to enable **faster charging** and **higher energy density**.

4. Saturn's New Title

Context: Saturn has "gained" **128 new moons** in a **groundbreaking discovery** by **astronomers** in **Taiwan**.

About

- **Saturn's New Title:**

- Saturn now holds the **title of "moon champion" with 274 moons**, the most of any planet in the solar system.
- This **surpasses the total number of moons of all other planets combined**.
- **Discovery Details:** Some moons were found during space missions like **Voyager 1** and others during "ring-plane crossings."
- **Irregular Moons:** All newly discovered moons are classified as "irregular" moons, which have **elliptical orbits at various angles**.
 - **Irregular moons were likely once small planets** captured by Saturn's gravity and later shattered by collisions.
 - **Regular moons** are formed around a planet at the same time as the planet itself forms.
- **Size of Moons:** The new moons are small, **only a few kilometers in size**, but still classified as moons by NASA.

	Moons	Planets
1	Deimos	Mars
2	Callisto	Jupiter
3	Rhea	Saturn
4	Titania	Uranus

5. Bioluminescent Blooms

Context: The **bioluminescent bloom** in **Kochi's backwaters**, while **visually stunning**, has raised **ecological and economic concerns** due to its **harmful effects** on **marine life** and **local fishing communities**.

Bioluminescent Blooms:**What is Bioluminescence?**

- A natural phenomenon where living organisms emit light through **biochemical reactions**.
- **Caused by the oxidation of a molecule called luciferin**, catalysed by the enzyme **luciferase**.
- In marine environments, **dinoflagellates** like **Noctiluca scintillans** are major bioluminescent contributors.

Key Marine Organisms Involved

- **Noctiluca scintillans** (commonly called sea sparkle)

- Non-toxic but causes **ecological impacts** through biomass accumulation.
- Bioluminescence occurs in specialized organelles called **scintillons**.
- Other bioluminescent organisms: **Certain jellyfish, squid, plankton, and bacteria.**

Ecological and Environmental Impact

- Though visually beautiful, large bioluminescent blooms can be **ecologically harmful**:
 - **Hypoxia** (low oxygen) due to decomposition of large amounts of algal biomass.
 - Potential **fish kills** and **disruption of marine ecosystems**.
- **Not always toxic, but their indirect effects can cause stress or death to marine life. .**

Triggering Factors

- **Eutrophication:** Excessive nutrients from agricultural runoff and sewage promote blooms.
- **Seasonal temperature changes** can contribute, but **nutrient loading** is a major driver.
- **Calm waters and minimal wave action** enhance visibility of bioluminescent events.

Notable Regions Affected

- **Indian west coast** (e.g., Konkan and Goa coasts)
- **Gulf of Mannar, Lakshadweep**
- **California, Maldives, Japan, and other parts of the Pacific.**

6. Technology and Innovation Report 2025

Context: India has been ranked **10th globally in private AI investments** and **36th in readiness for frontier technologies**, as per the **UNCTAD Technology and Innovation Report 2025**.

Technology and Innovation Report 2025 (TIR 2025):

- The **Technology and Innovation Report 2025 (TIR 2025)**, published by UNCTAD, focuses on the theme **“Inclusive Artificial Intelligence for Development.”** It addresses the profound impact that frontier technologies, especially artificial

intelligence (AI), have on economies and societies, with a particular emphasis on developing countries and the challenges they face in harnessing AI for sustainable and equitable growth.

Key Highlights of the Technology and Innovation Report 2025

- **Theme and Objective:**

- The report aims to guide policymakers through the complex AI landscape, helping design science, technology, and innovation (STI) policies that promote inclusive and equitable technological progress. It stresses that AI has the potential to accelerate progress toward the Sustainable Development Goals (SDGs) but also risks exacerbating inequalities if not governed inclusively.

- **Three Key Leverage Points:**

- The report identifies **infrastructure, data, and skills** as critical areas for policy focus to ensure AI benefits are broadly shared. It emphasizes building resilient digital infrastructure, promoting open and ethical data practices, and enhancing AI literacy and skills across populations.

- **Socioeconomic Perspective:**

- It analyzes the concentration of AI development in a few countries and companies, highlighting the risk of widening digital divides within and among countries. The report discusses productivity, workforce dynamics, and the need for policies that support AI adoption, adaptation, and development in national contexts.

- **Global Governance and Cooperation:**

- The report calls for stronger international collaboration to create a global AI governance framework that prioritizes shared prosperity, public goods creation, and

places humanity at the center of AI development. This includes ensuring developing countries have a voice in global AI decisions to avoid deepening economic inequalities.

- **Frontier Technologies Market Outlook:**

- AI is projected to become the largest frontier technology market by 2033, with an estimated market size of around \$4.8 trillion, highlighting its transformative economic potential.

- **Policy Recommendations:**

- Governments should strategically assess their AI capacities and gaps across infrastructure, data, and skills.
- Strengthen national innovation systems and foster multi-stakeholder collaboration across ministries and sectors.
- Adopt a whole-of-government approach integrating STI, industry, education, infrastructure, and trade policies.
- Rethink industrial policies to support the knowledge-intensive economy shaped by AI.
- Implement regulations addressing consumer protection, data privacy, and digital platform governance alongside incentives.

Importance for Developing Countries

- The report underscores that developing countries generally lag in readiness for frontier technologies but some, like Singapore and BRICS nations, show promising capabilities. It encourages building innovation ecosystems through R&D, industry capacity, and access to finance to better prepare for AI-driven transformations.

7. vdW squeezing

Context: Researchers from the Chinese Academy of Sciences have developed a breakthrough technique called vdW squeezing to create large, stable, atomically thin 2D metals at angstrom-scale thickness. This method enables precise control over

metal layer thickness and opens up new possibilities for advanced quantum, electronic, and photonic devices.

About:

- A new method called vdW squeezing enables the creation of stable, atomically thin 2D metals, opening doors to advanced devices and fundamental discoveries in materials science.
- Since the discovery of graphene in 2004, research into two-dimensional (2D) materials has advanced rapidly, opening new frontiers in both fundamental science and technological development.
- While nearly 2,000 2D materials have been theoretically predicted and hundreds successfully synthesized in laboratories, the vast majority are limited to van der Waals (vdW) layered crystals.
- A major goal in the field has been the development of atomically thin 2D metals, which would significantly broaden the scope of 2D materials beyond vdW structures.
- These ultrathin metals could also unlock new physical phenomena and enable novel device architectures.
- Despite considerable effort in recent years, producing large-area, high-quality 2D metals at the atomic scale has remained a major challenge.

8. CAPTCHA Systems

Context: CAPTCHA systems are once again in focus as debates arise over their role in the recent surge of bot activity and digital security breaches, highlighting both their importance and limitations in today's evolving cyber landscape.

CAPTCHA Systems:

What is CAPTCHA?

- CAPTCHA stands for **Completely Automated Public Turing test to tell Computers and Humans Apart**. It is a **security mechanism** used on websites and apps to determine whether the user is a **real human** or an **automated bot**.

Why CAPTCHA is Used:

- To **prevent bots** from accessing online forms, accounts, or services.
- To **block spam** in comment sections, sign-up pages, and feedback forms.
- To **thwart brute-force login attempts** and reduce cyberattacks.
- To ensure **fair access** to services (e.g., online ticket booking or product purchases).

Common Types of CAPTCHA:

- **Text-based CAPTCHA:** Typing distorted letters/numbers.
- **Image-based CAPTCHA:** Selecting images with a common feature (e.g., traffic lights).
- **Audio CAPTCHA:** Listening and typing words/numbers (for visually impaired users).
- **reCAPTCHA (by Google):** A smarter, user-friendly CAPTCHA using behavioral analysis (e.g., "I'm not a robot" checkbox).

Benefits of CAPTCHA Systems:

- Blocks **automated bots** and **fake registration**
- Reduces **spam and cyber fraud**
- Adds a **protective layer** to login and transaction pages

Common Misconceptions:

- CAPTCHA does **not** improve SEO rankings
- It does **not** compress image files or speed up websites
- Poorly implemented CAPTCHA can even **hinder user experience**

9. Land Subsidence

Context: Land subsidence at a dumping ground in Belgachia, West Bengal, left hundreds of families without water and electricity, highlighting the growing challenges of man-made urban crises.

What is Land Subsidence?

- According to the **National Oceanic and Atmospheric Administration (NOAA)**, subsidence

is the "sinking of the ground because of underground material movement".

- It can happen for a host of reasons, man-made or natural, such as the removal of water, oil, or natural resources, along with mining activities.
- Across the world, many cities are slowly sinking including tropical megacities like **Jakarta in Indonesia or Manila in the Philippines**, or places like **New Orleans, Vancouver, Mexico City** etc.
- Land subsidence has affected around **65 percent** of the houses in the pilgrimage town of **Joshimath in Uttarakhand** in 2023.
- Over-extraction of **groundwater** leads to voids in aquifers, causing the ground to collapse.
- **Mining** removes underground support, often triggering subsidence.
- **Solar farms**, especially on rocky terrain, have **no impact** on underground structures.
- **Natural compaction** of sediments (especially in deltas or floodplains) contributes to gradual sinking.
- **Wind turbines** are surface installations and do **not disturb subsurface** structures significantly.
- **Draining wetlands** removes water support from soft soils, leading to compaction and sinking.

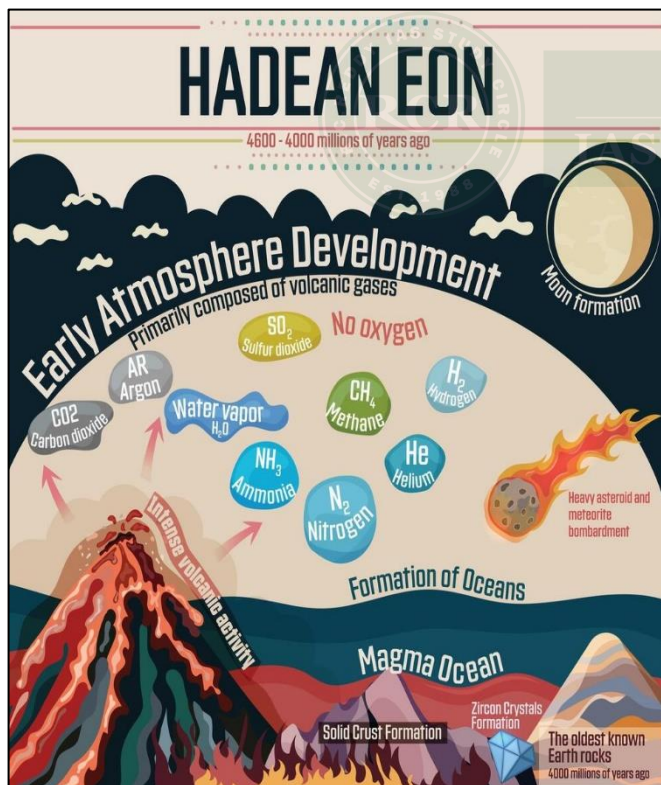
10. Hadean protocrust

Context: A new study questions the assumption that Earth's chemical signatures post Hadean protocrust appeared only after subduction began.

About

- The **Hadean protocrust** refers to Earth's first crust formed during the **Hadean eon**, which spanned from **about 4.6 billion to 4 billion years ago**.
 - This eon marks the time **right after the formation of the Earth**, when the planet was still very hot and largely molten.
 - During this time, the Earth's surface was molten and bombarded by space rocks.
- **Volcanic Activity:** Frequent volcanic eruptions and asteroid bombardment shaped the surface.

- **Conditions:** Hot, inhospitable with little to no liquid water and a volcanic gas-dominated atmosphere.
- **Thicker parts of the crust** gradually formed the **first continents**, which moved on the asthenospheric mantle.
 - **Plate tectonics** started as plates drifted, slid over, or dove under each other.
 - **These movements left distinct chemical signatures** in the crust, helping scientists study plate tectonics.
- **A new study questions the assumption** that these signatures appeared only after subduction began.
 - Researchers suggest that these signatures existed in the Hadean protocrust.
 - This finding challenges a key idea in geology and needs validation by independent research.



11. ZooWIN Portal

Context: The Union Health Ministry recently launched the ZooWIN portal to monitor the availability of anti-rabies and anti-snake venom vaccines in real time.

About ZooWIN Portal

- It is a digital platform, designed to track and manage the real-time availability of anti-rabies vaccines (ARV) and anti-snake venom (ASV) across the country.
 - It will centralise data and improve collaboration among healthcare providers, municipal authorities, and veterinary services.
- **Developed by:** National Centre for Disease Control (NCDC) with technical support from the United Nations Development Programme (UNDP).
- **Aim:** This initiative aims to streamline healthcare delivery and reduce mortality rates linked to these life-threatening conditions.
 - It also aims to enhance public access to information about rabies and snakebite treatments.
- **Working:** This platform is similar to the Co-WIN and U-WIN platforms.
 - It integrates with the Electronic Vaccine Intelligence Network (eVIN) to provide real-time tracking of vaccine and antivenom stocks.
- **Pilot project:** It will be piloted in five States/UTs: Delhi, Madhya Pradesh, Assam, Puducherry, and Andhra Pradesh.
- The platform aligns with the Health Ministry's broader initiatives like National Action Plan for Prevention and Control of Snakebite Envenoming (NAPSE), 2024 to combat rabies and snakebites.

12. 3D Printing

Context: Japan's West Japan Railway Company unveiled the world's first 3D-printed train station in Arida city. The new Hatsushima station was built in under six hours, showcasing cutting-edge construction innovation.

What is 3D Printing?

- 3D Printing or Additive Manufacturing is a technique of creating three-dimensional objects by layering materials based on a digital model.
- Unlike traditional manufacturing (subtractive), it adds material layer by layer, reducing waste and allowing intricate designs.

How 3D Printing Works?

- **Design:** The process begins with a 3D digital model created using CAD software, saved in formats like STL or .OBJ.
- **Slicing:** Slicing software divides the digital model into hundreds or thousands of horizontal layers.
- **Printing:** The 3D printer deposits material layer by layer, following the sliced instructions. Each layer solidifies quickly, gradually forming the final object.
- **Post-Processing:** Once printing is complete, the object undergoes finishing like curing, sanding, or painting.

Note: While circuits can be 3D printed, printing them on paper is typically associated with other technologies like inkjet printing with conductive inks (operation 1). Operation 5 is unrelated; converting 2D images into holograms involves optics and display tech, not additive manufacturing.

13. Aryabhata Satellite

Context: The Indian Space Research Organisation (ISRO) is set to celebrate the golden jubilee of the launch of India's first satellite Aryabhata, which took off onboard USSR rocket Kosmos-3M on April 19, 1975.

About Aryabhata Satellite

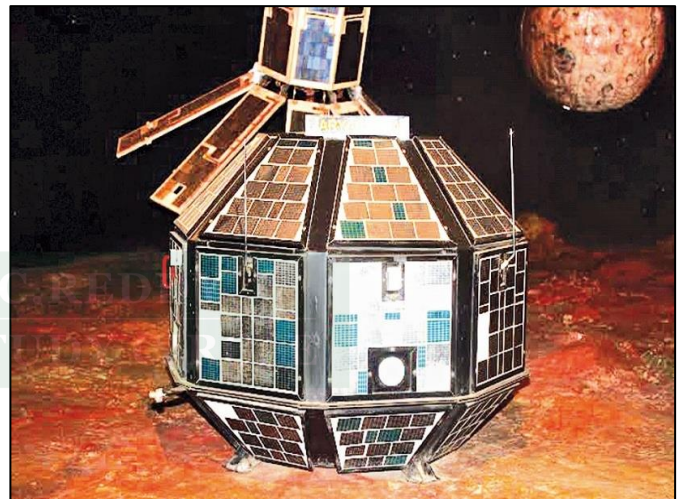
- **Name:** Aryabhata, after the ancient Indian astronomer (Aryabhata I – 476 to 550 CE).
- **Developed by:** Indian Space Research Organisation (ISRO).
- **Launch Date:** April 19, 1975.

• Launch Vehicle & Site:

- Launched using **Soviet Kosmos-3M rocket**
- From **Kapustin Yar, USSR** (present-day Russia)

Mission Details

- **Shape:** 26-sided quasi-spherical structure.
- **Scientific Objectives:**
 1. **X-ray astronomy experiments.**
 2. **Solar neutron and gamma ray detection.**
 3. **Upper atmospheric studies.**
- **Notable Milestone:** First satellite designed and built entirely in India; only launched with foreign assistance.

**14. Mk-II(A) Laser- Directed Energy Weapon (DEW)**

Context: India has successfully tested the indigenously developed Mk-II(A) Laser-Directed Energy Weapon (DEW) system at Kurnool, Andhra Pradesh, becoming the fourth nation with the capability to disable drones and missiles using laser technology.

About Mk-II(A) Laser- Directed Energy Weapon (DEW)

- It is a 30-kilowatt laser-based weapon system designed to take down helicopters, swarm drones, and radars.
- The Defence Research and Development Organisation's (DRDO) Centre for High Energy Systems and Sciences (CHES), Hyderabad,

developed the system along with several academic institutions and Indian industries. .

- It is one of the most **potent counter-drone systems** in the world due to its **lightning speed** of engagement, **precision**, and **lethal action** within a few seconds.
- The laser system **engages fixed-wing drones from a long range** and can **thwart multiple drone attacks** at a time, destroying surveillance sensors and antennae.
- **Once a target is identified by a radar or by its inbuilt Electro Optic (EO) system**, it uses an intense beam of powerful light (**laser beam**) to **cut through the target**, causing structural failures or even more lethal damage.
- The development of this laser weapon can **lower the risk of collateral damage** and **reduce reliance on expensive ammunition** during conflict.
- **With this, India has joined a list of selected countries, such as the US, China, and Russia, with such capabilities.**



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15. BatEchoMon

Context: India's first automated bat monitoring system, BatEchoMon, has been successfully developed to detect and classify bat species using real-time acoustic analysis.

What is BatEchoMon?

- **Definition:** BatEchoMon (Bat Echolocation Monitoring) is an autonomous, AI-powered

acoustic monitoring system that detects, analyses, and classifies bat echolocation calls in real-time.

- **Developed by:** Indian Institute for Human Settlements (IIHS), Bengaluru.
- **Aim:** To simplify and accelerate bat data processing, enabling deeper research into bat ecology and biodiversity with minimal manual intervention.

Key Features of BatEchoMon:

- **Real-time Acoustic Analysis:** Activates at sunset and uses a Raspberry Pi microprocessor to isolate and analyse bat calls.
- **Species Identification:** Employs convolutional neural networks (CNN) to match call structures with known bat species.
- **Visual Output:** Generates spectrograms and statistical activity data across species and time intervals.
- **Compact & Modular:** Housed in a 200×80×80 mm unit, with solar-powered battery backup (8-day runtime) and WiFi for data transfer.
- **Low-Cost Innovation:** Costs less than a third of conventional international detectors.

16. STELLAR Model

Context: The Central Electricity Authority (CEA) launched STELLAR, India's first fully indigenous resource adequacy model, aimed at optimizing electricity generation, transmission, and storage planning across states.

About STELLAR Model:

STELLAR (State of the art Totally indigenously developed Resource adequacy model) is a next-gen software tool for integrated planning of power generation, transmission, storage, and demand response.

- **Developed by:** Central Electricity Authority (CEA) in collaboration with The Lantau Group (TLG) and supported by the Asian Development Bank (ADB).

- **Aim:** To help states and power distribution companies (Discoms) prepare annual dynamic resource adequacy plans, ensuring uninterrupted power supply and system-wide efficiency.
- **Key Features of STELLAR:**
 - **Chronological Power System Modelling:** Simulates real-time power system operations with load flow, ramp rates, and unit constraints.
 - **Integrated Planning:** Simultaneously models generation, transmission, storage expansion, and demand-side response till FY 2034-35.
 - **Endogenous Demand Response:** Considers consumer flexibility in electricity use, optimizing overall load and cost.
 - **Ancillary Services Optimization:** Ensures grid stability by factoring in services like frequency control and reserves.
 - **Transparent, Customizable, and Open Access:** Shared with all states free of cost; designed for regular updates and user feedback.

17. Space Tourism

Context: Pop star Katy Perry and an all-female crew flew to space via Blue Origin, reigniting debates on space tourism's costs and environmental impact.

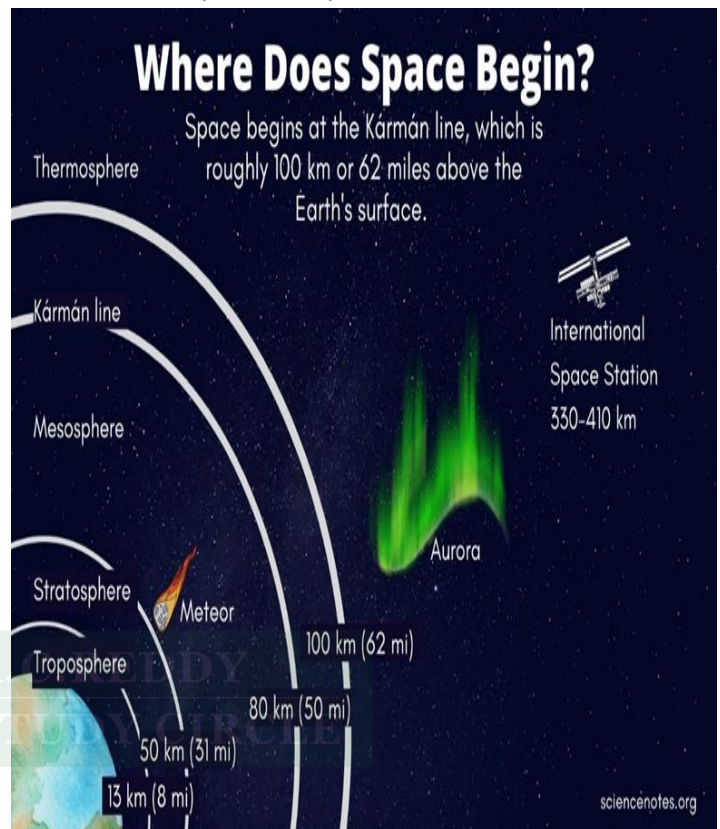
What is Space Tourism?

- Space tourism involves recreational, leisure, or business travel beyond Earth's atmosphere, offered by private companies like Blue Origin, Virgin Galactic, and SpaceX. Unlike government-led space missions, it caters to civilians, albeit at exorbitant costs.

What is Kármán Line?

- The **Kármán Line** lies at an altitude of **100 kilometers (62 miles)** above sea level.
- It is widely accepted by organizations such as the **Fédération Aéronautique Internationale (FAI)** as the **boundary between Earth's atmosphere and space**.

- Above this line, **conventional aircraft can no longer rely on aerodynamic lift** and require orbital velocity to remain aloft.
- It serves a crucial legal and scientific demarcation in aerospace and space law.



18. Q-Shield

Context: QNu Labs, a quantum-tech startup under India's National Quantum Mission (NQM), launched Q-Shield, the world's first unified platform for quantum-safe cryptography management.

What is Q-Shield?

- Q-Shield is a comprehensive cryptography management platform designed to secure critical infrastructure against future quantum threats.

Developed By:

- QNu Labs, incubated at IIT Madras Research Park (2016)
- Supported by the Department of Science and Technology (DST) under the National Quantum Mission

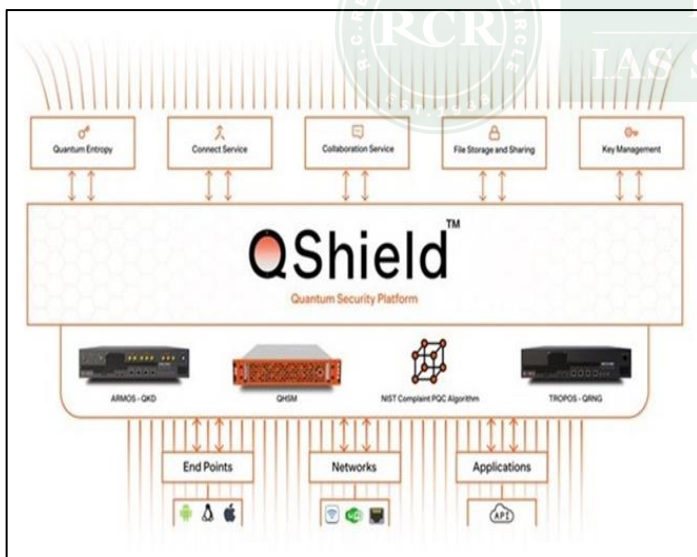
Objective:

- To empower enterprises with tools that ensure data privacy and cybersecurity across cloud, on-premises, and hybrid environments in a quantum-resilient manner.

Key Features of Q-Shield:**Quantum-Safe Security Tools:**

These are advanced tools that protect your data from being hacked, even by super-powerful quantum computers in the future.

- **Armos:** A system that sends super-secure secret keys, so no one can eavesdrop.
- **Tropos:** Creates truly random numbers, which are used to make passwords and encryption much stronger.
- **QISM:** Like a digital safe box that stores your keys and keeps them secure.
- **PQC Standards:** Uses special encryption methods that even future computers won't be able to break.

**19. Tensor Processing Unit**

Context: Google has launched Ironwood, its seventh-generation Tensor Processing Unit (TPU) to accelerate AI model processing.

Tensor Processing Unit (TPU):

- A Tensor Processing Unit (TPU) is a specialized hardware accelerator developed by Google

specifically to speed up machine learning (ML) and deep learning tasks. Unlike general-purpose processors like CPUs and GPUs, TPUs are application-specific integrated circuits (ASICs) optimized for the high-volume mathematical operations—particularly matrix multiplications—that underpin neural network training and inference.

Key Features and Architecture

- **Matrix Processing Power:**

- TPUs are designed to handle large-scale matrix operations, which are fundamental to modern ML algorithms. Their architecture enables them to perform a vast number of multiplications and additions concurrently, greatly accelerating deep learning workloads.

- **Systolic Array Design:**

- The core of a TPU is a systolic array—a grid of processing elements that efficiently performs matrix multiplications and accumulations, crucial for neural network computations.

- **Integrated Memory:**

- TPUs include high-speed memory (such as DDR3 DRAM in early versions) directly connected to the processor, ensuring rapid data access for weights and activations during model training and inference.

- **Activation and Buffering:**

- After matrix computations, TPUs apply activation functions and store results in unified buffers, preparing data for subsequent processing layers



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20. World Pandemic Treaty

Context: After over three years of negotiations, WHO Member States finalised the draft World Pandemic Treaty to boost global pandemic preparedness.

What it is?

- A legally binding international instrument aimed at strengthening global response to future pandemics.
- Developed by: Negotiated by the Intergovernmental Negotiating Body (INB), constituted under WHO in December 2021.
- Aim: To improve pandemic prevention, preparedness, and equitable response, using a One Health approach involving human, animal, and environmental health.

Key Features:

- Establishes pathogen access and benefit-sharing systems.
- Strengthens global supply chains and logistics for health emergencies.
- Promotes technology and knowledge transfer for vaccines, diagnostics, and therapeutics.
- Mobilises skilled global health workforce and supports geographically balanced R&D capacities.
- Respects national sovereignty — does not allow WHO to mandate lockdowns, travel bans, or vaccines.

21. K2-18b

Context: Scientists using the James Webb Space Telescope have detected possible biosignature gases Dimethyl Sulfide (DMS) and Dimethyl Disulfide (DMDS) in the atmosphere of exoplanet K2-18 b, suggesting a strong potential for microbial life.

About K2-18b:

- K2-18b is an exoplanet located about 120 light-years away in the Leo constellation.

- It is classified as a "Hycean" world—a type of super-Earth or mini-Neptune with potential liquid water oceans and a hydrogen-rich atmosphere.
- It orbits within the habitable zone of its star, raising interest about its potential to host life-supporting conditions.
- Recently, it made headlines after scientists detected possible signs of carbon-bearing molecules in its atmosphere, sparking discussions about habitability beyond Earth.

22. Intermediate-Mass Black Holes

Context: Indian astronomers used the Devasthal Optical Telescope (DOT) to detect and measure an elusive intermediate-mass black hole (IMBH) in the faint galaxy NGC 4395.

What Are Intermediate-Mass Black Holes (IMBHs)?

- They are missing links between stellar-mass and supermassive black holes.
- Intermediate-Mass Black Holes (IMBHs) are considered the "missing link" between stellar-mass black holes (few to tens of solar masses) and supermassive black holes (millions to billions of solar masses).
- They are believed to be seeds for the growth of supermassive black holes.
- IMBHs are considered to be the "seeds" that can eventually grow into supermassive black holes, helping explain how such giants formed in the early universe.

Why Are IMBHs Hard to Detect?

- They are difficult to observe due to their faint emissions and location in small galaxies.
- This makes traditional detection techniques ineffective, requiring advanced instruments and methods.

About the Discovery

- It provides strong evidence supporting the size-luminosity relationship in low-luminosity active galaxies and offers one of the most accurate mass estimates of an IMBH.

- The black hole is accreting matter at only 6% of its theoretical maximum rate.
- The findings mark a key step in understanding black hole growth and evolution, with more advanced observations planned in the future.

23. Artificial General Intelligence

Context: According to researchers at DeepMind, Google's AI research lab, it is "plausible that powerful AI systems will be developed by 2030."

What is Artificial General Intelligence (AGI)?

- It refers to the **hypothetical intelligence of a machine** that possesses the ability to understand or learn any intellectual task that a human being can.
 - It is a type of artificial intelligence (AI) that aims to mimic the cognitive abilities of the human brain.
- In a paper published in 2023, DeepMind researchers identified **five ascending levels of AGI**:
 - Emerging, "equal to or somewhat better than an unskilled human";
 - Competent, "at least 50th percentile of skilled adults";
 - Expert, at "least 90th percentile of skilled adults";
 - Virtuoso, "at least 99th percentile of skilled adults";
 - and Superhuman, which "outperforms 100% of humans."
- **Artificial Intelligence (AI):** Refers to systems designed for **specific tasks**—e.g., image recognition, language translation, or playing chess. These are known as **Narrow AI** or **Weak AI**.
- **Artificial General Intelligence (AGI):** Refers to a **hypothetical form of AI** capable of performing **any intellectual task** a human can do, with **general reasoning, adaptability, and learning ability** across domains.

24. Wet Bulb Impact

Context: Urban regions today are facing a dual climate threat—the intensifying Urban Heat Island (UHI) effect and the increasingly lethal Wet-Bulb Impact.

What is Wet Bulb Impact?

- **Wet-bulb impact** refers to the dangerous combination of high heat and humidity that significantly reduces the human body's ability to cool itself through sweating.
- **The Wet-Bulb Temperature (WBT) is the lowest temperature to which the human body can cool itself through the evaporation of sweat.**
 - This is a measure of how hot air feels, taking into account both air temperature and humidity.
- The **wet-bulb temperature** is a critical metric for understanding **heat stress** and the body's ability to cool itself.
- When the **wet-bulb temperature** exceeds **31°C (88°F)**, even individuals with access to **water** and **shade** can suffer from **heat exhaustion**, especially those who are **vulnerable**, such as the elderly or people with pre-existing health conditions.
- As the wet-bulb temperature rises, the body's natural cooling mechanism of **sweating** becomes ineffective due to high humidity, increasing the risk of **heat-related illnesses**.

25. Fast Breeder Reactors

Context: India's first Prototype Fast Breeder Reactor (PFBR) in Tamil Nadu's Kalpakkam is expected to be commissioned next year, nearly two years after it got the go-ahead from the nuclear regulator, officials have said.

Fast Breeder Reactors (FBRs):

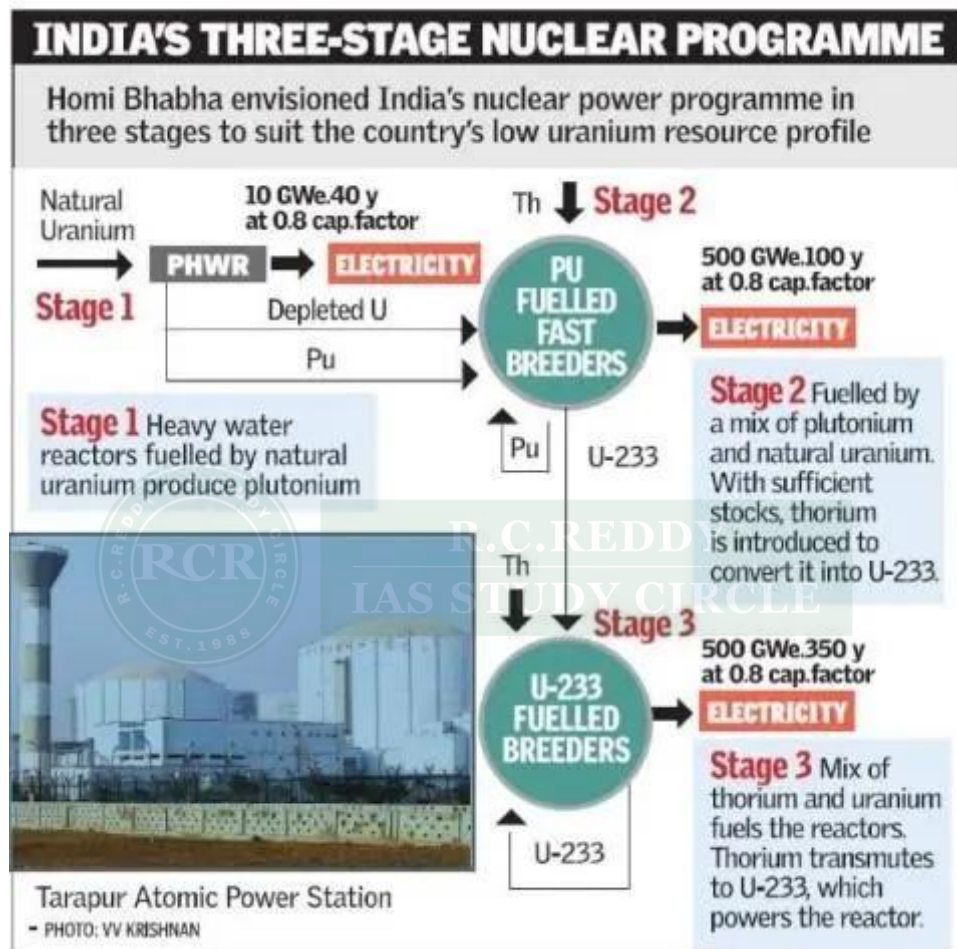
- **Fast Breeder Reactors (FBRs)** are designed to use **fast neutrons** to convert **non-fissile isotopes** (like uranium-238) into **fissile isotopes** (like plutonium-239), effectively "breeding" more fuel than they

consume. This capability is a key advantage, as it can greatly extend the life of nuclear fuel resources.

Advantages:

- They “breed” more fuel than they consume, making them more efficient in terms of fuel utilization.

- They help address concerns about **nuclear fuel scarcity** by utilizing **uranium-238**, which is far more abundant than **uranium-235**.
- FBRs are capable of utilizing **spent nuclear fuel** from other reactors.



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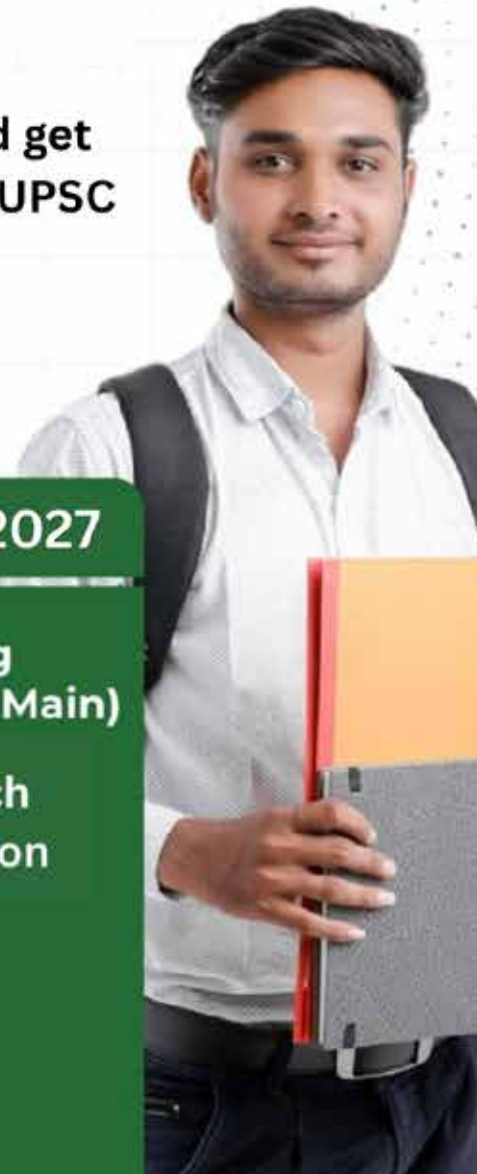
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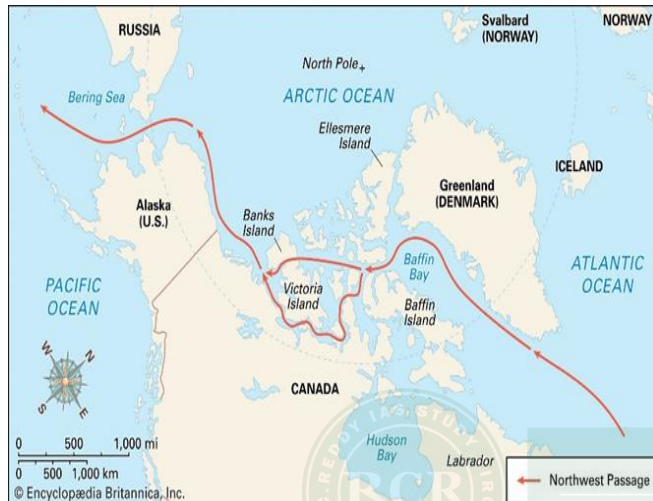
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GEOGRAPHY AND MAPPING

1. Northwest Passage

Context: The Northwest Passage is back in focus amid rising geopolitical tensions, with Canada and the U.S. disputing its legal status as internal waters vs international strait.



Northwest Passage:

The historical Northwest Passage is a sea route connecting the Atlantic and Pacific Oceans through the Arctic Ocean, along the northern coast of North America. It passes through a series of Arctic waterways, many of which are located within the Canadian Arctic Archipelago. To determine how many of the listed water bodies the Northwest Passage traverses, let's examine each one in relation to the established routes:

- **Baffin Bay:** The eastern entrance to the Northwest Passage is through Baffin Bay, between Greenland and Baffin Island, before entering Lancaster Sound.
- **Beaufort Sea:** On the western side, after passing through the Canadian Arctic Archipelago, the route enters the Beaufort Sea before reaching the Bering Strait.
- **Chukchi Sea:** After the Beaufort Sea, the passage continues westward and enters the Chukchi Sea before reaching the Bering Strait.

- **Bering Strait:** The westernmost exit (or entrance) of the Northwest Passage is through the Bering Strait, which separates Alaska and Russia.
- **Hudson Bay:** The main and historically navigated routes of the Northwest Passage do not pass through Hudson Bay. While there were attempts to find a westward exit from Hudson Bay, the Fury and Hecla Strait connecting Hudson Bay to the main passage is typically blocked by ice and not part of the main navigable routes.

2. Megaquake

Context: Japan has been alarmed over a long-anticipated megaquake in the Nankai Trough, warning that such an event could trigger devastating tsunamis.

What is a megaquake?

- A megaquake (or megathrust earthquake) is a massive seismic event with a magnitude of 8.0 or higher, capable of causing extreme destruction, tsunamis, and widespread loss of life and infrastructure.

What is the Nankai Trough?

- The Nankai Trough is a **subduction zone**—an **undersea trench where the Philippine Sea Plate is being forced under the Eurasian Plate**.
- This trench stretches about 800 km along Japan's Pacific coastline, from Suruga Bay near central Japan to the Hyuganada Sea near Kyushu.

Why the Concern?

- The Japanese government estimates a 70–80% chance of a magnitude 8–9 earthquake in the Nankai Trough within the next 30 years which could kill up to 300,000 people
- Historical data shows major quakes in this region every 100–150 years.

The **Nankai Trough (Japan)**, **Cascadia Subduction Zone (Pacific Northwest, USA & Canada)**, and **Sunda Megathrust (Indonesia region)** are all major **subduction zones**—regions where one tectonic plate is being forced beneath another. These zones are geologically active and are known for:

- **Frequent and powerful earthquakes**
- **Tsunami generation due to seabed displacement**
- **Historical records of devastating seismic events**

These areas are under close scientific monitoring because they pose significant natural disaster risks to the surrounding coastal populations.

Hence, they are **often in the news due to their high potential for generating large undersea earthquakes and tsunamis.**

3. Chile's longest and shortest land border

Context: Calling him a “key geopolitical player”, Chilean President Gabriel Boric on April 1 heaped praises for Prime Minister Narendra Modi’s diplomatic prowess particularly his ability to engage with world leaders.



Chile's longest and shortest land border:

- **Longest border:** Chile shares its **longest land border with Argentina**, stretching over **5,300 km** along the Andes mountains.
- **Shortest border:** Chile shares its **shortest land border with Peru**, which is approximately **171 km** long.
- While Chile also borders **Bolivia**, that border (~861 km) is longer than the one with Peru.

4. Heard and McDonald Islands

Context: Alongside a baseline 10 per cent tariff imposed on all trade partners, Trump’s administration also included Heard and McDonald Islands, a group of remote, barren, volcanic islands in the sub-Antarctic Indian Ocean—despite the fact that no one lives there.

Heard and McDonald Islands:

- These islands are **Australian territory**, which led to their inclusion in the tariff list.
- **Location:** In the Southern Indian Ocean, about **1,700 km from Antarctica** and **4,100 km southwest of Australia**.
- **Volcanic Activity:** Only active sub-Antarctic volcanoes, including Big Ben (Heard Island) and the McDonald Island volcano.
- **Geological Importance:** Key site for studying crustal plates, ocean basins, volcanic activity, and climate change through glaciers and volcanic processes.
- **Unique Ecosystem:** No introduced species, making it one of the rare pristine ecosystems, with large populations of marine birds and mammals.
- **Wildlife:** Home to the Heard Island cormorant, endemic subspecies of sheathbill, and other endemic species; vital breeding site for seals, petrels, penguins, and albatrosses.
- **Protection:** Protected under the **Environment Protection and Biodiversity Conservation Act 1999** and **World Heritage Convention**, with penalties for unauthorized actions.

- They are listed as the UNESCO World Heritage Sites.



5. Cardamom Mountains

Context: Cambodia's leader Hun Manet said on April 5 there was "nothing to hide" as he inaugurated a naval base renovated in recent years by China, after Washington had voiced concern over Beijing's role in the upgrades.

Cardamom Mountains:

- The **Cardamom Mountains** (also spelled **Kravanh Mountains**) are a major mountain range located primarily in **southwestern Cambodia** and extending slightly into **eastern Thailand**.
- This range is known for its **rich biodiversity**, dense tropical forests, and relative remoteness, making it one of the most important **ecological zones** in Southeast Asia.



6. Location of Portugal

Context: President Murmu held delegation-level talks with the Portuguese President, commemorating 50 years of diplomatic relations between India and Portugal.

Each countries share a land border with only one country:

- **Portugal** shares a border only with **Spain**.
- **Denmark** shares a land border only with **Germany**.
- **Lesotho** is an **enclave within South Africa**, sharing a border only with South Africa.
- **San Marino** is enclaved within **Italy**, so it borders only Italy.
- **Timor-Leste** shares a land border only with **Indonesia**.



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7. Location of Tanzania

Context: Tanzania's main Opposition leader Tundu Lissu was charged on April 10 with treason, which carries the death penalty, a day after being detained following a rally, one of his lawyers said.

Tanzania shares land borders with eight countries:

- **Kenya** (to the north)
- **Uganda** (to the north)
- **Rwanda** (to the west)
- **Burundi** (to the west)
- **Democratic Republic of the Congo** (to the west, bordering across Lake Tanganyika)
- **Zambia** (to the southwest)
- **Malawi** (to the south)
- **Mozambique** (to the south)



8. Location of DR Congo

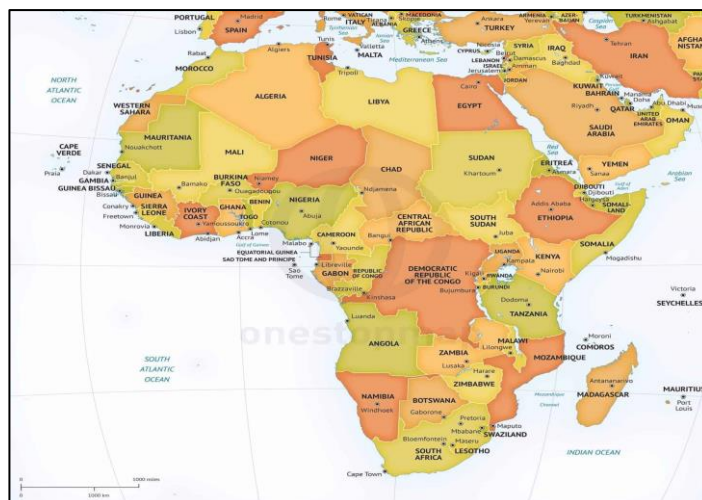
Context: The UN condemned the widespread rape of children in eastern DR Congo, where thousands faced sexual violence in early 2025.

Countries having coast lines along Atlantic coast:

- **Democratic Republic of the Congo (DRC):** Has a narrow coastline along the Atlantic Ocean near the town of Muanda.
- **Angola:** Has a long Atlantic coastline.
- **Gabon:** Lies entirely on the Atlantic coast in Central Africa.

While,

- **Zambia:** Landlocked country; no coastal access.
- **Botswana:** Also landlocked.



9. Gabon neighbours

Context: Gabonese voters began casting ballots on April 12 in a presidential election expected to elect junta chief Brice Oligui Nguema. Mr. Oligui, who led the 2023 coup against the Bongo dynasty, campaigns for a seven-year term amid high unemployment, poor infrastructure, and heavy debt.

Gabon neighbours:

Gabon shares land borders with three countries:

1. **Cameroon** (to the north)
2. **Equatorial Guinea** (to the northwest)
3. **Republic of the Congo** (to the east and south)



10. Mesopotamia Region of Argentina

Context: Three financial institutions pledged \$42 billion to aid Argentina's economy on April 11. The IMF approved a \$20 billion bailout, the World Bank offered \$12 billion, and the IDB committed \$10 billion. President Javier Milei hailed the support, aiming to stabilise the peso and boost economic growth.

Mesopotamia Region of Argentina

Location & Name Origin

- **Situated in the northeast** of Argentina.
- Bordered by the **Paraná River** (to the west) and the **Uruguay River** (to the east).
- The name "**Mesopotamia**" means "land between rivers" — a term borrowed from the famous Mesopotamian region in the Middle East, which was also defined by two rivers (Tigris and Euphrates).

Geography & Environment

- **Climate:** Humid **subtropical**, with high rainfall throughout the year.
- **Landscapes:**
 - Dense **forests** in Misiones.
 - **Swamps and wetlands** in Corrientes.
 - **Rolling plains and riverside towns** in Entre Ríos.
- A **biodiversity hotspot** — home to jaguars, howler monkeys, caimans, and hundreds of bird species.



11. Two main straits of Singapore

Context: The Singapore government has honoured four Indian migrant workers for their heroic actions in rescuing children and adults from a fire at a shophouse, where 16 minors and six adults were trapped.

Two main straits of Singapore:

- **Johore Strait:** Separates **Singapore** from **Malaysia** (specifically the state of Johor on the Malay Peninsula).
- **Singapore Strait:** Lies to the south of Singapore and separates it from the **Riau Islands of Indonesia**.



12. Neighbours of Italy

Context: Deputy Prime Minister of Italy Antonio Tajani, visited India to bolster bilateral cooperation between both the nations.

Neighbours of Italy:

Italy shares land borders with six countries:

1. **France** (to the west)
2. **Switzerland** (to the north)
3. **Austria** (to the north)
4. **Slovenia** (to the east)
5. **San Marino** (an enclave within Italy)

6. Vatican City (an enclave within Italy, located within the city of Rome)



13. Atmospheric rivers

Context: Recently, a large part of the United States experienced heavy rain, strong winds, and severe thunderstorms caused by an atmospheric river

Atmospheric rivers

- They are narrow, fast-moving bands of moisture and wind—like rivers in the sky—that transport large amounts of water vapor from tropical oceans to land.
- They typically span 402 to 606 km in width and over 1,600 km in length.
- They often resemble hurricanes in intensity and are most common in mid-latitudes.
 - A famous example is the **Pineapple Express**, which carries moisture from Hawaii to the U.S. and Canadian West Coasts.
 - However, the recent storm in the U.S. originated from the Caribbean.

Importance and Threats

- Most atmospheric rivers are weak and beneficial, supplying **vital rain and snow**

- They can also cause severe weather such as heavy rain, strong winds, flooding, and mudslides.
- Atmospheric Rivers are long, narrow bands of moisture in the atmosphere, often called “rivers in the sky,” and they carry water vapor from tropical regions to other parts of the world.
- They mainly affect mid-latitude regions and are not the primary source of snow/rain in polar regions.
- Atmospheric Rivers are **not limited to the Indian monsoon**; they occur globally, particularly affecting the west coasts of continents like **North America, South America, and Europe**.
- When they reach land, especially mountainous coasts, they can release massive rainfall leading to **floods and landslides** — commonly seen in **California, Chile, and Western Europe**.

14. Location of Algeria

Context: Fresh tensions flared between France and Algeria on April 14 as the French Foreign Minister said its former colony had ordered 12 French officials to leave in 48 hours.



Neighbours of Algeria:

Algeria shares land borders with **seven** countries and one territory:

1. **Morocco** (to the west)
2. **Tunisia** (to the northeast)
3. **Libya** (to the east)
4. **Niger** (to the southeast)
5. **Mali** (to the south)
6. **Mauritania** (to the southwest)
7. **Western Sahara** (to the west/southwest)

15. Tuti Island

Context: After two years of violent civil war, Sudan's Tuti Island has been reclaimed by the national army, but lies devastated and depopulated.



About Tuti Island:

- Tuti Island is a small, crescent-shaped island located at the confluence of the Blue and White Nile rivers in Khartoum, Sudan.
- It has historically been a peaceful agricultural hub, supplying fruits and vegetables to the capital.
- The island is connected to Khartoum by the Tuti Bridge, a suspension bridge completed in 2008.
- In April 2023, during the Sudanese civil conflict, the Rapid Support Forces (RSF) occupied Tuti Island, turning it into an open-air prison.
- The occupation led to severe humanitarian crises, including famine and disease outbreaks. By October 2024, most of the island's 30,000 residents had fled.
- In March 2025, the Sudanese Armed Forces (SAF) regained control of the island.

16. The Red Sea

Context: Environmentalists have raised alarms as Egypt plans large-scale tourism development at Ras Hankorab Beach, part of the Red Sea's fragile marine ecosystem, risking biodiversity loss amid efforts to boost tourism revenue.

The Red Sea

Geographical Overview

- The **Red Sea** is a **seawater inlet** of the Indian Ocean, lying between **Northeast Africa** and the **Arabian Peninsula**.
- It stretches approximately **2,300 km (1,400 miles)** in length and is about **355 km (220 miles)** wide at its widest point.
- It connects to the **Mediterranean Sea** via the **Suez Canal** in the north and opens into the **Gulf of Aden** and the **Arabian Sea** in the south through the **Bab el-Mandeb Strait**.

Bordering Countries

The Red Sea is bordered by the following countries:

- **Africa Side:** Egypt, Sudan, Eritrea
- **Arabian Peninsula Side:** Saudi Arabia, Yemen

Physical and Environmental Features

- **Salinity:** One of the **saltiest bodies of water** in the world due to high evaporation and limited freshwater inflow.
- **Depth:** Average depth is about **490 m (1,608 ft)**; the maximum depth reaches over **2,200 m (7,200 ft)**.
- **Coral Reefs:** Home to **extensive coral reef systems**, particularly around Egypt's Red Sea Riviera.
- **Marine Life:** Extremely biodiverse – over **1,000 species of invertebrates** and over **200 types of coral**.

Economic and Strategic Importance

- **Suez Canal Link:** A critical route for **international shipping and oil transport**.

- **Tourism:** Popular for **diving, snorkeling, and beach tourism**, especially in Egypt (Hurghada, Sharm El-Sheikh).
- **Fishing and Trade:** Important for **local economies** in bordering countries.

Scientific Facts

- **Tectonic Setting:** It is a young ocean basin, formed by the rifting of the African and Arabian tectonic plates.
- **Hydrothermal Activity:** Contains **underwater hot springs and mineral deposits**, studied for their geology and biology.

Note: While the Zubair Archipelago is a notable group of volcanic islands, it is not the only one. Jabal al-Tair Island, also in the Red Sea and belonging to Yemen, is another active volcanic island. In addition, there are other volcanic features and fields around the southern Red Sea and nearby areas (e.g., Eritrea, Ethiopia).



17. Countries having coast line with North Sea

Context: Four people have pleaded guilty to attempting to smuggle Giant African Harvester ants out of Kenya. Over 5,000 queen ants were found concealed, which could have been worth more than \$1 million had they made it to Europe.

Countries having coast line with North Sea:

The following countries have a coastline on the North Sea:

- **Belgium**
- **Denmark**
- **France**
- **Germany**
- **Netherlands**
- **Norway**
- **United Kingdom** (specifically, the coasts of England and Scotland)



18. Majuli Island

Context: Following Charaideo Maidams' UNESCO World Heritage status in 2024, Assam is now pushing for Majuli Island and Sivasagar to achieve UNESCO recognition.

About Majuli Island:

- **Location:** Majuli is located in the Brahmaputra River in Assam, about 40 km from Jorhat city.
- **Formation:** Formed by the dynamic shifting of Brahmaputra's River channels over centuries, Majuli emerged as the world's largest river island.

Key Features:

- **Area:** Once spread across 880 sq km, currently reduced due to severe erosion.

- **Biodiversity:** Known for lush landscapes, paddy fields, wetlands, and monsoon submergence enriching the soil.
- **Culture:** Home to vibrant Assamese traditions, Satras (Vaishnavite monasteries), and tribes like the Mising, Deori, and Assamese.
- **Status:** Declared a district in 2016, it is being proposed under the mixed category (cultural and natural) for UNESCO recognition.
- Majuli became India's first island district in 2016 and is renowned for its Neo-Vaishnavite culture, especially the Satra institutions.
- The island lies between the Subansiri and Brahmaputra (Lohit being another tributary that also influences the river system), contributing to its braided river structure.
- While Majuli does suffer from erosion, it falls under Brahmaputra basin conservation, not the National Mission for Clean Ganga, which is focused on the Ganga River basin.
- The Satras of Majuli were indeed founded by the revered saint Srimanta Sankardeva, a key figure in Assam's religious and cultural history.

19. River and places

Context: Telangana Chief Minister A. Revanth Reddy said the Musi rejuvenation, Hyderabad Metro expansion, Regional Ring Road, and radial roads are key to the State's progress. He invited Telugu persons in Japan to share ideas and also invest to realise the dream of making Telangana the symbol of development.

	Rivers	Cities
1	Rushikulya	Brahmapur, Chhatrapur
2	Maner	Karimnagar
3	Tawi	Jammu
4	Teesta	Rangpo

20. Vatican City

Context: U.S. Vice President JD Vance went to the Vatican on April 19 to meet senior Catholic Church officials who have been sharply critical of his administration's policies, in the first such in-person talks of the second Trump presidency.

Vatican City:

- **Vatican City** is a small, independent city-state entirely surrounded by the city of Rome, Italy. It is the smallest country in the world by both **area** and **population**. Despite its size, it holds immense cultural, religious, and political significance as the **center of the Roman Catholic Church** and the residence of the **Pope**.

Key Facts:

1. Official Name:

- Vatican City State (Stato della Città del Vaticano)

2. Location:

- Vatican City is located entirely within the city of Rome, Italy.
- It covers an area of about **44 hectares** (110 acres), or **0.17 square miles**.

3. Population:

- The population is **approximately 800-900 people**, making it the least populated country in the world.
- The population is mainly composed of **clergy, members of religious orders, and the Swiss Guard**.

4. Head of State:

- The **Pope**, the spiritual leader of the Roman Catholic Church, is the sovereign of Vatican City.
- The current Pope is **Pope Francis**, who became Pope in 2013.

5. Language:

- **The official language is Latin, but Italian is also commonly used in daily affairs.**
- Latin is particularly used in the Church's official documents, liturgies, and legal matters.

6. Form of Government:

- **Vatican City is an absolute monarchy with the Pope holding supreme executive, legislative, and judicial authority.**
- The Pope exercises his power through various institutions, including the Papal Secretariat of State and other Vatican-based ministries.

7. Currency:

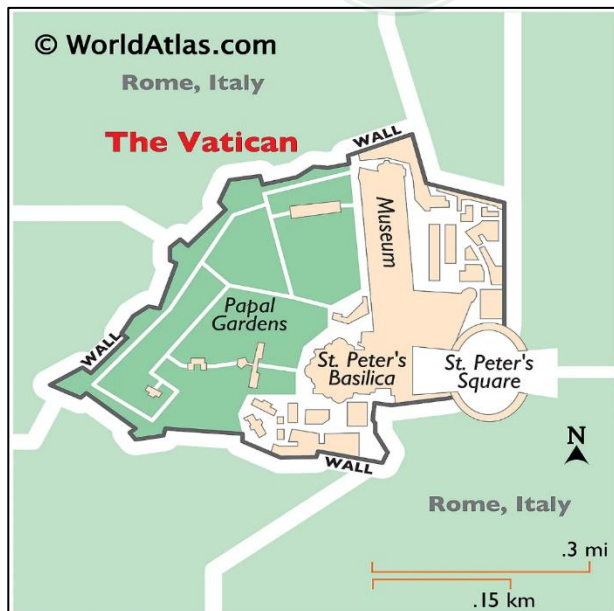
- The currency used is the **Euro (€)**, though Vatican City has its own **mint** for producing coins, which are highly collectible.
- Before the Euro, Vatican City used the **Vatican Lira**.

8. Religious Significance:

- Vatican City is the **spiritual and administrative center** of the Roman Catholic Church, housing significant religious sites like **St. Peter's Basilica** and **St. Peter's Square**.
- It is the residence of the **Pope**, and as such, it plays a central role in the lives of Catholics worldwide.

9. Cultural Significance:

- Vatican City is home to numerous **artworks**, including works by **Michelangelo**, **Raphael**, and **Leonardo da Vinci**.
- The **Sistine Chapel**, famous for Michelangelo's ceiling frescoes, is located within the Vatican.
- The **Vatican Museums** hold an immense collection of art and historical artifacts, attracting millions of visitors each year.

**21. Oman's coastline**

Context: Oman's Sultan Haitham bin Tariq al-Said is set to visit Moscow on April 21, days after the start of a round of Muscat-mediated nuclear talks

between the U.S. and Iran.

water bodies and Oman's coastline:

1. **Persian Gulf:** Oman shares a coastline with the **Persian Gulf**, specifically in its **Musandam** region, which is a small peninsula separated from the rest of Oman.
2. **Strait of Hormuz:** Oman has a coastline along the **Strait of Hormuz**, which lies between Oman and Iran, allowing access from the Persian Gulf to the Arabian Sea.
3. **Gulf of Masira:** Oman shares a coastline with the **Gulf of Masira**, which is located to the east of Oman and surrounds **Masira Island**.
4. **Arabian Sea:** Oman has a **long coastline along the Arabian Sea**, stretching from the southern tip of the country to the eastern coast.



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- **Mode** : Online/Offline
- **Location** : R.C.Reddy IAS Study Circle,
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TEST	TEST DATE & TIME	SUBJECT
GRAND TEST - 2 (OPEN FOR ALL)	04 th May 2025 GS 10:00 AM to 12:00 PM CSAT 2:00 PM to 4:00 PM	Complete Syllabus
GRAND TEST - 3 (OPEN FOR ALL)	11 th May 2025 GS 10:00 AM to 12:00 PM CSAT 2:00 PM to 4:00 PM	Complete Syllabus



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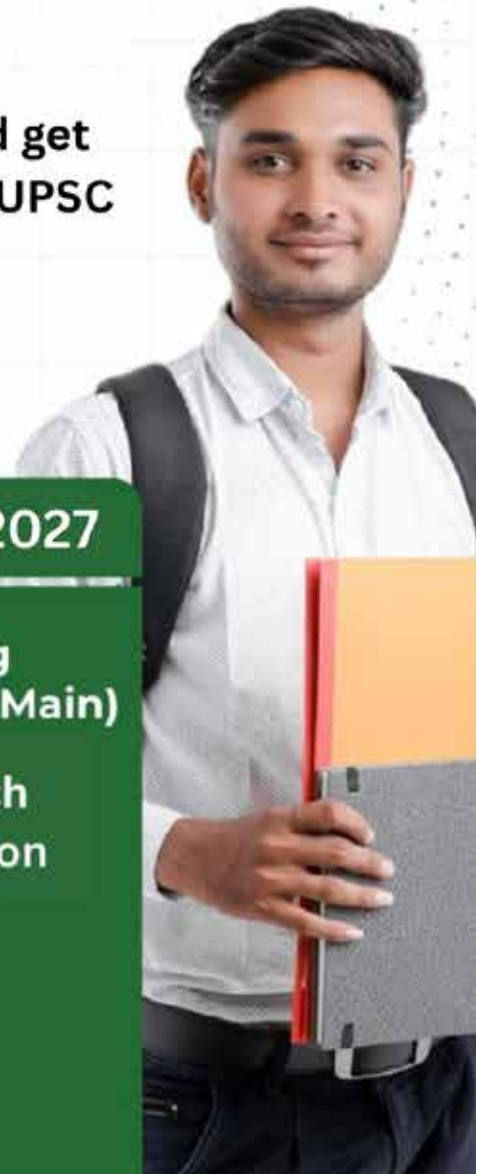
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ART AND CULTURE

1. Festivals and States

Context: Adivasis in Jharkhand and the larger Chhotanagpur region will welcome the new year and the spring season with the Sarhul festival on April 1.

	Festivals	States/UTs
1	Pola	Maharashtra
2	Medaram Jathara	Telangana
3	Sarhul	Jharkhand, Odisha, West Bengal
4	Losar	Arunachal Pradesh & Sikkim

2. Kannadippaya

Context: Kannadippaya, a traditional tribal mat from Kerala, has been awarded the Geographical Indication (GI) tag, marking it as the first tribal handicraft from the state to receive such recognition.

Kannadippaya:

- **Kannadippaya**, meaning “mirror mat,” is made from the soft inner layers of reed bamboo.
 - It is a traditional tribal handicraft from Kerala.
- The best-quality mats are woven from reed bamboo (*Teinostachyum wightii*) and other bamboo species like *Ochlandra* sp.
- It has unique properties of providing warmth in winter and a cooling effect in summer.
- It is mainly preserved by Oorali, Mannan, Muthuva, Malayan, and Kadar tribal communities, and artisans from Idukki, Thrissur, Ernakulam, and Palakkad districts.
- It was historically presented to kings as a mark of honor by tribal communities.

	GI tagged mats	States/UTs
1	Kannadippaya	Kerala
2	Chatrai / Hileuoi	Andaman and Nicobar Islands
3	Madurkathi	West Bengal
4	Pattamadai Pai	Tamil Nadu

3. Tipitakas

Context: Prime Minister Narendra Modi was presented with ‘The World Tipitaka: Sajjhaya Phonetic Edition’ by his Thai counterpart, Paetongtarn Shinawatra, in a diplomatic exchange.

	Name of the Tipitakas	Contents	Authors
1	Vinaya Piṭaka	Rules and procedures for monastic life	Upali
2	Sutta Piṭaka	Buddha’s teachings (discourses or sermons)	Ananda
3	Abhidhamma Piṭaka	Philosophical analysis of Buddhist teachings	Moggalliputtatissa

4. Meenakari Craft

Context: During his visit to Bangkok for the 6th BIMSTEC Summit, Prime Minister of India gifted exquisite Indian handicrafts to the Thai Prime Minister and her spouse, including artifacts showcasing the traditional Meenakari craft.

Meenakari Craft:

Origin & History

- **Meenakari** is a traditional art of **enameling** metal surfaces with vibrant colors and intricate designs.
- It originated in **Persia (Iran)** and was introduced to India by the **Mughals** in the 16th century.

- It flourished under **royal patronage**, especially in **Rajasthan**, and later in parts of **Uttar Pradesh** like **Varanasi**.

What Is Meenakari?

- Meenakari involves **fusing colored glass powder** onto **metal surfaces** (usually gold, silver, or copper) using intense heat.
- The designs often feature:
 - Floral and nature-inspired motifs
 - Religious symbols
 - Geometric patterns

Major Centres in India

City	Specialization
Jaipur	Gold Meenakari (most famous)
Varanasi	Silver Meenakari
Delhi, Lucknow, and Nathdwara	Other centers with regional styles

Processes involved:

- Design Engraving:** The base metal is etched with patterns.
- Enameling:** Colored powdered glass is carefully applied.
- Firing:** Each color layer is fired in a kiln at high temperatures to fuse it with the metal.
- Polishing:** The final product is cleaned and polished to a glossy finish.

Products Made

- Jewelry (earrings, pendants, bangles)
- Decorative items (boxes, trays, wall art)
- Temple accessories and religious idols

Cultural Significance

- Symbol of **royalty and tradition**, often used in Indian weddings and religious ceremonies.
- A part of India's **intangible cultural heritage**, representing a blend of **Mughal and Rajput aesthetics**.

Recognition

- Meenakari jewelry is often paired with **Kundan work** in bridal sets.
- It is a **GI-tagged** (Geographical Indication) art form in certain regions.



5. “Delisting” of monument

Context: Amid the controversy over demands for the removal of Mughal emperor Aurangzeb’s grave, a Parliamentary Committee has asked the Union Culture Ministry to form an independent panel to revisit and reform the criteria required for delisting a monument from the list of Archaeological Survey of India-protected spots.

About “Delisting” of monument

- Delisting a monument means it will no longer receive conservation, protection, and maintenance from the ASI.**
 - Once a monument is delisted, **regular construction and urbanization** activities can take place in the area.
- It is done in accordance of Section 35 of The Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958.**
 - It empowers the Central Government to declare, whether an ancient and historical monument or archaeological site and remains have ceased to be of national importance.

- There is **no term called “Missing Monuments”** in the **AMASR Act** and the term only came into existence as it was used by the CAG Audit team on their Report.
- **Article 49** of the Constitution directs the **state to protect monuments and places and objects of national importance across the country**

6. Ancient Denisovans

Context: A remarkable fossil of jawbone discovery off the coast of Taiwan has provided new insights into the geographic reach of Denisovans, an enigmatic group of archaic humans. The jawbone (known as Penghu 1) was recovered from the Penghu Channel, near Taiwan, during commercial fishing operations.

About Ancient Denisovans

- They are an extinct group of archaic humans, known primarily through limited fossil evidence, including a jawbone, teeth, and a finger bone.
- **Origins and Discovery:** Denisovans were **first identified in 2010** from DNA extracted from a **finger bone found in the Denisova Cave in Siberia**.
 - Genetic analysis revealed that they were a distinct lineage, closely related to Neanderthals and modern humans.
- **Physical Characteristics:** Reconstructions based on **DNA Methylation** patterns suggest Denisovans had a **wider skull** and a **longer dental arch** compared to Neanderthals and Homo sapiens.

Significance of the Findings

- **Geographic Range and Adaptability:** The discovery of the **Penghu 1 jawbone** highlights their adaptability to diverse environments, **from cold highlands to subtropical coastlines**. Key Geographical Range:
 - **Taiwan (Penghu Channel):** Recent Discovery
 - **Russia (Denisova Cave):** Teeth and a small finger bone fragment.

- **China’s Gansu Province (Baishiya Karst Cave, Tibetan Plateau):** A mandible and rib fragment.
- **Laos (Cobra Cave):** A molar (**believed to be from a Denisovan** based on its shape).

- **Genetic Legacy:** Denisovans **interbred with Neanderthals and Homo sapiens**, contributing genetic material to **modern populations in Asia and Oceania**.

- Their genetic influence is evident in traits such as **high-altitude adaptation in Tibetan populations**.

7. Mahavir Jayanti

Context: Mahavir Jayanti is being celebrated with great devotion across India.

Mahavir Jayanti

- It commemorates the birth of **Lord Mahavir (the 24th and last Jain Tirthankar)**
- It is a significant occasion for followers of Jainism to remember and embrace the core principles taught by Lord Mahavir.
- The celebration involves prayers, meditation, and compassionate deeds, serving as a reminder to lead an ethical life and show kindness to all living beings.
- It is primarily observed by Jains in India, Nepal, the US, and the UK.

Vardhaman Mahavira

- He has been accepted as the founder of Jainism.
- He was the **24th and the last Thirthankara (teacher)** of the Jains.
- He was born in 599 BC at Vaishali, the capital of the Vajji tribe.
 - His father Siddhartha was the chief of a clan of Kshatriyas
- He left worldly life at the age of thirty and led a very hard life to gain true knowledge.
- After he attained Truth, he was called Mahavira.

- He strongly believed in the importance of **celibacy or brahmacharya**
- Jainism holds that the universe is eternal and uncreated, operating under natural laws — not created by any deity or even Mahavir.
- The three jewels (Ratnatraya) are right faith (samyak darshana), right knowledge (samyak jnana), and right conduct (samyak charitra).
- Jainism is non-Vedic and does not accept the Vedas or a creator god.
- Non-violence is the most fundamental principle in Jain ethics.
- Jainism strictly prohibits all forms of violence, including ritual animal sacrifice.

8. Sir Sankaran Nair

Context: Prime Minister of India paid tribute to Sir Sankaran Nair on the 106th anniversary of the Jallianwala Bagh massacre, recalling his legal battle against British atrocities.

Sir Sankaran Nair:

- Sir C. Sankaran Nair was a distinguished Indian jurist, statesman, and reformer, widely recognized for his fearless advocacy for civil rights and his pivotal role in India's struggle for constitutional reforms during British rule. He was one of the first Indians to attain high-ranking positions in the colonial administration and is remembered for his principled stands, both against British tyranny and within the Indian nationalist movement.

Key Positions and Achievements

- **Legal Career:**
 - Began as a lawyer in the Madras High Court in 1880. He later served as Public Prosecutor (1899), Advocate-General of Madras (1906–1908), and Judge of the Madras High Court (1908–1915). His landmark judgment upheld the rights of converts to Hinduism, affirming they were not outcasts.

• Indian National Congress:

- Presided over the Amravati session in 1897, becoming the first Malayali and one of the youngest to hold the post. His leadership style emphasized constitutionalism and civil rights over populism.

• Viceroy's Council:

- Appointed as a member in 1915, he was in charge of the Education portfolio and advocated for significant constitutional reforms. His Minutes of Dissent in 1919 highlighted the flaws in British rule and suggested reforms, many of which were later accepted.

• Resignation in Protest:

- Resigned from the Viceroy's Council in 1919 after the Jallianwala Bagh massacre, protesting the imposition of martial law in Punjab. His resignation was a watershed moment, drawing national attention to the brutality of British rule and prompting the formation of the Hunter Commission to investigate the massacre.

• Role in Reforms:

- Played a key part in shaping the Montagu-Chelmsford Reforms and the Government of India Act, 1919, laying groundwork for India's gradual move towards self-government.

• Simon Commission:

- Chaired the All-India Committee in 1928–29, engaging with the Simon Commission on constitutional issues, and advocated for Dominion Status for India.

Publications and Views

• Founder and Editor:

- Established the Madras Review and the Madras Law Journal, contributing significantly to legal scholarship.

- **Author:**

- Wrote *Gandhi and Anarchy* (1922), critiquing both Gandhi's non-cooperation movement and British martial law. The book led to a notable libel case involving Sir Michael O'Dwyer.

- **Views on Non-Violence:**

- Nair was critical of Gandhi's doctrine of non-violence, arguing that it would not yield quick results against the British, a stance that set him apart from mainstream Congress leaders.

Honors and Recognition

- **Companion of the Indian Empire (CIE):** 1904
- **Knighted:** 1912, for his distinguished service in law and administration.

9. Memory of the World (MoW) Programme

Context: The manuscripts of the *Bhagavad Gita* and *Bharat Muni's Natyashastra* were added to UNESCO's Memory of the World Register.

What is the Memory of the World (MoW) Programme?

- The MoW Programme was launched by UNESCO in 1992 with the goal of preserving global documentary heritage and preventing what it called "collective amnesia."
- It aims to safeguard rare documents, including manuscripts, oral traditions, audio-visual content, and archive materials, of global and universal value.
- According to UNESCO, this documentary heritage should be preserved, protected, and permanently accessible to all, while respecting cultural practices.
- The MoW Register serves as a global compendium of such heritage, and is updated biennially (every two years).
- As of 2025, the Register contains 570 entries, including:
 - The **Mahavamsa** (Sri Lanka's ancient chronicle),

- **Shaiva Siddhanta manuscripts** (India),
- **Auschwitz trial recordings** (Germany),
-
-
- And the **March 7, 1971 speech of Bangabandhu Sheikh Mujibur Rahman** (Bangladesh).

India's Contributions to the MoW Register

- **India has made 13 contributions, including two joint submissions:**
 - **Rig Veda** (added in 2005),
 - **Works of Abhinavagupta**, the Shaivite philosopher (added in 2023),
 - **Archives of the Non-Aligned Movement's first summit in Belgrade, 1961** (joint submission),
 - **Dutch East India Company archives** (joint submission).

- In 2025, two new Indian manuscripts were added, both preserved at the **Bhandarkar Oriental Research Institute, Pune**:
 - **Natyashastra** by **Bharata Muni**
 - **Bhagavad Gita**, attributed to **Vyasa**

10. Sri Guru Tegh Bahadur

Context: The Prime Minister paid tribute to Sri Guru Tegh Bahadur on the auspicious Parkash Purab.

Sri Guru Tegh Bahadur:

- He was born on 1 April 1621 in Amritsar and he was the ninth Sikh Guru and the youngest son of Guru Hargobind Sahib.
 - He was originally named Tyag Mal, he earned the title Tegh Bahadur after displaying bravery in battle.
- He married Mata Gujri and had a son, Guru Gobind Singh.
- He lived a life of meditation, selfless service, and sacrifice.
- He traveled widely, preaching Sikhism, promoting social reform, and establishing new preaching centers.

Sacrifice

- In 1675, he was martyred in Delhi by the Mughal emperor Aurangzeb for refusing to convert to Islam and defending religious freedom, especially for persecuted Kashmiri Pandits.
 - His sacrifice earned him the title “Hind di Chadar” (Shield of India).

Legacy

- A great poet and philosopher, his hymns in Guru Granth Sahib emphasize courage, compassion, and devotion.
- His martyrdom laid the foundation for the creation of the Khalsa and inspired generations to fight against oppression.

11. Sterkfontein Caves

Context: South Africa’s Sterkfontein Caves, part of the Cradle of Humankind, have reopened to the public after three years.

About

- **Location:** Approximately 50 km northwest of Johannesburg, South Africa.
- **Geological Formation:** Composed mainly of dolomitic limestone, with striking rock formations

such as stalactites and stalagmites formed over millions of years.

- **Palaeoanthropological Significance:**

- Known as one of the richest sources of hominid fossils in the world.
- Key discoveries include “Mrs Ples”, *Australopithecus africanus* skull and “Little Foot”, a nearly complete *Australopithecus* skeleton.
- These findings suggest that early human ancestors lived in the region as far back as 3.5 million years ago.
- It was designated as Part of **UNESCO World Heritage Site** in 1999.



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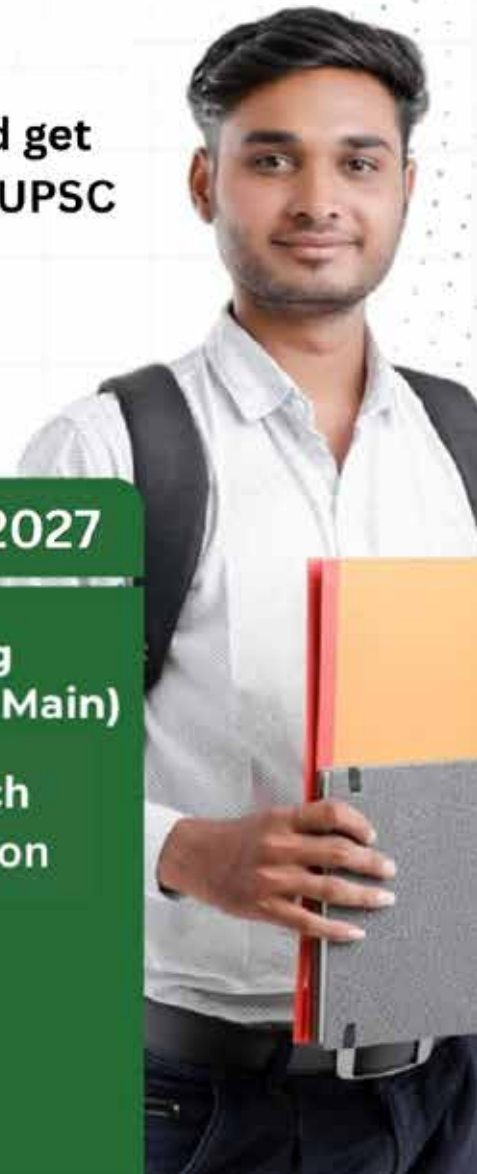
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MISCELLANEOUS

1. Palna Scheme

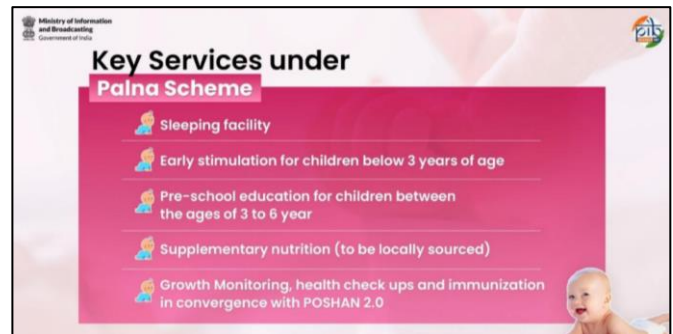
Context: The Palna Scheme addresses the childcare needs of working mothers by providing quality crèche facilities, enabling them to pursue employment without compromising their children's care.

Palna Scheme

- **About:**
 - In 2022, erstwhile National Creche Scheme was reorganized and renamed as Palna Scheme under the sub scheme 'Samarthya' of 'Mission Shakti'.
 - Palna is a Centrally Sponsored Scheme ensuring the participation of State/UT government to ensure better day-to-day monitoring and proper implementation of scheme, and is implemented with a funding ratio of 60:40 between Centre and State Governments and UTs with legislature except North East & Special Category States where ratio is 90:10. For UTs without a legislature, 100% funding is provided by the central government.
- **Objectives:**
 - To provide quality crèche facilities in a safe and secure environment for children (from ages 6 months–6 years), nutritional support, health and cognitive development of children, growth monitoring & immunization.
 - Crèche facilities under Palna are provided to all mothers, irrespective of their employment status.



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2. Breakthrough Prize

Context: The 2025 Breakthrough Prizes recognized top scientists in Life Sciences, Mathematics, and Fundamental Physics.

Breakthrough Prize

- The awards were established in 2013 by Mark Zuckerberg and his wife Priscilla Chan, former Google chief Sergey Brin, genomics company 23&Me founder Anne Wojcicki, and tech investor couple Yuri and Julia Milner.
- It is also known as the "Oscars of Science," and recognizes top scientists annually in Life Sciences, Fundamental Physics, and Mathematics, with each prize valued at \$3 million.
- **Latest Winners**
- The **Fundamental Physics prize** went to 13,508 physicists across four CERN collaborations for their work on the Higgs boson and particle research.
- **Life Sciences** awards were given for breakthroughs in weight-loss drugs, Multiple Sclerosis treatment, and gene-editing technologies.
- Dennis Gaitsgory won the **Mathematics** prize for his work on the Langlands conjecture.

3. Naval base under Project Varsha

Context: India is set to establish a new naval base under Project Varsha for nuclear submarines and warships in coastal Andhra Pradesh by 2026.

About

- **Located:** The new base will be located near the village of **Rambilli**, approximately 50 kilometers from Eastern Naval Command headquarters in Visakhapatnam.
- **Stealth capabilities:** The naval base will feature underground pens and tunnels to house nuclear submarines, ensuring stealthy operations in the Bay of Bengal.
 - The stealth capabilities are vital for **SSBNs (nuclear-powered ballistic missile submarines)**, which need to remain hidden during their long patrols.
- Similarly, **Karwar base in Karnataka** under **Project Seabird** safeguards the west coast.

2. District Mineral Foundation

Context: The Ministry of Mines announced the setting up of a Program Management Unit (PMU) to improve the efficiency of the District Mineral Foundation (DMF) and ensure smooth implementation of the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY). PMU will facilitate coordination between Centre, States, and DMF districts.

What is District Mineral Foundation (DMF)?

- **Legal Provision:** Constituted under Section 9B of the Mines and Minerals (Development and Regulation) (MMDR) Act 1957 (amended in 2015).
- **Nature:** A non-profit trust set up in mining-affected districts.
- **Objective:** To work for the interest and benefit of persons and areas affected by mining-related activities.
- **Status:** DMFs have been established in 645 districts across 23 States.
- **Funding:** Contribution by Mining Lease Holders:
 - 30% of royalty for leases granted after 2015.

- Funds are deposited at the district level and not transferred to the Consolidated Fund of India.
- The amount collected is meant for **area-based development, not for general infrastructure.**

3. MacGregor Memorial Medal Award

Context: Chief of Defence Staff felicitated five individuals from the Armed Forces of MacGregor Memorial Medal Award.

About

- It was instituted in 1888, and commemorates Major Gen Sir Charles Metcalfe MacGregor, founder of the United Service Institution of India established in 1870.
 - USI was established to advance military knowledge and professional development among British Indian Army officers.
- It was originally intended to recognise the acts of military reconnaissance and exploratory journeys.
 - The medal's scope was expanded in 1986, post-independence, to include military expeditions and adventure activities.
- The medal is open to all ranks (serving and retired) of the Armed Forces, Territorial Army, Reserve Forces, Rashtriya Rifles and Assam Rifles.
- To date, **127 medals** have been awarded, including **103** prior to independence.



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