

CURRENT AFFAIRS

WEEKLY



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- GS-II
- INDIA-BANGLADESH EXTRADITION TREATY

GS-II

- SEPARATION OF POWER
- STATE EMERGENCY AND IMPACT ON CENTRE-STATE RELATIONS
- ONE NATION-ONE ELECTION
- GRAM NYAYALAYAS
- NATIONAL PENSION SYSTEM (NPS) AND UNIFIED PENSION SYSTEM (UPS)

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- Gateways of the Great Stupa

HISTORY

- Discovery of Ancient Urn Burials in Kerala
- Poet-Saint Thiruvalluvar

INTERNATIONAL RELATIONS

- Disengagement in eastern Ladakh
- Indus Water Treaty

POLITY & GOVERNANCE

- Government Overhauls Statistical Advisory Bodies
- Resignation from CM's Post
- Cabinet approves PM-AASHA scheme

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- CPI-based Inflation or Retail Inflation
- Vande Bharat Express Trains
- Ammonium Nitrate Dumping

ENVIRONMENT

- Two Years of Project Cheetah
- World Ozone Day
- New Discovery of Dung Beetle Species

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- New GNSS-Based Toll Collection
- Cholera Outbreak
- The Rise of Dark Patterns
- OpenAI's new AI models o1 and o1-mini (Project Strawberry)
- Digi Yatra
- Nipah Virus
- Cabinet approved Bharatiya Antariksh Station

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DISCLAIMER

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

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SECTION -A

MAINS ISSUES

PORT BLAIR RENAMED SRI
VIJAYA PURAM

Context

The Union government announced the renaming of **Port Blair** to '**Sri Vijaya Puram**' to "free the nation from colonial imprints". Port Blair has long carried the name of **Captain Archibald Blair**, a British naval officer of the **East India Company** after whom the gateway to the island was named after. Earlier in January 2023, Prime Minister Narendra Modi named 21 large uninhabited islands in **Andaman and Nicobar** after **Param Vir Chakra** awardees.

Who Was Captain Archibald Blair?

- Archibald Blair joined the **Bombay Marine** under the **British East India Company** in 1771. His first significant role as a midshipman involved **surveying the coasts of India, Iran, and Arabia** in 1772.
- **French Captivity:** In 1780, Blair was captured by a French warship while on an expedition to the **Cape of Good Hope**. He was imprisoned until 1784 and later handed over to the Dutch.
- **Blair's Role in Andaman Islands**
 - ▶ His most notable work was **surveying the Andaman Islands** from December 1788 to April 1789. **His detailed report led to the British decision to colonize the islands.**
 - ▶ Blair discovered a natural harbour on the southern part of Great Andaman Island and initially named it **Port Cornwallis** in honor of **Commodore William Cornwallis**, the British-Indian navy's Commander-in-Chief. This harbour was later renamed **Port Blair** in his own honor.

○ Settlement Efforts:

- ▶ The first colony was established in South Andaman by Archibald Blair. He established a settlement on Chatham Island, initially called Port Cornwallis. This new location faced a series of disasters, including disease outbreaks, leading to its abandonment in 1796.
- ◆ Blair was replaced by **Major Alexander Kyd** and returned to England in 1795.

Freedom Struggle in Andaman and
Nicobar Islands

Infamously known as "Kala Pani" or "Black Waters," this remote convict colony became a place where prisoners in India, both political and non-political, were exiled.

- **Rise of Penal Colonization:** After the first war of independence in 1857, the British needed to suppress dissent more effectively. They decided to use the Andaman Islands as a penal settlement to isolate political and non-political prisoners. The Andaman Committee, led by Dr. F.J. Mouat, recommended this move.
- **Prison Conditions and Rebellions:** The harsh conditions led to multiple escapes and harsh reprisals. In 1858, 251 prisoners escaped, and the brutal execution of 88 escapees was ordered.
- **Great Andamanese Resistance:** The Great Andamanese tribe resisted British rule, culminating in the Battle of Aberdeen on May 17, 1859. Despite their bravery, the indigenous people suffered heavy casualties.

○ Notable Events and Figures

- ▶ **Assassination of Lord Mayo:** In 1872 Lord Mayo, the Viceroy of India, was assassinated by Sher Ali, a

convict from Peshawar. This assassination highlighted the discontent among prisoners and sent shockwaves through the British administration.

- ▶ **Construction of Cellular Jail (1896-1906):** The British constructed the Cellular Jail to impose stricter confinement on political prisoners. It became infamous for its brutal conditions and the torture inflicted on its inmates, including well-known revolutionaries and freedom fighters.
- ▶ **Hunger Strikes and Protests (1932-1937):** Several hunger strikes were organized by political prisoners demanding better conditions. These strikes, particularly the ones in 1933, garnered national attention and led to protests on the mainland.
- ▶ **Japanese Occupation (1942):** During World War II, the Japanese forces captured the Andaman Islands. The Indian Independence League, led by leaders like Subash Chandra Bose, raised the Indian flag on December 30, 1943, marking a significant event in India's fight for freedom.
- ▶ **End of Penal Settlement (1945):** With the end of World War II and the reoccupation by British forces, the penal settlement was closed. All prisoners were granted pardons, marking the end of this dark chapter.

INDIA-BANGLADESH EXTRADITION TREATY

Context

The chief prosecutor of **Bangladesh's International Crimes Tribunal (ICT)** announced plans to seek the extradition of ousted Prime Minister Sheikh Hasina from India. This follows her departure to India amid mass protests that forced her resignation, resulting in multiple criminal charges against her, including murder and crimes against humanity. The backdrop of this extradition request is the existing bilateral extradition treaty between India and Bangladesh.

What is India-Bangladesh extradition treaty?

- The India-Bangladesh extradition treaty, established in 2013 and amended in 2016, allows for the extradition of individuals charged with crimes punishable by a minimum of one year's imprisonment.
- It operates on the **principle of dual criminality**, meaning that the offenses must be punishable in both nations.
- This framework has previously facilitated the exchange of political prisoners, such as those involved in the assassination of Sheikh Mujibur Rahman.
- **Conditions for Extradition:** The treaty's 2016 amendment lowered the threshold for extradition by removing the requirement for concrete evidence, allowing an arrest warrant from a competent court in the requesting country to suffice.
 - ▶ Given the nature of charges against Hasina, including serious allegations of murder and torture, she meets the criteria for extradition.

- **Potential Refusals:** Under **Article 6**, extradition may be refused if the crime is of a political nature, but many charges against Hasina do not fall under this exemption.
 - ▶ Additionally, **Article 8** allows refusal if the request lacks good faith or if it pertains to military offenses. India might consider denying extradition on these grounds, especially due to concerns about political persecution and the fairness of trials in Bangladesh.

SEPARATION OF POWER

Context

"Power tends to corrupt, and absolute power corrupts absolutely" - Lord Acton

Prime Minister Modi's visit to the Chief Justice's residence has set off debate on the separation of powers (a cornerstone of the judiciary and a key feature of the basic structure of the Constitution) and post-retirement sinecures for judges. It has raised several questions, including the **lack of up-keeping of the principle of separating the judiciary from the executive.**

What is Separation of Powers?

- Separation of powers is a **fundamental principle of democratic governance** that involves distributing the functions of government among different branches:
 - ▶ **Legislative:** Parliament (Lok Sabha and Rajya Sabha), State legislative bodies
 - ▶ **Executive:** President (central level), Governor (state level)
 - ▶ **Judicial:** Supreme Court, High Court and all other subordinate courts
- This distribution aims to **prevent the concentration of power in any single branch** and to ensure that each branch operates **independently yet cooperatively.**
- **Application in the Indian Constitution:** While the Indian Constitution **does not explicitly** use the term "separation of powers," it implicitly incorporates the concept by allocating distinct functions and powers to the Legislature, Executive, and Judiciary.
 - ▶ In the case of **Ram Jawaya Kapur v. State of Punjab**, SC held that the doctrine of separation of powers is not explicitly mentioned in the Constitution but each branch of government should not encroach on the functions of the others. Each organ must exercise its powers within the limits set by the Constitution.
- This structure helps maintain a balanced system of governance and prevents any single branch from becoming too powerful.

Legislative, Executive, and Judicial Roles

Legislative Branch:

- ▶ It is responsible for creating laws and overseeing their implementation. The Parliament (Lok Sabha and Rajya Sabha) enacts laws within its jurisdiction as defined by the Union List, the Concurrent List, and the State List.

Legislative Checks	Executive Checks	Judicial Checks
<ul style="list-style-type: none"> ◦ No-Confidence Motions: The government must resign if it loses the confidence of the majority in Parliament. ◦ Question Hour and Censure Motions: Ministers must answer questions posed by Parliament members, and Parliament can express disapproval of the Executive's actions through censure motions. 	<ul style="list-style-type: none"> ◦ Ordinances: The Executive can issue ordinances during Parliamentary recesses, though these must be approved by Parliament to remain effective. ◦ The Executive operates within the framework set by the Legislature and is subject to judicial review of its actions. 	<ul style="list-style-type: none"> ◦ Article 13: If a statute is arbitrary or unconstitutional, the judiciary has the authority to invalidate it. Additionally, it has the authority to deem unconstitutional presidential actions void. ◦ Impeachment and Removal Procedures: Articles 61 and 124(4) of the Constitution detail the impeachment procedures for the President and Supreme Court judges, respectively.

Table No. 1

- ▶ **Oversight:** The Legislature checks the Executive through mechanisms such as **legislative oversight, budgetary control, and the power to impeach officials**. The Parliament also has the authority to question and censure the Executive.

Legislative Authority

- **Article 245:** Grants Parliament the authority to legislate on subjects specified in the Union List and Concurrent List, with respect to State List limitations.
- **Articles 53 and 154:** Vest executive powers with the President at the Union level and the Governors at the State level. These powers are exercised based on the advice of the Prime Minister and Council of Ministers at the central level, and the Chief Minister and Council of Ministers at the state level.
- **Article 123:** Allows the President to promulgate ordinances when Parliament is not in session, addressing urgent legislative needs. These ordinances hold the force of law but must be approved by Parliament to remain effective.
- **Article 361:** The President and the Governor enjoy immunity from court proceedings.

Executive Branch:

- **The branch enforces and administers laws.** The Executive includes the **President, the Prime Minister, and the Council of Ministers**. It is tasked with implementing policies and laws enacted by the Legislature.
- **Checks on Legislature:** The Executive can influence the Legislature through the **President's power to withhold assent to bills**, thereby requiring further deliberation. Additionally, the Executive can issue ordinances in urgent situations, subject to parliamentary approval.

Judicial Branch:

- Judiciary interprets laws and ensures their conformity with the Constitution. The Judiciary, headed by the Supreme Court, reviews laws and governmental actions through judicial review.

Judicial Independence

- **Article 50:** The state shall take steps to separate the judiciary from the executive in the public services of the state.
 - ▶ Article 50 is a directive principle rather than an enforceable mandate.
- **Articles 121 and 211:** The conduct of the judges cannot be taken about in the parliament and state legislature
- **Articles 32 and 136** confer the power of judicial review to the Supreme Court, allowing it to declare laws unconstitutional if they contravene Fundamental Rights (**Article 13**). The High Courts have similar powers under **Articles 226 and 227**.

Checks and Balances Mechanisms

- Checks and balances are **fundamental mechanisms** within a democratic system that prevent any single branch of government from gaining too much power.
- In India, these mechanisms are essential for maintaining a balanced governance structure where the **Legislature, Executive and Judiciary operate independently yet interdependently**.
- The **Indian Constitution's Doctrine of Checks and Balance** was introduced by the Supreme Court in the 1993 decision of **P. Kannadasan v. Tamil Nadu State**.

Table No. 1 given above

STATE EMERGENCY AND IMPACT ON CENTRE-STATE RELATIONS

Context

The recent violence in Manipur has reignited discussions about the **role of emergency provisions in India's federal structure** and their impact on Centre-State relations. This debate focuses on the use of emergency powers under

Articles 355 and 356 of the Indian Constitution, especially in light of the ongoing crisis in Manipur.

How is India's Federal Set-Up?

- India is a **federal republic** with a **division of powers** between the Union and State governments, as outlined in the **Seventh Schedule** of the Constitution.
- States are primarily responsible for maintaining law and order within their territories.

Emergency Provisions:

- Emergency provision is a unique feature of Indian Constitution that allows the Centre to assume wide powers so as to handle special situations.
- The emergency provisions are provided in Part XVIII of the Constitution.
- The Constitution of India provides for three different kinds of abnormal situations which call for a departure from the normal governmental machinery setup by the Constitution:
 - National Emergency (Article 352):** An emergency due to war, an external aggression or armed rebellion.
 - State Emergency or Presidential Rule (Article 356):** Failure of constitutional machinery in states
 - Financial Emergency (Article 360)**
- Articles 355 and 356 deal primarily with the affairs of government in a State under this part.
 - Article 355:** It mandates the **Centre to protect every State from external aggression and internal disturbance**, ensuring State governments operate according to the Constitution. It serves as a safeguard against arbitrary use of Article 356.

- Article 356:** It allows the **imposition of President's Rule** if a State government fails to function in accordance with constitutional provisions. This article is unique to India, as other federal systems like those in the **U.S. and Australia** do not have similar provisions for dissolving State governments.

Table No. 2 given below

Judicial Interpretations

- Misuse of Article 356:** Historically, Article 356 has been misused to dismiss elected State governments for reasons not strictly related to constitutional breakdown.
- S R Bommai Case (1994):** The Supreme Court restricted the misuse of Article 356, stating it should only be used in cases of constitutional machinery breakdown, and is subject to judicial review.
- Widening Scope of Article 355:** Subsequent rulings have expanded the scope of Article 355, allowing the Union to take actions to protect States and ensure constitutional governance.

Suggestions and Recommendations

- Sarkaria Commission (1987)** suggested that Article 355 should empower the Union to take necessary actions for State protection and governance.
- National Commission to Review the Working of the Constitution (2002)** and **Punchhi Commission (2010)** emphasized that Article 356 should be used only as a last resort in extreme situations.

National Emergency vs State Emergency (Key-Differences)		
	National Emergency	State Emergency
Applicability	In situations of war, external aggression or armed rebellion.	In situation of failure of constitutional machinery in State
Effect	No authority to the Centre to suspend the Constitution in a state.	The Council of Ministers is dissolved, vacating the office of Chief Minister. Furthermore, the Vidhan Sabha is either prorogued or dissolved, necessitating a new election.
Fundamental Rights	It affects Fundamental Rights	It does not affect Fundamental Rights
Centre-State Relationship	the relationship of all the states with the Centre changes	the relationship of only one state where the action is taken changes with the Centre
Proclamation	Approved by the Parliament within 1 month and thereafter every 6 months and there is no maximum duration prescribed	Approved by the Parliament within 2 months and thereafter every 6 months, and the maximum period that it remains in force is 3 years.

Table No., 02

ONE NATION-ONE ELECTION

Context

The Union cabinet has accepted a high-level committee's recommendations on 'One Nation, One Election' for holding simultaneous polls for the Lok Sabha, state assemblies and local bodies in a phased manner after a countrywide consensus-building exercise.

What is One Nation, One Election?

- The 'One Nation One Election' proposal aims to hold simultaneous elections for the Lok Sabha (India's national parliament) and all state legislative assemblies.
- This synchronized system is expected to streamline the election process and reduce the frequency of elections across the country.
- Until 1967, independent India had witnessed four simultaneous elections for Parliament and state assemblies.
- **Important Reports/Recommendations**
 - The **Election Commission** first suggested the proposal in 1983. It was reiterated by the **Law Commission in 1999**, under **Justice B.P. Jeevan Reddy**.
 - Subsequent discussions by **parliamentary committees in 2015** and the **Law Commission's draft report in 2018** have also explored its feasibility, though the latter concluded that the current constitutional framework does not support it.
- Amendments in Articles 83 and Article 172 recommended
 - To ensure that simultaneous elections do not conflict with the Constitution, the **Kovind committee** has proposed amendments to
 - ◆ **Article 83**, which governs the term of the Lok Sabha, and
 - ◆ **Article 172**, which covers the tenure of state assemblies
 - The committee suggested a one-time transitory

measure to synchronise all elections and proposed when Lok Sabha is constituted after the general elections, the President would by notification on the same date as that of the first sitting bring into force the provisions for transition.

- This date would be called the appointed date.

Table No. 3 given below

GRAM NYAYALAYAS

Context

The Supreme Court said establishment of Gram Nyayalayas across the country would help improve access to justice.

What are Gram Nyayalayas?

- The Central Government has enacted the **Gram Nyayalayas Act, 2008** to provide access to justice to the citizen at their door steps.
- It provides for **establishment of Gram Nyayalayas** at intermediate Panchayat level. However, the Act **does not make setting up of Gram Nyayalayas mandatory**.
- The State Governments are responsible for establishing Gram Nyayalayas in consultation with the respective High Courts.
 - Section 3 mandates state governments, in consultation with the respective high courts, to establish gram nyayalayas at the panchayat level, functioning as mobile courts capable of conducting proceedings at any suitable location within their jurisdiction.
 - Gram Nyayalayas are deemed to be a Court of **Judicial Magistrate of First Class** with both **civil and criminal jurisdiction** to settle petty disputes at the village level.
 - The concept of Gram Nyayalayas was proposed by the Law Commission of India in its 114th Report.

Challenges Facing Gram Nyayalayas (Village Courts):

- **Inadequate Infrastructure and Resources:** Many gram nyayalayas lack basic facilities required for

One Nation One Election': Pros and Cons

Pros	Cons
<ul style="list-style-type: none"> ◦ Conducting all elections concurrently would save significant resources spent on separate state and national elections. ◦ It would streamline the electoral calendar, eliminating frequent disruptions due to elections in different states. ◦ The Model Code of Conduct often hampers government initiatives and project announcements, which could be avoided with synchronized elections. 	<ul style="list-style-type: none"> ◦ Coordinating elections at various levels of government—national, state, and local—poses logistical and administrative challenges. ◦ Simultaneous polls could favor nationally dominant parties over regional ones, potentially undermining federalism. ◦ If any government, whether at the state or national level, were to collapse before its term, it could lead to complicated scenarios and potential governance issues. ◦ It could affect smaller regional parties ◦ National issues could dominate over regional issues

Table No., 03

conducting trials and hearings. As per a report, 16,000 gram nyayalayas were required, but only a little over 450 were set up with about 300 actually functional.

- **Financial Constraints:** Insufficient financial assistance impacts the ability to cover recurring costs, including salaries for judges and staff.
- **Lack of Awareness:** Rural populations often lack awareness about gram nyayalayas and their functions, coupled with low legal literacy, limiting their use for dispute resolution.
- **Low Case Disposal Rates:** Due to limited resources and irregular functioning, gram nyayalayas have not effectively handled cases, with only 161 cases disposed of out of 42,184 pending.
- **Lack of Integration with Mainstream Judiciary:** There is a need for better coordination and oversight with higher courts, as the current system lacks a clear appeals process.
- **Limited Access to Justice:** When gram nyayalayas are non-functional, rural residents have to travel long distances to reach higher courts, leading to high costs and delays.
- **Judicial Backlogs:** Inefficiencies in gram nyayalayas contribute to a backlog of cases in higher courts.

Benefits of Gram Nyayalayas:

- **Decentralised Justice Delivery:** Bringing courts closer to rural citizens reduces physical and financial barriers. Mobile court sessions (Section 17) are particularly helpful in remote areas.
- **Community-Centric Justice:** Emphasizes conciliation and settlement, aligning with traditional dispute resolution methods that prioritize community cohesion.
- **Increased Inclusivity:** The informal setting and simplified procedures enable self-representation, reducing the need for costly legal representation, which benefits rural communities.



FACT BOX

Recent Initiatives for Justice Delivery

- **National Mission for Justice Delivery and Legal Reforms** was set up in 2011, with the twin objectives of increasing access by reducing delays and arrears in the system and enhancing accountability through structural changes and by setting performance standards and capacities.
- Under the **e-Courts Mission Mode Project**, information and communication technology (ICT) has been leveraged for IT enablement of the Indian Judiciary.
- For the safety and security of women and girl child, **Fast Track Special Courts (FTSCs)** including exclusive POCSO Courts have been set up.

- **Lok Adalat** is an important Alternative Disputes Resolution Mechanism, where the disputes/ cases pending in the court of law or at pre-litigation stage are amicably settled/ compromised
- **Tele-Law Programme** started in 2017 is an effective and reliable e-interface platform connecting the needy and disadvantaged sections seeking legal advice with panel lawyers.
- **Nyaya Bandhu** is India's first dispensation pro bono framework where interested lawyers give pro bono services to the disadvantaged persons registered under **Section 12 of Legal Services Act, 1987**.

NATIONAL PENSION SYSTEM (NPS) AND UNIFIED PENSION SYSTEM (UPS)

Context

All central government employees retiring before April 1, 2025, can choose **Unified Pension Scheme (UPS)**. Employees under **National Pension Scheme (NPS)** (post-April 1, 2004) have the option to switch to UPS. Once a decision is made to switch to UPS, it cannot be reversed.

What is National Pension Scheme?

- The **traditional pension system** in India was the **Old Pension Scheme (OPS)**. Started in 1924 by the British government, it was relaunched by the Indian government post independence. The central government in 2004 introduced the National Pension System (NPS).
- The NPS, established in 2004 and expanded in 2009, was introduced as an alternative to the Old Pension Scheme. It is a **contributory pension scheme** designed to help individuals build a retirement fund through regular contributions.
- **Eligibility:** Open to all individuals aged 18 to 70 years.
- **Objective:** To help investors accumulate a retirement corpus through consistent contributions.
- **Accounts:**
 - ▶ **Tier I Account:** Has a lock-in period of 15 years. Offers additional tax benefits of up to Rs 50,000 per year, beyond the Section 80C limit of Rs 1.5 lakh.
 - ▶ **Tier II Account:** Functions like a savings account with no lock-in period.
- **New Option:** Starting April 1, 2025, central government employees will have the option to switch from the National Pension System (NPS) to the Unified Pension System (UPS) or continue with NPS.

Table No. 4 on next page

Considerations for Employees

- **For Younger Employees:** NPS might be more advantageous due to its flexibility and mobility.

Old Pension Scheme (OPS)	National Pension Scheme (NPS)	Unified Pension Scheme (UPS)
<ul style="list-style-type: none"> Employees received 50% of their last salary as a pension for life, without needing to contribute during their service. Inflation Protection: Included dearness relief to counter inflation. Family Pension: Extended to dependents. 	<ul style="list-style-type: none"> Both employees (10% of salary) and the government (14% of salary) contribute. Investment Choices: Contributions are invested in market-linked securities such as equities and bonds, affecting the final pension amount. Risk: Pension amount depends on market performance, leading to uncertainty. 	<ul style="list-style-type: none"> UPS combines elements of both OPS and NPS. Guarantees a pension of 50% of the average basic salary of the last 12 months before retirement. Indexation: Pension amount is adjusted based on the All India Consumer Price Index for Industrial Workers (AICPI-IW). Contributions: Employees contribute 10% of their salary, and the government contributes 18.5%.

Table No., 04

- For **Tenured Employees:** UPS offers more stability and guaranteed benefits, making it preferable for those closer to retirement.

Sustainability of Pension Schemes

- OPS** was financially challenging for the government due to the lack of employee contributions.
- NPS** puts the sustainability risk on the individual due to market-linked returns.
- UPS** balances between defined benefit and contribution aspects. While it offers a guaranteed pension and inflation protection, it requires significant contributions from both employees and the government.

CHANGES IN CAPITAL GAINS TAXATION

Context:

India's Union Budget 2024-25 introduced significant changes in **capital gains taxation**. These changes aim to **standardize tax rules** for different types of assets and holding periods, impacting investors across various asset classes.

Key Changes in Capital Gains Taxation:

- Uniform Holding Periods:** According to the Union Budget 2024-25, there will now be only two holding periods—12 months and 24 months—to determine whether capital gains are classified as long-term or short-term.
 - This means that all listed assets must be held for at least 12 months for the gains to be considered **long-term capital gains**.
- This change will apply to: **Listed stocks, Listed bonds, Equity exchange-traded funds (ETFs), Gold ETFs, Bond ETFs, Real estate investment trusts (REITs) and Infrastructure investment trusts (InvITs)**

- For **Listed Assets:** Short-term capital gains (STCG) and long-term capital gains (LTCG) are now based on a holding period of 12 months.
- For **Unlisted and Physical Assets:** The holding period to qualify as LTCG is set at 24 months.

Revised Tax Rates:

- STCG on Certain Financial Assets:** Taxed at 20% (previously lower for some assets).
- LTCG on Listed Assets:** Taxed at 12.5% (up from 10%).
- LTCG on Other Assets:** Taxed at 12.5% without indexation (previously 20% with indexation).

The new changes in capital gains tax include:

- The long-term capital gains exemption on financial assets has been raised from INR 100,000 (US\$1194.3) to INR 125,000 (US\$1492.9) per year.
- Listed financial assets** held for more than a year are now considered long-term.
- Unlisted financial assets and all non-financial assets** must be held for at least two years to be considered long-term.
- Unlisted bonds, debentures, debt mutual funds, and market-linked debentures** will be taxed on capital gains at the applicable rates, regardless of the holding period.

Removal of Indexation Benefit:

- Indexation** adjusts the purchase price of an asset for inflation. From July 23, 2024, indexation will no longer apply to calculate capital gains, except for properties sold before this date, where taxpayers can choose between paying 20% with indexation or 12.5% without it.

Exemption Limits and Options:

- ▶ **Section 54:** Exemption on LTCG from selling residential property if reinvested in another residential property within specified timeframes.
- ▶ **Section 54EC:** Exemption on LTCG from selling land/buildings if invested in specified bonds within six months.
- ▶ **Section 54F:** Exemption on LTCG from selling all assets (excluding residential property) if proceeds are reinvested in a residential property.
- **Impact on Non-Resident Indians (NRIs):** NRIs are affected by the new rules based on their residential status. They will face changes in capital gains tax rates from July 23, 2024.

Global Comparison:

- **Singapore, Mauritius, Oman:** No capital gains tax.
- **US:** Capital gains taxed at 0%, 15%, or 20%, depending on income.
- **China:** 20% tax on capital gains from non-share assets; shares are exempt.
- **Brazil:** Progressive tax rates from 15% to 22.5% based on the amount of gain.
- **Japan:** Total capital gains tax rate of 20.315% (15.315% national and 5% local).



FACT BOX

Short-Term Capital Gains (STCG) vs. Long-Term Capital Gains (LTCG)

- **Capital Gains** refer to the profit made from selling an asset (like property, stocks, bonds) at a higher price than what you paid for it.
 - ▶ Capital Assets include items like real estate, stocks, bonds, and jewelry.
- Securities which adhere to rules under the **SEBI Act of 1992** classify as capital assets in India.
- The profits an individual makes from sale or transfer of a capital asset is termed Capital Gains and they attract a **capital gains tax** under the **Income-tax Act, 1961**.
- They are classified as short-term capital gains or long-term capital gains, depending on the period for which the capital asset has been held.
 - ▶ **Short-Term Capital Gains (STCG):** Profits from selling an asset that has been held for a short period.
 - ◆ **Holding Period:** Typically, if you sell an asset within 12 months of buying it, the profit is considered short-term capital gain.
 - ▶ **Long-Term Capital Gains (LTCG):** Profits from selling an asset that has been held for a longer period.

- ◆ **Holding Period:** In India, an asset must be held for more than 12 months to be considered long-term for listed assets, and more than 24 months for unlisted and physical assets.
- ◆ In 2004, STT replaced the **long-term capital gains (LTCG) tax**. But the Budget 2018 brought back LTCG at a rate of 10 per cent on annual gains of over Rs 1 lakh. STT was not removed. Now the government has revised the STT, STCG as well as LTCG. The exemption limit for capital gains though has been raised to Rs 1.25 lakh

INDIA'S COAL INDUSTRY

Context:

India's coal industry plays a crucial role in the country's energy landscape, providing the primary fuel for power generation and various industrial activities.

Recent Developments:

- **Surge in Production:** Over the past fiscal year, India has significantly increased its coal production. The total amount of coal produced has reached about 411.62 million tonnes (MT). This is a notable rise of about 5.85% compared to the same period last year when production was around 388.86 MT.
- **Role of Coal India Limited (CIL):** A significant portion of this increase is due to Coal India Limited, the country's largest coal producer. CIL's output has risen to 311 MT, which is up from 302.53 MT the previous year. This increase is about 2.80%.
- **Coal Dispatches:** The coal being sent out to various consumers, including power plants, has also seen an improvement. As of the same date, dispatches have grown to 442.24 MT, marking a 4.97% increase from the previous year's 421.29 MT. Dispatches specifically to power plants have increased by 4.03%, reaching 362.65 MT.
- **Stock Levels:** Coal stockpiles, which are the reserves held by coal companies, have surged to 76.49 MT, a substantial 49.07% rise from last year. For domestic coal-based thermal power plants, the coal reserves have reached 36.58 MT, showing a growth of 43.68%.

Why It Matters?

- **Energy Security:** The increase in production and stockpiles is crucial for maintaining energy security, especially as coal is a primary energy source for India's power generation.
- **Resilience:** Despite facing challenges like adverse weather conditions that could have disrupted mining operations, the coal sector has shown remarkable resilience.
- **Future Outlook:** The growth in coal production and dispatches suggests that India is bolstering its energy infrastructure and preparing to meet increasing energy demands.

CENTRE TO LAUNCH 'BHASKAR' DIGITAL PLATFORM TO BOOST STARTUP ECOSYSTEM

Context

The **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry**, is set to launch the **BHASKAR initiative**, under the **Startup India** programme, to strengthen the startup ecosystem in the country.

About

- BHASKAR stands for **Bharat Startup Knowledge Access Registry' (BHASKAR)** initiative.
- It is a platform designed to **centralise, streamline, and enhance collaboration** among key stakeholders within the entrepreneurial ecosystem, including **startups, investors, mentors, service providers, and government bodies**.
- This initiative aligns with the **government of India's vision** to transform India into a global leader in innovation and entrepreneurship, reinforcing the country's commitment to the startup movement.
- India is currently home to over **1,46,000 DPIIT-recognised startups** (and ranks third globally, following the US and China.)
- BHASKAR seeks to leverage this potential by providing an all-encompassing, **one-stop digital platform** that addresses the challenges faced by entrepreneurs and investors alike.

Features & Goals

- **Personalized BHASKAR IDs:** Each stakeholder will receive a unique ID, facilitating easier interaction and efficient discovery of opportunities and partnerships.
- **Digital Registry:** BHASKAR aims to create the **world's largest digital registry for startup ecosystem stakeholders**.
- **Central hub:** The platform will offer networking, centralized access to resources, and enhanced discoverability to support India's global brand and entrepreneurial growth.

Start-Up Ecosystem of India

- India is the third-largest startup ecosystem globally with over 1.4 lakh DPIIT-registered startups.
- **Job Creation**
 - **Direct Jobs:** DPIIT-recognized startups have created over **15.5 lakh direct jobs**.
 - **Recent Growth:** In 2023, startups generated 3.9 lakh jobs, marking a 46.6% increase from the previous year and a 217.3% rise over the last five years.
- Startups contributed **USD 140 billion in FY23**, nearly **4% of India's GDP**, highlighting their significant role in

economic growth and innovation.

- **Unicorn:** By January 2024, India boasted **111 unicorn startups** valued at over **US\$ 350 billion**.
- **Inclusivity:** The rise of women-led startups, now at 18%, further highlights the inclusivity and potential of this thriving sector.
- **Top performing sectors:** Retail, Enterprise Applications, Fintech, Transportation & Logistics tech, Food & Agriculture tech, Auto tech, Travel & Hospitality tech, and Edtech.
- **New Emerging sectors** such as DeepTech, SpaceTech, Artificial Intelligence, and EVs have broadened the Indian startup landscape.

Several factors have fueled the growth of top-funded sectors, like:

- increased internet penetration
- digitization
- government initiatives

Key Challenges Faced by Indian Startups

Major issues: Valuation issues, less IPOs, regulatory changes, and macroeconomic and geopolitical trends in 2023

- **Capital Access:** Hard to secure adequate funding, impacting growth and innovation.
- **Investor Challenges:** Risk aversion and uncertain market conditions limit investor confidence.
- **Sustainable Revenue:** Struggles with finding viable business models and achieving profitability.
- **Lack of Support:** Inadequate physical and technological infrastructure, and limited mentorship and networking opportunities.
- **Complexity:** Regulatory and tax structures are complex, creating operational challenges.

Government initiatives and policies to nurture the startup ecosystem

- Initiatives like **'Make in India'** and **'Startup India'** aims to cultivate a business-friendly environment, attract investors and nurture domestic growth.
- **Startup India Hub:** The Startup India Hub, initiated by the Department for Promotion of Industry and Internal Trade (DPIIT), is a pivotal platform to promote engagement among stakeholders within the startup ecosystem.
- **Atal Innovation Mission (AIM):** AIM is an initiative that promotes the establishment of **Atal Incubation Centres (AICs)** and **Established Incubation Centres (EICs)** to nurture innovative startups in their pursuit to become sustainable entities.
- **Ministry of Rural Development (MoRD)** is implementing its flagship scheme **Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM)** to reduce poverty

- ▶ The **Startup Village Entrepreneurship Program (SVEP)** is a sub component of DAY-NRLM to support entrepreneurs in rural areas to set up local enterprises.

- **Ministry of Agriculture and Farmers' Welfare (MoA and FW)** is implementing "Innovation and Agri-Entrepreneurship Development" programme under **Rashtriya Krishi Vikas Yojana (RKVY)** to promote **innovation and agri-entrepreneurship** by providing financial and technical support for nurturing startups ecosystem in the country.

- **National Initiative for Developing and Harnessing Innovations (NIDHI)**: It aims to foster innovation through support for incubators, seed funds, accelerators, and Proof of Concept grants.

- ▶ Within NIDHI, the **Promoting and Accelerating Young and Aspiring Innovators and Startups (PRAYAS)** programme aids established Technology Business Incubators (TBI) by providing grants for Proof of Concept and prototype development.

- **Fund of Funds for Startups (FFS)**: The Government established FFS in 2016, to boost capital availability and stimulate private investments.

- **Startup India Seed Fund Scheme (SISFS)**: Easy availability of capital is essential for entrepreneurs at the early stages of growth of an enterprise.

Ministry-wise Initiatives

- **Ministry of Micro, Small & Medium Enterprises (MSME)**: MSME, through **Khadi and Village Industries Commission (KVIC)**, is implementing **Prime Minister's Employment Generation Programme (PMEGP)** for assisting entrepreneurs in setting up of new enterprises in the non-farm sector.

- ▶ PMEGP being a **Central Sector Scheme** assists General Category beneficiaries with Margin Money (MM) subsidy of 25% of the project cost in rural areas and 15% in urban areas.

- ▶ These states exhibit **higher-than-average per capita incomes**, indicating robust economic performance since liberalization.

- ◆ Before 1991, southern states did not show expectational performance. However, since the economic liberalization of 1991, the southern states have emerged as the leading performers.

Decline of West Bengal

- ▶ West Bengal has experienced a notable decline in its GDP contribution, from 10.5% in 1960-61 to just 5.6% currently.

- ▶ The state's per capita income has plummeted from 127.5% of the national average to 83.7%, now trailing behind states like Rajasthan and Odisha.

- ▶ Despite historical advantages, West Bengal's policies may have hindered its growth, marking it as an exception among maritime states, which have generally prospered.

Performance of Other Regions

- ▶ While Bihar's economic position has stabilized, it still lags behind in growth compared to other states. Conversely, Odisha has shown significant improvements, shedding its previous reputation as a laggard.

- ▶ **Maharashtra continues to be India's largest contributor to GDP**, though its share has decreased from over 15% to 13.3%. Despite this, its per capita income remains high at 150.7% of the national average.

Regional Disparities

- ▶ In the north, Haryana and Delhi have consistently performed well, with **Delhi having one of the highest per capita incomes in the country**.

- ▶ A stark contrast is noted between Punjab and Haryana, where Punjab has seen a decline in per capita income post-2000, while Haryana has surged ahead.

- ▶ Following the Green Revolution, both states experienced a boom in agriculture, leading to increases in their shares. Punjab's share rose to 4.4 per cent and Haryana's to 2.7 per cent by 1970-71.

- ◆ However, Punjab's share plateaued around 4.3-4.4 per cent over the next two decades. It began to decline from 1990-91 onwards and reached 2.4 per cent in 2023-24.

- ◆ In contrast, Haryana's share continued to rise, although it has remained relatively stable since 2010-11. Haryana's share in India's GDP was 3.6 per cent in 2023-24. It is likely that the **success of Gurugram** accounts for some part of Haryana's increasing share.

- ◆ This raises an interesting question: Did Punjab's focus on agriculture contribute to a form of **'Dutch disease'**, hindering its transition to industrialisation?" asked the paper.

EAC-PM PAPER

Context

The recent report by the **Economic Advisory Council to the Prime Minister (EAC-PM)** evaluates the economic trajectories of various Indian states post-liberalization. It emphasizes the **significant economic growth of southern states and contrasts their progress** with the stagnation or decline seen in some other regions, particularly West Bengal and certain northern states.

Key Highlights of the Report

Economic Surge in Southern States

- ▶ Southern states, namely **Karnataka, Andhra Pradesh, Telangana, Kerala, and Tamil Nadu**, now collectively contribute to **30% of India's GDP**.

- ◆ In economics, ‘**Dutch disease**’ is the apparent causal relationship between the increase in the economic development of a specific sector and a decline in other sectors.

- ▶ **Compliance markets** are created as a result of any national, regional and/or international policy or regulatory requirement.
- ▶ **Voluntary carbon markets** (national and international) refer to the issuance, buying and selling of carbon credits, on a voluntary basis.

About the Paper

- The paper ‘Relative Economic Performance of Indian States: 1960-61 to 2023-24’ focused on the relative performance of states in terms of their share of the national economy and their per capita GDP as per cent of the national average since 1960-61.
- The data span from **1960-61 to 2023-24**.
- **Calculation of state’s share in India’s GDP:** The state’s share in India’s GDP is calculated by dividing the Gross State Domestic Product (GSDP) of the state by the sum of GSDP of all states.
 - ▶ **Gross State Domestic Product (GSDP) or State Income** is the indicator for measuring the economic growth of a State.
 - ▶ GSDP is a measure in monetary terms, the **sum total volume of all finished goods and services** produced during a given period of time, usually a year, within the geographical boundaries of the State, accounted without duplication.
 - ▶ The State Domestic Product is classified under three broad sectors such as **Primary sector, Secondary sector and Tertiary sector**.
 - ▶ It is compiled economic activity wise as per the methodology prescribed by the **Central Statistics Office (CSO), GOI** and furnished to the **Ministry of Statistics and Programme Implementation (MOSPI)**.

- **Emission Targets:** The carbon market will set emissions targets for companies. Those who exceed their targets (emit less than their allowance) can sell their extra emission cuts to companies that do not meet their targets.
- **Compliance Procedure:** In August 2024, the **Bureau of Energy Efficiency (BEE)**, responsible for implementing CCTS, released the scheme’s compliance procedures. However, specific emission targets are still to be announced.

What is the purpose of a Carbon Market in India?

- In the short to medium term, the purpose is to increase energy efficiency and reduce emissions per unit of output, while continuing to drive economic expansion (which will result in increased emissions.)
- The goal is to move towards a more efficient use of energy, switching from fossil fuels to renewable energy as power generation increases.
- **Nationally Determined Contributions (NDCs):** This scheme is part of India’s commitment under the Paris Agreement to reduce emissions intensity by 45% from 2005 levels by 2030.
- **Net-Zero Target:** India has also pledged to become a **net-zero emitter** by 2070.
- India is the **world’s third-largest carbon emitter**, contributing 7.3% to the global greenhouse gas emissions in 2021.

INDIA’S CARBON MARKET INITIATIVE

Context:

India is set to establish a carbon market, which aims to control and reduce emissions. This market will be based on the **Carbon Credit Trading Scheme (CCTS)**, announced in June 2023, and is expected to be operational by 2026.

How it Works?

- Carbon markets, also known as **emissions trading mechanisms**, are trading systems in which **carbon credits** are sold and bought.
- It is a mechanism that internalises the cost of **greenhouse gas (GHG) emissions** in goods and services.
- Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that remove or reduce greenhouse gas emissions.
- There are broadly two types of carbon markets:

Driving Factors:

- **Global Influence:** The introduction of the Carbon Border Adjustment Mechanism (CBAM) by the European Union in 2026, which will impose additional tariffs on imports based on their greenhouse gas emissions, is likely pushing India toward this scheme.
- **International Trends:** Other developing countries, such as China and Indonesia, are also developing carbon markets, influencing India’s move.

Current State of Carbon Markets in India

- Globally, there are **over 28 emission trading systems** in existence, and plans are in place for more than 21 additional national and sub-national emission trading markets. Meanwhile, India is actively developing a framework for its domestic carbon market.
- India currently operates two market-based emission reduction schemes: **the Perform, Achieve and Trade (PAT) scheme and the Renewable Energy Certificates (REC) system**.
 - ▶ **PAT scheme** targets energy-intensive industries such as **aluminium, cement, chlor-alkali, fertiliser,**

iron and steel, paper and pulp, railways, thermal power and textiles. Under this scheme, the government sets energy reduction goals, known as **specific energy consumption (SEC)**, for companies in particular sectors. If a company uses less energy per unit of production than the established targets, it can earn certificates (ESCCerts) as a reward for saving energy. The earned ESCerts can be traded on Power Exchanges and purchased by other units participating in the PAT scheme to fulfill their compliance needs.

- **REC system** operates under the **Renewable Purchase Obligation (RPO)**, which mandates electricity generators to produce a certain percentage of their total power from renewable sources like solar and wind, etc. These certificates can be traded and are intended to promote the use of renewable energy sources.

Challenges and Issues:

- **Oversupply of Credits:** For instance, the EU Emissions Trading System faced issues with credit oversupply, leading to fluctuating prices.
- **Carbon Leakage:** The EU's Carbon Border Adjustment Mechanism (CBAM) addresses concerns of companies moving operations to countries with lax regulations.
- **Offset Projects:** The effectiveness of carbon offset projects (like tree planting) is questioned due to difficulties in measuring their carbon absorption potential.

RETHINKING RAPA NUI

Context

Recent studies have challenged **long-held beliefs** about the **population dynamics and environmental impact of the early inhabitants of Rapa Nui (Easter Island)**. The findings suggest that the island's population was never as large as previously thought and that the alleged ecological collapse leading to the island's demise may be an oversimplification.

What are Rapa Nui?

- Rapa Nui, commonly known as **Easter Island**, is a **remote volcanic island** in the **southeastern Pacific Ocean**, famous for its hundreds of large stone statues called **Moai**.
- It is one of the **most isolated inhabited places on Earth**, located about **1,900 kilometers from the nearest inhabited island** and nearly **3,800 kilometers from the Chilean mainland**.
- The island was first settled around **1210 AD** by ancestors of **contemporary Polynesians**.

Previous Theory

- The previous theory posited that **Rapa Nui's population experienced rapid growth, leading to environmental degradation**. It was believed that the inhabitants deforested the island to construct the **Moai** and to use wood for fuel, leading to a **collapse of the ecosystem**.
- This theory painted the island as a **cautionary tale of "ecocide,"** where human actions irrevocably destroyed the environment, resulting in the population's decline.

What Has Been Found Now?

Recent research indicates that the population of Rapa Nui **may never have exceeded sustainable levels**. Instead of a **significant population collapse**, it appears that early inhabitants maintained a stable population by adapting to the island's challenging conditions. Key findings include:

- **Rock Gardens:** Early settlers constructed **rock gardens to cultivate sweet potatoes**, which allowed them to secure a **food supply** despite the island's limited agricultural potential. This technique involved scattering stones over low-lying areas to create favorable microclimates for crop growth.
- **Population Estimates:** The area covered by these rock gardens is much smaller than previously assumed—less than 188 hectares, or less than 0.5% of the island. This could only sustain a population of about 2,000, contradicting earlier estimates that suggested larger numbers.
- **Diet and Adaptation: Isotope analysis of bones and teeth** indicates that early inhabitants derived a significant portion of their diet from the **sea (35-45%)** and supplemented it with less nutritious plants. This adaptability suggests resilience in managing limited resources.
- **Stable Population at European Contact:** When Europeans first arrived in 1722, the population of Rapa Nui was around 3,000, aligning with the findings that the island's inhabitants successfully adapted to its environmental constraints.

These discoveries challenge the narrative of a catastrophic collapse, suggesting instead that the islanders demonstrated resilience and ingenuity in the face of ecological limitations.



FACT BOX

Ecocide

- Ecocide refers to 'killing one's home' or 'environment'. Such 'killing' could include port expansion projects that **destroy fragile marine life and local livelihoods; deforestation; illegal sandmining; polluting rivers with untreated sewage**.
- There is **no accepted legal definition of ecocide**.
- Ecocide is a crime in 11 countries, with 27 other nations mulling laws around criminalising environmental damage that is wilfully caused and harms humans, animals and plant species.
- **India's stance:** Some Indian judgments have used the term 'ecocide' in passing, but the concept hasn't fully materialised in law.
- In **Chandra CFS and Terminal Operators Pvt. Ltd. v. The Commissioner of Customs and Ors, the Madras High Court noted**, "... the prohibitory activities of ecocide has been continuing unbridledly by certain section of people by removing the valuable and precious timbers..."

- The ongoing *T.N. Godavarman Thirumulpad vs Union Of India & Ors* case in Supreme Court called attention to an “anthropogenic bias” and argued that “**environmental justice could be achieved only if we drift away from the principle of anthropocentric to ecocentric.**”

QUANTUM COMPUTING FOR BETTER LANGUAGE MODELS

Context

Recent advancements in **artificial intelligence (AI)**, especially in **natural language processing (NLP)** and **generative AI (Gen-AI)**, have significantly transformed how we interact with technology. Major companies like OpenAI, Google, and Microsoft have developed **large language models (LLMs)** that excel in text generation and understanding. These models have improved human-computer interactions by providing experiences that closely mimic human understanding. However, the rise of these technologies has also highlighted several **challenges and potential areas for improvement.**

Challenges with Current LLMs

- **High Energy Consumption:** LLMs, such as GPT-3 with 175 billion parameters, require **enormous amounts of energy for training and operation.** Training such models can consume as much energy as an average American household uses in 120 years, and emit significant carbon dioxide, equivalent to running a large data center for a year.
- **Limited Control and “Hallucinations”:** LLMs, trained on vast datasets, can produce text that seems coherent but may be factually incorrect or nonsensical. This issue arises from the models’ inability to fully understand context or verify factual accuracy.
- **Challenges with Syntax:** While LLMs are proficient in understanding semantics (meaning), they struggle with syntax (sentence structure). This limitation can lead to errors in generating contextually appropriate text.

How Quantum can solve the challenges?

Quantum Computing offers a promising way to address these limitations. Quantum computing is a new type of computing that uses the **principles of quantum mechanics** to tackle problems that are too complex for even the most powerful traditional computers. It uses quantum phenomena like **superposition and entanglement** to perform computations more efficiently than classical systems.

- **Quantum Natural Language Processing (QNLP):** QNLP leverages quantum computing to enhance language models. It requires fewer parameters than traditional LLMs, potentially reducing energy consumption and improving accuracy. QNLP models can better understand both syntax and semantics simultaneously, addressing the issues of “hallucinations” and misinterpretations.

- **Quantum Generative Models for Time-Series Forecasting:** A recent development in quantum computing involves using quantum generative models (QGen) to analyze time-series data. A QGen model from Japan has shown the ability to work effectively with both stationary (e.g., commodity prices) and nonstationary data (e.g., stock prices). These models require fewer parameters and computational resources compared to classical methods, offering a more efficient solution for forecasting and anomaly detection.

Implications and Future Directions

- **Sustainability:** By reducing the energy requirements and improving the efficiency of AI systems, quantum computing can make LLMs more sustainable and cost-effective.
- **Accuracy and Efficiency:** QNLP and QGen models promise to enhance the accuracy of language processing and time-series forecasting, offering significant improvements over current technologies.
- **Research and Development:** Continued research in quantum computing and its applications in AI could lead to more sophisticated and environmentally friendly technologies.



FACT BOX

- **Artificial Intelligence (AI):** Artificial Intelligence (AI) refers to the field of computer science dedicated to creating systems or machines that can perform tasks typically requiring human intelligence. These tasks include reasoning, problem-solving, learning, and understanding.
 - ▶ **Applications:** Automation, Healthcare, Finance, Transport
- **Natural Language Processing (NLP):** NLP is a subfield of AI focused on enabling computers to understand, interpret, and generate human language in a meaningful way.
 - ▶ Applications:
 - ◆ **Chatbots and Virtual Assistants:** Like Siri, Alexa, and Google Assistant.
 - ◆ **Text Classification:** Spam detection in emails, content moderation.
 - ◆ **Language Translation:** Services like Google Translate.
 - ◆ **Information Retrieval:** Search engines and question-answering systems.
- **Generative AI (Gen-AI):** Generative AI involves creating new content or data based on input from a user. Unlike traditional AI that focuses on classification or prediction, generative AI is designed to generate new, original content.
 - ▶ **Key Techniques:** Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs)

- ▶ **Applications:** Content Creation, Data Augmentation, Personalization
- **Large Language Models (LLMs):** LLMs are a type of deep learning model designed to process and generate human-like text based on vast amounts of data. They are trained to understand and generate text in a way that mimics human language.
- ▶ **Examples:** GPT-3 (Generative Pre-trained Transformer 3), BERT (Bidirectional Encoder Representations from Transformers), T5 (Text-to-Text Transfer Transformer)
- ▶ **Applications:** Chatbots and virtual assistants, Text Completion and Summarization, Creative Writing, Question Answering

SC STOPS ILLEGAL 'BULLDOZER JUSTICE' ACTIONS

Context

By invoking its special powers under Article 142 of the Constitution, the Supreme Court froze **illegal bulldozer demolitions** across the country until October 1, highlighting reports of "**glorification, grandstanding, and even justifications**" of the destruction of private homes and properties belonging to undertrials and their families.

What is Bulldozer Justice?

- "Bulldozer Justice" refers to the practice where government authorities demolish the properties of individuals accused of crimes, such as rioters or protestors, often without a legal trial.
- This involves using heavy machinery like bulldozers to tear down homes or businesses, as a way to punish these individuals swiftly.
- **Why it is supported?** Supporters of "Bulldozer Justice" see it as a deterrent to discourage unlawful activities. They believe it provides **instant justice**, in contrast to the **lengthy judicial process**.

Criticism of Bulldozer Justice

- Bulldozer justice is a practice that is "**inconceivable**" in a nation governed by the rule of law.

- Bulldozing alleged illegal properties of crime accused without serving notice is a **violation of the rule of law**.
- Any state action, including demolitions, must be in accordance with the law and not used arbitrarily.
- The guilt of the accused must be proved before a court of law and the punishment should be given by the judiciary and not by executive action.
- It is a **gross violation of law, human rights and the principles of natural justice**.
- The demolitions often occur without proper legal procedures, **violating the fundamental principle of due process**.

Impact on Society

- **Public Perception:** The societal acceptance of "**instant justice**" reflects a troubling shift in attitudes towards legal processes. The glorification of demolitions as a deterrent undermines the foundational **principles of justice and equality before the law**.
- **Homelessness and Violation of Rights:** The destruction results in **severe human rights violations**, rendering families homeless and destabilizing communities.
- **Judicial Responsibility:** The reliance on the judiciary to curb executive overreach is a concerning trend in Indian democracy. It raises critical questions about the **effectiveness of existing laws and the accountability of government officials**.

Recommendations for Future Action

- **Implementation of Guidelines:** There is an urgent need for the Supreme Court's proposed guidelines to be effectively implemented, ensuring that all demolitions are conducted legally and with due process.
- **Accountability Mechanisms:** Establishing mechanisms to hold **government officials accountable** for unlawful demolitions can deter misuse of power and restore faith in governance.
- **Public Awareness:** Increasing public awareness about **legal rights** and the **importance of due process** can help foster a more informed citizenry that challenges unlawful state actions.



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SECTION - B

QUICK BYTES

GATEWAYS
OF THE GREAT STUPA

CONTEXT

External Affairs Minister S Jaishankar visited the replica of the **East Gate of Sanchi's Great Stupa** standing in front of **Humboldt Forum museum in Berlin**.

About The Great Stupa of Sanchi
(Madhya Pradesh)

- The Great Stupa of Sanchi was commissioned by **Emperor Ashoka** in the **3rd century BCE**.
 - ▶ Ashoka, reigned during the 3rd century BCE, embraced Buddhism and undertook the construction of this **monumental stupa** as a means to enshrine the Buddha's relics.
 - ▶ The stupa represents one of the oldest and largest stone structures in India.
- The Sanchi complex saw ongoing construction and embellishments until as late as the 12th century CE.
- During the Gupta dynasty, Sanchi was expanded much further. These feature a Buddhist temple and a lion pillar.

What is Stupa?

- A stupa is a **Buddhist commemorative monument** designed to house sacred relics of the Buddha or other revered saints.
- Originating from **pre-Buddhist burial mounds** found in India, the stupa is characterized by its **hemispherical shape**, which symbolizes the **universe's divine essence**.

Important Features

- **Chhatra**: While the core stupa itself is a **plain hemispherical structure** topped with a **chhatra** (a parasol symbolizing the protection of the Buddha's relics), the surrounding complex includes various stupas, temples, and monasteries.
- **Toranas (Gateways)**: The Great Stupa is renowned for its four intricately carved gateways, known as **toranas**, which are oriented towards the four cardinal directions.
 - ▶ They were constructed in the **1st century BCE** during the reign of the **Satavahana dynasty**.
 - ▶ The four gateways are arranged chronologically as follows: southern, northern, eastern, and western.
 - ▶ These toranas are composed of **two square pillars** topped with **three curved architraves (beams)** that feature spirally-rolled ends.
 - ▶ Each torana is adorned with elaborate bas-reliefs and sculptures that depict scenes from the **Buddha's life**, **Jataka Tales** (stories of the Buddha's past lives), and other Buddhist iconography.
 - ◆ In Europe, the East Gate (one of the **four toranas**) is the most famous of the **Sanchi toranas** due to its plaster cast, made by **Lieutenant Henry Hardy Cole** for the **Victoria and Albert Museum** in the late 1860s.
 - ◆ This cast was the basis for **numerous replicas** displayed across Europe.

The East Gate and Its Replicas

- The Sanchi complex fell into ruin until its rediscovery by British officer **Henry Taylor in 1818**.
- The first formal survey and excavation were conducted by **Alexander Cunningham in 1851**, who later founded

the **Archaeological Survey of India (ASI)**.

- The site was restored in the early **20th century** under **ASI director-general John Marshall**, with financial support from the begums of Bhopal.
- Before the restoration efforts of the late 19th and early 20th centuries, Sanchi was frequently looted.
- The **Humboldt Forum’s replica of the East Gate** involved advanced technology, including 3D scanning, modern robotics, and collaboration between German and Indian sculptors. The replica was crafted using artificial stone and enlarged photographs of the original torana to ensure accuracy.
- **Artistic Details of the East Gate**
 - **Upper Architrave:** Depicts the seven Manushi Buddhas, representing previous Buddhas in the lineage, with the historical Buddha being the latest incarnation.
 - **Middle Architrave:** Illustrates the Great Departure, portraying Prince Siddhartha leaving his palace in Kapilavastu to seek enlightenment as an ascetic.
 - **Lower Architrave:** Shows Emperor Ashoka visiting the Bodhi tree, where the Buddha attained enlightenment.

DISCOVERY OF ANCIENT URN BURIALS IN KERALA

CONTEXT

A **rainwater harvesting project** in Koduvayur has uncovered numerous **megalithic urn burials** atop **Kundlikkad hill**, shedding light on the **connections between the Mesolithic and Iron Age periods in Kerala**.

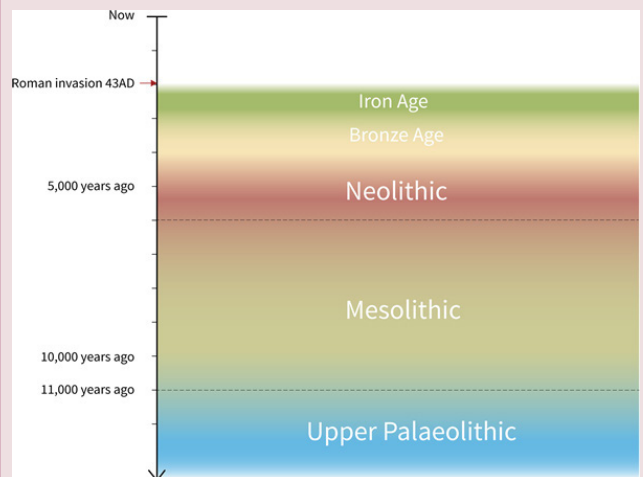
Key-highlights

- Such urn burials are rarely found on hilltops and could date back over 2,500 years, though further excavation is needed for precise dating.
 - **Urns:** These burials typically involve the use of large pottery urns that contain the ashes or remains of the deceased. The urns can vary in size and design, often reflecting the cultural practices of the community.
- Various pottery shards, including black and red ware, were discovered, revealing the craftsmanship of the megalith builders. Chisel marks on rocks indicate that these burial structures were carefully crafted.

The Stone Age (6,000-4,000 BP (Before Present))

Stone Age was a long prehistoric period characterised by the use of stone tools. It started about 2.5 million years ago with the arrival of the early humans ('Homo Habilis' and Australopithecus). The Stone Age is separated into three additional categories:

- **Paleolithic (Old Stone Age):** It dated from 2.5 million years ago to 12,000 years ago. It is characterised by the use of rudimentary stone tools, and a hunter-gatherer lifestyle
 - **Key Innovations:** Transition from crude pebble tools to advanced handaxes; control of fire around 1 million years ago was pivotal for human progress.
 - **Important sites in India-** Bhimbhetka, Belan, Chota Nagpur plateau (Bihar), Renigunta in Chittoor and Kurnool, Muchchatla Chintamani Gavi (Andhra Pradesh) and Imamgaon (Maharashtra).
- **Mesolithic (Middle Stone Age):** It spanned roughly from 20,000 to 10,000 B.C.E., varying by region.
 - **Characteristics:** Notable for the rise of pottery, peak hunter-gatherer cultures, and the beginnings of permanent settlements.
 - **Important sites in India-** Adamgarh(M.P) and Bagor in Rajasthan – earliest domestication of animals. Bhimbetka caves (Madhya Pradesh), Kharwar, Jaora and Kathotia (M.P), Sundargarh and Sambalpur (Odisha), Ezhuthu Guha (Kerala). Langhnaj (Gujarat), Sarai-Nahar-Rai (Pratapgarh U.P), Paisara(Munger Bihar).
- **Neolithic (New Stone Age):** It began around 10,000 B.C.E., marked by the agricultural revolution.
 - **Impact:** Farming enabled permanent settlements and laid the foundation for organized societies, particularly flourishing in the Fertile Crescent and spreading to Europe, Africa, and Asia.
 - **Important sites in India-** Burzahom, Gufkral, Chirand, Piklihal, Brahmagiri, Maski, Takkalakota, HallurKoldihwa and Mahagara
- The Stone Age was followed by the Bronze Age which began around the year 2300 BC.



Mesolithic Period

- The Mesolithic Age is the period of time between the **Palaeolithic Age** and the **Neolithic Age**. The exact beginning of this part of the **Stone Age** varies from region to region
- **Characteristics:**
 - ▶ Transition from hunter-gatherer societies to more settled lifestyles.
 - ▶ Development of microliths (small stone tools) for hunting and gathering.
 - ▶ Use of natural resources and early forms of domestication.
 - ▶ Emergence of semi-permanent settlements near water sources.
- **Tools in the Mesolithic Age:** The Mesolithic Age is characterized by a significant advancement in tool technology compared to the earlier Palaeolithic era. Here are the primary tools from this period:
- **Points:** Sharp, pointed tools often used for making spears. It was essential for hunting and fishing, allowing for more effective food procurement.
- **Stone Awls:** Sharp tools designed for piercing. It was used to poke holes in animal hides, aiding in the creation of clothing and shelter.
- **Scrapers:** Tools with a flat edge used for scraping surfaces. It was employed to prepare hides, wood, and other materials, crucial for various daily tasks.
- **Advancements (Microlithic Technology):** Unlike the simple pebble tools of the Palaeolithic era, Mesolithic tools were often smaller and more specialized. This technology allowed for more complex and efficient designs, supporting a diverse range of activities such as hunting, gathering, and crafting.
- **Life in the Mesolithic Age:** Transition to Agriculture, Permanent Settlements, Continued Hunting:

Iron Age (1200 B.C. and 600 B.C)

- **Timeframe:** Generally begins around 1,200 BCE and varies by region, lasting until the rise of classical civilizations. It followed the **Stone Age and Bronze Age**.
- **Characteristics:**
 - ▶ Widespread use of iron for tools and weapons, leading to advancements in agriculture and warfare.
 - ▶ Development of more complex societies, including the rise of cities and states.
 - ▶ Increased trade, social stratification, and cultural diversity.
 - ▶ Significant advancements in **art, architecture, and writing systems**.

POET-SAINT THIRUVALLUVAR

CONTEXT

The Madras High Court has recently dismissed a petition seeking to officially recognize the birthday of **Tamil saint-poet Thiruvalluvar** on the '**Anusham**' star day in the month of **Vaikasi** instead of the currently observed date on the second day of Thai. The court emphasized the lack of concrete evidence to substantiate claims regarding Thiruvalluvar's actual date of birth.

About Tamil Saint-Poet Thiruvalluvar

- Thiruvalluvar is a revered figure in Tamil literature and culture, known primarily for his work, the **Tirukkural**, a classic text composed of 1,330 couplets that encompass ethics, morality, and governance.
- His teachings advocate for virtuous living and are celebrated for their universal relevance, transcending regional and cultural boundaries.
- Thiruvalluvar is often depicted as a **symbol of Tamil identity** and pride, and his contributions are honored through various celebrations, including **Thiruvalluvar Day**.
 - ▶ This day, observed on the **second day of Thai**, serves as a tribute to his philosophical teachings and impact on Tamil literature.
- Despite the absence of concrete historical records regarding his life and exact date of birth, Thiruvalluvar remains an iconic figure, with numerous statues, temples, and public spaces dedicated to him across Tamil Nadu and beyond.
- Some accounts place him in the 3rd or 4th century CE; others date him to around 500 years later, in the 8th or 9th century.

DISENGAGEMENT IN EASTERN LADAKH

CONTEXT

China recently announced that its troops have disengaged (process where military forces pull back or withdraw from positions they occupied) from four locations in eastern Ladakh, including the Galwan Valley.

Locations of Disengagement

The disengagement has occurred in the following four areas in eastern Ladakh:

- **Galwan Valley:** The Galwan river valley is strategically located between Ladakh in the west and Aksai Chin in the east, which is currently controlled by China as part of its Xinjiang Uyghur Autonomous Region.
 - ▶ Galwan River has its source in Aksai Chin, on China's side of the LAC, and it flows from the east to Ladakh, where it meets the Shyok river on India's side of the LAC.



Figure No. 01

- ◆ The LAC lies east of the confluence of the **Galwan and Shyok rivers** in the valley.
- ▶ At its western end are the Shyok river and the Darbuk-Shyok-Daulat Beg Oldie (DSDBO) road. Its eastern mouth lies not far from China's vital Xinjiang Tibet road, now called the G219 highway.
- **Pangong Lake (North and South Banks):** Pangong Lake, situated at a height of almost 4,350m, is the world's highest saltwater lake.
 - ▶ Extending to almost 160km, one-third (45 km) of the Pangong Lake lies in India and the other two-thirds in China. The Line of Actual Control (LAC) passes through the lake, and both countries have conflicting claims over the territory surrounding it.
 - ▶ It is accessible via a high-altitude mountain pass, the **Chang La**, which is one of the **highest motorable passes in the world**.
 - ▶ **Khurnak Fort** lies on the northern shore of Pangong Tso and has been in Chinese-held territory since 1958. Before 1958, the boundary between India and China was considered at the Khurnak Fort but the latter has wrested control since then
- **Gogra and Hot Spring:** Both Hot Spring (PP15) and Gogra (PP17A) are part of the 65 patrolling points along the Line of Actual Control (LAC) in Ladakh.
 - ▶ PP15 is located in an area known as the Hot Springs, while PP17A is near an area called the Gogra post.
 - ▶ Both of these are close to the **Chang Chenmo river** in the Galwan sub-sector of the LAC in eastern Ladakh.
 - ▶ While Hot Springs is just **north of the Chang Chenmo river**, Gogra Post is **east of the point** where the river takes a hairpin bend coming southeast from Galwan Valley and turning southwest.
 - ▶ The area is north of the **Karakoram Range of mountains**, which lies north of the Pangong Tso lake, and south east of Galwan Valley.

Demchok and Depsang Friction Points

There has been no progress towards resolution of two important friction points (Demchok and Depsang) in the past two years.

About Demchok and Depsang

▫ **Depsang Plains**

- ▶ The Depsang Plains are located close to the strategically important **Daulat Beg Oldie**.
- ▶ The crucial **Sub-Sector North (SSN)** consists of the **Depsang plains and Daulat Beg Oldie (DBO)**. Currently, the airfield at DBO is accessible by the 255 km-long Darbuk-Shyok-DBO (DSDBO) road.
- ▶ In Depsang Plains, Chinese troops have been blocking Indian Army patrols from going up to the **PPs 10, 11, 11A, 12 and 13**, beyond the **Y junction**.
- ▶ Chinese build-up in this area threatens Indian positions at DBO and also brings Chinese troops closer to the DSDBO road.
- ▶ Depsang is also close to the **Karakoram pass** overlooking the strategic **Saltoro ridge and Siachen glacier**, the **world's highest battlefield**.
- ▶ The Depsang Plains issue began in 2013 when China carried out an 18-km incursion in the area.

▫ **Demchok**

- ▶ Demchok is in the southern part of eastern Ladakh,
- ▶ In Demchok, the problem is mainly at the **Charding Ninglung Nullah (CNN) junction**.

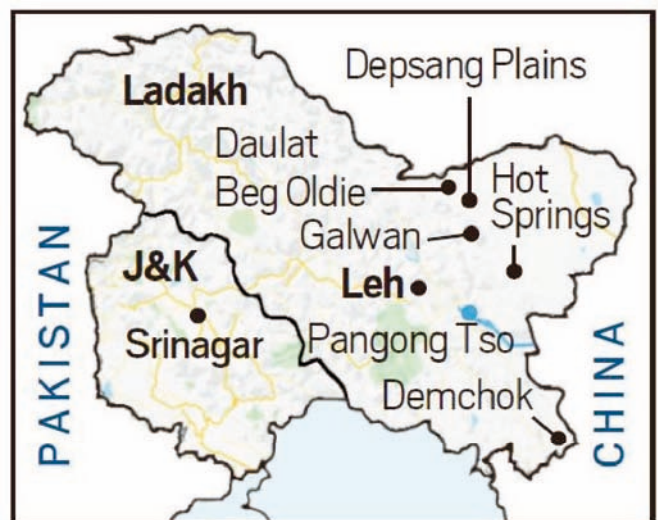


Figure No. 01



FACT BOX

India-China Dispute

- India and China have disputed border in the Himalayan region.
- The root cause is an ill-defined, 3,440km (2,100-mile)-long disputed border.
- The LAC has never been demarcated.
- The India-China border is divided into three sectors



Figure No. 03

- ▶ **Western:** The boundary dispute in the Western Sector pertains to the Johnson Line proposed by the British in the 1860s that extended up to the Kunlun Mountains and put Aksai Chin in the then princely state of Jammu and Kashmir.
- ▶ **Middle:** In the Middle Sector, the dispute is a minor one. It is the only one where India and China have exchanged maps on which they broadly agree.
- ▶ **Eastern:** The disputed boundary in the Eastern Sector of the India-China border is over the **MacMahon Line**.
- **Line of Actual Control (LAC):** The LAC refers to territory under the effective control of each side, not to their entire territorial claim.
- **Patrolling points (PPs):** Along the Line of Actual Control (LAC) between India and China, Indian Army has been given certain locations that its troops have to access to patrol the area under its control. These points are known as patrolling points, or PPs, and are decided by the **China Study Group (CSG)**.
 - ▶ CSG was set-up in 1976, when Indira Gandhi was the prime minister, and is the apex decision-making body on China.

INDUS WATER TREATY

CONTEXT

Citing “fundamental and unforeseen” changes in the circumstances, India has sent a formal notice to Pakistan to seek a review of the **Indus Water Treaty (IWT)**.

What is Indus Water Treaty?

- The Indus Water Treaty (IWT) was signed in 1960 between India and Pakistan with the World Bank as a signatory.
- **Division of Water Resources:** Under the provisions of the treaty:
 - ▶ **Eastern rivers**—the Sutlej, the Beas and the Ravi—are available for unrestricted use by India
 - ▶ **Western rivers**—the Indus, the Jhelum and the Chenab—are available for unrestricted use by Pakistan
- In effect, the treaty gave **India about 30% of the water carried out by the “Indus Rivers System” while Pakistan got 70% of the waters.**
- This arrangement aimed to ensure equitable water sharing, fostering cooperation between the two nations.
- **Dispute Resolution Process:** Article 9 of the treaty outlines a dispute resolution process, breaking it

down into three categories: question, differences and disputes.

- ▶ Under the treaty, the two countries have agreed to first attempt to resolve disputes through the **permanent commission** and seek the **World Bank's assistance** in appointing a neutral expert or set up an arbitration at the **Permanent Court of Arbitrage in The Hague, Netherlands**, if required.

Why India Wants to Renegotiate the Indus Water Treaty?

- **Changing Circumstances:** Key concerns include **shifts in population demographics, environmental challenges**, and the imperative to **advance clean energy development** to meet emission targets.
- **Hydroelectric Projects Controversy:** The push for renegotiation comes amidst a prolonged dispute over two hydroelectric projects in Jammu & Kashmir—**Kishanganga and Ratle**.
 - ▶ Both projects are designed to utilize the natural flow of rivers for electricity generation without obstructing them.

Indus River

- The Indus is a transboundary river of Asia and a trans-Himalayan river of South and Central Asia.
- The 3,120 km (1,940 mi) river rises in mountain springs northeast of Mount Kailash in Western Tibet, flows northwest through the disputed region of Kashmir, bends sharply to the left after the Nanga Parbat massif, and flows south-by-southwest through Pakistan, before emptying into the Arabian Sea near the port city of Karachi.
- **Significance:**
 - ▶ The river has historically been important to many cultures of the region.
 - ▶ The 3rd millennium BC saw the rise of the Indus Valley civilization, a major urban civilization of the Bronze Age.
 - ▶ During the 2nd millennium BC, the Punjab region was mentioned in the Rigveda hymns as Sapta Sindhu and in the Avesta religious texts as Saptha Hindu (both terms meaning "seven rivers").

GOVERNMENT OVERHAULS STATISTICAL ADVISORY BODIES

CONTEXT

The **Union Ministry of Statistics and Programme Implementation** has decided to dismantle the **Standing Committee of Statistics**, chaired by **Pronab Sen**, and replace it with a **new Steering Committee** headed by **Professor Rajeeva Laxman Karandikar**, Chairman of the **National Statistical Commission (NSC)**.

About the Standing Committee on Statistics (SCoS)

- The 14-member SCoS was established in July 2023.
- The SCoS was tasked with advising the Union government on various aspects of survey methodology, including **sampling frames, design, and the finalization of survey tabulation plans**.
- Despite its critical role, the existence of both the SCoS and the National Statistical Commission (NSC) created a dual advisory structure that led to confusion and inefficiencies in the management of **National Sample Survey Office (NSSO) surveys**.
- The overlapping responsibilities of these two bodies necessitated a more integrated approach to statistical oversight and coordination.
- To address this, the government has decided to dissolve the SCoS and replace it with a new Steering Committee.

New Steering Committee

- The new Steering Committee will be chaired by **Professor Rajeeva Laxman Karandikar**, who also serves as the Chairman of the NSC.
- The membership of the Steering Committee will consist of the same experts from the former SCoS, ensuring continuity and expertise in the transition.
- **Census Responsibilities**
 - ▶ It is important to note that the responsibility for conducting the national census does not fall under the purview of the **Ministry of Statistics and Programme Implementation, the NSC, or the NSSO**.
 - ▶ The **Population Registrar General**, operating under the **Ministry of Home Affairs**, is the designated authority for all census-related matters.

Statistical Setup

- The **Ministry of Statistics and Programme Implementation (MoSPI)** came into existence in 1999.
- It serves as the central nodal agency for the country's official statistics system.
- It attaches considerable importance to coverage and quality aspects of statistics released in the country.
- The Ministry has two wings
 - ▶ **Statistics:** The Statistics Wing re-designated as **National Statistics Office (NSO)** consists of the **Central Statistics Office (CSO) and National Sample Survey Office (NSSO)**.
 - ◆ CSO is an attached Office and NSSO is subordinate Office under the control of Ministry of S&PI.
 - ▶ **Programme Implementation:** The Programme Implementation Wing has three Divisions, namely,

- ◆ Twenty Point Programme.
- ◆ Infrastructure and Project Monitoring
- ◆ Member of Parliament Local Area Development Scheme.

About National Statistical Office (NSO)

- **Established in:** 2005
- The NSO is part of the **Ministry of Statistics and Programme Implementation (MoSPI)**.
- It collects, analyzes, and publishes statistical data on the country's population, economy, and society.

RESIGNATION FROM CM'S POST

CONTEXT

Delhi chief minister Arvind Kejriwal resigned from the post in two days — five months before his tenure is set to end.

About Chief Minister

- **State Executive** consists of Governor and Council of Ministers with Chief Minister as its head.
- Chief Minister is the elected head of the state government.
- **Appointment (Article 164):** The Chief Minister is appointed by the Governor and the other Ministers are appointed by the Governor on the advice of the Chief Minister.
- **Duty (Article 147):** It shall be the duty of the Chief Minister of each State-
 - ▶ To communicate to the Governor of the State all decisions of the Council of ministers relating to the administration of the affairs of the State and proposals for legislation;
 - ▶ To furnish such information relating to the administration of the affairs of the State and proposals for legislation as the Governor may call for; and
 - ▶ If the Governor so requires, to submit for the consideration of the Council of ministers any matter on which a decision has been taken by a minister but which has not been considered by the Council.
- **Qualification:** To be eligible for this role, a person must:
 - ▶ Be a citizen of India.
 - ▶ Be at least 25 years old.
 - ▶ Be a member of the state legislature.
- **Tenure:** The Chief Minister's term is not fixed and depends on the Governor's discretion. The Governor cannot remove the Chief Minister unless:
 - ▶ The Chief Minister loses the confidence of the majority in the State Legislative Assembly.

- ▶ The State Legislative Assembly passes a motion of no confidence against the Chief Minister.

- **Removal:** As per the law, a Chief Minister can only be disqualified or removed from office when he is convicted in any case.
- **No protection from arrest:** President of India and Governors of states and Union Territories are the **only constitutional post holders** who are immune from civil and criminal proceedings until his/her term ends, as per the law.
 - ▶ But the immunity **doesn't cover the Prime Ministers or Chief Ministers** who are treated as equals in front of the Constitution that advocates the **Right to Equality before the law. Yet, they are not disqualified just by an arrest.**



FACT BOX

President's Rule

- Delhi's power structure is characterised by a delicate balance between the **elected government (Chief Minister) and the Central government-appointed LG**.
- The LG can recommend to the President who can invoke **Article 239AB** citing "failure of constitutional machinery".
- President's rule under **Article 239AB** was invoked in Delhi only once, in 2014, subsequent to Mr. Kejriwal's resignation 49 days into his first tenure as Chief Minister.

CABINET APPROVES PM-AASHA SCHEME

CONTEXT

The Union Cabinet approved the continuation of the **Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) scheme**, allocating Rs. 35,000 crore for the **15th Finance Commission Cycle**, extending until 2025-26.

What is PM-AASHA?

- Pradhan Mantri Annadata Aay Sanrakshan Abhiyan' (PM-AASHA) is an **umbrella scheme** to ensure **Minimum Support Price (MSP)** to farmers.
- It comprises the erstwhile **Price Support Scheme (PSS)** with certain modifications and rolling out of new schemes of **Price Deficiency Payment Scheme (PDPS)** and pilot of **Private Procurement and Stockist Scheme (PPSS)**.

Integration of Schemes:

- The government has merged the Price Support Scheme (PSS) and the Price Stabilisation Fund (PSF) under PM-AASHA to enhance efficiency in supporting both farmers and consumers.

- PM-AASHA will now have the components of:
 - ▶ **Price Support Scheme (PSS):** Starting from the 2024-25 season, the government will procure pulses, oilseeds, and copra at Minimum Support Price (MSP), covering 25% of national production. A 100% procurement policy will be implemented for Tur, Urad, and Masur to prevent distress sales.
 - ▶ **Price Stabilisation Fund (PSF):** The PSF aims to protect consumers from volatile price changes by maintaining a buffer stock of essential commodities like pulses and onions. The Department of Consumer Affairs (DoCA) will procure these commodities when market prices exceed the MSP, discouraging hoarding and speculative trading.
 - ▶ **Price Deficit Payment Scheme (PDPS):** The coverage for this scheme has increased from 25% to 40% of state production for oilseeds, with the implementation period extended from three to four months. The Central Government will cover up to 15% of the difference between the MSP and market price.
 - ▶ **Market Intervention Scheme (MIS):** The MIS has been adjusted to support perishable horticultural crops by raising coverage from 20% to 25% of production. The government will now handle transportation and storage costs for tomato, onion, and potato (TOP) crops, aiding price stability during peak harvesting periods.

- ▶ **July's IIP:** Increased to 4.83%, up from 4.72% in June. This indicates a small improvement in industrial activity, suggesting that factories and businesses are producing more goods.



FACT BOX

What is CPI-based Inflation or Retail Inflation?

- CPI-based Inflation or Retail Inflation is a metric that is used to measure inflation.
- CPI measures **retail inflation** by collecting data on the **prices of goods and services** that are consumed by the retail population of the country.
- CPI meaning refers to an increase in the price level of a selected basket of goods and services over a select period of time.
- It is a **macroeconomic indicator of inflation**. It is a tool for the central bank and government for inflation targeting and for inspecting price stability, and as deflator in the national accounts.
- **Calculation:** It is calculated by referring to a base year which is a benchmark. The base year is monitored by the **Central Statistics Office, Ministry of Statistics and Programme Implementation (MoSPI)**, and changes from time to time.
 - ▶ MoSPI updated the base year of the **Consumer Price Index (CPI)** from 2012 to 2024 to improve economic data accuracy.
- **Categories:** Food and beverages, clothing, housing, fuel and light, etc.
- **CPI formula:** $(\text{Price of basket in current period} / \text{Price of basket in base period}) \times 100$

CPI-BASED INFLATION OR RETAIL INFLATION

CONTEXT

India's **Consumer Price Index (CPI)-based retail inflation** increased to 3.65 per cent in August (from 3.60 per cent in July), according to the government data. The Reserve Bank of India (RBI) aims to keep inflation around 4%.

More on News

- CPI inflation in August remains below the 4% mark, food price pressures continue
- **Food inflation** as measured by the Consumer Food Price Index inched up marginally to 5.66% in August from 5.44% in July. It was at 9.94% in August 2023.
- **Core Inflation:** This excludes volatile items like food and fuel to provide a clearer picture of underlying inflation trends.
 - ▶ **Current Rate:** Stands at 3.5%. Despite this, there have been slight increases in prices for clothing (2.72%) and services like recreation (2.31%), education (3.74%), and health (4.10%).
- **Industrial Production:** The Index of Industrial Production (IIP) tracks the output of factories, mines, and utilities. It reflects how much industrial activity is happening in the economy.

VANDE BHARAT EXPRESS TRAINS

CONTEXT

Prime Minister Narendra Modi virtually inaugurated six new Vande Bharat Express trains, marking another milestone in India's expanding rail network. The six new routes inaugurated include services between **Tatanagar-Patna, Brahmapur-Tatanagar, Rourkela-Howrah, Deoghar-Varanasi, Bhagalpur-Howrah, and Gaya-Howrah.**

About

- Vande Bharat is India's first indigenously designed and manufactured **semi-high-speed train**.
- These semi-high-speed trains has transformed rail travel in India. Originally launched as **Train 18** in 2019, these trains have become a game-changer for Indian Railways, connecting major cities in half the time.

- According to the Indian Railways, these trains have already completed approximately 36,000 trips and carried over 3.17 crore passengers.
- The fleet travelled a distance equivalent to 310.7 rounds of the Earth in the fiscal year 2023-24.
- The extensive network of these trains covers more than 280 districts across 24 states and Union Territories, highlighting their widespread reach and efficiency.
- The newest iteration, **Vande Bharat 2.0**, boasts several technological upgrades, including:
 - faster acceleration
 - indigenous 'Kavach' safety system
 - WiFi
 - anti-virus system
- These features make it a state-of-the-art option for travelers, ensuring both speed and safety.
- Earlier this year, **Coal India** entered into a joint venture with **Bharat Heavy Electricals Limited (BHEL)** to establish a new AN plant in Odisha, with an investment of Rs 11,782 crore.
 - Once operational, the joint venture is expected to produce 2,000 tonnes of ammonium nitrate per day.

AMMONIUM NITRATE DUMPING

CONTEXT

The **sharp increase in the import of ammonium nitrate (AN)** from Russia has raised alarms among domestic fertilizer companies, which are currently investing over Rs 4,000 crore to ramp up their AN production capacity.

The Issue at Hand

- The import of ammonium nitrate surged to 2.39 lakh tonnes in the last fiscal year, up from just 91,236 tonnes in FY22. This significant increase has resulted in a decline in domestic capacity utilization, which fell from 91% to 72%.
- A key factor contributing to this issue is the **substantial price gap** between domestic and imported AN.
- Countries that benefit from low-cost, subsidized natural gas, a critical raw material for AN production, are able to sell their products (dump) at much lower prices.
 - Dumping** is the export of a product at a price that is lower in the foreign market than the price charged in the exporter's domestic market.
- Industry stakeholders are calling for urgent measures to curtail imports of ammonium nitrate, aiming to eventually stop them altogether.
- Achieving self-reliance in AN production** would not only enhance the sustainability of coal production but also contribute to energy security in the country.

India's Capacity for Ammonium Nitrate Production

- India currently has an installed ammonium nitrate production capacity of **10.96 lakh tonnes per annum**, with an **additional 10.19 lakh tonnes per annum capacity** under development by major fertilizer companies, including **Rashtriya Chemicals and Fertilizers, Gujarat National Fertilizer, and National Fertilizer**.

Importance of Ammonium Nitrate

- Ammonium nitrate is a chemical compound with the formula NH_4NO_3 . It is a white crystalline salt consisting of ions of ammonium and nitrate.
- Usage:**
 - Fertiliser:** Ammonium nitrate is a widely used fertilizer, primarily due to its nitrogen content. The compound consists of two key components: **NH₄ (ammonium)** and **NO₃ (nitrate)**.
 - Plants can directly absorb nitrogen from the nitrate form, while the ammonium fraction is gradually converted into nitrate by soil microorganisms.
 - Mining operations:** It is used as an explosive for blasting before the extraction of ores such as coal, iron, and limestone.
 - Other than the above, it is used as an ingredient for manufacture of **anaesthetic gases, cold packs**, etc.

TWO YEARS OF PROJECT CHEETAH

CONTEXT:

An ambitious project of the Central government of reintroducing Cheetahs in India successfully completed two years after being declared extinct in 1952. The **Cheetah Action Plan (CAP)** is India's initiative to reintroduce African cheetahs into the country's ecosystems.

What is Project Cheetah?

- Launched in:** 2022
- Project Cheetah** is India's ambitious attempt to introduce African cats in the wild in the country. Cheetah were the only large carnivore species that went extinct in Independent India.
- The project is the first-ever intercontinental translocation of the big cats.
- As part of the project, 20 cheetahs have been brought to the **Kuno National Park in Madhya Pradesh** so far -- eight from Namibia in September 2022 and 12 from South Africa in February 2023.
- Current status:**
 - Since they arrived in India, eight adult cheetahs -- three females and five males -- have died.

- ▶ Seventeen cubs have been born in India, with 12 surviving, bringing the total number of cheetahs, including cubs, in Kuno to 24. Currently, all are in enclosures.
- **Objective:** Introduce African cheetahs to India to **conserve the species** and **restore degraded dry-open forest/savanna ecosystems**. The cheetahs are intended to boost eco-tourism and benefit local communities.
- **Timeline:** The population is expected to reach Kuno National Park’s carrying capacity in about 15 years and the wider landscape in 30-40 years.
- **Why Kuno National Park?** Kuno was chosen as the most suitable location among ten surveyed sites due to its habitat and prey base. However, cheetahs have been held captive here longer than planned.
 - ▶ Additional sites like **Banni Grasslands** in Gujarat and **Nauradehi Wildlife Sanctuary** in Madhya Pradesh are being considered for cheetah introduction.

Current Issues with the Project

- **Extended Captivity:** The cheetahs have faced **prolonged captivity**, far beyond the planned 1-2 months. This extended confinement has led to concerns about their readiness for the wild.
 - ▶ Radio-collared males and females were supposed to be released in stages but have faced delays. The extended captivity may affect their ability to adapt to the wild.
- **Cheetah Fatalities:** Several cheetahs have died due to **health issues or accidents**. Problems include pre-existing health conditions, improper management, and environmental stressors.

WORLD OZONE DAY

CONTEXT

September 16 is designated as the International Day for the Preservation of the Ozone Layer by the United Nations to protect the fragile shield of the Ozone layer, which protects the planet Earth from the harmful ultraviolet radiations from the Sun. India has been celebrating this day since 1995. The theme for this year is **“Montreal Protocol: Advancing Climate Actions”**.

What is Ozone (O3)?

- Ozone (O3) is a reactive gas made up of three oxygen atoms. The word ‘**ozone hole**’ refers to areas or regions harmed by damaging UV radiations.
- It is found in the stratosphere (15-30 km above Earth) and at ground level.
- **Characteristics:** Pale blue gas with a distinct odor. Measured in Dobson Units (DU); typical concentration is around 300 DU.
 - ▶ **Dobson Unit (DU)** is the unit of measurement for measuring the amount of ozone in a column of air above the Earth’s surface.

Ozone Layer Depleted

- ▶ **Regions Affected:** Mainly Antarctica and the Arctic, with greater recognition in Antarctica.
- ▶ **Mechanism:** Depletion is linked to **low stratospheric temperatures** and the **presence of halogen source gases (e.g., chlorofluorocarbons (CFCs) and halons)** which weaken the ozone layer.
- ▶ **Impact of Human Activities:** Industrial activities and consumer goods contribute to ozone depletion through emissions of ozone-depleting substances.

Harmful Effects of Ozone Depletion

- **Human Health:** Increased UVB radiation leads to higher **risks of skin cancer, cataracts, and other health issues**.
- **Flora:** UVB radiation negatively affects plant growth and development.
- **Marine Life:** UVB impacts phytoplankton, affecting the marine food chain.
- **Terrestrial Life:** Increased UVB alters biogeochemical cycles, impacting greenhouse gas levels.

Montreal Protocol

- **Adopted:** September 16, 1987
- The Montreal Protocol is the landmark multilateral environmental agreement that regulates the production and consumption of man-made chemicals referred to as **ozone-depleting substances (ODS)**.
 - ▶ The **stratospheric ozone layer** is damaged by these ODS.
- **Implementation:** Phases out ODS with specific timetables for developed and developing countries. Requires annual reporting, trade controls, and licensing systems.

Key Achievements

- **Hydrochlorofluorocarbons (HCFCs):** Phased out due to their ozone-depleting effects.
- **Universal Ratification:** On September 16, 2009, the Montreal Protocol was universally ratified.
- **Kigali Amendment:** Approved in October 2016 to phase down hydrofluorocarbons (HFCs) due to their high global warming potential. The goal is to reduce HFCs by 80-85% by the late 2040s.

NEW DISCOVERY OF DUNG BEETLE SPECIES

CONTEXT

Recent research in Bengaluru has brought a new focus to one of the city’s last remaining vast grasslands—the **Hesaraghatta grasslands**. Scientists have identified a new species of **dung beetle, Onitis visthara**, adding to the global count of such beetle species and underscoring the ecological importance of these grasslands.

About the New Species

- The newly discovered beetle, *Onitis visthara*, is part of a small but ecologically significant group of beetles.
- Dung beetles, of family **Scarabaeidae**, process and decompose cow dung by feeding, breeding, and nesting in it.
- *Onitis* species are **tunnellers**; they bury large quantities of cattle dung beneath the dung pat to provide food for their larvae.
- *Onitis visthara* is named for its relatively broader appearance (*visthara* is breadth in Kannada).
- The discovery adds to the global tally of *Onitis* species, bringing the total number to 179.
- In addition to *Onitis visthara*, two other new species were identified:
 - ▶ *Onitis kethai* (Biligiri Rangaswamy Temple Tiger Reserve, Karnataka)
 - ▶ *Onitis bhomorensis* (Tezpur, Assam)

Ecological Role of Dung Beetles

- ▶ **Waste Management:** They decompose and bury dung, helping to reduce the volume of waste and associated greenhouse gas emissions. This function is particularly important in India, where livestock waste significantly contributes to climate change.
- ▶ **Nutrient Cycling:** By breaking down dung, beetles enhance soil fertility and nutrient availability.
- ▶ **Soil Aeration:** Their activities improve soil structure and aeration.

Seed Dispersal and Parasite Control: Beetles also aid in the dispersal of seeds and help control parasites that could otherwise impact livestock health

INDIA'S NEW MOUNTAIN TANK: ZORAWAR

CONTEXT

In response to the operational challenges faced during the standoff with China in Eastern Ladakh and the lessons learned from the ongoing Russia-Ukraine conflict, India's Defence Research and Development Organisation (DRDO) has developed its first 'mountain tank', named **Zorawar**. This tank aims to address the specific needs of high-altitude and rugged terrain deployment.

About

- The Zorawar tank has been developed by DRDO's Combat Vehicles Research & Development Establishment (CVRDE) in collaboration with Larsen & Toubro (L&T).
- The project, named after the historic **General Zorawar Singh Kahluria**, took approximately three years to complete.

Key Features of Zorawar

- **Mobility and Deployment:**
 - ▶ **Weight:** 25 tonnes, making it light enough for air transport by helicopter.
 - ▶ **Speed:** Capable of traveling at about 60 kilometers per hour on land.
 - ▶ **Deployment:** Designed for high-altitude areas and able to perform effectively in both mountainous and desert terrains.
- **Armament:**
 - ▶ **Main Gun:** Equipped with a Cockerill 3105 turret, featuring a 105-millimetre calibre gun.
 - ▶ **Additional Armament:** Can be fitted with machine guns and anti-tank guided missiles.
 - ▶ **Fire Capability:** Capable of firing at high angles, allowing it to perform limited artillery roles.
- **Durability and Design:**
 - ▶ **Armor:** Strong armor for its category, providing enhanced protection.
 - ▶ **Water Mobility:** Can wade through water, adding to its versatility.
 - ▶ **Modularity:** Built in a modular fashion to allow for future upgrades and modifications.

NEW GNSS-BASED TOLL COLLECTION

CONTEXT:

The Indian Ministry of Road Transport and Highways has introduced **National Highways Fee (Determination of Rates and Collection) Amendment Rules, 2024**, for toll collection on national highways. These new regulations, expected to be implemented soon, aim to streamline toll payments and provide some relief to frequent travelers. This change involves integrating a **Global Navigation Satellite System (GNSS)** with the existing Fastag toll system.

The New Rules:

- **Free Travel Benefit:** Vehicle owners equipped with GNSS technology will be allowed to travel up to 20 kilometres daily on select highways and expressways without paying a toll.
- **Charges Beyond 20 Kilometres:** Fees will apply only for distances traveled beyond this 20-kilometre limit each day.
- **Implementation:** The GNSS-based system will initially be tested on select highways and will work alongside the current Fastag system.

What is GNSS-Based Toll Collection?

- GNSS (Global Navigation Satellite System) uses satellites to track vehicle locations. This technology calculates toll fees based on the distance traveled, following a pay-as-you-use model.

- **Efficiency:** By using satellites, the GNSS system aims to eliminate the need for vehicles to stop and wait at toll booths, thus speeding up the toll collection process.
- **Integration with Fastag:**
 - **Current System:** Fastag is an electronic toll collection system that uses Radio Frequency Identification (RFID) technology to facilitate quick toll payments.
 - **New System:** GNSS will be implemented as an additional feature. Vehicles with GNSS will have dedicated lanes at toll plazas equipped with advanced readers for smooth identification.
 - **Penalties:** Non-GNSS vehicles entering GNSS lanes will be fined.
- **Expected Benefits:**
 - **Reduced Congestion:** By reducing the need to stop at toll booths, the new system is expected to decrease traffic congestion at toll plazas.
 - **Cost Savings:** Frequent travelers can benefit from the 20-kilometre free travel allowance.

CHOLERA OUTBREAK

CONTEXT

Climate change is worsening health issues globally, yet fundamental problems like clean water, hygiene, and sanitation often receive less attention. Recent WHO cholera data underscores this issue, revealing how inadequate sanitation and unsafe water, exacerbated by climate change, lead to preventable diseases and reduced quality of life. Addressing these basic needs is crucial for preventing health crises and improving community well-being.

About

- Cholera is an **acute diarrhoeal disease** caused by the ingestion of water or food contaminated with vibrio cholerae.
- This bacterial disease is caused by the bacterium *Vibrio cholerae*.
- It can cause **severe diarrhoea, vomiting, leg cramps, and weakness**, and people with low immunity such as malnourished children and people living with HIV/AIDS are at greater risk of death if infected.
- The most common pathways of contracting the germs are by eating food cooked by infected people, drinking contaminated water, and shaking hands with infected people.
- The main symptom of cholera is severe acute watery diarrhoea that lasts for three to seven days.

Treatment: Oral rehydration solution (ORS), Intravenous fluids, Antibiotics, Zinc (in children younger than 5). If treatment is delayed, this can lead to excessive and fast dehydration and possibly death.

WHO's data:

- The global cholera crisis is worsening, with a 17% increase in deaths and a 13% rise in cases from 2022 to 2023.

- Cholera, a preventable and treatable disease, caused 4,000 deaths last year and continues to spread, with 22 countries reporting active outbreaks into 2024.
- In South-East Asia alone, 5,052 cholera and acute watery diarrhoea cases were reported from January to July 2024, with 2,400 deaths globally.
- Conflict, climate change, unsafe water and sanitation, poverty and displacement all contributed to the rise in cholera outbreaks last year.

THE RISE OF DARK PATTERNS

CONTEXT

As digital platforms become central to everyday life, a concerning trend has emerged: **dark patterns**. These deceptive design practices manipulate users into making decisions they might not otherwise make, such as subscribing to unwanted services or disclosing personal information. Dark patterns exploit human psychology to benefit companies at the expense of consumers.

What is dark patterns?

- The term 'dark patterns' by **Harry Brignull in 2010** refers to methods misleading users into giving money, time, or personal information.
- Dark patterns are carefully crafted interfaces that trick people into making decisions or performing actions that they otherwise would not.
- Dark patterns can range from **subtle omissions to outright lies**, but what they all have in common is that they undermine users' intentions and cost them time or money they never meant to spend.
- Dark patterns exploit human psychology for the sole purpose of encouraging people to act against their best interests. This is unethical and can be illegal.
- **Government Interventions**
 - **Guidelines for Prevention and Regulation of Dark Patterns 2023:** The Guideline specify 13 dark patterns namely; False urgency, Basket Sneaking, Confirm shaming, forced action, Subscription trap, Interface Interference, Bait and switch, Drip Pricing, Disguised Advertisements and Nagging, Trick Wording, Saas Billing and Rogue Malwares.
 - **Consumer Protection (E-commerce) Rules, 2020 (for protecting consumers from unfair practices)**

Prevalence in India's E-Commerce Sector

- India's e-commerce sector is booming, expected to reach \$350 billion by 2030.
- This growth, fueled by **increasing internet and smartphone** use—with 936.16 million internet subscribers and 350 million active online users—has also seen a rise in dark patterns.
- Common tactics include creating **false urgency, burying subscription cancellations, and using confusing language to mislead users.**
- **Global regulations to address dark patterns**
 - European Union's Digital Services Act (DSA)
 - General Data Protection Regulation (GDPR)
 - Unfair Commercial Practices Directive (UCPD)

Cyber Law in India

- **Information Technology Act, 2000 (IT Act):** The Act serves as the foundation of cyber law and covers types of cybercrimes, imposes punishments for crimes involving unauthorized accessing into computer systems stealing data, hacking, cyberterrorism and spreading inappropriate or offensive material on the internet.
- **Digital Personal Data Protection Act, 2023 (DPDPA):** DPDPA focuses on regulating data collection, processing, storage and usage while bolstering privacy safeguards with an emphasis on securing minor consent through the permission of guardian.
- India has made huge strides in cybersecurity by establishing the **National Cyber Coordination Centre (NCSC)** and the **Indian Computer Emergency Response Team (CERT In)** to combat cyber threats, data breaches and to improve cybersecurity resilience.
- **New criminal laws:** The **Bharatiya Nagarik Suraksha Sanhita, 2023**, the **Bharatiya Nyaya Sanhita, 2023**, and the **Bharatiya Sakshya Adhinyam, 2023** laws are part of a larger plan to update India's legal system in response to the changing digital world and the rising threat of cybercrime.

OPENAI'S NEW AI MODELS O1 AND O1-MINI (PROJECT STRAWBERRY)

CONTEXT

OpenAI has launched new AI models named **o1** and **o1-mini**. The o1 model is part of **OpenAI's secretive Project Strawberry**, focusing on enhancing AI's reasoning abilities. It is designed to tackle complex tasks in science, coding, and mathematics, the o1 model represents a significant leap in AI capabilities.

About

- The o1 model is engineered to approach problems more thoughtfully, mimicking human-like problem-solving. It evaluates queries from multiple perspectives, checks its outputs, and learns from errors.
- Although the new models lack the ability to browse the web or process uploaded files and images like the **GPT-4o model**, they can refine their "**thinking process**" by trying new strategies and recognising mistakes.
- **Performance:**
 - ▶ In a mathematics contest, the o1 model solved 83% of problems, a major improvement over earlier versions that solved only 13%.
 - ▶ In coding tasks, it outperformed 89% of participants.

- **Availability and Access:**
 - ▶ **Current Access:** Available in ChatGPT for Plus and Team subscribers, with a weekly message limit (30 for o1-preview and 50 for o1-mini).
 - ▶ **Future Updates:** OpenAI plans to expand availability and introduce a feature for automatic model selection based on user prompts.

Differences Between o1 and o1-mini

- ▶ **o1 Model:** It offers advanced reasoning and problem-solving abilities. It is suitable for complex tasks and applications requiring deep problem-solving capabilities.
- ▶ **o1-mini Model:** It is smaller, faster, and more cost-effective version of the o1 model. It is 80% cheaper than the o1 model. It is designed for efficiency in coding tasks and applications where extensive world knowledge is less critical.

DIGI YATRA

CONTEXT:

Recent findings from a study highlight concerns about the **potential misuse of facial recognition technology**, such as the **Digi Yatra app**. While Digi Yatra aims to streamline airport check-ins and boarding, there is significant apprehension regarding the **abuse of biometric data by private entities**.

About

- **Developed by:** Digi Yatra Foundation and the Ministry of Civil Aviation
- **Objective:** To provide air travelers with a hassle-free, frictionless, and health-risk-free experience.
- **Functionality:** It uses facial biometrics as a single token to digitally confirm travel, identification, and health data.
- **Technology:** It is based on a **Self-Sovereign Identity (SSI) ecosystem** with Privacy by Design principles to ensure security and privacy of biometric and personal information.
- **Process:** It links a traveler's boarding pass to a **facial recognition system (FRS)** for quicker identification and smoother passage through boarding gates and pre-security checks.



FACT BOX

Face Recognition Technology

- Facial recognition is a way of identifying a human face through technology known as biometrics, oftentimes mapping facial features from a photograph or video and then comparing the information with a database of known faces to find a match.
- It uses technology and biometrics — typically through AI — to identify human faces.

How Does Facial Recognition Work?



- 1 Software analyzes photos or videos of a face.
- 2 Software creates a map of a person's facial features.
- 3 Facial recognition systems compare the individual's facial signature to its database.
- 4 The facial recognition system determines whether or not the facial signature is a match to anything in its database.

Figure No. 04

NIPAH VIRUS

CONTEXT

A 24-year-old student has died from the Nipah virus in the southern Indian state of Kerala.

What is Nipah?

- Nipah virus is a **zoonotic virus** transmitted from animals to humans. The virus was first identified in Malaysia in 1998.
- It is transmitted to humans mainly from fruit bats, pigs, contaminated fruits, or through human-to-human transmission.
- **Symptoms:** Symptoms can range from asymptomatic infection to acute respiratory infection.
 - **Initial symptoms:** headache, muscle pain, vomiting, and sore throat, later leading to severe respiratory issues, atypical pneumonia, and neurological issues such as encephalitis. O
 - **Other symptoms:** dizziness, drowsiness, and altered consciousness.
- Nipah can cause a **lethal, brain-swelling fever** in humans.

Pros

- Easy and time-saving
- **Safety:** Airports use facial recognition to identify criminals or potential threats.
- **Identify criminals** from photos or videos.
- **Find missing persons** using facial recognition technology.
- **Phone security:** Many phones today use facial recognition to unlock or verify your identity before purchasing.

Cons

- **Mistaken identity:** Relying on facial recognition alone can lead to falsely identifying criminal suspects.
- Inaccuracies with older adults
- Wearing a mask, sunglasses, or even certain makeup can make it less accurate.
- It can violate privacy
- Poses security risks
- Potential ownership issues

- **Fruit bats** are known as the **reservoir of the virus**, and all the outbreaks in Kerala had been reported during the May-September period – the rainy season.
- Nipah is classified as a **priority pathogen** by the **World Health Organization (WHO)** because of its potential to trigger an epidemic.
- There is **no vaccine** to prevent infection and no treatment to cure it.

Other important zoonotic viruses:

- **Rabies Virus:** It is primarily transmitted through the bite of an infected animal, such as dogs, bats, or other mammals.
- **Hantavirus Pulmonary Syndrome (HPS) and Hemorrhagic Fever with Renal Syndrome (HFRS):** Contact with rodent urine, droppings, or saliva.
- **Ebola Virus Disease (EVD):** Direct contact with blood, bodily fluids, or tissues of infected animals like bats or primates.
- **Lassa Fever Virus:** Contact with urine or feces of infected rodents (multimammate rats).
- **SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus):** Respiratory droplets and contact with infected animals (e.g., civet cats).
- **MERS-CoV (Middle East Respiratory Syndrome Coronavirus):** Respiratory droplets and contact with camels or infected individuals.
- **Zika Virus:** Primarily through mosquito bites, but can also be transmitted through sexual contact and from mother to baby.
- **West Nile Virus:** Mosquito bites, with birds as the primary reservoir.
- **Influenza A Virus (Avian Flu):** Contact with infected birds or their droppings.
- **Tick-borne Encephalitis Virus:** Tick bites, and possibly through consumption of unpasteurized dairy products.

CABINET APPROVED BHARATIYA ANTARIKSH STATION

CONTEXT

The Union Cabinet has approved the development of the first module of the Bharatiya Antariksh Station (BAS-1) by expanding the scope of the Gaganyaan programme. This decision marks a crucial step towards establishing India's own space station by 2035 and paves the way for a crewed lunar mission by 2040.

About the revised Gaganyaan programme

- The Gaganyaan Programme was approved in 2018. It envisages undertaking the human spaceflight to

Low Earth Orbit (LEO) and to lay the foundation of technologies needed for an Indian human space exploration programme in the long run.

- The **revised Gaganyaan programme** now encompasses eight missions to be completed by December 2028, including the launch of the **BAS-1 unit**.
 - ▶ This expansion involves **additional uncrewed missions** and hardware requirements to support the ongoing human spaceflight initiatives.
- The total funding for the Gaganyaan programme has been increased to Rs 20,193 crore, with an additional allocation of Rs 11,170 crore to accommodate the expanded scope.
- The programme aims to develop and demonstrate critical technologies for long-duration human space missions, with four missions under the ongoing Gaganyaan programme scheduled by 2026, followed by the development of the BAS-1 module and four additional missions for technology demonstration and validation by 2028.

Significance of Bharatiya Antariksh Station

- ▶ The Bharatiya Antariksh Station is expected to boost microgravity-based scientific research and technology development, fostering innovations in key areas. This initiative is also anticipated to generate increased employment opportunities in high-technology sectors related to space and allied industries. Beyond its technological and scientific objectives, the expanded programme aims to inspire India's youth to pursue careers in science and technology, offering unique opportunities in microgravity research and development.
- ▶ The resulting innovations and technological spin-offs are expected to benefit society at large, positioning India as a leading nation in space exploration and research.

The Cabinet also approved the Chandrayaan-4 mission to Moon and the Venus Orbiter Moon to Earth's mysterious twin.

What is Chandrayaan-4?

- Chandrayaan-4 is India's upcoming lunar mission, aimed at developing and demonstrating technologies necessary for a successful return to Earth after landing on the Moon. It will also focus on collecting lunar samples for analysis back on Earth.
- **Key Features of Chandrayaan-4**
 - ▶ **Development and Launch:** The mission will be developed and launched by the Indian Space Research Organisation (ISRO) and is expected to be completed within 36 months.
 - ▶ **Budget:** The total cost of the Chandrayaan-4 mission is ₹2,104.06 crore, which encompasses spacecraft development, two LVM3 launches, deep space network support, and necessary special tests.

- ▶ **Technological Self-Sufficiency:** This mission aims to enhance India's self-sufficiency in technologies related to manned missions and lunar sample analysis, with significant contributions from Indian industries and academic institutions.
- **Venus Orbiter Mission (VOM):** The Venus Orbiter Mission (VOM) will focus on scientific exploration to deepen our understanding of Venus's atmosphere and geology, generating valuable scientific data through its analysis of the planet's thick atmosphere.
- **Key Features of VOM**

- ▶ **Scientific Objectives:** The mission aims to orbit Venus with a scientific spacecraft that will study its surface, subsurface, atmospheric processes, and the influence of the Sun on its atmosphere.
- ▶ **Importance of Venus:** Understanding Venus is crucial, as it is believed to have once had conditions suitable for habitability, similar to Earth.
- ▶ **Launch Schedule:** The Venus Orbiter Mission is scheduled for launch in March 2028, marking another significant step in India's space exploration endeavors.



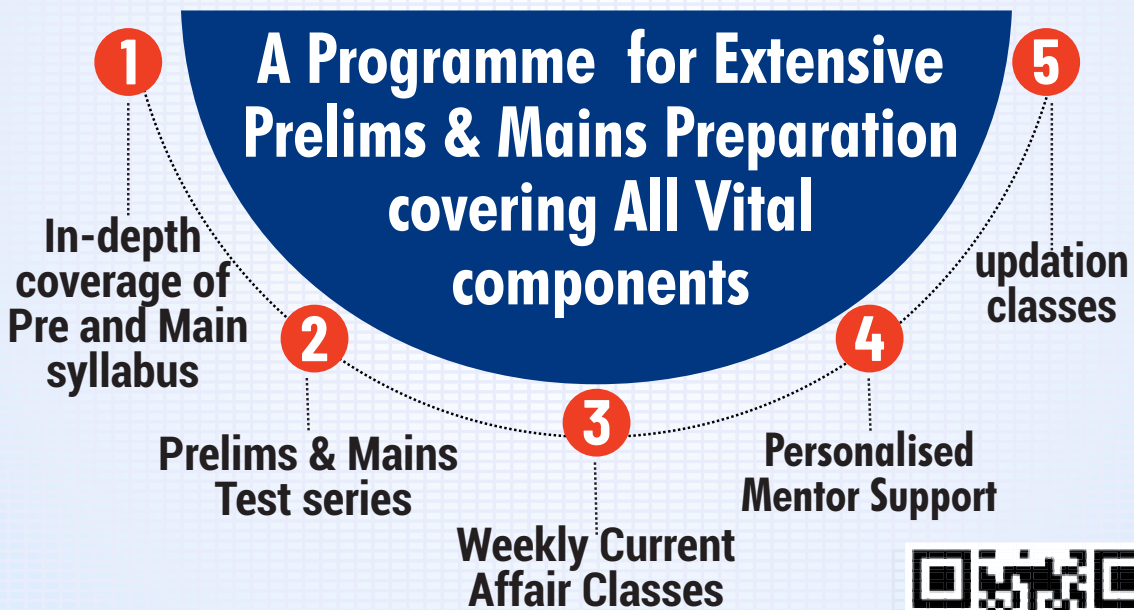
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