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INDIA'S SEMICONDUCTOR MANUFACTURING

IT ACT AND CONTENT BLOCKING

PRIORITY SECTOR LENDING

EUTELSAT

BANGUS VALLEY

TOPPER'S RECOMMENDED

BEST CHOICE

Contents

PRELIMS

POLITY & GOVERNANCE

COMPTROLLER AND AUDITOR GENERAL OF INDIA

Context: The Supreme Court decided to examine a plea challenging the sole prerogative of the Centre, acting through the President, to appoint the Comptroller and Auditor General of India.

Background:

- The petitioner, Centre for Public Interest Litigation, referred to recent "deviations" in the CAG's work, including reports on the "pause" in Maharashtra audits, a steady decline on audits on the Union government, the shelving of the performance audit on 'debt sustainability', allegations of corruption in recruitment to several vacancies in the CAG, among others.

Key takeaways

- The **Comptroller and Auditor General (CAG)** of India is the supreme audit authority of the country.
- CAG acts as the guardian of public finances and ensures transparency in government spending.
- It is an independent constitutional authority, established under Article 148 of the Indian Constitution.
- Appointment & Tenure
    - Appointed by the **President of India.**
    - Holds office for 6 years or until the age of 65, whichever is earlier.
    - Removal process similar to that of a Supreme Court judge (cannot be removed except on grounds of proven misbehavior or incapacity, requiring a special majority in Parliament).

The CAG performs the following key functions:

- Auditing
    - **Audit of Union Government**: Examines the accounts of the central government.
    - **Audit of State Governments**: Audits the accounts of state governments.
    - **Audit of Public Sector Undertakings (PSUs):** Reviews the finances of government-owned companies.
    - **Audit of Autonomous Bodies:** Checks the accounts of bodies funded by the government.
- Types of Audits Conducted
    - **Financial Audit:** Ensures the accuracy of financial statements.
    - **Compliance Audit:** Verifies whether expenditures comply with laws and regulations.
    - **Performance Audit:** Assesses the efficiency and effectiveness of government programs.
    - **Propriety Audit:** Examines the legality and propriety of expenditures.
- Reporting - Submits audit reports to the President of India (for central government) and Governors (for state governments).These reports are then laid before Parliament and State Legislatures for discussion.

Independence of the CAG

- The CAG is an independent constitutional authority and is not subject to control by the executive or legislature.
- The salary and expenses of the CAG are charged to the Consolidated Fund of India, ensuring financial independence.
- The CAG can be removed only through a process of impeachment, similar to a Supreme Court Judge.

Source: The Hindu

IT ACT AND CONTENT BLOCKING

Context: Elon Musk-owned X (formerly Twitter) has challenged the government's use of Section 79(3)(b) of the Information Technology Act, 2000 (IT Act) to moderate and order the removal of content on social media.

Background: -

- X has asked the court to direct the government that orders to block content can only be issued under Section 69A of the **Information Technology (IT) Act, 2000**, and not by invoking Section 79(3)(b) of the Act.

Key takeaways

- In Shreya Singhal v Union of India (2015), the Supreme Court struck down Section 66A of the IT Act which criminally punished, among other things, sending false information "for the purpose of causing annoyance or inconvenience". SC said the provision was vague, giving the governmentunchecked powers to restrict the freedom of speech.
- After this decision, Section 69A of the IT Act became the primary law governing the matter. This section allows the Centre to issue orders blocking "any information generated, transmitted, received, stored or hosted in any computer resource", but unlike 66A, it contains safeguards against misuse.
- For blocking content under Section 69A, the Centre must deem it "necessary". This "necessity", however, is only justifiable under grounds provided in Article 19(2) of the Constitution which "imposes reasonable restrictions" on the freedom of speech "in the interests of the sovereignty and integrity of India, the security of the State, friendly relations with Foreign States, public order, decency or morality or in relation to contempt of court, defamation or incitement to an offence".
- The Centre must record its reasons in the blocking order so that it can be challenged in court.

Govt's use of Section 79

- The SC in Shreya Singhal also clarified the application of another provision — Section 79 of the IT Act. The provision is a "safe harbour" measure that exempts an "intermediary" (such as X) from liability for information published on the platform by a "third party", that is, users of the platform.
- But Section 79(3)(b) states that the intermediary could be held liable if it does not

immediately remove such unlawful information "upon receiving actual knowledge, or on being notified by the appropriate Government or its agency".

- The apex court limited the scope of this provision, ruling that the requirement under Section 79(3)(b) will only kick in once a court order has been passed to that effect, or the government issues a notification stating that the content in question is related to grounds provided in Article 19(2).
- But in2023, the Ministry of Electronics and Information Technology (MeitY) issued a directive to all ministries, state governments, and the police saying that information blocking orders could be issued under Section 79(3)(b). A year later in 2024, MeitY launched a portal called "Sahyog" where the aforementioned authorities could issue and upload blocking orders.
- X's challenge argues that MeitY's orders are an attempt to "bypass the multiple procedural safeguards" provided under Section 69A. The petition relies upon the SC's ruling in Shreya Singhal, and says that content can only be censored though the process given under Section 69A or through a court order.

Source: Indian Express

COLLEGIUM

Context: After meeting on March 20, the Supreme Court collegium unanimously decided to transfer Delhi High Court judge Justice Yashwant Varma back to the Allahabad High Court, where he originally came from.

Background:

- This came after a large sum of cash was allegedly recovered from Justice Varma's residence after a fire.

About Collegium

- It is the system by which judges of the higher judiciary in India — the Supreme Court and High Courts — are appointed and transferred.
- Although not rooted in the Constitution or any specific law, it has evolved over the years through judgments of the apex court popularly known as the the "Judges Cases".
- The Supreme Court collegium is a five-member body headed by the incumbent Chief Justice of India (CJI), and comprising the four other seniormost judges at that time.High Court collegiums are led by the incumbent Chief Justice and the two other seniormost judges of that court.

How does the collegium system work?

- The SC collegium recommends the names of judges to be appointed to the apex court. So do HC collegiums (for their respective High Courts), although their recommendations must be approved by the SC collegium.
- These recommendations reach the government, whose role in the process is limited to conducting an Intelligence Bureau (IB) inquiry into the persons recommended. While the government can raise objections and seek clarifications regarding the collegium's choices, it is

bound under Constitution Bench judgments to approve the names if the collegium reiterates the same.

Why has the system been criticised?

- Critics have pointed out that the system is non-transparent, since it does not involve any official mechanism or secretariat. It is seen as a closed-door affair with no prescribed norms regarding eligibility criteria, or even the selection procedure.
- There is no public knowledge of how and when a collegium meets, and how it takes its decisions as there are no official minutes of collegium proceedings.

Have any alternatives been suggested?

- The Justice M N Venkatachaliah Commission, appointed by Prime Minister Atal Bihari Vajpayee in 2000, recommended the creation of a National Judicial Appointments Commission (NJAC) to replace the collegium. This would comprise the CJI and the two seniormost SC judges, the Union Law Minister, and an eminent person to be chosen by the President in consultation with the CJI.
- While the Narendra Modi government cleared the NJAC Bill in 2014, it was struck down by the SC within a year as unconstitutional.

Source: Indian Express

JUDICIARY'S IN-HOUSE INQUIRY AGAINST JUDGE

Context: Chief Justice of India (CJI) Sanjiv Khanna initiated an unprecedented three-member in-house inquiry into the conduct of Delhi High Court judge Justice Yashwant Varma following allegations that wads of currency notes were found in his official residence where a fire broke out on March 14.

Background: -

- The internal inquiry of the judiciary follows a process that is distinct from that of impeachment under the Constitution.

Key takeaways

- The process of impeachment of a judge of the Supreme Court is laid down in Article 124(4) of the Constitution of India. Article 218 says the same provisions shall apply in relation to a judge of the High Court.
- **Under Article 124(4),** a judge can be removed by Parliament through a laid-down procedure on only two grounds: "**proved misbehaviour**" and "**incapacity**".
- For an impeachment motion against an SC or HC judge to be accepted, at least two-thirds of those "**present and voting**" in both Lok Sabha and Rajya Sabha must vote in favour of removing the judge — and the number of votes in favour must be more than 50% of the "total membership" of each House.
- If Parliament passes such a vote, the President will pass an order for the removal.

In-house procedure

- The need for an internal mechanism was felt in 1995, after allegations of financial impropriety surfaced against then Bombay High Court Chief Justice A M Bhattacharjee.

- After the Bombay Bar Association moved a resolution calling for the judge's resignation, a writ petition was filed before the Supreme Court seeking to restrain the Bar from protesting.
- While hearing the case, SC noted there was no process to hold a judge accountable for "bad conduct inconsistent with the high office", when such conduct did not meet the high bar of impeachment set by Article 124 of the Constitution.To fill the gap, the SC decided to formulate an in-house procedure.
- SC constituted a five-member committeeto devise the procedure "for taking suitable remedial action against judges, who by their acts of omission or commission, do not follow the accepted values of judicial life, including the ideals expressed by the Supreme Court in the Restatement of Values of Judicial Life".
- The committee submitted its report in 1997. It was adopted with amendments in a full court meeting of the SC in 1999.

Process revisited in 2014

- In 2014, when a woman additional district and sessions judge from Madhya Pradesh filed a complaint of sexual harassment against a sitting judge of the High Court, the SC revisited its in-house procedure.
- SC summarised and explained this process through "seven steps" (Additional District and Sessions Judge 'X' v. Registrar General High Court of Madhya Pradesh).
- Essentially, this process begins when the Chief Justice of a HC, the CJI, or the President of India receives a complaint. The CJ of the HC or the President will forward the complaint to the CJI.
- This complaint can be dropped at any stage, if not found serious enough by the CJI. However, to test the veracity of the complaint, the CJI can seek a preliminary report from the CJ of the HC concerned.
- If the CJ of the HC, in the preliminary report, recommends a "deeper probe", the CJI may examine the recommendation and the statement of the judge facing the accusations, and then decide to order a three-member inquiry, comprising two other HC Chief Justices and one HC judge.
- Once the inquiry has been concluded, the committee will submit its report to the CJI. This report must state whether:
    - There is any substance to the allegations against the concerned judge and,
    - If there is sufficient substance to the allegations, whether they are serious enough that they require initiation of removal proceedings against the judge.
- If the committee concludes that the misconduct is not serious enough to warrant removal proceedings, the CJI may "advise" the judge concerned, and direct that the committee's report be placed on record.
- If the committee decides that the allegations are serious enough to initiate removal proceedings, the CJI will advise the concerned judge to resign or retire voluntarily.

- If the judge does not accept, the CJI will direct the HC Chief Justice not to assign any judicial work to said judge.
- If the judge does not abide by the CJI's advice to resign or retire, the CJI will inform the President and the Prime Minister of the committee's finding that removal proceedings should be initiated.

Source: Indian Express

DOCTRINE OF EMINENT DOMAIN

Context: The Supreme Court, in a judgment held that it was a fraud played on the State's power of eminent domain if land acquired by the government for public purposes is transferred back to the original owner by the beneficiary of the acquisition through a private agreement.

Background: -

- Litigation relating to acquired land, mainly because of creation of third-party rights, has been a key factor for delay in execution of many projects, especially national highways.

Key takeaways

- The Doctrine of Eminent Domain refers to the sovereign power of the state to acquire private property for public use, with fair compensation to the owner.
- It is based on the principle that public interest is superior to individual property rights.

Constitutional Provisions in India

- **Article 300A:** Guarantees that no person shall be deprived of property except by authority of law (inserted by the 44th Amendment Act, 1978).
- Earlier, Right to Property (Article 31) was a Fundamental Right, but it was made a legal right under Article 300A.
- **5th Schedule & 6th Schedule:** Provide special provisions regarding land acquisition in tribal areas.

Essential Elements

- **Compulsory Acquisition:** The state can take private property even without the owner's consent.
- **Public Purpose:** The acquisition must serve a social, economic, or infrastructural goal (e.g., roads, railways, dams).
- **Fair Compensation:** The government must provide just and reasonable compensation to the affected landowners.

Important Laws in India

- **Land Acquisition Act, 1894 (Repealed):** Gave broad powers to the government but was criticized for inadequate compensation and forced acquisition.
- Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (LARR), 2013:

- Ensures fair compensation and rehabilitation of affected people.
- Requires consent of 70% landowners for PPP projects and 80% for private projects.
- Social Impact Assessment (SIA) is mandatory before acquisition.

Source: The Hindu

INTERNATIONAL RELATIONS

EUTELSAT

Context: Suggestions that Ukraine could lose access to Elon Musk's Starlink satellite Internet system, which has been vital in maintaining its military communications, have focused investor interest on Starlink's smaller European rival Eutelsat.

Background: -

- The stock price of Eutelsat, a Franco-British company, has more than quadrupled since the February 28 public showdown between Ukrainian President Volodymyr Zelenskyy and US President Donald Trump.

Key takeaways

- Starlink users access the Internet for data or voice communication by using a small satellite dish to bounce signals off a constellation of satellites overhead.
- Ukraine's fixed-line and mobile networks have been badly damaged by bombing since Russia invaded in February 2022, and Starlink has helped Kyiv fill the void by sending tens of thousands of its dishes with terminals.
- Some are made available to civilians, but most are used by Ukraine's armed forces. Ukrainian units often talk to each other via Starlink, and its services have become virtually indispensable for battlefield command and control.
- Initially, SpaceX helped to fund the provision of Starlink to Ukraine. The US government then took over, though last month Poland said it had been paying Ukraine's Starlink subscription and would continue to do so.

Eutelsat and Starlink

- Eutelsat already supports government and institutional communications in Ukraine, and can provide an alternative for certain government and defence applications, according to the company.
- Since its merger in 2023 with Britain's OneWeb, Eutelsat controls the only operational global-coverage constellation, besides Starlink, of satellites in low earth orbit (LEO).
- Starlink's more than 7,000 LEO satellites, suited to real-time communication, allow it to reach more users around the world and offer higher data speeds.
- But Eutelsat says that even with only 630 LEO satellites, backed up by 35 linked satellites in higher, geostationary orbit, it offers the same capabilities as Starlink in Europe.
- Starlink promises broadband at up to 200 megabits per second, Eutelsat 150.
- OneWeb terminals, however, cost as much as $10,000, plus a monthly subscription. Starlink charges Ukrainian users a one-time payment of $589 in addition to a monthly subscription of $95-$440, depending on the usage.

Source: Indian Express

INDIA-MAURITIUS RELATIONS

Context: Prime Minister Narendra Modi's visit to Mauritius (March 11-12), will be a celebration of the deep and long-standing ties between the two countries.

Background: -

- Newly elected Prime Minister Navinchandra Ramgoolam (Labour Party) shares a historic connection with India. His father, Sir Seewoosagur Ramgoolam, led Mauritius to independence and worked with Netaji Subhas Chandra Bose.

Key takeaways

People to people ties

- Nearly 70% of Mauritius population is of Indian origin, mainly descendants of indentured laborers brought by colonial rulers.About 50% trace their ancestry to Bihar and Uttar Pradesh and still speak the Bhojpuri dialect.
- There are smaller communities of Tamil, Telugu-, and Marathi-speaking communities.
- In 1976, India inaugurated the Mahatma Gandhi Institute as a premier institution for promoting Indian languages and culture.
- The Indian Cultural Centre in Mauritius is the largest of anywhere in the world. The island hosts the World Hindi Secretariat that is supported by India.

Economic and Trade Cooperation

- Bilateral trade reached $554 million in 2022-23.
- Mauritius serves as a business gateway to Africa, being part of the African Union.
- Due to a favourable Double Taxation Avoidance Agreement (DTAA) with India, Mauritius is also a major channel for foreign investment into India.
- Mauritius has emerged as a successful international financial centre.

Maritime Security Cooperation

- Mauritius is strategically located in the western Indian Ocean.
- The Colombo Security Conclave brings together India, Sri Lanka, the Maldives, Mauritius and Bangladesh to ensure regional maritime security.
- Mauritius has a vast EEZ of 2.3 million sq. km, making surveillance vital.
- India has set up a chain of coastal radar stations, redeveloped the Mauritian island of Agaléga to serve as a joint surveillance facility and given Mauritius access to the Information Fusion Centre for the Indian Ocean Region (IFC-IOR) in Gurugram, to significantly advance domain awareness in its vast EEZ.
- India's oceanographic survey ship, INS Sarvekshak, has completed the survey of 25,000 sq.km of Mauritius' ocean territory.
- At a time when China's footprint in the Indian Ocean is expanding, India-Mauritius maritime security cooperation has assumed special importance.

Source: The Hindu

INTERNATIONAL CRIMINAL COURT (ICC)

Context: Former Philippine President Rodrigo Duterte was arrested onMarch 10th on a warrant issued by the International Criminal Court (ICC), which was investigating allegations that "crimes against humanity" had been committed during his so-called "war on drugs".

Background: -

- During his six-year term, 6,000 suspects were gunned down as part of his "war on drugs" campaign. A UN report subsequently revealed that most of the victims were young, poor urban males, and that "the police who do not need search or arrest warrants to conduct house raids, systematically forced suspects to make self-incriminating statements or risk facing lethal force,".

Key takeaways

- The International Criminal Court (ICC) is a permanent international tribunal established to prosecute individuals for serious crimes like genocide, war crimes, crimes against humanity, and aggression.
- The Rome Statute, the treaty that established the ICC, was adopted on 17 July 1998 and entered into force on 1 July 2002 after being ratified by 60 countries.
- As of January 2025, 125 countries are party to the Rome Statute, including Britain, Japan, Afghanistan, and Germany. India, China, and the United States are not members.
- So far, 32 cases have come before the ICC, which is composed of 18 judges who are elected by the member states and serve 9-year, nonrenewable terms.

The ICC is composed of four main organs:

- **The Presidency:**Responsible for the administration of the Court, except for the Office of the Prosecutor.
- **Judicial Divisions:**
    - **Pre-Trial Division:** Handles preliminary examinations, investigations, and issuance of arrest warrants.
    - **Trial Division:** Conducts trials and issues verdicts.
    - **Appeals Division:** Reviews appeals against decisions made by the Trial Division.
- **Office of the Prosecutor (OTP) :** Responsible for conducting investigations and prosecutions.
- **Registry :** Provides administrative and operational support to the Court, including victim and witness protection, legal aid, and public outreach.

The ICC has jurisdiction over the following crimes:

- **Genocide:**Acts committed with the intent to destroy, in whole or in part, a national, ethnic, racial, or religious group.
- **Crimes Against Humanity**:Widespread or systematic attacks directed against civilians, including murder, enslavement, torture, and sexual violence.
- **War Crimes:**Serious violations of international humanitarian law during armed conflicts, such

as targeting civilians, using child soldiers, and destroying property.

- **Crime of Aggression:**The use of armed force by a state against the sovereignty, territorial integrity, or political independence of another state.

Key Principles

- **Complementarity:**The ICC acts as a court of last resort, intervening only when national courts are unwilling or unable to prosecute.
- **Individual Criminal Responsibility:**The ICC prosecutes individuals, not states or organizations.
- **Non-Retroactivity:**The Court can only prosecute crimes committed after the Rome Statute entered into force (1 July 2002).
- **Jurisdiction:**The ICC can exercise jurisdiction if the crimes were committed by a State Party national, or in the territory of a State Party, or in a State that has accepted the jurisdiction of the Court; orthe crimes were referred to the ICC Prosecutor by the United Nations Security Council (UNSC).

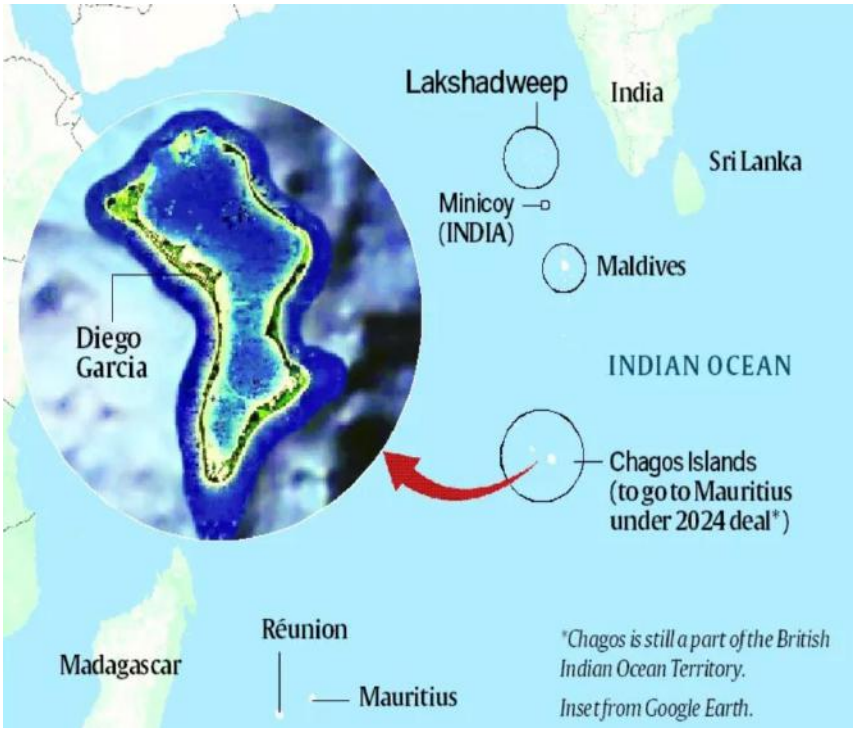
Source: Indian Express

THE STORY OF CHAGOS

Context: Ahead of Prime Minister Narendra Modi's two-day visit to Mauritius this week, India affirmed its support for the island country's claim over the Chagos archipelago.

Background: -

- Chagos has long been the subject of a dispute between Mauritius and the UK, which held on to these islands for decades after granting independence to Mauritius in 1968.



Key takeaways

- The Chagos archipelago comprises more than 60 low-lying islands in the Indian Ocean roughly 1,600 km to the northeast of the main island of Mauritius.Diego Garcia is the largest island of the Chagos Archipelago.
- Chagos was uninhabited for most of its history.The Portuguese used the Chagos islands as a stopover in voyages around the Cape of Good Hope to India. But it was only in the 18th century that the first permanent settlements emerged.
- France became the first power to officially plant its flag on Chagos. The French had earlier set up Indian Ocean colonies in Île Bourbon (now Réunion) in 1665, Isle de France (now Mauritius) in 1715, and the Seychelles in 1744.

- By 1786, a number of fishing settlements and coconut plantations was established. The labour for these enterprises was supplied by slaves from Mauritius, the Seychelles, Madagascar, and East Africa.
- In 1814, after the fall of the Napoleonic Empire, France formally ceded Mauritius, including Chagos, and the Seychelles to Britain. After Britain abolished slavery in its colonies in 1833, indentured labour from India and Malaya was brought to the plantations.
- The Chagossian population today traces its origins to freed African slaves, and the Indian and Malayan labourers who arrived in the 18th and 19th centuries. Under international law, they are the indigenous people of the Chagos archipelago.

British Indian Ocean Territory (BIOT)& Diego Garcia base

- Mauritius became independent on March 12, 1968. But Britain kept control of Chagos.
- In 1965, the UK had created a new administrative entity — the British Indian Ocean Territory (BIOT) — which included the Chagos islands from Mauritius, and the islands of Aldabra, Farquhar, and Desroches from the Seychelles (these were restored to the Seychelles when the country received its independence in 1976).
- In 1966, the UK and the US signed a secret agreement to establish a military base in Diego Garcia.In 1971, when the US began to construct the Diego Garcia base, islanders were forcibly deported to Mauritius and the Seychelles. The roughly 2,000-strong native population was expelled.

The 2024 agreement

- In 2017, the UN General Assembly voted to ask the International Court of Justice to examine the legal status of the archipelago. The ICJ concluded that the UK is under an obligation to bring to an end its administration of the Chagos Archipelago.
- A deal was struck between the UK and Mauritius in 2024. Britain recognised Mauritius' claim over all of Chagos, including Diego Garcia — however, the deal said that the UK would, for a 99-year initial period, exercise "the sovereign rights [over Diego Garcia] and authorities of Mauritius are required to ensure the continued operation of the base well into the next century".

Source: Indian Express

UN80 INITIATIVE

Context:UNSecretary-General Antonio Guterres has announced the 'UN80 Initiative'.

Background: -

- While announcing the initiative, Mr. Guterres said that the world is facing challenges on every front. He also voiced concern over shrinking resources and liquidity crisis amid an environment of uncertainty and unpredictability.

Key takeaways

- The UN80 Initiative is a comprehensive reform program launched by United Nations Secretary-

General António Guterres as the organization approaches its 80th anniversary.

- This initiative aims to enhance the UN's efficiency, effectiveness, and responsiveness to global challenges.

Key Objectives of the UN80 Initiative:

- **Identify Inefficiencies and Improvements:** Rapidly pinpoint areas where the UN can optimize its operations to work more effectively.
- **Review Implementation of Mandates:** Thoroughly assess how mandates from member states are executed, especially given their significant increase in recent years.
- **Strategic Structural Review:** Conduct a comprehensive evaluation to implement deeper structural changes and realign programs within the UN System.

Rationale Behind the Initiative:

- The UN faces multiple challenges, including escalating conflicts, persistent poverty, human rights violations, and the rapid advancement of unregulated technologies like artificial intelligence.
- The UN has been grappling with a liquidity crisis for at least the past seven years, primarily because not all member states pay their dues in full or on time.

Leadership and Implementation:

- The UN80 Initiative will be spearheaded by Under-Secretary-General for Policy, Guy Ryder, leading a task force comprising top officials from across the UN system. The initiative encompasses all UN entities, including those based in Geneva, Nairobi, and Vienna.

Source: News On Air

UN CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD)

Context: Global cooperation and balanced policies are critical to preventing economic fragmentation and safeguarding long-term growth amid growing trade uncertainty, the UN Conference on Trade and Development (UNCTAD) has said.

Background: -

- Coming even as tariff wars look set to intensify in the face of proposed reciprocal tariffs by the U.S., the UNCTAD report said world trade saw record expansion to $33 trillion in 2024.

Key takeaways

- **Established:** 1964
- **Headquarters:** Geneva, Switzerland
- **Parent Organization:** United Nations General Assembly (UNGA)
- India is a founding member and benefits from UNCTAD’s trade and investment research.

Functions & Role

- Assists developing nations in integrating into the global economy.

- Provides policy advice, technical assistance, and research on trade and development issues.
- Publishes key reports like:
    - Trade and Development Report
    - World Investment Report
    - Technology and Innovation Report
    - Digital Economy Report
- Focuses on issues like trade policies, investment flows, economic inequality, digital economy, and debt sustainability.

Key Initiatives

- **Global System of Trade Preferences (GSTP):** It is a preferential trade agreement, currently encompassing 42 members signed in 1988 with the aim of increasing trade between developing countries. It was negotiated within the framework of UNCTAD.
- **eTrade for All Initiative:** Supports digital trade in developing countries.
- **Creative Economy Programme:** Encourages cultural and creative industries.

Source: The Hindu

ECONOMY

VIRTUAL DIGITAL ASSETS

Context: For the first time in India, the Income Tax Bill, 2025 explicitly treats Virtual Digital Assets (VDAs) as property and capital assets.

Background:

- The bill categorically states that VDAs, which include crypto assets, Non-Fungible Tokens (NFTs), and similar digital assets, should be considered property. This move aligns India with global practices, where digital assets are either classified as securities (like in the U.S.) or property (like in the U.K., Australia, and New Zealand).

Key takeaways

- VDAs are classified as capital assets. This means that any gains arising from their sale, transfer, or exchange will be taxed under capital gains provisions, similar to real estate, stocks, and bonds.
- For example, if an individual purchases Bitcoin at ₹10 lakh and sells it for ₹20 lakh, the ₹10 lakh profit will be subject to capital gains tax — either short-term or long-term, depending on the holding period.
- By treating VDAs as capital assets, the government ensures that transactions are subject to standard asset taxation principles, preventing their misuse as unregulated financial instruments.
- Continuing the precedent set in 2022, the bill imposes a 30% tax on income from VDA transfers.
- Unlike traditional capital assets, no deductions (other than the cost of acquisition) are allowed. This means that expenses related to mining, transaction fees, platform commissions, and gas fees cannot be deducted when calculating taxable income. For instance, if an investor buys Ethereum for ₹5 lakh and sells it for ₹7 lakh, the ₹2 lakh profit is taxed at a flat 30% — with no relief for transaction costs.
- Another crucial provision is the inclusion of VDAs in undisclosed income taxation and asset seizure regulations. If an individual fails to report VDA holdings in their tax filings, they can be classified as undisclosed income and taxed accordingly.
- Furthermore, Bill allows tax authorities to seize VDAs during investigations or tax raids, similar to how cash, gold, or real estate is confiscated in cases of tax evasion.
- As per the bill, any entity dealing in crypto assets — including exchanges, wallet providers, and even individual traders — is required to report transactions in a prescribed format.

Source: The Hindu

CAPITAL ACCOUNT CONVERTIBILITY

Context: India should not rush into full capital account convertibility at its current per capita income level of about $2,570, Arvind Panagariya, Chairman of the 16th Finance Commission, has said.

Background: -

- Instead, the country should consider this reform only when per capita income reaches $8,000-10,000, he suggested.

Key takeaways

- **Capital Account Convertibility (CAC)** refers to the freedom to convert local financial assets into foreign financial assets and vice versa at market-determined exchange rates.
- It is part of the **Balance of Payments (BoP**), which consists of the current account (trade in goods and services) and the capital account (financial transactions).
- **Types of Convertibility:**
    - **Current Account Convertibility:** Allows free exchange of currency for trade in goods and services.
    - **Capital Account Convertibility:** Allows free exchange of currency for financial transactions like investments, loans, and acquisitions.

Importance of Capital Account Convertibility:

- **Foreign Investment:**CAC attracts foreign investment and capital inflows boosting economic growth.
- **Global Integration:**It facilitates integration with global financial markets, enabling access to international capital.
- **Economic Efficiency:**CAC promotes efficient allocation of resources by allowing capital to flow to its most productive uses.

Challenges and Risks of Capital Account Convertibility:

- **Volatility:**Free capital flows can lead to exchange rate volatility and financial instability, as seen during the Asian Financial Crisis (1997).
- **Capital Flight:**In times of economic uncertainty, investors may withdraw capital rapidly, leading to currency depreciation and economic instability.
- **Monetary Policy Constraints:**CAC limits the ability of the central bank to control domestic interest rates and money supply, as it must consider global financial conditions.
- **Speculative Attacks:**Countries with weak economic fundamentals may face speculative attacks on their currency, leading to crises.

India's Approach to Capital Account Convertibility:

- **Tarapore Committee (1997):**
    - The S.S. Tarapore Committee was set up by the Reserve Bank of India (RBI) to recommend a roadmap for CAC in India.
    - The committee suggested a three-phase approach with preconditions like fiscal consolidation, low inflation, and a strong financial system.
- **Partial Convertibility:**
    - India has adopted a gradual and cautious approach to CAC, allowing partial convertibility with certain restrictions.

- For example, while FDI and FPI are allowed, there are limits on the amount of capital that can be moved in and out of the country.

- Current Status:
  - India has full current account convertibility but partial capital account convertibility.
  - The Liberalized Remittance Scheme (LRS) allows individuals to remit up to $250,000 per year for permissible transactions.

Source: Hindu Businessline

E-SHRAM PORTAL

Context: The government has informed that that over 30 crore 68 lakh unorganised workers have been registered on the e-Shram Portal.

Background: -

- Of the total registered workers, more than 53 per cent are women. So far, 13 schemes of different Central Ministries and Departments have already been integrated with the e-Shram. This includes PM-SVANidhi, Pradhan Mantri Suraksha Bima Yojana, Pradhan Mantri Jeevan Jyoti Bima Yojana, Pradhan Mantri Awas Yojana – Gramin and Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana.

Key takeaways

- The e-Shram Portal is a significant initiative by the Government of India, launched on August 26, 2021, to create a comprehensive National Database of Unorganized Workers (NDUW).
- This platform aims to register unorganized workers, including migrant laborers, gig and platform workers, and others, to facilitate the delivery of social security schemes and employment benefits.

Objectives of E-Shram Portal

- Establish a centralized database of unorganized workers for effective policy implementation.
- Enhance access to social security schemes and benefits for workers in sectors such as agriculture, construction, domestic work, and street vending.
- Facilitate job matching and skill development opportunities.
- Strengthen labor market resilience by integrating unorganized workers into the formal economy.
- Promote financial inclusion through direct benefit transfers and digital payments.

Eligibility Criteria:

- **Age:** Workers aged between 16 and 59 years.
- **Sector:** Engaged in the unorganized sector, including self-employed individuals, daily wage laborers, and gig workers.
- **Documentation:** Must possess an Aadhaar card, a valid mobile number linked to Aadhaar, and a bank account.
- **Exclusions:** Should not be a member of the **Employees' Provident Fund Organization** (EPFO) or **Employees' State Insurance Corporation (ESIC).**

Key Features of the E-Shram Portal

- **Universal Account Number (UAN):** Registered workers receive a UAN linked to their Aadhaar, enabling seamless access to benefits.
- **Single Registration Process:** The portal streamlines the registration process, requiring minimal documentation such as Aadhaar and bank account details. The ease of self-registration is also available to the beneficiaries.
- **Integration with Employment and Skill Opportunities:** Registered workers can connect with employment opportunities, skilling, apprenticeship, pension schemes, digital skilling, and state-specific schemes through the portal.
- **Family Details for Migrant Workers**: Family details for migrant workers are captured, aiding in the provision of child education and women-centric schemes for those who have migrated with their families.
- **Data Sharing with BOCW Welfare Boards:** The data of construction workers registering on e-Shram is shared with the concerned Building and Other Construction Workers' (BOCW) Welfare Boards, ensuring their registration with the respective boards and access to schemes meant for them.
- **Data Sharing Portal (DSP):** A Data Sharing Portal has been launched to allow the secure sharing of e-Shram beneficiary data with State and Union Territory governments. facilitating the targeted implementationschemes for registered unorganised workers.

Source: News On Air

RECESSION

Context:US stocks have plunged, the constant talk of tariffs has caused uncertainty, and a survey has shown that mood among American consumers is pessimistic, even as an economic adviser to President Donald Trump has dismissed talks of a recession in the US economy.

Background:

- At its simplest, in any economy, a recessionary phase is the counterpart of an expansionary phase.

Key takeaways

- When the overall output of goods and services — typically measured by the GDP — increases from one quarter (or month) to another, the economy is said to be in an expansionary phase. And when the GDP contracts from one quarter to another, the economy is said to be in a recessionary phase.
- Together, these two phases create what is called a "business cycle" in any economy. A full business cycle could last anywhere between one year and a decade.
- When a recessionary phase sustains for long enough, it is called a recession. In other words, when the GDP contracts for a long enough period, the economy is said to be in a recession.
- There is no universally accepted definition of a recession — as in, for how long should the GDP contract before an economy is said to be in a recession. But most economists agree with the definition that the National Bureau of Economic Research (NBER) in the United States uses.
- According to NBER, "During a recession, a significant decline in economic activity spreads across the

economy and can last from a few months to more than a year".

- The NBER typically looks at various variables — employment, consumption etc — apart from GDP growth to arrive at a decision. It also looks at the "depth, diffusion, and duration" of decline in economic activity to determine whether an economy is in a recession or not.
- Economic commentators also use the word technical recession. A technical recession occurs when a country's Gross Domestic Product (GDP) contracts for two consecutive quarters (i.e., two successive three-month periods)

Source: Indian Express

VENTURE CAPITAL

Context: India's venture capital (VC) market experienced a sharp resurgence in 2024, with total funding reaching $13.7 billion, marking a 1.4x increase from 2023.

Background: -

- Several regulatory changes in 2024 created a more favourable investment environment, including the removal of the angel tax, reduction in long-term capital gains (LTCG) tax rates, streamlining of the National Company Law Tribunal (NCLT) process, and simplification of foreign venture capital investor (FVCI) registrations.

Key takeaways

- Venture Capital (VC) is a form of private equity financing provided to startups and small businesses that have high growth potential.
- It plays a crucial role in fostering innovation, entrepreneurship, and economic development by providing capital to early-stage companies.

Key Features of Venture Capital

- **High-Risk, High-Reward:**Venture capital investments are risky because they are made in unproven businesses, but they offer the potential for substantial returns if the startup succeeds.
- **Equity Stake:**In exchange for funding, venture capitalists (VCs) receive an equity stake in the company.
- **Active Involvement:**VCs often provide mentorship, strategic guidance, and access to networks, in addition to funding.
- **Stages of Funding:** VC is provided at different stages, including seed funding, early-stage, and expansion-stage financing.
- VC funds in India are regulated by the Securities and Exchange Board of India (SEBI) under the Alternative Investment Fund (AIF) Regulations, 2012.

Source: Your Story

DIFFERENT TYPES OF BONDS

Context: The Sovereign Green Bonds (SGrBs) in India has received a luke response. The two new SGrBs worth Rs 10,000 crore auctioned in November and January faced muted responseas bonds valued at Rs

7,443 crore remained unsold. This came despite a rule change allowing NRIs and foreign portfolio investors to participate without restrictions.

Background: -

- The government's inability to raise adequate proceeds through bonds increases fiscal constraints.

Key takeaways

- A bond is an instrument to borrow money. A bond could be floated/issued by a country's government or by a company to raise funds.
- Since government bonds (referred to as G-secs in India, Treasury in the US, and Gilts in the UK) come with the sovereign's guarantee, they are considered one of the safest investments. As a result, they also give the lowest returns on investment (or yield).
- The yield of a bond is the effective rate of return that it earns. But the rate of return is not fixed — it changes with the price of the bond.

Sovereign Green Bonds

- **Sovereign green bonds (SGrBs)** are those that are issued by sovereign entities, like the Government of India, which formulated a framework for issuing such bonds in 2022.
- The framework defines "green projects" as those that encourage energy efficiency in resource utilisation, reduce carbon emissions, promote climate resilience, and improve natural ecosystems.

Masala Bonds

- Masala Bonds are rupee-denominated bonds i.e. the funds would be raised from the overseas market in Indian rupees.
- According to RBI, any corporate, body corporate, and Indian bank is eligible to issue rupee-denominated bonds overseas.
- **Advantages of Masala Bonds :**
    - **Lower Cost of Borrowing**: Interest rates may be lower compared to domestic borrowing.
    - **Diversification of Funding Sources:** Enables Indian companies to access global capital markets.
    - **Boosts Rupee Internationalization**: Encourages wider acceptance of the Indian rupee in global finance.
    - **Foreign Investors Bear Currency Risk:** If the rupee depreciates, investors receive fewer dollars upon conversion, making it riskier for them.

Social Impact Bonds

- Social Impact Bonds (SIBs) are innovative financial instruments designed to fund social programs through a results-based approach.
- Unlike traditional bonds, SIBs do not provide fixed returns to investors. Instead, returns are linked to the achievement of predefined social outcomes (e.g., reducing unemployment,

improving public health, or enhancing education).

- **How SIBs Work?**
  - Government/Authority Identifies a Social Issue: A government or public sector entity defines a social problem that needs intervention.
  - Investors Provide Upfront Capital: Private investors or philanthropic organizations fund the project.
  - Service Providers Implement the Program: Non-profits or social enterprises execute interventions to achieve the desired impact.
  - Independent Evaluation: Third-party assessors measure the project's success based on pre-agreed metrics.
  - Outcome-Based Repayment: If the project meets its goals, the government repays investors with a return. If the project fails, investors may lose part or all of their investment.
- **Key Features**
  - **Pay-for-Success Model:** Government pays only if the intervention achieves measurable results.
  - **Risk Transfer:** Shifts financial risk from the public sector to private investors.
  - **Encourages Innovation:** Service providers have flexibility in implementing evidence-based solutions.
- Examples of Social Impact Bonds : India's Educate Girls Development Impact Bond (2015): Focused on improving girls' education in Rajasthan.

Source: Indian Express

DERIVATIVES

Context: IndusInd Bank reported derivative losses of Rs 2,100 crore on March 10, which pulled down its share price by 23%.

Background: -

- The bank sought to put the blame on a change of rules by the Reserve Bank of India relating to the derivative portfolio. However, the loss from the derivative book remained unresolved for a long time, leading to the accumulation of losses.

Key takeaways

- Derivatives are financial contracts whose value is derived from the performance of an underlying asset. The underlyingasset can be tangible (e.g., gold, oil) or intangible (e.g., stock index, interest rate).
- **Purpose: Derivatives are used for:**
  - **Hedging:** Reducing or mitigating risk.
  - **Speculation:** Betting on the future price movements of assets.
  - **Arbitrage:** Exploiting price differences in different markets.

Types of Derivatives

- Forward Contracts

- A customized agreement between two parties to buy or sell an asset at a future date at a predetermined price.
- **Traded over-the-counter (OTC)** and not standardized.
- Example: An oil producer and an airline company agreeing on a fixed price for crude oil delivery in the future.

- **Futures Contracts**
  - Similar to forwards but standardized and traded on exchanges (e.g., NSE, BSE).
  - Reduces counterparty risk due to clearinghouse settlement.
  - Example: A farmer locking in a price for wheat to be sold at a future date.
- Options Contracts- Gives the right but not the obligation to buy or sell an asset at a set price before or on a specific date.
  - **Two types:**
    - **Call Option:** Right to buy at a specified price.
    - **Put Option:** Right to sell at a specified price.
  - Example: An investor purchasing a call option on a stock, expecting its price to rise.
- Swaps - A contract where two parties exchange cash flows or liabilities based on a financial instrument.
  - **Common types:**
    - **Interest Rate Swaps:** Exchange of fixed and floating interest rates.
    - **Currency Swaps:** Exchange of payments in different currencies.
  - Example: An Indian company exchanging its fixed interest rate loan for a floating rate to reduce costs.

Source: Indian Express

PRIORITY SECTOR LENDING

Context: The Reserve Bank issued revised guidelines on Priority Sector Lending (PSL) to facilitate better targeting of bank credit to the priority sectors of the economy. The new guidelines will come into effect from April 1, 2025, the RBI said.

Background:

- The major changes include the enhancement of several loan limits, including housing loans for enhanced PSL coverage, and the broadening of the purposes based on which loans may be classified under 'renewable energy.'
- There is also a revision of the overall PSL target for urban cooperative banks (UCBs) to 60% of Adjusted Net Bank Credit (ANBC) or Credit Equivalent of Off-Balance Sheet Exposures (CEOBSE), whichever is higher. The revised norms also expand the list of eligible borrowers under the category of Weaker Sections.

Key takeaways

- Priority Sector Lending (PSL) is a policy initiative by the Reserve Bank of India (RBI) aimed at ensuring that certain sectors of the economy receive adequate credit. These sectors are considered

crucial for economic development and include agriculture, micro, small, and medium enterprises (MSMEs), education, housing, renewable energy, and weaker sections of society.

Key Features of PSL

- **Targets**: Banks are required to allocate a specific percentage of their Adjusted Net Bank Credit (ANBC) or Credit Equivalent of Off-Balance Sheet Exposures (CEOBSE) to priority sectors. For example, commercial banks must allocate 40% of their ANBC to PSL.
    - **Categories:** PSL covers various categories such as:
    - **Agriculture:** Loans for farmers, agricultural infrastructure, and allied activities.
    - **MSMEs:** Credit for small businesses and startups.
    - **Export Credit:** Loans to exporters.
    - **Education:** Loans for students pursuing higher education.
    - **Housing:** Loans for affordable housing projects.
    - **Renewable Energy:** Financing for solar, wind, and other clean energy projects.
    - **Weaker Sections:** Loans for economically disadvantaged groups.
- **Monitoring and Penalties**: Banks are monitored for compliance, and penalties are imposed for failing to meet PSL targets.

Source: Money Control

GEOGRAPHY

MAJULI RIVER ISLAND

Context:A recent six-day survey conducted by NGO Aaranyak has shed light on the escalating human-wildlife conflict (HWC) in the Majuli River Island district of Assam.

Background: -

- Wildlife such as rhinos, wild buffaloes, wild boars, elephants, and tigers have increasingly damaged crops and livestock, posing severe risks to the largely agrarian population, nearly 90% of whom depend on agriculture for their livelihoods.

Key takeaways

- Majuli, the world's largest river island, is situated on the Brahmaputra River in Assam.

Geographical Significance

- Formed by the fluvial action of the Brahmaputra River and its tributaries, Majuli is a dynamic landmass undergoing constant erosion and deposition.
- The island spans an area of ~352 sq. km (as per recent estimates), but continuous riverbank erosion has significantly reduced its size over the years.
- Declared as India's first island district in 2016.

Cultural and Historical Importance

- **Spiritual Hub:** Majuli is known as the cradle of Neo-Vaishnavism, founded by Srimanta Sankardeva in the 15th century.
- **Satras (Vaishnavite Monasteries):** The island is home to several Satras, which serve as cultural and religious centers promoting Assamese traditions, art, and music. Notable ones include:Kamalabari Satra, Auniati Satra, Dakhinpat Satra.
- **Traditional Art & Dance:** The island is renowned for its mask-making tradition, Sattriya dance, and handloom weaving.
- **Biodiversity Hotspot:** Majuli hosts migratory birds, indigenous flora, and fauna, making it a vital ecotourism destination.

Source: NorthEast News

ANTARCTIC CIRCUMPOLAR CURRENT

Context:A groundbreaking study has revealed that the Antarctic Circumpolar Current (ACC)—the world's most powerful ocean current—is slowing down due to melting ice sheets.

Background: -

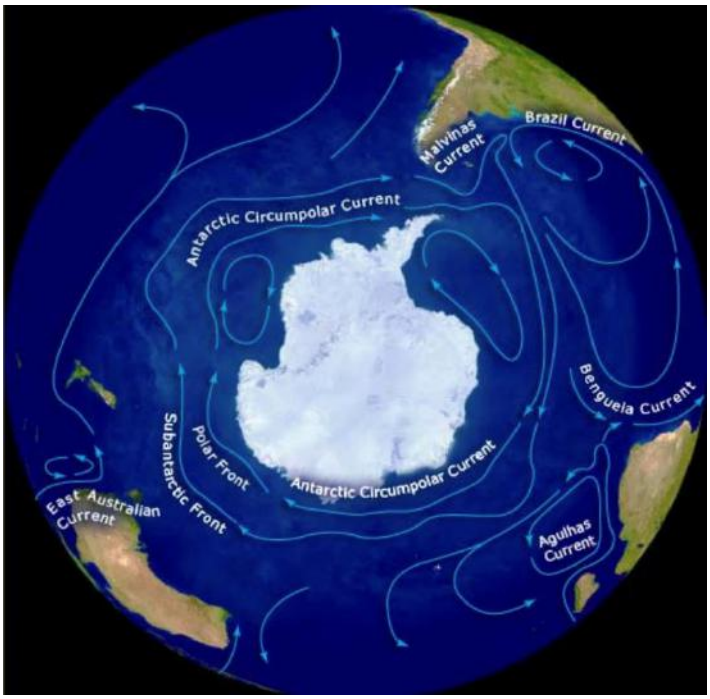
- The research suggests the Antarctic Circumpolar Current will be 20% slower by 2050 as the world warms, with far-reaching consequences for life on Earth.

Key takeaways

- The Antarctic Circumpolar Current (ACC) is a major ocean current that flows clockwise from west to east around Antarctica. It is the largest and strongest ocean current in the world, transporting more water than any other current.
- The ACC flows between 50°S and 60°S latitude, and is the only current that circumnavigates the globe uninterrupted by landmasses.
- The ACC is approximately 21,000 kilometers long and 1,000 kilometers wide.

Key Features of the Antarctic Circumpolar Current:

- **Location:** The ACC is located in the Southern Ocean, encircling the continent of Antarctica. It extends from the surface to depths of over 4,000 meters.
- **Direction and Flow:** The current flows in an eastward direction, driven by the strong westerly winds known as the "Roaring Forties" and "Furious Fifties." The ACC connects the Atlantic, Indian, and Pacific Oceans, allowing for the exchange of water, heat, and nutrients between these basins.



- Strength and Volume: The ACC is the strongest ocean current, with a flow rate of approximately 135 to 145 million cubic meters of water per second.
- Temperature and Salinity: The ACC transports cold, dense water from the Antarctic region northward and brings relatively warmer, saltier water from the subtropics southward. This exchange of water masses helps regulate the global climate by redistributing heat and influencing oceanic temperature gradients.
- Ecological Importance: The ACC brings nutrient-rich deep waters to the surface, promoting the growth of phytoplankton, which forms the base of the marine food web. This, in turn, supports various marine species, including krill, fish, birds, and marine mammals.

- **Climate Influence:** The ACC acts as a barrier that isolates Antarctica from the warmer waters of the subtropics. This helps maintain the continent's cold climate. The current also influences global weather patterns.

Source: Economic Times

BANGUS VALLEY

Context: The Jammu and Kashmir government announced a new set of rules for Bangus, a far-off tourist

spot near the Line of Control (LoC) in north Kashmir, in a bid to promote it as an ecotourism destination.

Background: -

- The decision comes in the wake of unplanned and uncontrolled growth in concrete structures in the traditional tourist hotspots of Pahalgam, Gulmarg and Sonamarg in Kashmir.

Key takeaways

- Bangus Valley, also known as Bungus Valley, is a pristine and lesser-known destination located in the Kupwara district of Jammu and Kashmir, India.
- The name "Bangus" is derived from the Sanskrit words "Van" (forest) and "Gus" (grass), reflecting the valley's lush grassy landscapes.
- Situated approximately 100 kilometers northwest of Srinagar, the valley rests at an elevation of about 10,000 feet above sea level within the Pir Panjal mountain range.
- **The valley is divided into two main sections:**
    - **Bodh Bangus (Big Bangus):** The main valley, locally known as Bodh Bangus, covers an estimated area of about 300 square kilometers. It consists of a linear elliptical bowl aligned along the east-west axis.
    - **Lokut Bangus (Small Bangus):** A smaller valley known as Lokut Bangus lies on the northeastern side of the main valley.
    - Both valleys feature level green meadows surrounded by low-lying mountains covered with dense coniferous forests.
- The valley is encircled by the Rajwar and Mawar regions to the east, the Shamasbury and Dajlungun Mountains to the west, and the Chowkibal and Karnah Guli areas to the north.

Source: The Hindu

SHARAVATHI PUMPED STORAGE

Context: After receiving a nod from the State Wildlife Board of Karnataka in January, the controversial Sharavathi pumped-storageproject has now secured final approval from the state government.

Background: -

- The project has encountered environmental concerns, particularly due to its location within the Sharavathi Lion Tailed Macaque Sanctuary.

Key takeaways

- The project is situated on the Sharavathi River in Karnataka, India. The Sharavathi River is a vital source of hydroelectric power in the region and is known for the Jog Falls, one of the highest waterfalls in India.

Key Features:

- Capacity: The project is designed to generate 2,000 megawatts (MW) of power, utilizing eight units of 250 MW each.
- It leverages existing water bodies—the Talakalale and Gerusoppa reservoirs—as the upper and lower reservoirs, respectively. The Talakalale dam, standing at 62.48 meters, and the 64-meter

high Gerusoppa dam are integral to the project's infrastructure.

- During periods of low electricity demand, water will be pumped from the lower reservoir to the upper reservoir using grid power. When electricity demand is high, water from the upper reservoir will be released to generate electricity.

Additional Information - Sharavathi River

- The Sharavathi River is a west-flowing river in Karnataka.
- It originates in the Western Ghats and flows into the Arabian Sea, making it an important river for Karnataka's water resources and biodiversity.

Source: Bangalore Mirror

NORTH SEA

Context:A collision between a cargo ship carrying toxic chemicals and an oil tanker transporting jet fuel for the United States military in the North Sea raised concerns about an environmental disaster.

Background: -

- Maritime experts questioned how the collision could have occurred in broad daylight, despite modern navigation and safety measures.

Key takeaways

- The North Sea is a marginal sea of the Atlantic Ocean, bordered by several European countries.
- Geographical Location
  - Located between Great Britain, Scandinavia, Germany, the Netherlands, Belgium, and France.
  - Connected to the Atlantic Ocean via the English Channel (south) and the Norwegian Sea (north).
  - Important straits: Dover Strait (narrowest part) and Skagerrak (connects to the Baltic Sea).

- **Economic and Strategic Importance**
  - **Oil & Gas Reserves :** The North Sea is one of the world's major offshore oil and natural gas reserves.
  - **Renewable Energy (Offshore Wind Farms) :** The North Sea is a hub for offshore wind energy, with major wind farms in the UK, Germany, and Denmark.
  - **Fisheries :** One of the world's most productive fishing zones, supporting industries in the UK, Norway, and the Netherlands.
  - **Trade & Maritime Importance :** Major shipping routes connecting Europe to global

markets.

- **Key ports:** Rotterdam (Netherlands), Hamburg (Germany), Antwerp (Belgium), and London (UK).

Source: Down To Earth

MAJOR ISLANDS OF JAPAN

Context: Japan is planning to deploy long-range missiles on its southern island of Kyushu amid concerns around the Trump administration's stance towards its security pacts and continuing regional tensions.

Background: -

- The missiles, with a range of about 1,000km, would be capable of hitting targets in North Korea and China's coastal regions. They would bolster the defences of the strategically important Okinawa island chain and are part of Japan's development of "counterstrike capabilities" in the event it is attacked.

Island	Area (sq. km)	Significance
Honshu	227,943	Largest island, political & economic center (Tokyo, Osaka, Kyoto)
Hokkaido	83,424	Northernmost, cold climate, agriculture, fisheries
Kyushu	36,782	Volcanic activity, industrial hub (Fukuoka, Nagasaki)
Shikoku	18,801	Smallest of main islands, agriculture, tourism
Okinawa	2,281	Southernmost, strategic US military base

Key takeaways

- Japan is an archipelago consisting of 6,852 islands, out of which five major islands dominate in terms of area, population, and economic significance. These islands play a crucial role in Japan's geopolitical, economic, and strategic importance.
- Major Islands of Japan
- **Honshu – "Mainland Japan"**
  - Largest & most populous island.
  - Tokyo, Kyoto, Osaka, Yokohama located here.
  - Famous for Mount Fuji, Japan's highest peak.
- **Hokkaido – "Northern Island"**
  - Least populated among the major islands.
  - Cold climate, heavy snowfall – popular for skiing & winter tourism.
  - Major city: Sapporo (famous for Snow Festival).
- **Kyushu Island**
  - Third-largest island of Japan (after Honshu & Hokkaido).

- Known for volcanic activity (Mount Aso – Japan's largest active volcano).
- Fukuoka, the largest city, is a major industrial & trade center.
- Nagasaki, historically important due to atomic bombing in 1945.

- **Shikoku – "Smallest Main Island"**
  - Known for agriculture (citrus fruits), pilgrimages, and scenic beauty.
  - Home to 88 Temple Pilgrimage, a famous Buddhist pilgrimage route.
  - Connected to Honshu via the Seto Inland Sea Bridges.
- **Okinawa – "Strategic Southern Island"**
  - Located far south, closest to Taiwan & China.
  - Hosts US military bases, crucial for Indo-Pacific security.

Source: The Guardian

BETWA RIVER

Context: The Betwa River is facing severe degradation, with declining water levels and ecological distress.

Background: -

- The Betwa River, historically known as Vetravati, has played a vital role in the cultural and historical landscape of Madhya Pradesh. It has supported civilizations, nourished the Vindhyas, and witnessed significant historical events.

Key takeaways

- The Betwa River is a tributary of the Yamuna River, flowing through Madhya Pradesh and Uttar Pradesh.
- Origin: Rises in the Vindhya Range near Barkhera village in Raisen district, Madhya Pradesh.
- Length: Approximately 590 km.

- Flow Path: Flows north-eastward, passing through Madhya Pradesh and Uttar Pradesh.
- Confluence: Joins the Yamuna River near Hamirpur, Uttar Pradesh.

Significance

- **Historical & Cultural Significance**
  - Mentioned in ancient texts as Vetravati and associated with Mahabharata and Puranic traditions.
  - Important historical sites along the river include Orchha (Madhya Pradesh), known for its medieval temples and forts.
- **Economic & Agricultural Importance**
  - Supports irrigation and agriculture in Madhya Pradesh and Uttar Pradesh.
  - Major crops: Wheat, pulses, oilseeds.
  - Provides water for drinking and industrial purposes.

Source: NDTV

ENVIRONMENT AND ECOLOGY

ARCTIC GLACIERS AND METHANE EMISSIONS

Context:A team of scientists have discovered that Arctic glaciers are leaking significant amounts of methane, a potent greenhouse gas, into the atmosphere.In their analysis, the scientists found that glacial melt rivers and groundwater springs release large volumes of methane from beneath the ice to the atmosphere.

Background: -

- While carbon dioxide remains in the atmosphere for much longer than methane, methane is roughly 25 times more powerful at trapping heat in the atmosphere, and has an important short-term influence on the rate of climate change

Key takeaways

- For their study, the researchers analysed a small valley glacier in central Svalbard, called Vallåkrabreen. They looked at methane levels in groundwater springs and the melt river draining from the glacier.
- Methane concentrations in the melt river were found to be up to 800 times higher than the atmospheric equilibrium level.
- Notably, the methane that was being released was not produced by microbial activity beneath the ice. Rather it came from thermogenic sources — methane that had been trapped in the region's ancient geological formations for millions of years.
- Methane is one of the main drivers of climate change, responsible for 30 per cent of the warming since preindustrial times, second only to carbon dioxide.
- Over 20 years, methane is 80 times more potent at warming than carbon dioxide, according to a report by the United Nations Environment Programme.
- It is also the primary contributor to the formation of ground-level ozone, a colourless and highly irritating gas that forms just above the Earth's surface. According to a 2022 report, exposure to ground-level ozone could be contributing to 1 million premature deaths every year.
- Several studies have shown that in recent years, the amount of methane in the atmosphere has dramatically shot up. In 2022, the US National Oceanic and Atmospheric Administration (NOAA) said that the atmospheric levels of methane jumped 17 parts per billion in 2021, beating the previous record set in 2020.

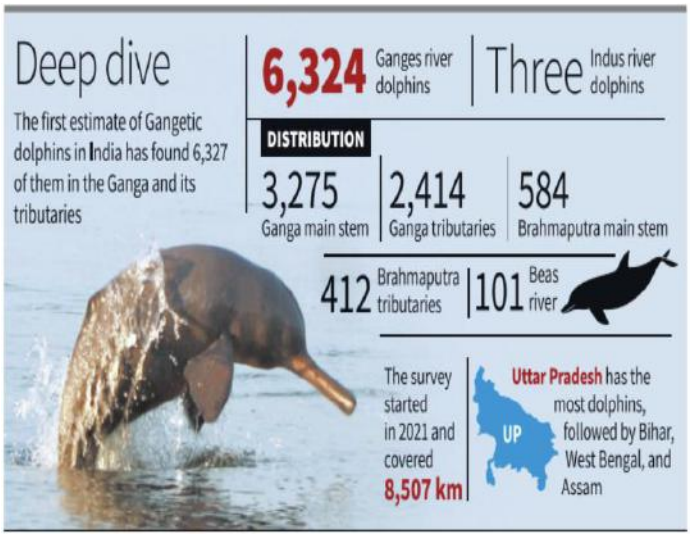
Source: Indian Express

GANGETIC DOLPHINS

Context: The first estimate of Gangetic dolphins, the only riverine dolphins in India, has found 6,327 of them in the Ganga and its tributaries.

Background: -

- For the survey, researchers travelled by boat at a constant speed using acoustic hydrophones —



essentially underwater microphones — that pick up sounds emitted by the dolphins. The animals are blind and rely on echolocation to communicate and move.

Key takeaways

- The Gangetic Dolphin (Platanista gangetica) is a freshwater dolphin species endemic to the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of India and Bangladesh, and the Sapta Koshi and Karnali Rivers in Nepal.
- It is India's National Aquatic Animal and plays a crucial role in the river ecosystem.
- **Conservation Status** -
    - **IUCN Red List:** Endangered
    - **Wildlife Protection Act, 1972:** Schedule I (Highest protection)
    - **CITES:** Appendix I (Strict trade restrictions)
    - **CMS (Bonn Convention):** Appendix II

Characteristics

- Blind due to poorly developed eyes; relies on echolocation for navigation and hunting.
- Can only survive in freshwater and requires deep, slow-flowing rivers.
- Indicator species for healthy river ecosystems.

Threats

- **Habitat Degradation:** Dams, barrages, and pollution (industrial, agricultural, and domestic waste) disrupt their natural habitat.
- **Poaching:** Hunted for oil and meat.
- **Accidental Catch:** Often gets entangled in fishing nets.
- **Water Pollution:** High levels of toxic metals, pesticides, and industrial effluents impact their survival.

Conservation Efforts in India

- **Project Dolphin (2020):** Launched under the Ministry of Environment, Forest and Climate Change (MoEFCC) to protect river and marine dolphins.
- **Vikramshila Gangetic Dolphin Sanctuary (Bihar):** India's only dolphin sanctuary.

Source: The Hindu

WORLD WILDLIFE DAY & CITES : THINGS TO KNOW

Context: March 3 is observed each year as World Wildlife Day to highlight the importance of conserving flora and fauna.

Background: -

- In 2013, the United Nations General Assembly (UNGA) proclaimed March 3 as the UN World Wildlife Day to celebrate and raise awareness of protecting the world's wild animals and plants. This was as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed in 1973 on this day.

About CITES

- CITES is an international agreement aimed at ensuring that international trade in wild animals and plants does not threaten their survival.
- It is legally binding on the parties but does not take the place of national laws.
- Currently there are 185 Parties to CITES. India is a party to CITES since 1976.
- The CITES Secretariat is administered by UNEP (The United Nations Environment Programme) and is located in Geneva, Switzerland.
- The Conference of the Parties to CITES is the supreme consensus-based decision-making body of the Convention and comprises all its parties.

How does CITES work?

- The species covered under CITES are listed in three Appendices, according to the degree of protection they need.
    - Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted rarely, only in "exceptional circumstances". Examples - Indian rhino, Asiatic lion, Indian star tortoise.
    - Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled to ensure their survival. For example, certain kinds of foxes and Hippopotamuses.
    - Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade, like the Bengal fox or the Golden Jackal from India.
- Different procedures are given category-wise to engage in the trade of species in each of the lists.

Source: Indian Express

WALLACE LINE

Context: Kangaroos and cockatoos are synonymous with Australia and tigers and orangutans with Asia. Both these continents boast rich biodiversity that is also very unique. A simple yet popular way to understand these unique and distinct species distribution is Wallace line.

Background: -

- Named after the British naturalist Alfred Russel Wallace, who first identified it in the 19th century, the Wallace Line is a crucial concept for understanding biodiversity, evolution, and ecological distribution

Key takeaways

- The Wallace Line is a significant biogeographical boundary that separates the distinct flora and fauna of Asia and Australasia.
- Location:The Wallace Line runs between the islands of Bali and Lombok in Indonesia, extending northward through the Makassar Strait between Borneo (Kalimantan) and Sulawesi, and further

into the Philippine Sea.

The original line, first proposed by Wallace in 1859, delineates flora and fauna of Asia (west of the line) and Australasia (east of the line). It was later modified by TH Huxley to separate the island of Palawan from the Phillipines.

- It marks the boundary between the Indo-Malayan ecozone (to the west) and the Australasian ecozone (to the east). These regions have distinct evolutionary histories and biodiversity.

Key Features of the Wallace Line:

- **Biodiversity Divide:**
  - **West of the Wallace Line:** The flora and fauna are predominantly of Asian origin, including species like tigers, rhinoceroses, and primates.
  - **East of the Wallace Line:** The flora and fauna are predominantly of Australian origin, including marsupials, cockatoos, and eucalyptus trees.

- **Evolutionary Significance:**The Wallace Line represents a deep historical separation caused by plate tectonics and continental drift. The regions on either side of the line evolved in isolation for millions of years.
- **Ecological Transition:**The area between the Wallace Line and the Lydekker Line (further east) is known as Wallacea, a transitional zone with a mix of Asian and Australian species.

Factors Contributing to the Wallace Line:

- **Geological History:**During the Ice Ages, sea levels dropped, exposing land bridges that allowed species to migrate between continents. However, the deep Wallace Trench between Bali and Lombok acted as a barrier, preventing the mixing of Asian and Australian species.
- **Ocean Currents:**Strong ocean currents in the region further limited the dispersal of species across the line.
- **Climatic Differences:**Variations in climate and habitat types on either side of the line also contributed to the distinct evolutionary paths of species.

Source: The Hindu

ONGOLE CATTLE

Context: The population of Ongole cattle is dwindling in India, while its numbers and prestige are increasing in countries like Brazil.

Background: -

- In February, an Ongole purebred cowwas sold for a whopping 4.38 million USD (25.7 million Brazilian Real or INR 40 crore) in Brazil.

Key takeaways

- Ongole Cattle are a renowned breed of indigenous cattle native to India, known for their strength, endurance, and adaptability. They are primarily found in the Prakasam district of Andhra Pradesh, particularly in the Ongole region, from which they derive their name.
- **Physical Characteristics:**
    - **Size:** Ongole cattle are large and robust, with a well-built muscular frame.
    - **Color:** They are typically white or light gray, with a distinctive hump on their back.
    - **Dewlap:** They have a prominent dewlap (loose skin under the neck), which helps them tolerate hot climates.
- **Adaptability:**
    - Ongole cattle are highly adaptable to tropical climates and can thrive in harsh, dry conditions.
    - They are resistant to many tropical diseases, making them ideal for regions with challenging environments.
- **Utility:**
    - **Draught Purposes:** Ongole cattle are primarily used as draught animals for plowing and transportation due to their strength and endurance.
    - **Milk Production:** While not high-yielding milk producers, they provide a moderate amount of milk with high fat content.
- **Temperament:**Ongole cattle are known for their docile nature, making them easy to handle and manage.

Source: Indian Express

WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2025

Context: Union Minister for Environment, Forest, and Climate Change, Bhupender Yadav, inaugurated the World Sustainable Development Summit (WSDS) 2025 in New Delhi on Wednesday.

Background: -

- Union Ministerstressed that under the leadership of Prime Minister Modi, India has taken transformative steps with initiatives like the International Solar Alliance (ISA), the Coalition for Disaster Resilient Infrastructure (CDRI), and Mission Lifestyle for Environment (LiFE).

Key takeaways

- The World Sustainable Development Summit (WSDS) is an annual event organized by The Energy and Resources Institute (TERI), serving as a global platform to discuss and advance sustainable development and climate solutions.
- Established in 2001 as the Delhi Sustainable Development Summit (DSDS), it was rebranded to WSDS to reflect its broader international scope.
- **WSDS 2025 Theme:** 'Partnerships for Accelerating Sustainable Development and Climate Solutions'
- This 24th edition emphasizes the critical role of collaborations among governments, businesses,

civil society, and other stakeholders in driving meaningful progress toward sustainability goals.

Key Components of WSDS:

- **Sustainable Development Leadership Award (SDLA):** Since 2005, this award has honored global leaders for their contributions to sustainable development.
- **Ministerial and High-Level Sessions:** Panels featuring policymakers, business leaders, and academics discussing pressing environmental issues.
- **Thematic Tracks:** Focused discussions on specific sustainability challenges, engaging domain experts to propose actionable solutions.
- **CEO Forum:** A platform for industry leaders to brainstorm sustainable business practices.
- **Youth Connect:** Initiatives to engage young students in sustainability dialogues, fostering awareness and involvement.

Source: DD News

CONVENTION ON CLUSTER MUNITIONS

Context: Lithuania quit an international convention banning cluster bombs, citing security concerns over neighbouring Russia in a move that has drawn criticism from human rights groups.

Background:

- NATO member Lithuania has said it wants to strengthen its defences following Russia's invasion of Ukraine, fearing it could be next if Moscow succeeds.

Key takeaways

- The Convention on Cluster Munitions (CCM) is an international treaty that prohibits the use, production, transfer, and stockpiling of cluster bombs, which pose severe risks to civilians.

Key Features of the Convention

- **Adoption:** 30 May 2008 in Dublin, Ireland.
- **Entry into Force:** 1 August 2010 (after 30 countries ratified it).
- **Signatories:** 123 countries (as of 2023), but major powers like the USA, Russia, China, and India have not signed.
- **Main Provisions:**
    - Total Ban on cluster munitions.
    - Stockpile Destruction within 8 years.
    - Clearance of Affected Areas within 10 years.
    - Assistance to Victims (healthcare, rehabilitation, and reintegration).

Why Cluster Munitions are Controversial?

- **Wide Area Effect:** Cluster bombs release multiple submunitions over large areas, causing indiscriminate damage.
- **Failure Rate:** Unexploded bomblets become de facto landmines, harming civilians for decades.
- **Humanitarian Crisis:** Countries like Laos, Vietnam, Syria, and Ukraine suffer from past cluster munition use.

India's Stand on CCM

- **Not a Signatory:** India has not signed or ratified the CCM.
- **Reasons for Non-Signature:**
    - Believes in the legitimate defense use of cluster munitions.
    - Calls for a balance between security and humanitarian concerns.
    - Reluctant to accept legally binding disarmament treaties without universal participation (as major powers like the USA and Russia are not part of it).

Source: The Hindu

MADHAV NATIONAL PARK

Context: The Centre declared the Madhav National Park in Madhya Pradesh as the country's 58th tiger reserve on Sunday (March 9, 2025).

Background: -

- Three tigers, including two females, were introduced to the Madhav National Park in 2023 as part of the tiger reintroduction project in the State.
- Madhav National Park is country's 58th tiger reserve and also the ninth from the State of Madhya Pradesh.
- Notably, on December 2, 2024 India got its 57th tiger reserve in the Ratapani Wildlife Sanctuary of Madhya Pradesh.

Key takeaways

- Madhav National Park is a protected area located in the Shivpuri district of Madhya Pradesh, India.
- Established in 1959, Madhav National Park was originally a hunting ground for the erstwhile Scindia royal family. the park was named after Madho Rao Scindia, the Maharaja of Gwalior.
- Madhav National Park is situated in the northern part of Madhya Pradesh. It lies on the northern fringe of the Central Highlands of India, forming part of the Upper Vindhyan Hills intermixed with plateaus and valley sections.
- Notable lakes within the park include Sakhya Sagar and Madhav Sagar, both created by damming the Manihar River.
- **Fauna:** Madhav National Park hosts a variety of wildlife, including:
    - **Mammals:** Species such as the Indian gazelle (Chinkara), Chital (Spotted deer), Nilgai (Blue bull), Sambar deer, Four-horned antelope (Chousingha), Sloth bear, Leopard, Indian wolf, Jackal, Bengal fox, Dhole (Wild dog), Wild boar, and Porcupine.
    - **Reptiles:** The park is home to reptiles like the Mugger crocodile, various turtle species, and snakes.
    - **Birds:** The lakes attract numerous migratory birds during winter, including species of geese, ducks, and waders.

Historical Significance:

- **George Castle:** At the park's highest point (484 meters), George Castle was built in 1911 by Madho Rao Scindia for an anticipated visit by King George V, although the king never stayed there.

Conservation Efforts:

- **Ramsar Site:** In January 2022, a 248-hectare area around Sakhya Sagar Lake within the park was designated as a Ramsar site, recognizing its importance as a wetland of international significance.

Source: The Hindu

DULCIBELLA CAMANCHACA

Context: Marine biologists have discovered a new species of amphipod, named Dulcibella camanchaca, hidden in the extreme depths of the Atacama Trench.

Background: -

- The discovery of this species highlights the incredible diversity of life forms that have evolved to survive in the most extreme conditions on our planet.

Key takeaways

- Dulcibella camanchaca is a species of amphipod crustacean discovered in the Atacama Trench, one of the deepest parts of the ocean.

- This species was found at depths of nearly 8,000 meters (26,000 feet) in the South Pacific Ocean near Chile. The Atacama Trench is known for its extreme conditions, including crushing pressure, frigid temperatures, and complete darkness.

Physical Characteristics

- **Size:** Dulcibella camanchaca measures approximately 4 centimeters (1.6 inches) in length, making it larger than most amphipods found at similar depths.

- **Appearance:** This amphipod has specialized appendages designed for capturing and consuming smaller crustaceans, indicating its predatory nature.

Ecological Role

- **Predatory Behavior:** Unlike many deep-sea amphipods that scavenge for food, Dulcibella camanchaca is an active predator. It uses its specialized appendages to capture and consume smaller crustaceans.

- **Adaptations:** This species is adapted to the extreme conditions of the hadal zone, making it one of the deepest-living predators identified to date.The hadal zoneencompasses ocean depths between 6,000 and 11,000 meters.

Source: Times of India

DELHI'S AIR WORST AMONG CAPITALS

Context: According to the World Air Quality Report 2024 by Swiss air quality monitoring company IQAir, Delhi has been ranked as the world's most polluted national capital for the sixth consecutive year. The report also highlights that 13 of the 20 most polluted cities globally are in India.

Background:

- IQAir examined data collected from 40,000 air quality monitoring stations in 138 countries.

Key takeaways

- The report looked specifically at concentrations of fine particulate matter, or PM2.5, one of the smallest but most dangerous of pollutants.
- PM2.5 comes from sources such as the combustion of fossil fuels, and can cause respiratory problems, chronic kidney disease, cancer, and stroke or heart attacks.
- Only 12 countries, regions, and territories recorded PM2.5 concentrations below the World Health Organization's (WHO) recommended average annual limit of 5 µg/m3.Most of these countries were in Latin America, the Caribbean, or the Oceania region.
- The five most polluted countries, according to the report, were Chad, Bangladesh, Pakistan, Congo, and India, with annual average PM2.5 concentrations of 91.8 µg/m3, 78 µg/m3, 73.7 µg/m3, 58.2 µg/m3, and 50.6 µg/m3 respectively.

Pollution in India

- At 50.6 µg/m3, India's average PM2.5 concentration last year was 7% lower than in 2023 (54.4 µg/m3).
- The most polluted city in the world is Byrnihat on the border of Assam and Meghalaya, according to the report.
- Delhi continued to see high levels of pollution, with an annual average of 91.6 µg/m3 in 2024, which was almost unchanged from the 92.7 µg/m3 recorded in 2023.
- Extreme levels of pollution were seen in November in Delhi, Punjab, Chandigarh, Haryana, and Himachal Pradesh.
- Crop stubble-burning remained the major contributor to PM2.5 levels, accounting for 60% of pollution during peak periods.
- Other major sources of pollution in the country included vehicular emissions, industrial discharges, and construction dust, the report said.

Source: Indian Express

NATIONAL BOARD FOR WILDLIFE

Context: More than 10 years after assuming office, Prime Minister Narendra Modi chaired his first-ever meeting of the National Board for Wildlife (NBWL) last week.

Background: -

- The last full-body NBWL meeting was held on September 5, 2012, chaired by then

PM Manmohan Singh. The PM is the ex officio chairman of the NBWL.

Key takeaways

- The present-day National Board for Wildlife was created in 2003 after amending The Wild Life (Protection) Act, 1972.
- The NBWL is the country's apex body on matters of framing wildlife policy, conservation of wildlife and forests, and on giving recommendations to set up new national parks and sanctuaries.
- The NBWL consists of 47 members with the Prime Minister as its chairperson and the Union environment minister its vice-chairperson.
- The NBWL has a standing committee, to which are delegated key tasks such as appraising projects situated on forest lands inside and around national parks and sanctuaries as well as projects within 10-km of protected areas.
- The standing committee's decisions are recommendatory, which the environment ministry can overrule.

Why has the board recently faced criticism?

- Over the past decade, the NBWL has cleared several controversial projects in and around wildlife habitats. These include the Ken Betwa river linking project's Daudhan Dam, which will submerge nearly 100 sqkm of Panna Tiger Reserve, and an oil exploration project of Vedanta in the eco-sensitive zone of the Hollongapar Gibbon sanctuary, home to the endangered Hoolock Gibbon, India's only ape species. Also, in 2021, the Galathea Bay Sanctuary in Andaman and Nicobar Islands, a nesting site of leatherback sea turtles, was denotified.
- After the BJP came to power in 2014, the NBWL was reconstituted. The move faced allegations of dilution of powers, as only three non-governmental members were appointed.
- The last standing committee of the UPA era had seven members not linked to the government — four conservation experts, and three representing non-governmental organisations.

Source: Indian Express

END-PERMIAN MASS EXTINCTION

Context: The End-Permian Mass Extinction that killed 80% of life on Earth 250 million years ago may not have been quite as disastrous for plants, new fossils hint. Scientists have identified a refuge in China where it seems that plants weathered the planet's worst die-off.

Background: -

- The end-Permian extinction is particularly interesting to scientists because it was driven by greenhouse gases, much like climate change today. The situation was far more extreme then: The polar ice caps melted completely — a situation that would cause sea levels to rise a staggering 230 feet (70 meters) today.

Key takeaways

- The End-Permian Mass Extinction, also known as "The Great Dying", is considered the most

severe extinction event in Earth's history.

- Occurring approximately 252 million years ago, it marked the boundary between the Permian and Triassic geological periods. This event led to the extinction of about 90% of all species, including 95% of marine species and 70% of terrestrial species.

The exact causes are still debated, but several factors likely contributed:

- **Siberian Traps Volcanism:**Massive volcanic eruptions in what is now Siberia released enormous amounts of lava and greenhouse gases (CO_2 and methane).This led to global warming, ocean acidification, and environmental disruption.
- **Climate Change:**The release of greenhouse gases caused a dramatic increase in global temperatures, possibly by 8-10°C.This disrupted ecosystems and made many habitats uninhabitable.
- **Ocean Anoxia:**Warming oceans and changes in circulation led to widespread oxygen depletion in marine environments.This caused the collapse of marine ecosystems.
- **Methane Hydrate Release:**Warming may have triggered the release of methane hydrates from ocean sediments, further exacerbating global warming.
- **Ozone Depletion:**Volcanic emissions may have damaged the ozone layer, exposing life to harmful ultraviolet radiation.
- The recovery of ecosystems after the extinction was slow, taking 5-10 million years. The survivors, including early dinosaurs, mammals, and reptiles, diversified and eventually gave rise to new ecosystems in the Triassic Period.

Source: Live Science

IUCN GREEN LIST

Context: The IUCN Green List is seeing growth with the addition of four new listings from West Asia, marking a positive trend toward effective and equitable area-based conservation.

Background: -

- Four new sites included are Sharaan Nature Reserve and King Abdulaziz Royal Nature Reserve of Saudi Arabia, Aqaba Marine Reserve of Jordan and Sir Bu Nair Protected Area from UAE.

Key takeaways

- The International Union for Conservation of Nature (IUCN) Green List of Protected and Conserved Areas is a global initiative aimed at recognizing and promoting effective, equitable, and successful management of protected and conserved areas worldwide.
- It serves as a benchmark for quality in nature conservation, ensuring that these areas deliver tangible benefits for both people and nature.

Objectives of the IUCN Green List:

- **Enhance Conservation Outcomes:** Increase the number of protected and conserved areas that achieve successful conservation results through effective management and governance.

- **Provide a Global Benchmark:** Offer a globally consistent standard to measure and improve the performance of protected and conserved areas.

The IUCN Green List Standard is structured around four key components, each encompassing specific criteria:

- **Good Governance:** Ensures that the area is managed transparently, inclusively, and accountably, respecting the rights of stakeholders and indigenous communities.
- **Sound Design and Planning:** Focuses on clear, long-term conservation goals based on a comprehensive understanding of the area's natural, cultural, and socio-economic values.
- **Effective Management:** Involves implementing strategies and actions that are efficient, adaptive, and based on the best available knowledge to maintain or enhance the area's values.
- **Successful Conservation Outcomes:** Measures the achievement of tangible and positive results in conserving the area's values, contributing to biodiversity and ecosystem health.

The path to Green List certification involves several stages:

- **Application Phase:** Protected areas submit an application and provide initial documentation demonstrating commitment to the Green List indicators.
- **Candidate Phase:** Upon acceptance, the site undergoes a thorough evaluation against all criteria, including stakeholder consultations and site visits.
- **Green List Phase:** Successful sites are awarded Green List status, recognized for their excellence in conservation, and are subject to periodic reviews to ensure ongoing compliance.
- There are no Indian sites listed on the IUCN Green List

Source: IUCN

IGUANAS

Context: Fiji and Tonga's native iguanas have puzzled scientists as all other iguana species are found in the Americas. A study published in Proceedings of the National Academy of Sciences suggests their ancestors drifted nearly 8,000 km across the Pacific on floating vegetation, marking the longest known oceanic journey by a non-human vertebrate.

Background: -

- Rafting — the term scientists use for hitching a ride across oceans on uprooted trees or tangles of plants — has long been recognised as a way for small creatures to reach islands. But this is generally seen among invertebrates, whose small size means they can survive a long way in an uprooted tree trunk. Among vertebrates, lizards and snakes seem to be able to raft farther than mammals, perhaps because their slower metabolism allows them to fast for a long time.

Key takeaways

- Iguanas are large, herbivorous lizards belonging to the family Iguanidae. They are primarily found in tropical regions of Central and South America, the Caribbean, and parts of the Pacific.

Habitat & Distribution

- Native to the Americas, including Mexico, Central and South America, and the Caribbean.

- Fiji and Tonga Iguanas: Unique populations exist in these Pacific islands, believed to have arrived via floating vegetation from the Americas.

Behavior

- Iguanas are diurnal, meaning they are active during the day.
- They are known for their keen vision, which helps them detect predators and locate food.
- Iguanas communicate using visual signals like head bobs and dewlap displays.

Notable Species

- Green Iguana (Iguana iguana) – Found in Central and South America, commonly kept as pets.
- Marine Iguana (Amblyrhynchus cristatus) – Endemic to the Galápagos Islands, the only sea-going lizard.
- Fiji Banded Iguana (Brachylophus fasciatus) – A rare species found in Fiji.
- While some iguana species, like the green iguana, are abundant, others, such as the Fiji crested iguana, are critically endangered due to habitat loss and hunting.

Source: Indian Express

LIFE UNDER ANTARCTIC ICE SHELF

Context: A team of scientists may have discovered dozens of new species, including giant sea spiders, octopi, and corals on the newly exposed seafloor left behind by the enormous A-84 iceberg that broke away from the George VI Ice Shelf on January 13.

Background: -

- The break-away of the 510-sq-km iceberg gave access to an underwater world that was previously beyond human reach. A remotely-operated submersible got to the seafloor on January 25, where it captured photos and videos, and collected specimens.

Key takeaways

- The mission was part of Challenger 150, a UNESCO-endorsed global initiative for deep-sea research.
- Using a remotely operated vehicle (ROV), scientists explored the seafloor for eight days, and found flourishing ecosystems at depths of up to 1,300 metres.
- The reason scientists were surprised to find diverse ecosystems under the ice shelf is that deep-sea communities typically depend on photosynthesising organisms to rain down nutrients from the surface to the seafloor. However,Antarctic ecosystems have been covered by 150-metre-thick

ice for centuries, completely cut off from surface nutrients.

- Scientists have hypothesised that ocean currents, glacial meltwater or something else could be transporting essential nutrients, sustaining life beneath the ice shelf. The precise mechanism fueling these ecosystems is yet to be understood.

Challenger 150 Mission

- The Challenger 150 is a global scientific initiative, endorsed by the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO), aimed at enhancing our understanding of deep-sea ecosystems.
- Launched in alignment with the UN Decade of Ocean Science for Sustainable Development (2021-2030), its mission is to map life in the deep ocean and provide the scientific foundation necessary for sustainable management of these vast environments.

Source: Indian Express

OKJÖKULL

Context: Two satellite photos taken 33 years apart show the disappearance of Okjökull glacier in Iceland that was the first ice mass to be declared dead as a result of human-caused climate change.

Background: -

- Because of inconsistent monitoring and debates about the true sizes of glaciers, it is unclear exactly how many glaciers have been lost due to climate change, according to the National Snow and Ice Data Center.

Key takeaways

- Okjökull, often referred to as "Ok Glacier," was a glacier located atop the Ok volcano in western Iceland.
- In the late 19th century, it spanned approximately 16 square kilometers. However, due to rising global temperatures, it experienced significant shrinkage over the 20th century. By 2012, its area had diminished to merely 0.7 square kilometers.
- In 2014, glaciologists declared Okjökull "dead," as it no longer possessed the characteristics essential for a glacier, notably the ability to move under its own weight. This marked the first instance in Iceland where a glacier lost its status due to climate change.

Additional Information

- In 2023, Iceland created the world's first iceberg graveyard, where ice-like headstones were constructed for the 15 major glaciers listed on the Global Glacier Casualty List, all of which are either dead or critically endangered, according to the United Nations.
- The Global Glacier Casualty List (GGCL) is a comprehensive initiative aimed at documenting glaciers worldwide that have disappeared or are critically endangered due to climate change.
- Established in 2024 through a collaboration between Rice University, the University of Iceland, the Iceland Glaciological Society, the World Glacier Monitoring Service, and UNESCO, the GGCL seeks to preserve the names and stories of these glaciers, highlighting their cultural, economic,

and environmental significance.

Source: Live Science

URBAN HEAT ISLAND

Context: In recent years, Hyderabad has become an Urban Heat Island (UHI), experiencing higher temperatures than surrounding rural areas. The Telangana government acknowledged this in its Socio Economic Outlook 2025 report.

Background: -

- This situation raises concerns not only for climate conditions but also for public health, as hot nights hinder recovery from day time heat, leading to extended physical stress.

Key takeaways

- An Urban Heat Island (UHI) is a phenomenon where urban areas experience higher temperatures than surrounding rural areas due to human activities and urbanization.

Causes of UHI

- **Reduced Vegetation:** Less greenery leads to less cooling through evapotranspiration.
- **Heat Absorption by Buildings & Roads:** Concrete, asphalt, and glass trap and retain heat.
- **Waste Heat Emission:** From air conditioners, vehicles, and industries.
- **Altered Wind Patterns:** High-rise buildings obstruct natural airflow, reducing cooling.
- **Air Pollution:** Smog and pollutants trap heat, enhancing the greenhouse effect.

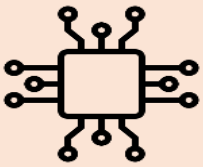
Effects of UHI

- **Increased Energy Demand:** Higher use of air conditioning raises electricity consumption.
- **Health Issues:** Heat-related illnesses, dehydration, and respiratory problems.
- **Reduced Air Quality:** Higher temperatures worsen air pollution and smog formation.
- **Water Stress:** Increased evaporation and water demand.
- **Impact on Biodiversity:** Heat stress affects urban flora and fauna.

Mitigation Strategies

- **Increasing Green Cover:** Planting trees, rooftop gardens, and urban forests.
- **Cool Roofs & Reflective Materials:** Using light-colored or reflective surfaces to reduce heat absorption.
- **Sustainable Urban Planning:** Reducing vehicular emissions and promoting public transport.
- **Water Bodies & Green Spaces:** Creating urban lakes and parks for natural cooling.
- **Improving Ventilation:** Designing open spaces for better airflow in cities.

Source: New Indian Express



SCIENCE & TECHNOLOGY

OCELOT

Context: Amazon Web Services (AWS) announced Ocelot, its first-generation quantum computing chip, as it enters the race against fellow tech giants in harnessing the experimental technology.

Background:

- Quantum research is seen as a critical emerging field, and both the United States and China have been investing heavily in the area, with Washington also placing restrictions on exports of the sensitive technology.

Key takeaways

- Ocelot is a nine-qubit chip that has been internally fabricated by Amazon.
- Amazon's announcement comes a week after rival Microsoft introduced its own quantum computing chip 'Majorana 1' .

Key Features of Ocelot:

- **Error Correction Efficiency:** Ocelot is designed to address one of the primary challenges in quantum computing—error correction. Utilizing "cat qubits," the chip intrinsically suppresses certain types of errors, potentially reducing the resources required for error correction by up to 90% compared to traditional methods.
- **Scalability:** The chip's architecture is designed to be scalable, allowing for the development of practical, fault-tolerant quantum computers. AWS believes that this approach could accelerate the timeline to a practical quantum computer by up to five years.

Source: The Guardian

BLUE GHOST MISSION 1

Context:U.S. company Firefly Aerospacesuccessfully landed its spacecraft on the moon on Sunday, marking only the second private mission to achieve the milestone — and the first to do so upright.

Background: -

- Firefly Aerospace's Blue Ghost Mission 1 touched down shortly after 3.34 a.m. U.S. Eastern Time (0204 IST) near Mons Latreille, a volcanic formation in Mare Crisium on the moon's northeastern near side.
- The mission is part of a NASA-industry partnership aimed at reducing costs and supporting Artemis, the programme designed to return astronauts to the moon.

Key takeaways

- Blue Ghost carries 10 instruments, including a lunar soil analyser, a radiation-tolerant computer and an experiment testing the feasibility of using the existing global satellite navigation system to navigate the Moon.
- Designed to operate for a full lunar day (14 earth days), Blue Ghost is expected to capture high-

definition imagery of a total eclipse on March 14, when the earth blocks the sun from the moon's horizon.

- On March 16, it will record a lunar sunset, offering insights into how dust levitates above the surface under solar influence — creating the mysterious lunar horizon glow first documented by Apollo astronaut Eugene Cernan.
- Blue Ghost's arrival will be followed on March 6 by fellow Texas company Intuitive Machines' IM-2 mission, featuring its lander Athena.
- In February 2024, Intuitive Machines became the first private company to achieve a soft lunar landing — also the first U.S. landing since the crewed Apollo 17 mission of 1972.
- However, the success was tempered by a mishap: the lander came down too fast and tipped over on impact, leaving it unable to generate enough solar power and cutting the mission short.
- Until Intuitive Machines' first successful mission, only five national space agencies had accomplished this feat: the Soviet Union, the United States, China, India and Japan, in that order.

Source: The Hindu

INDIA'S SEMICONDUCTOR MANUFACTURING

Context: India is set to roll out its first domestically manufactured semiconductor chip in 2025.

Background:

- This initiative aims to reduce India's dependency on semiconductor imports, which have risen significantly over the past decade.

Key takeaways

Semicon India Programme

- The Semicon India Programme, launched in 2021, aims to develop the semiconductor and display manufacturing ecosystem.
- **Key Initiatives:**Five manufacturing facilities are under construction for the manufacturing and assembly of semiconductor chips, backed by the Semicon India Programme.
- **Notable projects:**
    - Tata Semiconductor Assembly and Test Facility – Morigaon, Assam.
    - Dholera Semiconductor Fabrication (Fab) Facility – Tata Electronics in collaboration with Taiwan's Powerchip Semiconductor Manufacturing Corporation.
    - However, the actual spending under the Semicon India Programme has consistently fallen short of budgeted allocations.

India's Semiconductor Import Dependency

- India heavily relies on semiconductor imports, with key imports including:
    - Monolithic Integrated Circuits (ICs) – Used in CPUs, smartphones, automobiles, medical devices, and industrial automation.

- Memory Chips – Includes volatile (RAM) and non-volatile (NAND flash).
- Amplifiers – Used in wireless communication and audio equipment.

- **Import trends (FY16-FY24):**
  - Monolithic IC imports increased by 2,000%.
  - Memory chip imports surged by 4,500%.
  - Amplifier imports rose by 4,800%.
  - Semiconductor imports now constitute a higher share of total imports, with monolithic ICs forming 2.09% of total imports in FY25, up from 0.19% in FY16.
- **Major Semiconductor Suppliers to India**
  - Top Supplier: China (except FY19).
  - Other key sources: Hong Kong, Japan, South Korea, Singapore, and Taiwan.

Challenges in India's Semiconductor Ecosystem

- With the new facilities, India will be able to add value in the assembly, testing, and packaging, and fab segments of the global value chain for semiconductors, but it is yet to make major strides in -
  - EDA (Electronic Design Automation) software – Critical for chip design.
  - Core IP (Intellectual Property) – Patents for semiconductor technology.
  - Wafers – Key raw material for chip fabrication.
  - Fab tools and ATP (Assembly, Testing, and Packaging) tools – Machinery required for semiconductor manufacturing.
  - Chip design capabilities – India needs to invest more in R&D to develop indigenous chip designs.

Source: The Hindu

NATIONAL QUANTUM MISSION (NQM)

Context: The Centre has made operational "hubs" in four leading institutions to develop quantum computer technology and earmarked funds for them.

Background: -

- Quantum computers are a work-in-progress globally and exploit properties of the atom, which are only explainable by the principles of quantum mechanics.

Key takeaways

- The Union Cabinet, approved the National Quantum Mission (NQM) in 2023 at a total cost of Rs.6003.65 crore from 2023-24 to 2030-31, aiming to seed, nurture and scale up scientific and industrial R&D and create a vibrant & innovative ecosystem in Quantum Technology (QT).
- The Mission objectives includedeveloping:
  - intermediate-scale quantum computers with 50-1000 physical qubits in 8 years in various platforms like superconducting and photonic technology.

- Satellite-based secure quantum communications between ground stations over a range of 2000 kilometers within India, long-distance secure quantum communications with other countries, inter-city quantum key distribution over 2000 km.

- **The National Quantum Mission will focus on developing :**
  - magnetometers with high sensitivity in atomic systems and Atomic Clocks for precision timing, communications, and navigation.
  - It will also support the design and synthesis of quantum materials such as superconductors, novel semiconductor structures, and topological materials for the fabrication of quantum devices.
  - Single photon sources/detectors, and entangled photon sources will also be developed for quantum communications, sensing, and metrological applications.
- **Mission Implementation includes setting up of four Thematic Hubs (T-Hubs) in top academic and National R&D institutes in the domains:**
  - Quantum Computing
  - Quantum Communication
  - Quantum Sensing & Metrology
  - Quantum Materials & Devices
- The hubs which will focus on generation of new knowledge through basic and applied research as well as promote R&D in areas that are mandated to them.

Source: The Hindu

CAR T-CELL THERAPY

Context: The clinical trial results of India's first CAR T-cell therapy, published in The Lancet, show that it worked for nearly 73 per cent of patients. These results come from the Phase I and II trials of the therapy, where researchers assess its safety and effectiveness against a given condition.

Background:

- This is the first clinical trial of a CAR T-cell therapy from India to be published in an international journal.
- The treatment developed in India is meant for patients with two types of blood cancers that affect the B cells — acute lymphoblastic leukemia and large B cell lymphomas.

Key takeaways

- CAR T-cell therapy, or chimeric antigen receptor T-cell therapy, trains the body's own immune cells to identify and destroy cancer cells. This treatment is designed for specific types of blood cancer and is given to patients whose cancer has either relapsed or not responded to first-line treatment.
- India's drug regulator had granted approval for this therapy in 2023. It is now available at several hospitals across India, including Apollo, Fortis, Amrita and Max, among others.
- Given that the treatment is novel and intended for cancer patients with no other options, the regulator allowed the company — a start-up incubated in IIT Bombay called ImmunoAct — to

forgo a large Phase III clinical trial to demonstrate its efficacy in a broader population. However, the company must follow up with all patients who receive the therapy for 15 years.

- While the response rate was found to be similar to other therapies approved across the world, there was high incidence of haemophagocytic lymphohistiocytosis — a serious but known complication of CAR T therapies where the immune cells get uncontrollably activated leading to hyper inflammation and organ damage.
- For any CAR T-cell therapy, a patient's immune T-cells are collected by filtering their blood. These cells are then engineered in a lab to add receptors that can bind with cancer cells. These cells are then multiplied and infused in the patient.

Additional Information

- T-cells are primarily used in CAR-T cell therapy because of their pivotal role in the immune system's response to pathogens and malignancies. These cells can be genetically engineered to express chimeric antigen receptors (CARs), which are specifically designed to recognise and bind to antigens on the surface of cancer cells. Once bound, these modified T-cells can efficiently kill cancer cells.
- Other cells like B cells or natural killer cells also play roles in immunity but don't have the same adaptability and memory capabilities as T cells, making them less effective for the persistent and targeted action required in CAR-T cell therapy.

Source: Indian Express

CORONAL MASS EJECTIONS (CMES)

Context: Scientists from the Indian Institute of Astrophysics(IIA) have reported observations of a flareless coronal mass ejection (CME) from the solar atmosphere with the Visible Emission Line Coronagraph (VELC) instrument onboard Aditya-L1 mission.

Background:

- The Aditya-L1 mission isIndia's first scientific mission dedicated to studying the sun.

Key takeaways

- Coronal Mass Ejections (CMEs) are massive bursts of solar plasma and magnetic fields ejected from the Sun's corona into space. They are often associated with solar flares and can have significant effects on Earth's magnetosphere.

Causes of CMEs:

- Intense magnetic field activity in the Sun's corona.
- Reconnection of magnetic field lines leading to explosive energy release.
- Increased solar activity, particularly during solar maximum (the peak of the Sun's 11-year solar cycle).

Impact of CMEs on Earth:

- **Geomagnetic Storms:**When CMEs interact with Earth's magnetosphere, they can cause geomagnetic storms, leading to disturbances in satellite communications and GPS signals.

- **Auroras**:High-energy charged particles from CMEs interact with Earth's atmosphere, creating bright auroras (Northern and Southern Lights).
- **Disruptions in Power Grids & Communication**:Intense CMEs can induce electric currents in power grids, potentially causing large-scale blackouts.
- Radio communications, especially HF (High Frequency) bands, can experience disruptions.
- **Satellite Damage:**CMEs can increase the radiation exposure of satellites, leading to malfunctions or permanent damage.
- **Health Risks to Astronauts:**Increased radiation exposure from CMEs poses health risks to astronauts in space.

Source: The Hindu

WHITE HYDROGEN

Context: France has discovered a massive 46-million-ton white hydrogen reserve in the Moselle region, valued at $92 trillion.

Background: -

- Hydrogen is considered the future of clean energy. Unlike solar or wind energy, it produces only water when burned.
- The discovery challenges previous assumptions that hydrogen must be lab-produced, proving it exists naturally.

Key takeaways

- Based on its production method and environmental impact, hydrogen is classified into several types:
- Grey Hydrogen
    - **Source**: Produced from natural gas or fossil fuels using steam methane reforming (SMR).
    - **Emissions**: High carbon dioxide (CO_2) emissions since no carbon capture technology is used.
    - **Usage**: Currently, the most common form of hydrogen used in industry, refineries, and chemical production.
- **Blue Hydrogen**
    - **Source**: Similar to grey hydrogen (produced from natural gas) but with Carbon Capture, Utilization, and Storage (CCUS) technology.
    - **Emissions**: Lower than grey hydrogen, as up to 90% of CO_2 emissions are captured.
    - **Usage**: Considered a transition fuel in the shift to green hydrogen.
- **Green Hydrogen**
    - **Source**: Produced using electrolysis of water, powered by renewable energy sources like solar or wind.

- **Emissions**: Unlike others, this "white hydrogen" requires no industrial production and emits no CO_2.
- **Usage**: The most sustainable form of hydrogen, used in fuel cells, transportation, and energy storage.

- **White Hydrogen**
  - **Source**: Naturally occurring underground hydrogen deposits.
  - **Emissions**: Zero, but not yet commercially viable due to extraction challenges.
  - **Usage**: Research is ongoing to explore its potential.
- **Pink Hydrogen**
  - **Source**: Produced via electrolysis powered by nuclear energy.
  - **Emissions**: Low, as nuclear power does not generate carbon emissions.
  - **Usage**: Can be a stable alternative where nuclear power is available.

Source: Times Now

SPRING EQUINOX

Context: March 20, 2025, marks the vernal or spring equinox in the Northern Hemisphere.

Background: -

- Equinoxes occur twice a year, in March and in September, and are the only times when both poles are sunlit at the same time.

Key takeaways

- An Equinox is when the Sun is directly above the Equator, resulting in nearly equal duration of day and night across the globe.The term is derived from the Latin words “aequus” meaning “equal”, and “nox” (meaning “night”).
- On all other days, the Earth’s axis is tilted either towards or away from the sun. This impacts how the light and the warmth of the sun are distributed across the hemispheres.
- During the equinox, the Earth’s axis and orbit align just so that both hemispheres obtain an equal amount of sunlight.
- In the Northern Hemisphere, the vernal or spring equinox, typically occurs between March 19 and 21, while the autumnal or fall equinox occurs between September 21 and 24.
- The names are switched for the Southern Hemisphere, so March 20, 2025, marks the autumnal equinox there.

what are solstices?

- Solstices mark the days when the Earth is extremely tilted toward or away from the sun. On these days, each hemisphere gets significantly different amounts of light and warmth from the sun, with the days and nights being just as lopsided.
- The summer solstice in the Northern Hemisphere, between June 20 and 22, creates the longest day and shortest night of the year, as the upper half of the earth is tilted towards the sun.

- Conversely, the winter solstice in the Northern Hemisphere, between December 20 and 23, creates the shortest day and longest night of the year, with the upper half of the earth is tilted towards the sun.

Source: Indian Express

STAR IN THE MAKING

Context: The Webb Space Telescope has captured a plume of gas and dust streaming from a star in the making.

Background: -

- The outflow is about 625 light-years from Earth in one of the closest star-forming regions of our Milky Way galaxy, according to NASA.

Formation of stars

- The process of star formation is an extraordinary sequence of events that occurs within massive clouds of gas and dust scattered throughout galaxies, often referred to as molecular clouds or stellar nurseries.

Formation of Molecular Clouds

- **Initial Conditions:** Star formation begins in regions of dense and cold interstellar gas and dust. These molecular clouds are primarily composed of hydrogen (H_2) with traces of helium and heavier elements.
- **Triggering Mechanisms:** External events like supernova explosions, galactic collisions, or shockwaves can compress the molecular cloud, initiating the process.

Gravitational Collapse

- **Instability**: Regions within the cloud become denser over time, leading to local instabilities.
- **Formation of Dense Cores:** As gravity overwhelms internal pressure, parts of the cloud collapse into compact, dense clumps known as protostellar cores.

Protostar Stage

- **Heating and Rotation:** During the collapse, gravitational potential energy converts into heat, increasing the core's temperature. Conservation of angular momentum causes the core to rotate and form a rotationally flattened disk around it.
- **Accretion Disk:** Material from the surrounding envelope spirals inward onto the protostar through the accretion disk, fueling its growth.

Ignition of Nuclear Fusion

- **Core Temperature and Pressure**: When the protostar's core temperature rises to approximately 10 million Kelvin, nuclear fusion of hydrogen into helium begins. This marks the birth of a star.
- **Radiative Pressure:** The energy generated from fusion creates outward radiative pressure, balancing the inward pull of gravity and halting further collapse.

Main Sequence Stage

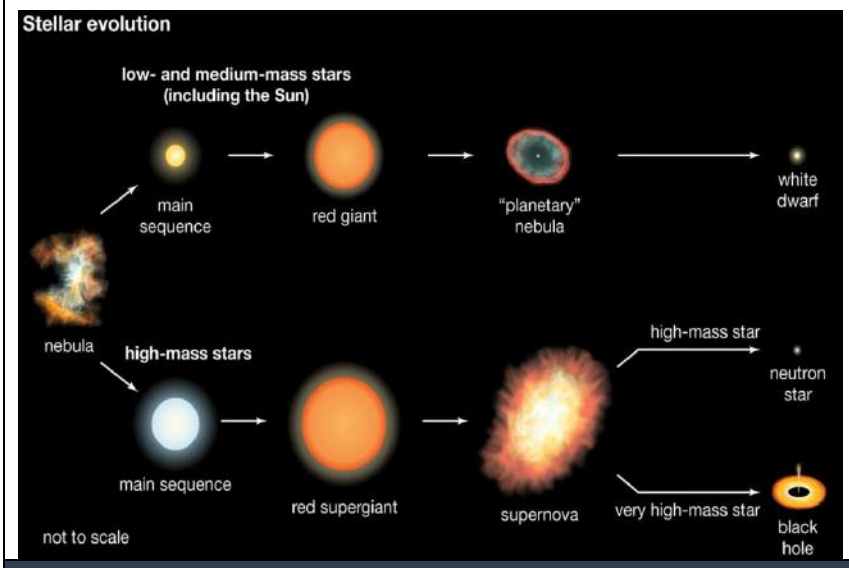
- **Equilibrium:** The star enters the main sequence phase, where it remains in hydrostatic equilibrium for millions to billions of years. During this time, it burns hydrogen in its core, producing energy.

Factors Influencing Star Formation

- **Mass of the Star**: The amount of material available determines whether the star becomes a low-mass star (like the Sun) or a high-mass star (more massive stars may end their lives as black holes or supernovae).
- **Environmental Conditions:** The metallicity (presence of elements heavier than helium) and external forces influence the efficiency of star formation.

End States - the lifecycle of a star depends on its initial mass:

- Low-Mass Stars (e.g., red dwarfs): End as white dwarfs.



- Medium-Mass Stars (e.g., Sun-like stars): Become red giants before shedding their outer layers as planetary nebulae, leaving behind a white dwarf.
- High-Mass Stars: Explode as supernovae and may form neutron stars or black holes.

Source: AP News

PARKER SOLAR PROBE

Context:NASA's Parker Solar Probe has successfully completed its second close flyby of the sun.

Background: -

- Thespacecraft swooped within 6.1 million kilometersof the sun's surface at a whopping speed of 692,000 kilometers per hour.

Key takeaways

- The Parker Solar Probe (PSP) is a groundbreaking NASA mission designed to revolutionize our understanding of the Sun by venturing closer to it than any spacecraft before.
- Launched in 2018, the probe is part of NASA's Living With a Star program and is built and managed by the Johns Hopkins University Applied Physics Laboratory.

Mission Objectives

- **Mapping the Corona and Solar Wind:** Parker's primary objective is to investigate the physical processes in the solar corona. By entering the Sun's outer atmosphere, the probe collects data on the temperature, magnetic fields, and plasma characteristics that drive the solar wind.
- **Understanding Particle Acceleration:** Studying how particles are accelerated to speeds of up to half the speed of light enhances the understanding of space weather—a phenomenon that can

impact satellites, power grids, and communications on Earth.

- Unraveling the Mysteries of Solar Activity: By getting closer than ever to the Sun, scientists hope to answer longstanding questions about the mystery of coronal heating (why the corona is significantly hotter than the Sun's surface) and the mechanisms behind solar flares and coronal mass ejections.

Key Technical Details

- **Orbit and Proximity:** Utilizing multiple gravity assists from Venus, the Parker Solar Probe's elliptical orbit gradually reduces its perihelion (closest approach), allowing it to pass as near as approximately 6.1 million kilometers from the solar surface. This proximity is a record among human-made objects.
- **Speed Records:** At its closest approaches, the probe reaches staggering speeds of up to 692,000 kilometers per hour, making it the fastest human-made object in history. This record-breaking speed is essential for minimizing the time spent in the harshest sections of the corona while still gathering critical data.

Source: Space

AGRICULTURE

AGRICULTURE INFRASTRUCTURE FUND (AIF) SCHEME

Context: Punjab has utilised 100% of the Rs 4,713 crore allocated to it by the Centre under the Agriculture Infrastructure Fund (AIF) scheme.

Background: -

- As of February 28, with 21,740 projects, Punjab is at the No.1 position in the country for the highest number of sanctioned projects, said the state government.

Key takeaways

- The Agriculture Infrastructure Fund (AIF) is a central sector scheme, started in 2020 with an aim to provide medium to long-term financing for agriculture infrastructure projects at the post-harvest stage.
- When the scheme was started, it was meant for post-harvest management and processing at the primary level, but now, integrated processing at the secondary level has also been included.
- For example, a kinnow farmer could earlier get funds under the scheme for grading, waxing, and packaging of the crop (primary post-harvest processes), but since 2024, can also avail money to make and sell juices, jams, etc. out of his kinnow produce (secondary level).
- However, the secondary level funds are available only to those involved in the primary processing too.
- This scheme offers credit guarantees and interest subvention. Farmers, agripreneurs, primary agriculture cooperative societies, farmers producer organisations, start-ups, state sponsored public-private partnerships, state-agencies can apply for funds under this scheme.
- All loans under this financing facility have interest subvention of 3% per annum up to a loan limit of ₹2 crores. This interest subvention is available for a maximum period of 7 years. In case of loans beyond ₹2 crores, interest subvention is limited up to ₹2 crores.
- Under the AIF, one can take benefits of other state and central subsidies as well. Credit guarantee support is through the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) and National Bank for Agriculture and Rural Development (NABSanrakshan) Scheme.

Source: The Hindu

WHEAT PRODUCTION

Context: India's wheat production is estimated to reach a record level of 115.3 million metric tonnes during 2024-25, which is about 2 per cent higher compared to the 113.3 million tonnes produced during 2023-24, showed the Second Advance Estimates of production of major crops released by the Ministry of Agriculture and Farmers' Welfare.

Background: -

- Wheat is the second largest crop after paddy in terms of area coverage. Uttar Pradesh is the top wheat-producing state in the country, followed by Madhya Pradesh, Punjab, Haryana, Rajasthan, Bihar, Gujarat and Maharashtra.

Key takeaways

- Wheat (Triticum aestivum) is the second most important staple food crop in India after rice.India is the second-largest producer of wheat in the world after China.
- The average yield of wheat in India is around 3.5 tonnes per hectare, which is lower than global averages due to factors like small landholdings and inadequate irrigation.

Climatic and Soil Requirements

- **Climate:** Wheat is a rabi crop, sown in winter (October-December) and harvested in spring (March-April).
- **Ideal temperature:** 10-15°C during sowing and 21-26°C during harvesting.
- **Rainfall:** Requires 50-75 cm of rainfall, well-distributed over the growing season.
- **Soil:** Grows best in well-drained loamy and clayey soils with a pH of 6.0-7.5.

Major Wheat-Producing States

- **Uttar Pradesh:** Largest producer, contributing about 30% of India's total wheat production.
- **Punjab and Haryana:** Known for high yields due to advanced farming practices and irrigation facilities.
- **Madhya Pradesh:** Rapidly growing production due to increased acreage and government support.
- **Rajasthan:** Significant production despite arid conditions, thanks to irrigation projects like the Indira Gandhi Canal.

Source: Indian Express

HISTORY AND ART & CULTURE

AMIR KHUSRAU

Context: In his address to the 25th edition of Jahan-e-Khusrau, Prime Minister Narendra Modi described the annual music festival that commemorates the Sufi poet-musician Amir Khusrau as imbued with the "fragrance of the soil of Hindustan".

Background: -

- Bestowed with the sobriquet of Tuti-yi-Hind, the 'Parrot of India', the 13th century mystic is seen as a father figure for North India's syncretic Ganga-Jamuni culture.

Key takeaways

- Khusrau made lasting contributions to Indian classical music, Sufi qawwali, and Persian literature, and is also credited for developing Hindavi, a precursor to modern Hindi and Urdu.
- Khusrau's father likely came to India from Central Asia as the Mongol hordes of Genghis Khan ravaged Transoxiana (corresponding to parts of modern-day Uzbekistan, Tajikistan, southern Kazakhstan,Turkmenistan and Kyrgyzstan).
- Abu'l Hasan Yamin ud-Din Khusrau, was born in 1253.Khusrau became a professional poet at age 20, and served as one until his death. He started out in the service of princes and nobles, before becoming a permanent fixture in the court of the Delhi Sultan.
- Amir Khusrau served at least five Sultans — Muiz ud din Qaiqabad, Jalaluddin Khalji, Alauddin Khalji, Qutbuddin Mubarak Shah, and Ghiyasuddin Tughlaq. He wrote in Persian, the language of the court, as well as Hindavi.
- Sultan Jalaluddin Khalji bestowed upon Khusrau the title of 'Amir'. Historian Ziauddin Barani wrote in Tarikh-i-Firuz Shahi that Jalaluddin held Khusrau "in great esteem", and Khusrau "served as keeper of the Qur'ān" in his court.
- Khusrau was the most beloved disciple of the Chishti Shaikh Nizamuddin Auliya.

Khusrau's lasting legacy

- 700 years after his death, the lyrical beauty, sophisticated wordplay, and exploration of diverse themes in Khusrau's poetry continues to enamour audiences.
- In form and content, Khusrau's poetry borrowed heavily from Persian and Turkic, as well as local influences, making him one of the most important figures in propagating a syncretic Hindu-Muslim culture — the so-called Ganga-Jamuni tehzeeb.
- He wrote highly of Hindus. "The Brahmans of India have greater wealth of philosophical thought than what Rumi had revealed to the World. As nobody has tried to learn from the Brahmans, their learning has not been revealed to the world," he wrote in his masnavi Nuh Siphir.
- Khusrau's ghazals and qawwalis are today sung in both sacred and secular contexts, at sufi dargahs and Bollywood musicals. His most popular compositions include Chhaap Tilak, Zehal-e-Maskeen, and Sakal Ban Phool Rahi Sarson.

Source: Indian Express

DRAMATIC PERFORMANCES ACT, 1876

Context: Prime Minister Narendra Modi recently asked why a colonial law, Dramatic Performances Act, 1876, continued to exist even 75 years after independence. He was speaking of government's efforts to repeal archaic and obsolete laws.

Background: -

- The repeal of obsolete laws has been a flagship exercise by the Modi government.Since 2014, it has repealed more than 2,000 such laws. Obsolete laws, by definition, are laws which are no longer in use.

Key takeaways

- Under the Dramatic Performances Act, "any play, pantomime or other drama performed or about to be performed in a public place" could be banned if the government was of the "opinion" that the play was "of a scandalous or defamatory nature", was "likely to excite feelings of disaffection to the Government established by law", or "to deprave and corrupt persons present at the performance".
- This law was among those enacted by the British to clamp down on the budding Indian nationalist sentiment following the visit of the Prince of Wales, Albert Edward, to India from 1875 to 1876. Other laws enacted during this period were the draconian Vernacular Press Act, 1878, and the sedition law of 1870.
- The law was formally repealed in 2018 as part of the Modi government's exercise to weed out obsolete laws. However, the Dramatic Performance Act had not been a "valid law" since at least 1956.
- In a ruling in 1956, the Allahabad High Court ruled that the law was inconsistent with the Constitution of India.

Why India continue to have colonial laws?

- Article 372 of the Constitution states that laws in operation at the time of Independence would continue to be in operation.
- However, colonial laws do not enjoy the presumption of constitutionality – which means that when a colonial law is challenged, the government must defend the law for it to be valid.
- Other laws – those enacted by the Parliament of independent India – are deemed constitutional unless declared otherwise, which means that when challenged in court, the onus is on the petitioner to prove that the legislation violates the Constitution.

Source: Indian Express

TANTRIC BUDDHISM

Context: The excavationin Odisha's Ratnagiri has unearthed important historical details, such as Ratnagiri once being a major centre of Tantric Buddhism.

Background: -

- Ratnagiriis located on a hillock in the Assia hill range in Jajpur and encircled by the rivers Brahmani, Kimiria, and Birupa and their tributaries. It is part of the 'Diamond Triangle', a collection of three Buddhist sites — Ratnagiri, Udayagiri and Lalitgiri — located in a 10-km radius.

Key takeaways

- Tantric Buddhism, also known as Vajrayana Buddhism, is a form of Buddhism that incorporates esoteric rituals, meditation techniques, and mystical practices to attain enlightenment.
- It emerged in India around the 5th to 7th centuries CEand later spread to Tibet, Nepal, Bhutan, and Mongolia.
- Vajrayana is often referred to as the "Diamond Vehicle" because it is believed to offer a swift and powerful path to enlightenment.

Key Features of Tantric Buddhism:

- **Use of Tantras (Sacred Texts):**
    - Tantric Buddhism derives its name from the Tantras, a set of esoteric scriptures that provide secretive teachings.
    - These texts emphasize mantras (chants), mudras (hand gestures), mandalas (sacred diagrams), and visualization techniques.
- **Esoteric and Mystical Practices:**
    - Unlike Theravada and mainstream Mahayana Buddhism, Vajrayana followers believe in hidden knowledge (Guhya Vidya) accessible only through a guru (spiritual teacher).
    - The practice often involves meditation on deities, symbolic rituals, and transformative yogic practices.
- **Concept of 'Deity Yoga':**
    - One of the central practices in Tantric Buddhism is Deity Yoga, where practitioners visualize themselves as a deity or Buddha figure. This practice is intended to help the practitioner embody the qualities of the deity.
    - Prominent deities: Avalokiteshvara (compassion), Manjushri (wisdom), Tara (protection), and Vajrapani (power).
- **Belief in the Vajra (Thunderbolt) and Bell:**The Vajra (thunderbolt) symbolizes indestructible wisdom, while the Ghanta (bell) represents compassion. Together, they signify the union of wisdom and compassion.
- **Importance of Guru-Disciple Relationship**:A Guru or Lama is essential in guiding followers through complex tantric practices.The lineage system is crucial, ensuring that sacred knowledge is passed down without distortion.

Historical Development of Tantric Buddhism:

- **Origin in India:** Developed in medieval India, particularly in Bihar, Bengal, and Odisha.
- **Spread to Tibet (8th century CE):** Indian masters like Padmasambhava (Guru Rinpoche) introduced Vajrayana Buddhism to Tibet.
- **Influence in Nepal, China, and Japan**: Evolved into different sects like Shingon Buddhism in Japan

and Esoteric Buddhism in China.

Tantric Buddhism in India:

- Flourished in Nalanda and Vikramashila universities under the Pala dynasty (8th–12th centuries CE).
- **Significance of Tantric Buddhism in Tibet:**Tibetan Buddhism, a form of Vajrayana, developed into four major schools:
    - Nyingma (Oldest)
    - Kagyu (Meditation-focused)
    - Sakya (Scholarly tradition)
    - Gelug (Dalai Lama's sect)
    - The Dalai Lama (spiritual leader of Tibet) belongs to the Gelug school.

Source: The Hindu

GANDHI AND BHAGAT SINGH

Context: Among the various criticisms levelled at the Gandhi-Irwin Pact, signed on March 5, 1931, is that it failed to secure the commutation of Bhagat Singh's death sentence.

Background: -

- Some argue that it is unfair to claim that the Mahatma was indifferent to Bhagat Singh, as he had repeatedly appealed to Irwin on behalf of the revolutionaries. This assertion is not entirely incorrect.

Key takeaways

- Bhagat Singh was arrested for bombing the Central Assembly in Delhi on April 8, 1929. But it was the Lahore Conspiracy Case for which he would eventually be sentenced to death by a Special Tribunal set up by Viceroy Lord Irwin.
- The Hindustan Socialist Republican Association (HSRA), led by Bhagat Singh and Chandra Shekhar Azad, had killed British police officer John P Saunders on December 17, 1928 to avenge the death of Lala Lajpat Rai.
- Three HSRA members — Bhagat Singh, Shivram Rajguru, and Sukhdev Thapar — were sentenced to death on October 7, 1930 after a controversial trial.
- Because of the way the Tribunal was set up, little legal recourse was available after the sentencing. A political settlement was the only plausible way to save Bhagat Singh from the gallows.

Gandhi, Irwin, and a pact to end Civil Disobedience

- In 1930, Gandhi launched the Civil Disobedience Movement with his 24-day march to Dandi. After he broke the salt laws, protests erupted across the country.
- Police launched acrackdown, and thousands of freedom fighters including Gandhi were arrested. On January 25, 1931, Viceroy Irwin announced the unconditional release of Gandhi and other leaders to facilitate negotiations.

- The Gandhi-Irwin Pact was followed by the release of all political prisoners who were not convicted of violence, remission of fines, and return of some confiscated lands. Government employees who had resigned from service were treated leniently.
- The Congress agreed to end the Civil Disobedience Movement and take part in the Second Round Table Conference later that year.

Bhagat Singh: A glaring omission in Gandhi-Irwin Pact

- Gandhi's talks with Irwin began less than a week after Bhagat Singh's final appeal was rejected. As the negotiations progressed, there was expectation that Gandhi would ensure that the young revolutionary did not hang.
- In his autobiography Sinhavalokan (1951-55), Bhagat Singh's comrade Yashpal wrote: "Gandhi considered it moral to put government pressure on the people for prohibition [of alcohol] but he considered it immoral to put people's pressure on a foreign government to commute the sentence of Bhagat Singh."

Gandhi and Bhagat Singh

- Gandhi described the bombing of the Central Assembly in Delhi as the "criminal act of two mad youth". At the Congress' Karachi session, held three days after Bhagat Singh's execution on March 23, 1931, Gandhi spoke of the revolutionary's "error".
- Gandhi and Irwin discussed Bhagat Singh on multiple occasions. As early as May 4, 1930, Gandhi had objected to the creation of the Special Tribunal.
- During the negotiations for the Gandhi-Irwin Pact, he brought up the case of Bhagat Singh on February 18, 1931, although he did not take a particularly strong position.But Gandhi never officially asked for commutation, and the Viceroy refused to suspend the execution.
- On the morning of March 23, the day of Bhagat Singh's execution, Gandhi once again wrote to the Viceroy asking for a suspension of the sentence. But his pleas were rejected.

Source: Indian Express

WOMEN'S DAY 2025

Context: International Women's Day (IWD) is celebrated globally on March 8 each year to recognize women's achievements, promote gender equality, and advocate for women's rights.

Background: -

- The occasion offers an opportunity to recall the struggle of female revolutionaries for the cause of women's education in India.

Pre Independence Women Activists

- In the pre-independent times, several female revolutionaries struggled hard for the cause of women's education, including Savitribai Phule, Fatima Sheikh, Pandita Ramabai, Chandraprabha Saikiani, Begum Rokeya Sakhawat Hossain, Sarala Ray, Anasuya Sarabhai, and Abala Bose.

Savitribai Phule

- Savitribai Phule was a Dalit woman who challenged the upper caste hegemony of education.

- She opened India's first school for girls in Vishrambag Wada, Pune, Maharashtra in 1848 along with her husband Jyotirao Phule. Her school was open to all castes.
- Savitribai Phule not only promoted education for girls but also stood in opposition to existing social evils like untouchability and prohibition on widow remarriage.

Fatima Sheikh and Pandita Ramabai

- Another notable figure, Fatima Sheikh, widely celebrated as India's first Muslim woman educator, was an associate of Jyotirao and Savitribai Phule in Pune. Unfortunately, not a lot is known about her.
- Pandita Ramabai, from Mangalore (then Madras presidency but now part of Karnataka), challenged the caste system by marrying a man from the lower caste.
- She was also a staunch advocate for women's education and actively spoke out against the plight of widows, especially child widows, and child marriage.
- Ramabai founded the Arya Mahila Samaj in 1882 to promote women's education, which was seen as instrumental in eradicating child marriage.

Chandraprabha Saikiani

- Chandraprabha Saikiani was a social reformer and active proponent of women's education from Assam.
- Saikiani demonstrated her commitment to the cause by starting a school for girls at the young age of 13, where she imparted whatever knowledge she had to other girls.
- Her activism extended beyond education. At a large public gathering, she called for a ban on opium – an unusual act for a woman in that era when women speaking in public gatherings was unconventional.
- In 1926, Saikiani founded the Assam Pradeshik Mahila Samiti and dedicatedly worked for women's education.

Begum Rokeya Sakhawat Hossain and Sarala Ray

- Begum Rokeya, born in Pairaband, Rangpur, Bengal (part of Bangladesh now), advocated for Muslim women's education through her visionary women-centric writings.
- Her most famous short story, Sultana's Dream, imagines a gender-reversed society where women run the world and men are confined indoors. Having never been allowed to earn a formal education, she started schools for Muslim girls in Bhagalpur (1909) and Kolkata (1911).
- Sarala Ray, an educator from Bengal, founded the Gokhale Memorial Girls' School in 1920 in Kolkata, where all girls were encouraged to learn three languages – Hindi, Bengali and English – as part of the school's innovative curriculum.
- Later, she extended her efforts towards women's higher education and established the Gokhale Memorial Girls' College in 1938.

Source: Indian Express

THE DANDI MARCH AND BEYOND

Context: Today (12 March) marks the 95th anniversary of the historic salt march led by Mahatma Gandhi from Sabarmati Ashram to Dandi in Gujarat. The 24-day march from ended with the defiance of the law after he made salt at Dandi marking the inauguration of the civil disobedience movement.

Background: -

- The 1882 Salt Act gave the British a monopoly in the manufacture and sale of salt. Even though salt was freely available on the coasts, Indians were forced to buy it from the colonisers. Gandhi decided that if there was any one product through which civil disobedience could be inaugurated, then it was salt.

Key takeaways

- On 6 April 1930, Gandhi along with his followers defiantly broke the salt law by manufacturing salt from the sea.With this, the movement spread throughout the countryside.
- The British government declared the Indian National Congress as illegal. Gandhi informed the Viceroy that he was going to raid the government salt works at Dharasana. Before he could proceed, he was arrested and sent to Yeravda Central Jail.
- After Gandhi's arrest, Mr. Abbas Tyabji, took over the march to Dharsana but he was also arrested. Sarojini Naidu succeeded Abbas Tyabji who led the march but was met with police brutality.
- Several Colonial laws were broken along with a boycott of foreign cloth and liquor.
- In Bengal, volunteers led by Satish Chandra Dasgupta walked from Sodepur Ashram to the village of Mahisbathan to make salt. K.F Nariman in Bombay led another group of marchers to Haji Ali Point where they prepared salt at a nearby park.
- The anti-chowkidari (village police) tax along with non-payment of rent was followed in the raiyatwadi areas. There were many violent confrontations with the police and massive tribal invasions of forests in Central Provinces, Maharashtra, and Karnataka.
- In the North-West Frontier Province (NWFP), Khan Abdul Ghaffar Khan, popularly known as the Frontier Gandhi, raised a band of non-violent volunteers known as the Khudai Khidmatgars (Red Shirts), who played an active role in the movement.
- In Chittagong, revolutionaries headed by Surjaya Sen launched a campaign against the British. They seized the local armoury and an Independence Proclamation was made in the name of the 'Independent Republican Army' and fought a pitched battle on the Jalalabad hill leading to the death of several revolutionaries.
- C. Rajagopalachari led the Civil Disobedience movement in Tamil Nadu. He organised a march from Trichinopoly to Vedaranniyam on the Tanjore coast to break the salt law in April 1930.In Malabar, Congress leader, Kelappan, organised the salt march.
- Similarly, in Orissa, the Civil Disobedience movement was carried out under the leadership of Gopabandhu Chaudhary. In Bihar, leaders like Ram Briksha Benipuri, Prof Abdul Bari and Acharya Kripalani led the movement.

Source: Indian Express

MENHIR

Context: The Mudumal megalithic menhirs in Telangana's Narayanpet district will soon be the second UNESCO World Heritage Site in the state, after being one of the six Indian sites to be added to the tentative list by the World Heritage Centre in 2025.

Background: -

- The menhir's in Mudumal, dated to roughly 3,500 to 4,000 before present (BP), are the oldest known menhirs in India.

Key takeaways

- A menhir is a standing or an upright stone, which is usually tapered at the top. It is man-made, in that it is sculpted and placed by humans, and usually quite large.

How old are menhirs? Why were they erected?

- The ones in Europe were originally associated with the Beaker culture who lived during the late Neolithic and early Bronze Age — roughly 4,800 to 3,800 before present (BP). But the oldest European menhirs are today dated to as early as 7,000 BP.
- Menhirs can either be found alone, or as a part of a larger complex of prehistoric megaliths, simply, large stone structures.
- While the exact purpose is debated, they likely served ceremonial functions. Some were markers of graves, while others might have served some astronomical purposes.
- The Mudumal site has been described as a "megalithic astronomical observatory" by the UNESCO dossier. "Some menhirs are aligned with the rising and setting sun during the summer and winter solstices, suggesting their use as an ancient observatory," the dossier says. Today, the Mudumal menhirs are closely associated with local legend, with "one particular menhir being worshipped as Goddess Yellamma".

Why Menhirs deserve UNESCO recognition?

- First, they give us insight into the ingenuity of early humans. Not only do these tonnes-heavy stones need a solid understanding of physics to be sculpted and move to precise locations, the precision of their placement itself tells us how much our ancestors knew about astronomy and solstices.
- Second, they give us insight into how the cultures who built them saw and understood the world. The effort taken to build these megalithic structures tells us that they were undoubtedly meaningful to the people who built them. This in turn can help us better understand these cultures who have left no written material for the historical record.

Source: Indian Express

DARA SHIKOH

Context: Dara Shikoh is often invoked as the nemesis of Aurangzeb. March 20th marks the birth anniversary of Dara Shikoh, who was born in 1615.

Background: -

- Dara Shikoh was the eldest son of Mumtaz Mahal and Shah Jahan and was engaged in an intense battle of succession.

Key takeaways

- Dara Shikoh strove to develop cordial relationships between people by finding commonalities between Hinduism and Islam.
- His most important works, Majma-ul-Bahrain (Mingling of Two Oceans) and Sirr-i-Akbar (Great Mystery), are devoted to the cause of establishing connections between Hinduism and Islam.
- Dara Shikoh concluded that the "hidden book" mentioned in the Quran was none other than the Upanishads and believed that to understand the Quran, one needed to study the Hindu text.

Battle	Year	Outcome
Battle of Bahadurpur	February 24, 1658	Shah Shuja, second son of Shah Jahan, who has declared himself independent governor of Bengal was defeated by Dara's son Sulayman Shikoh.
Battle of Dharmat	April 15, 1658	Aurangzeb defeated the combined army of Dara Shikoh and Jaswant Singh of Marwar.
Battle of Samugarh	May 29, 1658	Dara was defeated by Aurangzeb and Murad.
Battle of Khajwa	January 5, 1659	The battle between Aurangzeb and Prince Muhammad Shuja, the second son of Shah Jahan. Aurangzeb defeated Shuja.
Battle of Deorai (near Ajmer)	March 14, 1659	Fought between Dara Shikoh and Aurangzeb. Dara fled to Sindh and sought refuge with Malik Jiwan, an Afghan chieftain. But Jiwan betrayed Shukoh and handed him and his second son, Sipihr Shukoh, over to Aurangzeb.

- With the help of pandits, he translated 52 volumes of the Upanishads from Sanskrit to Persian into a tome called Sirr-e-Akbar (The Greatest Secret). He even drew an equation between Adam and Brahma — a view which, according to historians, led to him being branded a heretic and to his execution.
- However, he was defeated by his brother Aurangzeb in the War of Succession following Shah Jahan's illness. Thus he was executed on the orders of Aurangzeb under a fatwa issued by his clerics stating that he had apostatised from Islam.

War of Succession

- The Mughals did not believe in the rule of primogeniture, where the eldest son inherited his father's estate. They followed the custom of coparcenary inheritance or a division of the inheritance amongst all the sons. This became the ground for the war of succession during the Mughal Empire.
- The war of succession broke out in 1657 after Shah Jahan fell ill. Though all four brothers — Dara, Aurangzeb, Murad and Shuja — were locked in a bitter war, the first two were the serious contenders.
- Aurangzeb battled fiercely with his brothers, eventually sentencing all three to death and confining his father to a gilded prison for the last seven years of his life.

Source: Indian Express

KAMBA RAMAYANA

Context: In an effort to preserve and promote the Kamba Ramayana, one of the most significant works in Tamil literature, the South Zone Cultural Centre (SZCC), under the Ministry of Culture is launching a comprehensive initiative aimed at reviving the oral tradition of 'Kamba Ramayana' recitals.

Background: -

- This initiative will include a series of performances, workshops, symposia, and educational competitions to ensure that future generations can connect with and appreciate this epic text, which has long been integral to Tamil heritage.

Key takeaways

- The Kamba Ramayana, also known as Ramavataram, is a Tamil epic written by the poet Kambar (Kamban) in the 12th century.
- It is one of the most significant literary works in Tamil literature and an important adaptation of the Valmiki Ramayana.
- Style: Kamban's writing is known for its poetic beauty, intricate descriptions, and emotional depth. He adds his own interpretations and cultural nuances to the original Valmiki Ramayana.
- Cultural Context: The Kamba Ramayana reflects the socio-cultural and religious milieu of Tamil Nadu during the Chola period. It incorporates Tamil traditions, values, and aesthetics.

Comparison with Valmiki's Ramayana:

- Follows the broad structure of Valmiki's Ramayana but introduces regional variations and character interpretations.
- More devotion-centric with philosophical and ethical discourses.

Themes and Significance

- **Dharma and Morality:** Like the Valmiki Ramayana, the Kamba Ramayana explores themes of duty, righteousness, and the struggle between good and evil.
- **Bhakti (Devotion):** The epic highlights devotion to God, particularly through the character of Rama as an incarnation of Vishnu.
- **Human Emotions:** Kamban's portrayal of characters like Rama, Sita, and Hanuman is deeply emotional, making the epic relatable to readers.
- **Cultural Integration:** The Kamba Ramayana reflects the synthesis of Sanskrit and Tamil traditions, showcasing the cultural unity of India.

Source: PIB

JNANPITH AWARD

Context: Vinod Kumar Shukla winsthe 59th Jnanpith Award, India's highest literary honour.

Background:

- The 88-year-old author of novels such as Naukar ki Kameez, about a clerk forced to submit to professional hierarchies, and Khilega Toh Dekhenge, about a teacher who arrives in a village with

eccentric residents, is the 12th Hindi writer to win the award and the first from Chhattisgarh.

Key takeaways

- The Jnanpith Award is India's highest literary honor, awarded annually by the Bharatiya Jnanpith to an author for outstanding contributions to Indian literature.
- Instituted in 1961, the award is bestowed only on Indian writers writing in Indian languages included in the Eighth Schedule to the Constitution of India and English,with no posthumous conferral.
- Until 1982 the award was presented for a specific work; thereafter, it was given for a writer's overall contribution to literature. Since then the award has typically been given every year to one author, although in some years it has been jointly offered to two.
- The first Jnanpith Award was given in 1965 to G. Sankara Kurup for his contributions to Malayalam literature.
- The prize carries a cash award, a citation, and a bronze replica of Vagdevi (Saraswati), the goddess of learning.

Source: Indian Express

VIKRAMSHILA UNIVERSITY

Context: A decade after Nalanda University came up in the foothills of Rajgir, work is on to revive another ancient centre of learning in Bihar — Vikramshila.

Background: -

- The ASI has been developing the ancient Vikramshila University site since December to boost tourism, while the Bihar government recently allocated 202.14 acres in Antichak, Bhagalpur, for the proposed Central University. Despite the Centre's 2015 approval and a ₹500 crore sanction, the project had stalled due to land allocation delays.

Key takeaways

- Vikramshila University was an ancient center of learning established during the Pala Empire in medieval India. It was renowned for its focus on Buddhist education, particularly the Vajrayana sect of Mahayana Buddhism.

Key Facts:

- **Founded by**: Dharmapala (c. 8th–9th century), a ruler of the Pala Dynasty.
- **Location:** Present-day Bhagalpur, Bihar.
- **Notable Scholars:**Atisha Dipankara Srijnana – A key Buddhist scholar who spread Vajrayana Buddhism to Tibet.
- It had a rigorous selection process for scholars and focused on Buddhist philosophy, logic, grammar, and metaphysics.
- Supported by Pala rulers, who were great patrons of Buddhism.
- **Destroyed by:** Bakhtiyar Khilji in 1203 CE, during the Turkish invasions, along with Nalanda and

Odantapuri universities.

Comparison with Nalanda

- While Nalanda university flourished from the Gupta Period (320-550 AD) to the 12th Century, Vikramshila thrived during the Pala Period (8th to 12th century).
- While Nalanda got more international fame for teaching varied disciplines, Vikramshila was the only university that specialised in tantric and occult studies. In fact, during Dharmapala's reign, Vikramshila reigned supreme and is known to have controlled Nalanda's affairs as well.
- At its peak, subjects such as theology, philosophy, grammar, metaphysics and logic were taught at Vikramshila. But the most important branch of learning were the tantras because Vikramshila flourished in the days of tantricism, when occult sciences and magic were subjects of study both in Buddhism as well as Hinduism.
- While Nalanda is the older of the two universities, at one point, the two centres of learning, who had a common patron in King Dharmapala, exchanged knowledge and even teachers, who were called Acharyas.

Source: Indian Express

RANA SANGA

Context: Rajasthan Chief Minister Bhajanlal Sharma strongly criticised Samajwadi Party MP Ramji Lal Suman for calling Mewar ruler Rana Sanga a "traitor" and demanded that the Akhilesh Yadav-led party take action against him.

Background:

- Rana Sanga was the Rana of Mewar from 1508 to 1528 CE. He controlled parts of present-day Rajasthan, Gujarat and Madhya Pradesh with his capital at Chittor.

Key takeaways

- Rana Sanga, also known as Maharana Sangram Singh, was a legendary Rajput ruler of Mewar from the Sisodia dynasty.
- Born in 1482 to Rana Raimal of Mewar.
- Ascended the throne of Mewar in 1508 after a succession struggle.
- Faced internal challenges but emerged as a strong and capable ruler.

Military Achievements and Battles

- **Expansion of Mewar**
    - Consolidated Rajput power by forming alliances with Rajput clans.
    - Defeated Malwa Sultan Mahmud Khalji II, expanding his territory.
    - Fought against Gujarat Sultan Muzaffar Shah II and Lodhi rulers of Delhi.
- **Battle of Khatoli (1518) -** Defeated Ibrahim Lodi, capturing key territories in Rajasthan and Madhya

Pradesh.

- **Battle of Dholpur (1519) -** Once again defeated Ibrahim Lodi, increasing his influence in North India.
- **Battle of Khanwa (1527) -**
    - The most famous battle of his career, fought against Babur, the founder of the Mughal Empire.
    - Rana Sanga led a massive Rajput confederacy but was defeated due to Babur's use of gunpowder, artillery, and superior tactics.The defeat marked the beginning of Mughal dominance in India.
- After the defeat at Khanwa, he attempted to regroup but was allegedly poisoned by his own nobles in 1528, who feared another battle with the Mughals.

Source: The Hindu

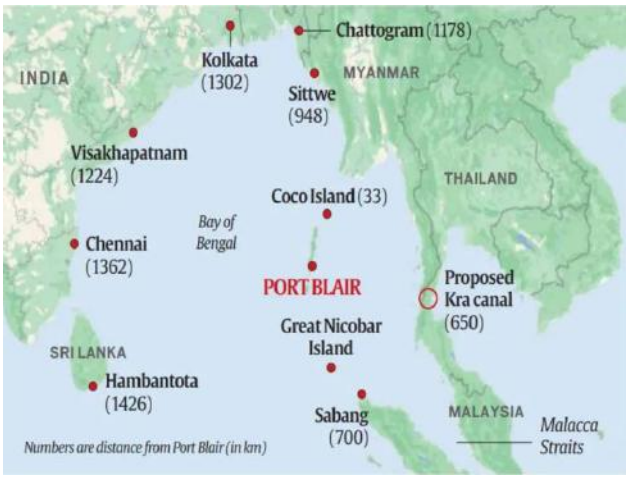
DEFENCE& SECURITY.

GREAT NICOBAR ISLAND PROJECT

Context: During the ongoing Rajya Sabha session Union Tribal Affairs Minister Jual Oram said that the government has not received any information about objections to the Great Nicobar Infrastructure project.

Background: -

- The Great Nicobar Island (GNI) infrastructure project was conceived by NITI Aayog and launched in 2021.



Key takeaways

- The Great Nicobar Island Development Project is a significant infrastructure initiative by the Government of India, aiming to transform the southern tip of Great Nicobar Island into a strategic hub for commerce, tourism, and defense.
- Key plans in the project include the construction of an International Container Transshipment Terminal (ICTT), a greenfield international airport with a peak hour capacity to handle 4,000 passengers, a township, and a gas and solar-based power plant.
- The project is being implemented by the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO).
- It aligns with India's Maritime Vision 2030 and is one of the key projects under the Amrit Kaal Vision 2047.
- It also gives an opportunity to leverage the strategic location of the island, which is roughly equidistant from Colombo in Sri Lanka to the southwest and Port Klang (Malaysia) and Singapore to the southeast.

Additional Information - About Andaman & Nicobar

- The Andaman and Nicobar Islands are a cluster of 836 islands, split into two groups — the Andaman Islands to the north and the Nicobar Islands to the south — by the 150-km wide Ten Degree Channel.
- Great Nicobar is the southernmost and largest of the Nicobar Islands, a sparsely inhabited 910-sq-km patch of mainly tropical rainforest in the southeastern Bay of Bengal. Indira Point on the island, India's southernmost point, is only 90 nautical miles (less than 170 km) from Sabang at the northern tip of Sumatra, the largest island of the Indonesian archipelago.
- Great Nicobar has two national parks (Campbell Bay National Park and Galathea National Park), a biosphere reserve (Great Nicobar Biosphere Reserve), small populations of the

Shompen and Nicobarese tribal peoples, and a few thousand non-tribal settlers.

Source: Indian Express

ASSAM RIFLES

Context: In a development towards addressing a long-standing issue, a ceremonial transfer of land between Assam Rifles and Mizoram government took place to mark the relocation of paramilitary force from areas in the heart of Aizawl to Zokhawsang, 15 km away from the city.

Background: -

- Assam Rifles will give 106.853 acres of land in Aizawl, while the Mizoram government has given 1305.15 acres on lease to the Assam Rifles in Zokhawsang.
- Mizoram CM said the transfer, "will greatly facilitate the process, freeing up valuable space and resources, that can be redirected towards the development of our city and improving the quality of life for our citizens".

Key takeaways

- The Assam Rifles (AR) is one of the six central armed police forces (CAPFs). The AR is tasked with maintaining law and order in the Northeast along with the Indian Army. It also guards the Indo-Myanmar border.
- It is the only paramilitary force with a dual control structure. While the administrative control of the force is with the Ministry of Home Affairs (MHA), its operational control is with the Indian Army, which is under the Ministry of Defence (MoD).
- Due to the dual control structure, salaries and infrastructure for the force is provided by the MHA, but the deployment, posting, transfer and deputation of the personnel is decided by the Army. All its senior ranks, from DG to IG and sector headquarters, are manned by officers from the Army.
- The Force is commanded by an officer of the rank of Lieutenant General of the Army. The highest HQ of the force known as the HQ Directorate General of Assam Rifles is located at Shillong.
- Assam Rifles is a region specific force with its operational role in the North East and therefore the HQ DGAR is also located in the East. The HQs of all other Central Para Military Forces are located at Delhi.
- Its recruitment, perks, promotion of its personnel and retirement policies are governed according to the rules framed by the MHA for CAPFs.

Historical Evolution

- According to the official website of Assam Rifles, the AR came into being in 1835, as a militia called the 'Cachar Levy'. This Force was formed to primarily protect British Tea estates and their settlements against tribal raids.
- 1917 – Renamed Assam Rifles in recognition of its role in World War I.

- World War II – Played a critical role against the Japanese advance.
- The post-independence role of the Assam Rifles continued to evolve, ranging from a conventional combat role during the Sino-India War in 1962, operating in foreign land as part of the Indian Peace Keeping Force (IPKF) to Sri Lanka in 1987 (Op Pawan), to a peacekeeping role in the northeastern areas of India.
- It remains the most awarded paramilitary force in both pre- and post-Independence India, having won a very large number of Shaurya Chakras, Kirti Chakras, Vir Chakras, Ashok Chakras, and Sena Medals.

Source: Indian Express

SQUAD ALLIANCE

Context: Bearing the brunt of China's aggressive expansionist tactics in the South China Sea, the Philippines now wants India to join the relatively new `Squad' strategic alliance.

Background:

- Pointing to China's "illegal, coercive and disruptive Grey Zone" tactics to claim territory and build militarised artificial islands in the South China Sea region, Philippines chief of staff of armed forces said countries like India and South Korea should also be included in the squad.

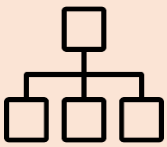
Key takeaways

- The "Squad Alliance" is an informal grouping that focuses on security in the South China Sea, aiming to counter China's growing influence and aggressive activities in the region.
- The current members include the Philippines, Japan, Australia, and the United States. The alliance emphasizes military collaboration, intelligence sharing, and joint maritime exercises within the South China Sea.
- The 'Squad' was conceptualized during the Shangri-La Dialogue in June 2023, with defense chiefs from the member countries convening to discuss collaborative security measures.
- **The primary objectives of the 'Squad' include:**
    - **Maritime Security:** Conducting joint maritime patrols and exercises to ensure freedom of navigation and adherence to international maritime laws.
    - **Intelligence Sharing:** Enhancing information exchange among member nations to improve situational awareness and coordinated responses to regional threats.
    - **Capacity Building:** Strengthening defense capabilities through collaborative training and resource sharing.
- Notably, in April 2024, the 'Squad' nations conducted cooperative maritime patrols within the Philippines' exclusive economic zone, marking a significant development amid ongoing tensions in the South China Sea.
- Recognizing the evolving security dynamics, the Philippines has advocated for the inclusion of India and South Korea into the 'Squad' alliance.

Distinction from the 'Quad'

- While the 'Quad' (Quadrilateral Security Dialogue) comprises the United States, Japan, Australia, and India, focusing on broader strategic cooperation in the Indo-Pacific, the 'Squad' is more narrowly centered on traditional security and defense collaboration, particularly addressing maritime security challenges in the Western Pacific.

Source: Times of India



GOVT. INITIATIVES, SCHEMES AND POLICIES, ORGANISATION

THREE -LANGUAGE FORMULA

Context: In a strongly worded letter to the Prime Minister, Tamil Nadu Chief Minister M K Stalin sought the release of Rs 2,152 crore pending for the centrally-sponsored Samagra Shikshascheme meant to support the provisions of the RTE Act.

Background: -

- The Centre has withheld funds for the Samagra Shiksha scheme in Tamil Nadu due to the state's refusal to implement the New Education Policy (NEP) of 2020.
- At the heart of the clash between the Centre and Tamil Nadu is the so-called "three-language formula" that is a part of the NEP. While the Centre maintains that this policy is meant to ensure that youth get employment across regions, Tamil Nadu has long viewed it as an attempt to impose Hindi on the state.

Key takeaways

- Tamil Nadu has an almost century-old history of anti-Hindi agitations. Unlike most other states — including southern states such as Kerala and Karnataka — it follows a two-language formula in which students are taught only Tamil and English
- In the past,Centre has maintained that education is in the Concurrent List of the Constitution, and that the implementation of the three-language formula is the responsibility of the states.
- However, now, the Ministry of Education has linked the release of Samagra Shiksha funds to the implementation of the NEP.

Evolution of 3 language policy

- The debate over language policy in education — regarding both the medium of instruction and teaching of languages — has existed since Independence. The University Education Commission of 1948-49, chaired by Dr Sarvepalli Radhakrishnan, who went on to become the second President of India, examined this topic in detail.
- The Radhakrishnan Commission favoured Hindi (Hindustani) as India's federal language, to be used for all federal activities — administrative, educational and cultural — while regional languages would serve the provinces.
- At the same time, the Commission recognised that immediately abandoning English would be impractical. It stated that English would have to continue as "the medium for Federal business" till such time that all provinces are ready for the change, having "spread the Federal language adequately".
- It was this Commission that first proposed what would later become the three-language formula for school education.
- This proposal was accepted by the National Education Commission of 1964-66 (Kothari Commission), and was incorporated into the National Policy on Education, 1968 passed by the

Indira Gandhi government.

- For secondary education, the formula proposed that students learn "a modern Indian language, preferably one of the southern languages, apart from Hindi and English in the Hindi-speaking States" and "Hindi along with the regional language and English in the non-Hindi speaking States."
- The National Policy on Education of 1986, passed by the Rajiv Gandhi government, and the latest NEP of 2020, too retained this formula.

Source: Indian Express

PHILANTHROPY IN INDIA

Context: Over the next five years, private funding in India's social sector is expected to see a 10%–12% annual growth, largely driven by family philanthropy from high-net-worth individuals (HNIs), according to a new report.

Background: -

- Generally, the share of private funds allocated towards philanthropy in India has been low compared to other major economies.

Key takeaways

- As of FY24, the total size of the country's social sector funding – on education, healthcare, gender equality, etc. – is around Rs 25 lakh crore ($300 billion). Public spending accounted for 95% of total funding at Rs 23 lakh crore, including schemes such as MGNREGS and the Pradhan Mantri Awas Yojana.
- On the other hand, private spending stood at around Rs 1.3 lakh crore, according to the India Philanthropy Report (IPR) 2025 from venture philanthropy firm Dasra and management consultancy Bain & Co.
- Currently, family giving accounts for approximately 40% of philanthropy, including personal giving and corporate social responsibility (CSR) initiatives from family-owned/run businesses.

HNIs and philanthropy

- The India Philanthropy Report 2022 found that "Relative contributions (giving as a percentage of wealth) among Indian UHNIs (Ultra-high-net-worth individuals) range from 0.1% to 0.15% compared with 1.2% to 2.5% in the United States, 0.5% to 1.8% in the UK, and 0.5% to 1.4% in China."
- As defined in the 2025 report, UHNIs refer to ultra-high-net-worth individuals (UHNIs) with a net worth of Rs 1,000 crore and more. HNIs have a net worth of Rs 200 to 1,000 crore, while the "Affluent" category includes those ranging between Rs 7 to 200 crore.
- In comparison, a tradition of philanthropy has long existed in the US. According to a 2024 analysis from Forbes, American billionaires such as Warren Buffett, Bill Gates, Melinda French Gates, and MacKenzie Scott have donated at least 20% of their wealth.

What do projections say about philanthropy in India?

- One reason behind the projected rise in the share of private spending in the next five years is

the high growth in HNIs and the affluent givers segment.

- CSR growth is also expected to grow by 10-12%, driven by an uptick in compliance by firms.
- It is mandated that any firm with a net worth of at least Rs 500 crore or annual turnover surpassing Rs 1,000 crore or net profits exceeding Rs 5 crore must spend a minimum of 2% of their average net profit of preceding three financial years on CSR activities.
- The report also noted the growth in family offices, which are firms that manage HNIs and their families' assets and wealth. It said that tapping into family offices and developing structured services for channelling funds towards the nonprofit ecosystem can help the larger cause of Indian philanthropy.

Source: Indian Express

CITIES COALITION FOR CIRCULARITY (C-3)

Context: India launched the Cities Coalition for Circularity (C-3) at the 12th Regional 3R and Circular Economy Forum in Asia and the Pacific, held in Jaipur.

Background: -

- Prime Minister Modi, in a special written message to delegates at the launch, said India follows and strongly advocates the P (Pro-Planet People) approach and highlighted the role of 3Rs(reduce, reuse and recycle) and circular economy principles in ensuring sustainable urban development and resource efficiency.

Key takeaways

- The Cities Coalition for Circularity (C-3) is a multinational alliance established to promote city-to-city collaboration, knowledge-sharing, and partnerships with the private sector, focusing on advancing circular economy principles.

Key Objectives of C-3:

- **City-to-City Collaboration:** Facilitate cooperation among cities globally to share best practices and strategies for implementing circular economy models.
- **Knowledge Sharing**: Create a platform for exchanging technical expertise, innovative solutions, and successful case studies related to resource efficiency and waste management.
- **Private Sector Partnerships:** Engage businesses and industries in developing and adopting sustainable practices that contribute to a low-carbon economy.

About Regional 3R and Circular Economy Forum in Asia and the Pacific

- The Regional 3R and Circular Economy Forum in Asia and the Pacific is an annual platform established in 2009 by the United Nations Centre for Regional Development (UNCRD) to promote the principles of Reduce, Reuse, and Recycle (3R) and advance circular economy initiatives across the Asia-Pacific region.
- The Forum serves as a collaborative space for policymakers, industry leaders, researchers, and development partners to discuss and implement sustainable solutions for waste management and resource efficiency.

- The 12th edition of the Forum was inaugurated on March 3, 2025, in Jaipur, India, focusing on the theme "Realizing Circular Societies Towards Achieving SDGs and Carbon Neutrality in Asia-Pacific."

Source: The Hindu

PRADHAN MANTRI SHRAM YOGI MAANDHAN YOJANA

Context: Pradhan Mantri Shram Yogi Maandhan Yojana (PM-SYM) completes six years.

Background:

- The scheme is a tribute to the workers in the Unorganized sectors who contribute around 50 per cent of the nation's Gross Domestic Product (GDP).

Key takeaways

- Pradhan Mantri Shram Yogi Maandhan (PM-SYM), is a voluntary and contributory pension scheme launched by the Government of India to provide social security to unorganised workers.
- The scheme is administered by the Ministry of Labour and Employment in collaboration with Life Insurance Corporation of India (LIC) and Common Service Centres e-Governance Services India Limited (CSC SPV) for seamless implementation.
- LIC is the Pension Fund Manager and responsible for Pension pay out.

Key Features of PM-SYM

- **Minimum Assured Pension:** ₹3,000 per month after 60 years of age.
- Government Contribution: The Government of India matches the worker's contribution on a 1:1 basis.
- **Voluntary and Contributory:** The scheme is voluntary, allowing workers to contribute based on their affordability and requirement.
- **Family Pension:** If the beneficiary passes away, the spouse receives 50% of the pension amount as a family pension. Family pension is applicable only to spouse.
- **Exit Provisions:** Participants can exit the scheme under specified conditions.
- **Easy Enrolment:** Eligible workers can register at Common Service Centres (CSCs) or through the Maandhan portal.
- The contribution amount varies based on the age at the time of enrolment.
- To enroll in PM-SYM, individuals must meet the following eligibility conditions:
    - **Age Requirement:** 18 to 40 years.
    - **Income Limit:** Monthly income should be ₹15,000 or less.
    - Workers engaged Unorganised.
- **Exclusion Criteria:**
    - Should not be covered under the Employees' Provident Fund (EPF), Employees' State Insurance Corporation (ESIC), or National Pension Scheme (NPS).
    - Should not be an income taxpayer.
    - Should not be receiving benefits from any other government pension scheme.

Source: PIB

REAL ESTATE REGULATORY AUTHORITY (RERA)

Context: The Supreme Court criticised the functioning of the Real Estate Regulatory Authority (RERA) and termed it as "disappointing".

Background:

- This isn't the first time the court has criticised RERA's performance. In September 2024, the Supreme Court described RERA as a "rehabilitation centre for former bureaucrats," accusing it of undermining the Act's purpose.

Key takeaways

- The Real Estate Regulatory Authority (RERA) was established under the Real Estate (Regulation and Development) Act, 2016 to regulate and promote transparency in the real estate sector.
- RERA is applicable to residential and commercial real estate projects, including plotted developments.
- **Objectives of RERA**
    - Regulate the real estate sector and improve accountability.
    - Ensure timely completion of projects and prevent delays.
    - Promote transparency in property transactions.
    - Protect buyers' rights by setting grievance redressal mechanisms.
    - Encourage investment by creating a reliable framework.

Key Provisions of the RERA Act, 2016

- Establishment of RERA
    - States and Union Territories must establish a Real Estate Regulatory Authority for grievance redressal.
    - Functions include project registration, dispute resolution, and policy implementation.
- **Mandatory Project Registration :** Developers must register real estate projects (above 500 sq. m. or 8 apartments) before advertising or selling.Projects without RERA registration are illegal.
- **Escrow Account Requirement :** Builders must deposit 70% of funds collected from buyers into a separate escrow account to ensure funds are used for the same project.
- **Timely Completion & Compensation :** Developers must complete projects on time, failing which they face penalties or compensation liabilities.
- **Consumer Protection & Rights**
    - Buyers have the right to full project details, possession timeline, and compensation for delays.
    - False advertising by developers can lead to refunds or penalties.
- **Establishment of Real Estate Appellate Tribunal :** If dissatisfied with RERA decisions, consumers can approach the Real Estate Appellate Tribunal.

Source: Economic Times

OVERSEAS CITIZEN OF INDIA (OCI)

Context: Prime Minister Narendra Modi's presented the Overseas Citizen of India (OCI) card to his Mauritius counterpart Navinchandra Ramgoolam and termed it a "proof of friendship" between two nations.

Background: -

- The Overseas Citizen of India (OCI) scheme was introduced in 2005 through an amendment to the Citizenship Act, 1955, to allow certain categories of foreign nationals of Indian origin to register as OCIs.

Key takeaways

- **The Overseas Citizen of India (OCI**) card grants several privileges similar to Indian citizens but does not confer full citizenship.
- Following categories of foreign nationals are eligible for registration as Overseas Citizen of India (OCI) Cardholder -
    - Who were citizens of India at the time of, or after, the commencement of the Indian Constitution (26 January 1950).
    - Who were eligible to become citizens of India on 26 January 1950.
    - Who belonged to a territory that became part of India after 15 August 1947
    - who is a child or a grandchild or a great grandchild of such a citizen
    - who is a minor child of such persons mentioned above
    - who is a minor child and whose both parents are citizens of India or one of the parents is a citizen of India
    - Spouse of foreign origin of a citizen of India or spouse of foreign origin of an Overseas Citizen of India Cardholder (subject to certain conditions).
- However, no person, who or either of whose parents or grandparents or great grandparents is or had been a citizen of Pakistan, Bangladesh or such other country as the Central Government may, by notification in the Official Gazette, specify, shall be eligible for registration as an Overseas Citizen of India Cardholder.

Benefits of OCI

- **Visa-Free Travel:**OCI cardholders enjoy a multiple-entry, multipurpose lifelong visa to visit India.
- **Residency Rights:**They can live and work in India indefinitely.
- **Economic Rights:** OCI is entitled to general 'parity with Non-Resident Indians in respect of all facilities available to them in economic, financial and educational fields except in matters relating to the acquisition of Agricultural land or Farm house or Plantation properties.
- **Exemptions:**They are exempt from registering with the Foreigners Regional Registration Office (FRRO) regardless of the duration of their stay.

Restrictions on OCI

- **No Political Rights:**OCI cardholders cannot vote, hold constitutional offices (e.g., President,

Vice-President, Judge of Supreme Court/High Court).

- The OCI Cardholder shall not be entitled for appointment to public services and posts in connection with the affairs of the Union or of any State except for appointment in such services and posts as the Central Government may, by special order, in that behalf, specify.
- **No Agricultural Land:**They cannot purchase agricultural or plantation properties in India.
- **Revocation of OCI:**The OCI card can be revoked if the holder violates Indian laws or engages in activities prejudicial to India's interests.

OCI vs. Dual Citizenship

- India does not allow dual citizenship under the Citizenship Act, 1955.
- OCI is not dual citizenship but a form of permanent residency with limited rights.
- OCI cardholders retain their foreign citizenship while enjoying certain benefits in India.

Source: DD News

APAAR ID

Context: Parents and activists worry that the Ministry of Education's Automated Permanent Academic Account Registry (APAAR) ID for school students could become near impossible to opt out from, even though the programme is supposed to be voluntary.

Background: -

- The APAAR ID system has also drawn scrutiny on data privacy and necessity grounds.

Key takeaways

- The Automated Permanent Academic Account Registry (APAAR) ID is a unique identification system designed for students in India.
- It is part of the "One Nation, One Student ID" initiative launched by the government, aligning with the National Education Policy (NEP) 20202.

key features and benefits of the APAAR ID:

- **Lifelong Academic Identity:** Each student is assigned a unique and permanent 12-digit ID that consolidates all their academic achievements, including degrees, scholarships, awards, and other credits.
- **Seamless Academic Mobility:** The APAAR ID facilitates smooth transitions between educational levels and institutions, making it easier for students to pursue further education.
- **Digital Repository:** Students can digitally store and retrieve comprehensive academic records, achievements, and co-curricular accomplishments.
- **Integration with DigiLocker:** Links with DigiLocker, allowing students to securely store and access essential documents like exam results and academic credentials.
- The APAAR ID will be linked to the student's Aadhaar number for authentication and verification.

Source: The Hindu

LAWS GOVERNING IMPORT OF GOLD

Context: A Special Court of Economic Offences in Bengaluru rejected the bail plea of Kannada actor Ranya Rao, who was arrested for allegedly smuggling over 14 kilograms of gold on a flight from Dubai to

Bengaluru.

Background: -

- Directorate of Revenue Intelligence (DRI) officials called it one of the biggest seizures of gold at Bengaluru airport in recent times.

Key takeaways

- Until its repeal in 1990, the Gold (Control) Act, 1968, curbed gold imports and placed heavy restrictions on the acquisition, possession, and disposal of gold in India. However, with liberalisation in1990s, the government modified its approach, imposing an import duty on gold.
- Now, gold imports are largely governed under the Customs Act, 1962, and by the Central Board of Indirect Taxes and Customs (CBIC).
- The customs duty for gold may differ depending on the amount of gold carried by a passenger and the duration spent abroad before traveling back to India, as per the Baggage Rules, 2016 (issued under the Customs Act).
- Under these rules, a man residing abroad for over a year may carry up to 20 grams of jewellery duty free (with a value cap of Rs 50,000) and a woman may similarly carry up to 40 grams (with a cap of Rs 1 lakh).
- The CBIC also has specific guidelines for Indian passengers returning from Dubai after residing there for over six months, allowing them to carry up to 1 kg of gold as long as the applicable customs duty is paid.
- In 2003, the Supreme Court held that any article imported without complying with the relevant conditions or restrictions must be considered a “prohibited good”. Such goods are liable to be confiscated under Section 111 and punished under Section 112 of the Customs Act.
- The punishment may include a fine of up to the value of the goods. Section 135 provides a punishment of up to 7 years imprisonment if the market price of the smuggled goods exceeds Rs. 1 lakh.
- Smuggling is also punishable under Section 111 (Organised Crime) of the Bharatiya Nyaya Sanhita, 2023, which punishes “trafficking in illicit goods” with imprisonment of at least five years, extendable to life imprisonment.
- The UAPA also carries the same punishment for smuggling as a “terrorist act” under Section 15 if it causes “damage to the monetary stability of India”.

Source: Indian Express

INDIA’S DEEP SEA CAPABILITIES

Context: Recently, India completed wet testing of its Matsya-6000 submersible, capable of diving up to 6 km below the surface to look for underwater minerals off the coast.

Background: -

- Globally, deep-sea technology is critical for economic development, resource exploitation, and national security.

Key takeaways

Importance of Deep Sea Exploration for India

- **Economic Potential**
    - **Marine resources:** The oceans hold vast reserves of minerals, hydrocarbons, and biodiversity.
    - **Hydrocarbons & Gas Hydrates:** Essential for India's energy security and economic growth.
    - **Fisheries & Nutraceuticals:** Expansion of deep-sea fishing can enhance India's Blue Economy.
    - **Undersea Mining:** Exploration of polymetallic nodules for rare earth elements (REEs).
- **Strategic and Security Imperatives**
    - **Underwater Domain Awareness (UDA):** Critical for monitoring deep-sea activities and securing maritime interests.
    - **China's Deep-Sea Capabilities**:Largest fleet of submersibles and development of undersea infrastructure and cable-cutting technology.
- **Communication & Infrastructure**
    - Undersea Cables carry over 95% of global internet traffic and are crucial for digital economy, financial transactions, and secure communications.India must develop cable-laying and maintenance capabilities.
    - Undersea Pipelines & Mining Equipment - Infrastructure is required for resource exploitation and there is need for robust technology to maintain and protect these assets.

Challenges in Deep-Sea Exploration

- Extreme Pressure Conditions.
- Lack of indigenous deep-sea vehicles and submersibles and dependence on foreign technology for underwater research and exploration.
- Deep-sea technology development is capital-intensive.
- Limited Human Capital & Research Base:Need for specialized training in oceanography, marine engineering, and underwater robotics.

Way Forward

- Institutional & Policy Reforms
    - Upgrading the Department of Ocean Development to a full-fledged Ministry of Ocean Affairs.
    - A dedicated policy framework with clear funding, targets, and mission-mode execution.
- Establishing a National Deep-Sea Research Institute for technological development.
- Technological Advancements
    - **Hydrographic Research:** Developing precision oceanographic mapping tools.

- **Deep-Sea Sensors & Security Systems:** Countering undersea cyber and military threats.

- Strategic Collaboration & Investments
  - **Public-Private Partnerships (PPP):** Encouraging investment in deep-sea exploration.
  - **International Cooperation:** Collaborating with leading maritime nations for deep-sea technology exchange.

Source: Indian Express

MISCELLANEOUS

RACE FOR COPPER

Context: Recently, the government announced the securing of a 9,000-sq-km block to explore copper and cobalt in a region in Zambia known for high-grade deposits.

Background: -

- With production in domestic mines faltering, the project is a crucial step for India to establish overseas mining operations.
- On February 25, the White House warned in a fact sheet that the "overreliance on foreign copper" could jeopardize U.S. With supply of copper ore tightening, China is moving to rein in smelting overcapacity – companies looking to build new smelters must secure long-term contracts with copper mines, many of which are in the Democratic Republic of Congo (DRC), Chile, and Peru.

Key takeaways

- With the demand for copper, led by electric vehicle (EV) batteries and clean energy technologies, projected to outstrip supply from mines by 2035, countries are scrambling to secure supply chains and strengthen domestic capabilities.
- While more recycling and alternative battery chemistries could ease pressure on primary supply, mining remains critical to meeting global demand.

India's overseas focus

- Copper is listed as a critical mineral in India. Domestic ore production in 2023-24 was 3.78 million tonnes (mt), 8% lower than in 2018-19.
- Between April and January in the current financial year, ore production by government-owned Hindustan Copper Ltd (HCL), the sole domestic copper miner, was 6% lower year-on-year.
- Due to stagnant domestic ore production, India's copper concentrate imports have doubled in value terms to Rs 26,000 crore in 2023-24 from 2018-19.
- While India has large copper deposits, they require extensive exploration before mining can commence. Globally it takes up to 17 years on average to operationalise a copper mine.
- To meet demand in the short term, India has been looking to secure both greenfield and brownfield mineral assets in copper-rich countries such as Zambia, Chile, and the DRC.

Spotlight on Africa

- The share of Africa in the production of critical minerals such as copper, lithium, and natural graphite is rising.
- The continent already accounts for 70% of global cobalt production and 16% of global copper production. The DRC is on course to become the world's second-largest copper supplier by 2030.
- India has got the 9,000-sq-km block in Zambia's Northwestern province on a government-to-government basis. The Geological Survey of India (GSI) will explore the land, which is roughly six

times the size of Delhi.

- Zambia is the seventh largest producer of copper in the world. (Chile, Peru and DRC are numbers 1, 2, and 3 respectively.)

Source: Indian Express

RATNA STATUS

Context: The Centre approved the upgradation of Indian Railway Catering and Tourism Corporation (IRCTC) and Indian Railway Finance Corporation (IRFC) as the country's 25th and 26th Navratna companies respectively.

Background: -

- All seven listed Central Public Sector Enterprises (CPSEs) of the Indian Railways now have Navratna status. The Indian Railways have a total 12 CPSEs.

Key takeaways

- The Government of India classifies Central Public Sector Enterprises (CPSEs) into Maharatna, Navratna, and Miniratna categories to grant them varying degrees of financial and operational autonomy. This classification aims to enhance efficiency, competitiveness, and decision-making powers in India's public sector enterprises.

Criteria for grant of Maharatna status to CPSEs

- The CPSEs meeting the following criteria are eligible to be considered for grant of Maharatna status.
    - Having Navratna status
    - Listed on Indian stock exchange with minimum prescribed public shareholding under SEBI regulations
    - An average annual turnover of more than Rs. 25,000 crore during the last 3 years
    - An average annual net worth of more than Rs. 15,000 crore during the last 3 years
    - An average annual net profit after tax of more than Rs. 5,000 crore during the last 3 years
    - Should have significant global presence/international operations.

Criteria for grant of Navratna status to CPSEs

- Navratnas are the second category of the central government-owned 'Ratna' companies, placed between the Maharatnas and the Miniratnas.
- The Department of Public Enterprises (DPE) of the Ministry of Finance picks the CPSEs for Navratna status. Six indicators are considered: (i) ratio of net profit to net worth, (ii) ratio of manpower cost to total cost of production or services, (iii) ratio of profit before depreciation, interest, and tax (PBDIT) to capital employed or return on capital employed, (iv) ratio of profit before interest and taxes (PBIT) to turnover, (v) earning per share, and (vi) inter-sectoral performance of the company.
- The six indicators carry weights from 10 (for earning per share) to 25 (for ratio of net profit to net worth).

- If a CPSE has a composite score of 60 or higher for all six indicators, and has obtained an Excellent or Very Good MOU rating in three of the last five years, it is eligible to be considered for Navratna status.

Criteria for grant of Miniratna status to CPSE

- **Miniratna Category-I status**: - The CPSEs which have made profit in the last three years continuously, pre-tax profit is Rs.30 crores or more in at least one of the three years and have a positive net worth are eligible to be considered for grant of Miniratna-I status.
- **Miniratna Category-II status:** - The CPSEs which have made profit for the last three years continuously and have a positive net worth are eligible to be considered for grant of Miniratna-II status.
    - Miniratna CPSEs should have not defaulted in the repayment of loans/interest payment on any loans due to the Government.
    - Miniratna CPSEs shall not depend upon budgetary support or Government guarantees.

Source: Indian Express

RARE EARTH MINERALS

Context:A proposal by the Trump administration to secure $500 billion worth of profits from Ukraine's rare earth minerals as compensation for U.S. wartime assistance highlights the strategic importance of these resources.

Background:

- World's 5% critical raw materials are currently present in Ukraine. 19 million tonnes of proven reserves of graphite are found in Ukraine. Lithium deposits, one third of all of Europe's, lie in Ukraine.
- Ukraine also had 7% of world's titanium production which is utilised in manufacturing aeroplanes to power stations. Ukraine is also the host of significant deposits of rare earth metals.

Key takeaways

- Rare Earth Elements (REEs) or Rare Earth Metals are a set of 17 chemical elements in the periodic table — the 15 lanthanides, plus scandium and yttrium, which tend to occur in the same ore deposits as the lanthanides, and have similar chemical properties.
- Despite their name, most rare earth elements are relatively abundant in the Earth's crust, but they are rarely found in concentrated, economically exploitable forms.
- REEs are classified as light RE elements (LREE) and heavy RE elements (HREE).
- The 17 Rare Earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- **Major Producers:**
    - **China:** Dominates global REE production (over 60%) and reserves (37%). Key mining areas

include Inner Mongolia and Sichuan.

- **Australia:** Second-largest producer, with significant reserves in Mount Weld.
- **United States:** Mines REEs at Mountain Pass, California.

Why are REEs important?

- REEs are an essential — although often tiny — component of more than 200 consumer products, including mobile phones, computer hard drives, electric and hybrid vehicles, semiconductors, flatscreen TVs and monitors, and high-end electronics.
- Rare Earth elements are also used in space shuttle components, jet engine turbines, and drones.
- Scandium is used in televisions and fluorescent lamps, and yttrium is used in drugs to treat rheumatoid arthritis and cancer.

REEs and India

- Some REEs are available in India — such as Lanthanum, Cerium, Neodymium, Praseodymium and Samarium, etc.
- Others such as Dysprosium, Terbium, and Europium, which are classified as HREEs, are not available in Indian deposits in extractable quantities. Hence, there is a dependence on countries such as China for HREEs.

Source: Indian Express

AIKOSHA

Context: Union Minister for Electronics & Information Technology, Railways, and Information & Broadcasting, Shri Ashwini Vaishnaw marked a major milestone in India's AI journey with the launch of several key initiatives under the IndiaAI Mission during its anniversary celebration. Key among the newly introduced initiatives is AIKosha: IndiaAI Datasets Platform.

Background: -

- The launch of AIKosha signifies a major step in democratizing AI access, enabling research-driven innovation, and strengthening India's global AI leadership.

Key takeaways

- AIKosha, launched by India's Ministry of Electronics and Information Technology (MeitY), is a comprehensive platform designed to streamline access to high-quality, non-personal datasets, AI models, and development tools, thereby fostering AI innovation across the nation.

Key Features of AIKosha:

- Extensive Repository: The platform hosts over 300 datasets and more than 80 AI models from 12 organizations, providing a rich resource for model builders and developers to create India-centric AI solutions.
- AI Sandbox Capabilities: AIKosha offers integrated development environments equipped with tools and tutorials, enabling users to experiment, develop, and refine AI applications effectively.
- Secure and Accessible: The platform ensures data security through features like data encryption (both at rest and in motion), secure APIs, and firewalls for real-time threat filtering. It also emphasizes content discoverability and AI readiness scoring of datasets to assist users in

selecting appropriate resources.

Objective and Impact:

- By providing a unified portal for seamless access to datasets, models, and tools, AIKosha aims to democratize AI development in India. It supports students, startups, researchers, academia, and government departments in building AI applications tailored to India's diverse linguistic and cultural landscape.
- This initiative is part of the broader IndiaAI Mission, which seeks to establish a comprehensive ecosystem catalyzing AI innovation through public-private partnerships.

Source: PIB

MAINS

PAPER 1

AURANGZEB

GS I –Modern Indian history from about the middle of the eighteenth century until the present- significant events, personalities, and issues

Context : Nagpur remained tense on Tuesday, a day after violence erupted over rumours that a holy book was burned during a protest by the Vishwa Hindu Parishad and Bajrang Dal demanding the removal of Aurangzeb's tomb in Chhatrapati Sambhajinagar district of Maharashtra.

Aurangzeb:

- He ruled over the Mughal Empire from 1658 to 1707.
- His reign can be divided into two halves - the first twenty-five years were spent predominantly in the North, while the latter years were primarily focused on the Deccan region.He resided in the north for the first twenty-five years, chiefly in Delhi, and personally occupied himself with the affairs of northern India, leaving the Deccan in the hands of his viceroys. In around 1681, prompted by the rebellion of his son, Prince Akbar, he went to the Deccan. He never returned to Delhi and died disheartened in Ahmad Nagar in 1707.

Revolts by Aurangzeb:

- In 1669 AD, Jatsraised the banner of rebellion under the leadership of a local Zamindar, Gokula but were defeated as Aurangzeb personally marched against them. The Jats continued their resistance, and in 1685under Rajaram's leadershipoffered a tough fight to Raja Bishan Singh, the Kachhawah ruler appointed by Aurangzeb to crush the rebellion. The rebellion ended in 1691, and Rajaram and his successor, Charuman, were forced to submit.
- The Satnami Revolt began in 1672 AD due to their conflict with a local officer and soon grew in extent. The Satnamis were defeated as Aurangzeb marched in person to Narnaul, a place near Mathura, to crush the revolt.
- He also had strained relationships with Sikhs.
- Aurangzeb's relationship with the Rajputs began to deteriorate after the death of Raja Jai Singh of Ambar and Raja Jaswant Singh of Marwar as he failedto realize the value of an alliance with the Rajputs, which had contributed so much to the growth of the Mughal Empire since Akbar's time.
- He launched military campaigns and besieged Bijapur and Golconda Sultanates for several years. Eventually, in 1686, he successfully captured Bijapur, followed by the fall of Golconda in 1687, bringing them under Mughal rule.
- The Marathas resisted Aurangzeb's expansionist plans and forced him to divert significant resources to counter their activities under leaders like Shivaji and later his son Sambhaji.
- Aurangzeb's focus on the Deccan campaigns diverted attention from other parts of the empire, leading to the neglect of governance in regions like Bengal and Punjab.

Administration during Aurangzeb's Reign:

- It was highly centralized as he looked into the minute details of administration, read the petitions submitted to him, and either wrote or dictated orders.
- His ministers were reduced to mere clerks, as the emperor himself made all the critical decisions. It led to great administrative degeneration and helplessness.
- Local chiefs and zamindars in several provinces disregarded law and order as a natural result of the central authority's weakening caused by the emperor's obsession with never-ending wars and his unwise policy of

religious intolerance.

- Besides the land revenue, other important government income sources were zakat (realized from Muslims), jizya (poll tax from Hindus), salt tax, customs duty, and mint and spoils from war.
- The mode of assessment and collection of revenue established by Akbar was replaced by the revenue farming system, which allowed the contractors to realize the revenue from the peasants directly, not by the state officials under the direct supervision of the government.Because of this change, the condition of the peasants was worse than under Akbar or Jahangir.
- The army under Aurangzeb had increased considerably as he was engaged in fighting throughout his life.
- He replaced the Solar calendar with the Hijra calendar under the Influence of the Nakshabandi Sufi order.
- Muhtasibs were appointed to uphold moral codes and sharia.
- He dismissed court musicians and royal painters and discontinued the practice of Jharokha darshan.

Role of Aurangzeb's Policies in the Fall of the Mughal Empire:

- He implemented religious policies favouring Islam over other religions, such as imposing jizya which alienated non-Muslim subjects, leading to widespread discontent and resistance.
- His Deccan policy drained the treasury, stretched the military, and diverted attention from other pressing issues within the empire. It also weakened the central authority and exacerbated regional tensions.
- He faced financial difficulties due to increased military spending, a lack of revenue reforms, and inadequate revenue collection mechanisms.
- The Mughal authority was challenged by the Jats, Sikhs, Rajputs, and Marathas who sought to establish their independent kingdoms.
- His strong centralization of power and autocratic rule led to administrative inefficiencieshindering the empire's ability to respond to local challenges and led to an increased administrative burden.

His long reign and the tensions caused by his policies resulted in a succession crisis after his death

KONARK SUN TEMPLE

GS I - The Konark Sun Temple in Odisha, one of the UNESCO World Heritage Sites, is one of India's most fascinating architectural wonders.

Context: The Konark Sun Temple in Odisha, one of the UNESCO World Heritage Sites, is one of India's most fascinating architectural wonders.

Konark Sun Temple:

- It is a UNESCO World Heritage Site and is also known as Black Pagoda, Arka Kshetra, and Padma Kshetra.
- The Sun Temple and Konark Wheel were built during the 13th century under the reign of Eastern Ganga King Narasimhadeva-I.
- It represents the most evolved period inKalinga Architecture.
- Sun temples are temples dedicated to the worship of the Sun God and these are designed to highlight the celestial movement of the Sun.
- Materials used for building the temple include Chlorite, Laterite, and Khondalite rocks.
- Konark Sun Temple was once described by Nobel Laureate Rabindranath Tagore as the place where the language of stone surpasses the language of man.

Structure of the Konark Sun Temple:

- The main entrance of the Sun Temple, the Gajasimha - gaja meaning elephant and Simha referring tolions. According to mythology, lions resemble pride,elephants resemble wealth and both of them kill thehuman.
- Gajasimha leads to the Sun Temple's finelycarved Natya Mandapa, the hall for dance and theatre. The sculptures here depict different types of dance styles.
- It is the assembly hall of the temple and the steps that rise to Jagamohan are flanked by stone horses.
- The Jagamohan is followed by the deul which is the sanctum where the idol is placed.
- Bhoga-mandira (kitchen) to make bhoga for the deity and devotees.

Architectural features of the Konark Sun Temple:

- It was designed in such a way that the rising sun's first rays would illuminate the sanctum andthe presiding deity.
- It has been designed like the chariot of Surya, the Sun God. The temple stands on a base of a total of 24 intricately carved wheels, 12 on each side. The chariot seems to be drawn eastwards towards the dawn by a team of seven spirited horses.
- The thicker wheels are all carved with circular medallions at their centers on the widest part of theface. The rims are carved with designs of foliage with various birds and animals, whereas the medallions in the spokes are carved with the figures of women in various luxurious poses, mostly of a sensual nature.
- These seven horses have been named in Bhagawat Gita, as 'Gyatri', 'Usnika', 'Anustuv', 'Vrihati', 'Pangti', 'Tristup', and 'Jagati' which possibly stand for the rhythmic representation of the sacred verses of the Vedas. The seven horses are also named after the seven colours of the rainbow - Sahasrara (Violet), Indra-nila (Indigo), Nila (Blue), Haritaha (Green), Pita (Yellow), Kausumbhaha (Orange), and Rakta (Red).
- There are two carved war horses in front of thesouthern side of the Konark Temple. The sculpture depicts each of them with its massive strength and energy crushing down the warrior. This figure of the war horse of Konark has been accepted as the symbol of the state Government of Odisha.
- It has three impressive carvings of the Sun God at three strategic locations, to catch the sun atdawn, at noon, and at sunset. The carvings at the base of the temple and on its walls chronicle everyday activities.

Some carvings depict sensuous details while othersexhibit mythical creatures and animals like elephants and birds.

Eastern Ganga or Chodaganga Dynasty:

- It ruled over Kalinga or Odisha from the 5th century to the early 15th century.
- According to early Chodaganga copper-plate grants, the Eastern Gangas of Kalinga were a branch of Mysore's ruling Western Ganga family.

Kamarnava is believed to be the founder of the Eastern Ganga dynasty, however, Indravarman I, whose Jirjingi copperplategrant was issued in 537 CE, is the first historical ruler of the Eastern Ganga dynasty known from reliable records. The most powerful ruler of this dynasty was AnantavarmanChodaganga.

MARINE HEATWAVES IN THE ARCTIC OCEAN

GS I –Important geophysical phenomena

Context: A new study has been published in the journal Nature Communications titled- 'Arctic marine heatwaves forced by greenhouse gases and triggered by abrupt sea-ice melt', which shows that since 2007,unprecedented Marine Heatwave (MHW) events have occurred over the Arctic Ocean.

Key findings/highlights of the study:

- There have been 11 **Marine Heatwaves (MHWs)** events in the Arctic from 2007 to 2021, characterized by prolonged **high Sea Surface Temperatures (SST).** These events coincide with record **declines in Arctic Sea ice.** In 2022, the Arctic saw severe and extreme marine heatwaves in the Laptev and Beaufort seas from spring to autumn, **according to the State of the Global Climate 2022 Report.**
- The perennial sea ice cover over the Arctic Ocean, known to reflect solar radiation, has seen a marked decrease in both summer and winter since the mid-1990s. Since 2007, there has been a **pronounced regime shift from a thicker and deformed ice cover** to a thinner and more uniform one. The thin ice is less durable and melts more quickly, allowing incoming solar radiation to warm the water's surface.
- Arctic MHWs primarily occur over marginal seas, including the **Kara, Laptev, East Siberian, and Chukchi seas.** These regions are characterized by **shallow mixed-layer depths** and predominantly first-year ice cover, creating conditions conducive to MHW development.
- Without GHGs, marine heatwaves exceeding **1.5°C couldn't happen**. GHGs are a sufficient cause for moderate marine heatwaves, with a 66-99% probability.
- There is a pronounced **long-term warming trend in the Arctic,** with SST increasing at a rate of 1.2°C per

decade from 1996 to 2021. Over the last two decades, there has been an increase in the frequency of extreme SST events in the eastern Arctic marginal seas.

The technique used in the study:

- It employs an **Extreme Event Attribution (EEA) technique** to assess the role of **Greenhouse Gas (GHG)** forcing in Arctic MHWs.

The EEA technique determines the **extent to which human-induced climate change influences** the likelihood and severity of specific extreme weather events.

Marine Heat Waves (MHWs):

- A MHW is an extreme weather event. It occurs when the surface temperature of a particular region of the sea rises to 3 or 4 degrees Celsius above the **average temperature for at least five days.**
- According to the **National Oceanic and Atmospheric Administration (NOAA)**, MHWs can last for **weeks, months, or even years.**

First-year ice:

It refers to sea **ice that forms and grows during a single winter season** and typically melts away completely during the following summer melt season.

PAPER 2

ARTICLE 142

GS II –Significant provisions of the Indian Constitution

Context: The Supreme Court exercises its power under Article 142 of the Constitution to ensure "complete justice" in various cases.

Article 142:

- The Supreme Court in the exercise of its jurisdiction may pass such decree or make such order as is necessary for doing complete justice in any cause or matter pending before it.
- It enables the Supreme Court to exercise executive and legislative functions in specific scenarios, including issuing guidelines, directives, or orders to governmental bodies or other authorities.
- It permits the Supreme Court to intervene in matters concerning public interest, human rights, constitutional values, or fundamental rights, safeguarding them against any form of violation or infringement.
- It elevates the Supreme Court's role as the protector of the Constitution and ultimate interpreter of the law, catalyzing judicial activism and innovation.

Significance/Impacts of the Article 142:

- It addresses urgent issues with the legislative vacuum through its proactive approach that enables courts to provide remedies and resolutions in cases where the absence of legislation can hinder the delivery of swift justice and lead to irreparable harm. In Bhanwari Devi and Ors. vs State of Rajasthan (2002), the SC provided “the Vishaka Guidelines” to address workplace sexual harassment, eventually resulting in “the Prevention of Sexual Harassment Act, 2013”.
- It strengthens democracy by protecting the rights of minorities and ensures that all voices are heard and respected within the democratic process. K.S. Puttaswamy (Privacy) vs. Union of India (2017)established guidelines for safeguarding individual privacy.
- It provides checks and balances as it serves as a crucial check on government branches, preventing overreach and protecting citizens. In 2014, the SC canceled all but four of the 218 coal block allocations deemed illegal and arbitrary.
- It protects civil rights and social justice by addressing issues overlooked or avoided by the legislative and executive branches. In Vineeta Sharma vs. Rakesh Sharma & Ors. (2020) SC addressed conflicting judgments on daughters' coparcenary rights under the Hindu Succession Act.
- It promotes equality by challenging discriminatory laws and practices and ensuring equal protection under the law irrespective of race, gender, sexual orientation, or other characteristics. In the Secretary, Ministry of Defense vs. Babita Puniya case SC granted permanent commissions to women officersin the Indian Army.

Concerns/Issues of the Article 142:

- While using Article 142, the court has wide discretion, and this allows the possibility of its arbitrary exercise or misuse due to the absence of a standard definition for the term “complete justice”. Defining “complete justice” is a subjective exercise that differs in its interpretation from case to case.
- Judicial activism may sometimes blur boundaries between judiciary and legislature, causing confusion in roles, and leading to jurisdictional conflicts. In S.R. Bommai vs. Union of India (1994), the SC's intervention in Karnataka's political crisis with a floor test blurred judiciary-executive lines, sparking concerns of overreach.
- It grants the judiciary, unlike the executive and legislative branches, immunity from easy scrutiny or challenge for its decisions. The power has also been criticised on grounds of the separation of powers doctrine.

Inconsistent legal rulings under Article 142 complicate litigation planning and operations forindividuals and businesses.

AUKUS

GS II –Bilateral, Regional, and Global Groupings and Agreements involving India and/or affecting India's interests

Context: AUKUS, a trilateral security and defence partnership between Australia, the United Kingdom, and the United States, has entered its fifth year.

AUKUS:

- It is a **trilateral security partnership** between the**United Kingdom, the United States** of America, and**Australia** agreed upon in 2021 that focuses on**technologysharing in the Indo-Pacific region.**
- It is widely understood to be a strategic buildup in response to, and**deterrence against, Chinese aggression** and ambitions in that strategically important area.
- It is intended to strengthen the ability of each government to support security and defence interests, building on longstanding and ongoing bilateral ties.
- It consists of **two key pillars. They are:**
  - **Pillar 1** focuses on **supporting Australia to acquire**its **first conventionally armed, nuclear-powered submarine fleet**. It **does not involve** the **transfer of nuclear weapons** to Australia.
  - **Pillar 2** focuses on **cooperation in eight advanced military capability areas**: artificial intelligence (AI), quantum technologies, innovation, information sharing, and cyber, undersea, hypersonic, counter-hypersonic, and electronic warfare domains.

Significance of AUKUS:

- It strengthensthe defence capabilitiesof Australia by ramping up its defence industrialbase by 2040 by aligning with the vision of a freeand open Indo-Pacific.
- It canfill the gap by emphasizing the defencepartnerships in the Indo-Pacific region as India is reluctant to project the QUAD alliance as a security platform against China.
- It is being projected as the alliance of liberal democracies against autocratic powersstrengthens its acceptance and legitimacy as a security group.
- It aims to enhance collaboration in areas like artificial intelligence (AI), quantum computing, and cybersecurity.

Issues/Concerns related to AUKUS:

- It enables Australia to acquire nuclear-powered submarines, raising concerns over the potential precedent it sets under the Nuclear Non-Proliferation Treaty (NPT).
- Many South East Asian nations like Indonesia and Malaysia, raised concerns about potential armsraces and nuclear proliferation in the Indo-Pacific Region.

Quadrilateral Security Dialogue (QUAD), which includes the U.S., India,Japan, and Australia, might see a shift in focus as AUKUS takes centre stage.

BHARATIYA NAGARIK SURAKSHA SANHITA OF 2023

GS II –Government policies and interventions

Context: Bharatiya Nagarik Suraksha Sanhita, 2023 replaced the Code of Criminal Procedure, 1973. It provides for the procedure for arrest, prosecution, and bail for offences under various Acts, including the Indian Penal Code, 1860.

Key highlights/provisions of Bharatiya Nagarik Suraksha Sanhita of 2023:

- First-time offenders will be released on bail if they have completed detention for one-third of the maximum imprisonment for an offence.
- If the accused has spent half of the maximum period of imprisonment during investigation or trial, he/she must be released on a personal bond. This does not apply to offences that are punishable by death and life

imprisonment.
- All trials, inquiries, and proceedings can be held in electronic mode.
- Any police officer can request for medical examination of the accused in certain cases, such as rape.
- It mandates forensic investigation for offences punishable with at least seven years of imprisonment. If a state does not have a forensics facility, it shall utilise such a facility in another state.
- It allows for the collection of specimen signatures, handwriting, finger impressions, and voice samples from any person, whether arrested or not.
- It prescribes timelines for various procedures such as giving judgment, informing victims of the progressof the investigation, and framing of charges.
- It provides for the conduct of trial and pronouncement of judgment in the absence of a proclaimed offender. Proclaimed offender refers to a person who is accused of an offence punishable with imprisonment of at least 10 years or death and fails to appear at a specified time and place as specified by a court.
- It adds that death sentences can only be converted to life imprisonment and life imprisonment can be pardoned only within seven years of punishment.

Significance/Potential Impact of the Act:

- Prescribed timelines for different judicial procedures and framing of chargesheets will help in the timely delivery of justice.
- It provides for the forensic investigation of crimes and the integration of Information and Communication Technology (ICT) tools into the investigation and judicial process.
- The provision allows registration of FIR in any police station irrespective of where the offence was committed.
- Mandatory video recording of search and seizure seeks to address fairness in policeinvestigations.

The period during which an arrested person can be sent to police custody has been expanded.

BIOECONOMY IN INDIA

GS II –Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Context: A new government report has pegged the value of India's bioeconomy in 2024 at more than $165 billion, accounting for over 4.2% of the country's GDP.

Bioeconomy:

- As per the Food and Agriculture Organization (FAO), Bioeconomy is defined as the **production, utilization, conservation, and regeneration of biological resources, including related knowledge, science, technology, and innovation, to provide sustainable solutions** (information, products, processes, and services) within and across all economic sectors and enable transformation to sustainable economy.
- Biological resources and natural processes have been integral to the healthcare, pharmaceutical, and agriculture sectors for a long time.
- Bioresources like plants or microorganisms are renewable, relatively cheap, and locally available, while natural processes are more sustainable and eco-friendlier.

Significance of Bioeconomy:

- It can contribute to India's economic growth by creating new industries, businesses, and job opportunities in sectors like agriculture, and pharmaceutical, and diversify India's economic base.
- It can enhance India's food security by improving agricultural productivity and soil health, developing nutritious, climate-resilient crops, through innovative biotechnologies farmers and biological alternatives like Biofertilizers.
- It can lead to the development of new drugs, vaccines, etc., and enhance accessibility and affordability of healthcare, thus improving health outcomes.
- It can drive job creation in India, especially in sectors like biopharmaceuticals, bioenergy, etc., and foster entrepreneurship in tier-2 and 3 cities through the development of bio-manufacturing hubs.

- It can boost growth in India's exports as India is one of the biggest suppliers of low-cost drugs and vaccines in the world.
- Bioeconomy products, such as biofertilizers, biopesticides, etc. reduce harmful chemicals in the environment and improve ecosystem health.
- It can reduce India's carbon footprint and help meet climate goals like a 45% reduction in emission intensity by 2030 and achieving net zero by 2070.

Issues/Challenges faced by the Bioeconomy sector in India:

- The regulatory landscape in India is often fragmented as different agencies (DBT, FSSAI, etc.) have overlapping roles, leading to delays and confusion.
- High upfront costs and long timelines for returns on bio-economy projects (e.g., bio-plastics, biofuels) make it difficult for start-ups and even established companies to secure sustained investment.
- Securing intellectual property rights for innovations in biotechnology is complex, challenging, and slow-moving, discouraging innovation in bio-economy sectors.
- India's biotechnology sector remains dependent on global supply chains for essential raw materials, equipment, and advanced technologies.
- India's bio-economy sector biotech lacks scientific research and innovation in areas like synthetic biology, bioinformatics, and enzyme technology.
- Overexploitation of biological resources and transboundary movement of bio-based products can lead to the depletion of species and the introduction of invasive alien species.
- India faces a shortage of professionals trained in bioengineering, molecular biology, genomics, and other high-tech fields, further exacerbated by the gap in academia-industry partnership.
- Public scepticism about Genetically Modified Organisms (GMOs) and other bio-based innovations, such as lab-grown food or biofuels, can hinder the adoption of bio-economy products.

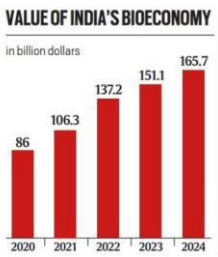
Government Measures to enhance the Bioeconomy sector in India:

- **Draft National Biotechnology Development Strategy (2020-2025) t**o make India globally competitive in biotechnology research, innovation, translation, entrepreneurship, and industrial growth and be a USD 150 billion Bioeconomy by 2025.
- **National Mission on Bioeconomy**, **2016 was l**aunched by the Institute of Bio-resources and Sustainable Development (under the Ministry of Science and Technology) to boost the **rural economy by utilizing bio-resources.**
- **Biotechnology Research and Innovation Council (BRIC)** aims to streamline governance and amplify the impact of biotech research across the nation.
- BioE3 (Biotechnology for Economy, Environment, and Employment) Policy implemented by the Department of Biotechnology (DBT) sets forth a framework for 'Fostering High-Performance Biomanufacturing'.

Biological Research Regulatory Approval Portal (BioRRAP) simplifies the approval process for biological research.

Findings of the India BioEconomy Report, released by the Department of Biotechnology:

- There is ample opportunity for this sector to grow to about $300 billion by 2030, and to $1 trillion by 2047.
- The report shows that the value of India's bioeconomy nearly doubled in the last five years, from around $86 billion in 2020 to $165 billion in 2024 (see chart).



TOP CONTRIBUTING STATES (IN 2024)

State	Value*	Share of total value
Maharashtra	35.45	21.4%
Karnataka	32.4	19.5%
Telangana	19.9	12%
Gujarat	12.9	7.8%
Andhra Pradesh	11.1	6.7%
Tamil Nadu	9.9	6%
Uttar Pradesh	7.7	4.6%

*in billion $. Source: India BioEconomy Report

- The number of companies operating in the bioeconomy has gone up by almost 90% in the last three years, from 5,365 in 2021 to 10,075 in 2024. This number is projected to double again by 2030, by which time such companies would employ close to 35 million people, according to the report.
- Nearly half the value of the bioeconomy (roughly $78 billion) was generated in the industrial sector, for the development and use of biofuels and bioplastics, among other things. The pharma sector accounted for another 35% of the total value, with vaccines the major contributor.

The report showed that only five states — Maharashtra, Karnataka, Telangana, Gujarat, and Andhra Pradesh —

accounted for more than two-thirds of the value generated in the bioeconomy (see table). The entire eastern and northeastern region generated less than 6% of the total value.

CASTE-BASED DISCRIMINATION OF PRISONERS IN JAILS

GS II –Government policies and interventions for development in various sectors

Context: Supreme Court of India found that prison manuals in more than 10 States, including Uttar Pradesh, West Bengal, Odisha, Maharashtra, Tamil Nadu, and Kerala, continue to have provisions that sanction discrimination and forced labour on the ground of caste in prisons.

Caste-based discrimination:

- Caste-based discrimination refers to the unjust treatment of individuals based on their caste or social class.
- It happens when individuals are treated unfairly or denied opportunities, rights, or privileges based on their caste. This can impact various aspects of life, including education, and employment.

Reason for caste-based discrimination in prisons:

- **The Prisons Act of 1894** contains specific provisions concerning prisons' functioning and the regulation of prisoners' actions. Since **prisons are a state list** subject, the **Prisons Act guides respective state governments to formulate their respective prison manual rules. Ex: Accordingly, the Rajasthan Prison Manual prescribed** that hospital attendants must belong to a "good caste".
- The prison system reflects and perpetuates societal biases. Discrimination based on caste may be ingrained in the attitudes and practices of prison staff, affecting the treatment of inmates. **Ex: Dalits even have a separate ward in prisons.**
- The caste system has historically dictated social interactions, leading to hierarchies and inequalities. **Ex: Treatment of inmates from the denotified tribes as habitual offenders.**
- The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013, **does not encompass prison administration, thereby rendering it ineffective in prohibiting manual scavenging within Indian prisons.**
- **Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act of 1989 ignores the casteist allocation of jobs in prison and is unable the protect the core dignity of human beings.**

Various measures/initiatives undertaken to deal with caste-based discrimination in prison:

- **Article 15 p**rohibits discrimination on grounds of religion, race, caste, sex, or place of birth.
- **Under Article 17, u**ntouchability is abolished and its practice in any form is forbidden.
- **Under Article 21,** no person shall be deprived of his life or personal liberty.
- **Model Prison Manual of 2016 based on Nelson Mandela Rules,** aims at bringing in basic uniformity in laws, rules, and regulations governing the administration of prisons and the management of prisoners all over the country.
- **The Supreme Court in Rama Murthy Judgment (1997)** identified nine issues concerning prisons, such as overcrowding, trials being delayed, the torture and ill-treatment of prisoners, neglect of health and hygiene, insubstantial food, and inadequate clothing.

The Supreme Court in Shatrughan Chauhan v. Union of India said the legal procedure adopted to deprive a person of his life or liberty must be fair, just, and reasonable and the protection of Article 21 of the Constitution of India inheres in every person, even death-row prisoners, till the very last breath of their lives.

Caste system:

- It is a form of **social stratification that involves a system of hierarchically** ranked, closed endogamous strata, the membership of which is ascribed and between which contact is restricted and mobility theoretically impossible.

Nelson Mandela Rules:

- **It aims t**o treat prisoners with inherent dignity to prohibit torture and other ill-treatment and state that there should be no discrimination amongst the inmates on the grounds of status.

Question for Practice:

What are the **reasons for caste-based discrimination in prisons? Discuss the various measures undertaken to deal with caste-based discrimination in prison.**

COASTAL SECURITY SCHEME (CSS)

GS II –Government policies and interventions

Context: During a review of the implementation of the Coastal Security Scheme (CSS) by the Ministry of Home Affairs, various shortcomings were reported.

Coastal Security Scheme (CSS):

- It was launched to **strengthen security** across India's **7,516.6 km** coastline, including **1,382 offshore islands**, to prevent **unauthorized entry, smuggling, and infiltration**.
- It is overseen by the **Department of Border Management, Ministry of Home Affairs (MHA)**, in collaboration with **coastal States/UTs** and the **Indian Coast Guard (ICG)**.
- Its objective is to strengthen the infrastructure of Coastal Police for patrolling and surveillance of coastal areas, particularly shallow waters close to the coast.
- Phases of the Scheme:
  - Phase I (2005-2011) is based on the requirements projected by the coastal States/Union Territories. The government aided all the coastal states and UTs to set up 73 coastal police stations (CPS), 97 checkposts, 58 outposts, and 30 operational barracks.
  - Phase II (2011-2020) is based on vulnerability/gap analysis carried out by coastal States/Union Territories which projected additional requirements for strengthening the coastal security infrastructure.
  - Phase III is currently under the process of formulation by the center.

Key Features of the Coastal Security Scheme (CSS):

- **It enhances infrastructure Development through the c**onstruction of **coastal police stations**, **jetties**, **outposts**, **barracks**, and **marine operation centers**.
- **It provides marine patrolling by d**eploying **interceptor boats** for rapid response and improved surveillance.
- **It has provisions for manpower andtraining by s**pecialized marine police personnel trained at the **National Academy of Coastal Policing** of Gujarat.

It helps in technological integration by collaborating with the **Coastal Surveillance Network (CSN)** for **real-time monitoring** and swift threat detection.

COLLEGE AUTONOMY

GS II –Education

Context: The National Education Policy 2020 envisages a future where colleges evolve into autonomous institutions, characterised by innovation, self-governance, and academic freedom. **Granting autonomy to colleges is seen as pivotal for promoting innovation,** enhancing academic quality, and fostering institutional excellence.

Benefits of College Autonomy:

- Autonomous colleges have the freedom to design their **curriculum according to the specific needs and demands of their students, industries, and local communities.** This flexibility enables them to offer innovative courses, update existing ones, and integrate interdisciplinary approaches, ensuring that graduates

are well-prepared for the dynamic job market and societal challenges.

- Autonomous colleges are **better positioned to promote research culture among faculty and students.** Additionally, **autonomy facilitates collaborations with industries, other academic institutions,** and research organisations, fostering interdisciplinary research and knowledge exchange.
- The **decentralised governance structure allows for quicker responses** to emerging trends, opportunities, and challenges in higher education. It also **promotes transparency and inclusivity in decision-making processes**, involving various stakeholders such as faculty, students, alumni, and industry experts.
- Autonomy **creates an entrepreneurial mindset among college stakeholders by encouraging initiatives such as start-up incubators**, entrepreneurship development cells, and industry-academia partnerships. Colleges **can offer courses in entrepreneurship, provide mentorship to aspiring entrepreneurs**, and facilitate access to funding and networking opportunities, thereby contributing to economic growth and job creation.
- **Autonomous colleges prioritise the cultivation of critical thinking**, creativity, and problem-solving skills among students.

Significance of College Autonomy:

- The National Institutional Ranking Framework (NIRF) of 2023 highlights the positive impact of autonomy on academic excellence, with **a significant portion of top-ranked colleges being autonomous institutions.** Besides, **in the top 10 colleges of the NIRF Rankings of 2023 from the college category, five are autonomous colleges.**
- Having half the top spots occupied by autonomous colleges significantly strengthens the case for autonomy as a successful approach to achieving academic excellence.
- Higher education in India is witnessing a marked trend towards establishing autonomous colleges, **with the number soon expected to reach 1,000 across 24 States and Union Territories. States like Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, and Telangana lead in establishing autonomous colleges**, indicating a nationwide interest in exploring autonomy's potential.

Challenges Faced by Autonomous Colleges:

- Despite being granted autonomy by the UGC, **some universities may impose restrictions on the extent of autonomy enjoyed by colleges.** This could include caps on syllabus changes, limiting colleges to modifying only a fraction of their curriculum. **Such limitations hinder colleges' ability to innovate and tailor their academic offerings** to meet evolving needs effectively.
- **Colleges may still find themselves entangled in bureaucratic processes** controlled by the university, limiting their ability to make independent decisions.
- While the UGC grants complete autonomy to colleges, **some universities may exhibit reluctance to cede control,** particularly in critical areas such as syllabus design, introduction of new courses, and assessment methods. **This reluctance may stem from a traditional hierarchical approach to governance within the university system,** where centralised control is favoured over decentralised decision-making.
- Autonomous colleges **may encounter challenges in implementing internal policies** and procedures without interference from external authorities. **This could include resistance from faculty or staff accustomed to the traditional hierarchical structure** or difficulty in enforcing decisions without the backing of university authorities.
- With autonomy comes the responsibility of maintaining and enhancing academic standards. However, **there is a risk that colleges may vary in their approach to quality assurance,** leading to inconsistencies in educational offerings and outcomes.
- Navigating the regulatory requirements while maintaining autonomy can be challenging, particularly for colleges with limited administrative capacity or expertise. **Collaboration with regulatory bodies and adherence to best practices can help colleges navigate these challenges.**

Way Forward:

- **State Councils for Higher Education play a crucial role in overseeing the implementation of UGC regulations** on autonomy. To ensure effective implementation, these councils should be empowered with

sufficient authority, resources, and expertise.

- **Universities must recognise the importance of autonomy** in promoting institutional excellence and collaborate with autonomous colleges in a spirit of trust and partnership. **This collaboration should involve regular communication, joint decision-making forums**, and shared resources.
- To facilitate autonomy, **universities should streamline decision-making processes between colleges and university authorities.** This includes delegating decision-making authority to college governing bodies, establishing clear guidelines and procedures for decision-making, and minimising bureaucratic hurdles.
- **Universities must address the concerns and challenges faced by autonomous colleges** within the broader framework of higher education reform. This includes addressing limitations imposed by universities, ensuring timely recognition of autonomy, and resolving disputes or conflicts that may arise.
- **Universities should adopt a proactive approach to address these concerns**, soliciting feedback from colleges and taking corrective action where necessary.

Autonomous colleges **may require support and capacity-building initiatives to effectively exercise autonomy.** Universities should provide training, workshops, and resources to college administrators, faculty, and staff on topics such as curriculum development, quality assurance, financial management, and governance. **This capacity-building support will enable colleges to leverage autonomy** to drive innovation, excellence, and inclusivity in higher education

Question for Practice:

Examine the significance and challenges faced by autonomous colleges.

CUSTODIAL DEATH

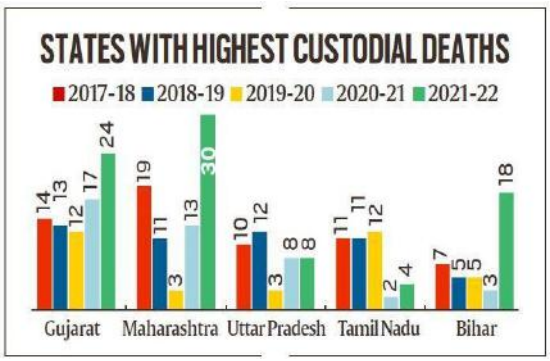
GS II –Issues relating to development

Context: The family of a 52-year-old man, who died in police custody at GarhiHisia village of Agra district, has accused the police of inaction as no FIR has been registered in the matter yet.

Custodial Death:

- Custodial death refers to a **death that occurs while a person is in the custody of law enforcement officials** or a correctional facility.
- It can occur due to **various causes such as the use of excessive force, neglect, or abuse** by the authorities.
- According to the **Law Commission of India**, the crime by a public servant against the arrested or the detained person who is in custody amounts to **custodial violence.**

Constitutional Framework Related to Custodial Death:



- **Article 21 of the Constitution of India** guarantees the **right to life** and personal liberty, which includes the **right to be free from torture** and other cruel, inhuman, or degrading treatment or punishment.
- **Article 20** grants protection against arbitrary and excessive punishment to an accused person, whether a citizen or foreigner or a legal person like a company or a corporation. It contains three provisions in that direction - **No ex-post-facto law (Article 20 (1)), No double jeopardy (Article 20 (2)), and No self-incrimination (Article 20 (3)).**
- **In Selvi v. State of Karnataka**, the court observed that the **state could not perform narco-analysis, polygraph, and brain-mapping tests on any individual without their consent.**

Legal ProtectionsAssociated with Custodial Death:

- **Section 24 Indian Evidence Act, of 1872** declares that all the confessions made by the **accused by**

succumbing to the threat of investigating agencies would **not be admissible in a court of law.** This Section primarily works to prevent the accused from giving confessions using force against his will.

- **Sections 330 and 331 of the Indian Penal Code (IPC)** criminalise voluntarily causing hurt or grievous hurt to extort confession or information from any person.
- Section 41 of **the Criminal Procedure Code (CrPC)** was amended in 2009 to include safeguards so that:
  - Arrests and detentions for interrogation have reasonable grounds and documented procedures.
  - Arrests are made **transparent to family, friends, and the public,** and there is protection through legal representation.

International Conventions Against Custodial Torture:

- **International Human Rights Law of 1948** contains a provision that **protects people from torture and other enforced disappearances.**
- **United Nations Charter of 1945** calls for treating prisoners with dignity. The Charter clearly states that despite being prisoners, their fundamental freedoms and human rights are set out in the **Universal Declaration of Human Rights**, the **International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social, and Cultural Rights.** The International Human Rights Law contains a provision that **protects people from torture and other enforced disappearances.**
- **The Nelson Mandela Rules of 2015** were **adopted by the United Nations General Assembly in 2015 to treat prisoners with inherent dignity** and to prohibit torture and other ill-treatment.
- **United Nations Convention Against Torture (UNCAT)** is an **international human rights treaty** under the purview of the United Nations that **aims to prevent torture** and **other acts of cruel, inhuman,** or degrading treatment or punishment around the world.

Way Forward to Combat Custodial Torture:

- **Strengthening Legal Systems by e**nacting comprehensive legislation explicitly **criminalising custodial torture** like **Supreme Court** directives in **Prakash Singh Case 2006. SC** directed the separation of investigation and law and order functions to better improve policing, setting up of **State Security Commissions (SSC)** that would have members from civil society, and forming a **National Security Commission.**
- By ensuring **prompt and impartial investigations into allegations** of custodial torture.
- By enhancing **police training programs to emphasise respect for human** rights and dignity.
- By promoting a culture of accountability, professionalism, and empathy within law enforcement agencies.
- By establishing **oversight mechanisms** to monitor and address cases of custodial torture effectively.
- **Empowering Civil Society and Human Rights Organisations**to actively advocate for victims of custodial torture. The **National Human Rights Commission (NHRC) should be allowed to inquire** into any matter **even after one year** from the date of the alleged human rights violation. Its jurisdiction should be expanded to cases of human rights violations by armed forces with appropriate measures.
- By providing support and **legal assistance to victims** and their families.

By collaborating with international human rights bodies and organisations to seek redress and justice

Types of Custodial Death:

- **Death in Police Custody** can result from excessive force, torture, denial of medical care, or other forms of abuse or incidental cause.
- **Death in Judicial Custody** may occur due to overcrowding, poor hygiene, lack of medical facilities, inmate violence, or suicide.

Death in the Custody of the Army or Paramilitary Forces can happen through torture or extrajudicial killings

INDIA-NEW ZEALAND RELATIONS

GS II –Bilateral Relations with India

Index: Welcoming his counterpart from New Zealand Christopher Luxon, Prime Minister Modi said the two sides will

"strengthen and institutionalize" defence and maritime cooperation and reminded that both India and New Zealand have fought global terrorism in Mumbai (26/11) and in Christchurch (15 March 2019).

India-New Zealand Relations:

- India and New Zealand share **a longstanding and growing friendship** dating back to the 1800s. Indian troops fought alongside ANZACs in Gallipoli (1915) during **World War I.**
- Both countries share **a Commonwealth heritage, parliamentary democracy, and the English language.**
- The diplomatic ties between the two countries wereestablished in **1950** with the opening of a Trade Commission, later upgraded to a High Commission.
- New Zealand is **India's 11th largest two-way trading partner**. The key trading sectors include education, tourism, dairy, food processing, pharmaceuticals, renewable energy, and critical minerals.
- **India exports p**harmaceuticals, precious metals & gems, textiles, motor vehicles, and non-knitted apparel to New Zealand.
- **India imports l**ogs, forestry products, wool, edible fruit,and nuts from New Zealand.
- India NZ Business Council (INZBC) and India NZ Trade Alliance (INZTA) promote trade and investment ties.
- **Approximately 250,000 persons of Indian origin & NRIs** contribute significantly to New Zealand's society.
- New Zealand Post issued Diwali stamps (2021), recognizing the cultural significance of the Indian diaspora.

Importance of New Zealand for India:

- The advanced farming expertise in dairy and horticulture in New Zealand can support India's farm modernization.
- The top-tier education in New Zealand attracts Indian students, while its vocational training programs can help India address its skill gaps and improve employability.
- The advanced climate technology and sustainability developed in New Zealand support India's low-carbon transition, with its firms recognized in HolonIQ's Indo-Pacific Climate Tech 100.

Issues/Challenges in India-New Zealand Relations:

- The Free Trade Agreement (FTA) talks between the two countries began in 2010 but stalled in 2015 due to India's high tariffs on New Zealand's dairy and agricultural exports to protect its local industry.
- New Zealand's foreign policy is shaped by allies like Australia and the US, while its economic reliance on China may lead to differences with India on regional security and trade.
- Indian exports like grapes, okra, and mangoes face Sanitary and Phytosanitary (SPS) barriers in New Zealand, while the lack of a Mutual Recognition Arrangement (MRA) for standards and certifications further complicates trade.

Market complexities hinder New Zealand's trade with India, while India sees New Zealand mainly for tourism, overlooking its strengths in innovation, technology, and sustainability.

Key Highlights of the India-New Zealand (NZ) Joint Statement:

- Both sides agreed to launch negotiations for a balanced, ambitious, and mutually beneficial trade agreement as per the NZ's "Opening Doors to India" Policy.
- A defence cooperation MoU was signed for regular engagements like military exercises and naval visits and NZ expressed interest in joining India's Indo-Pacific Oceans Initiative (IPOI).
- Both countries pledged to uphold a free, inclusive, and stable Indo-Pacific, supporting rules-based order and navigation freedom under UNCLOS.

Both leaders acknowledged the Indian diaspora's role (6% of NZ's population), for strengthening ties and committed to ensuring the safety of students and tourists.

MEDIATION IN INDIA

GS II –Judiciary

Context: Every Chief Justice of India coming into office has the spectre of the legal system's backlog haunting him or her, as does every senior and concerned member of the higher judiciary. It is an ever-present phenomenon — currently, the Supreme Court of India has 82,000 cases, the High Courts over 62 lakhs, and the lower courts close to five crores. Nearly 50 lakh cases have been pending for more than 10 years.

Mediation:

- It is an ADR process in which a neutral third party (mediator) facilitates discussions between disputing parties to help them reach a mutually agreeable solution.
- It is voluntary, confidential, and cost-effective, with mediators guiding parties to a mutual solution.

Legal Framework:

- Mediation Act of 2023 mandates pre-litigation mediation for civil and commercial disputes, except in urgent cases.
- According to the Commercial Court Act of 2015, parties are mandated to try mediation before entering courts.
- Code of Civil Procedure of 1908 includes ADR methods like Arbitration, Mediation, and Conciliation for resolving disputes outside traditional court proceedings.

Issues/Challenges Regarding Mediation in India:

- Due to a lack of awareness about meditation, many litigants and lawyers prefer traditional litigation over mediation.
- Lawyers are not facilitating pre-institution mediation because they believe that resolving disputes through mediation will curtail their income which they are making through litigation, and they will lose their clients.
- The Mediation Act of 2023 mandates the Mediation Council of India (MCI) but no such body has been formed yet for its effective implementation.
- The agreement or outcome derived through the mediation process is not binding on the parties, they can further approach the court for resolution of disputes.

It has limited institutional support as court-annexed mediation centers are not available in all courts.

NATIONAL JUDICIAL APPOINTMENTS COMMISSION (NJAC)

GS II –Judiciary

Context: The row over the discovery of wads of currency notes at the residence of Delhi High Court judge Justice Yashwant Varma has given the debate on judicial appointments a new lease of life.

National Judicial Appointment Commission (NJAC):

- The 99th Constitutional Amendment Act of 2014 which established the NJAC and the NJAC Act, was passed by Parliament in 2014 to set up a commission for appointing judges, replacing the Collegium system. This would essentially increase the government's role in the appointment of judges.
- The NJAC was to comprise of:
  - The Chief Justice of India as the ex officio Chairperson,
  - two senior-most Supreme Court Judges as ex officio members,
  - The Union Minister of Law and Justice as ex officio member, and
  - Two eminent persons from civil society — one of whom would be nominated by a committee consisting of the CJI, Prime Minster, and the Leader of Opposition in the Lok Sabha, and the other would be nominated from the SC/ST/OBC/minority communities or women.
- The National Judicial Appointments Commission (NJAC) Act of 2014 was a significant legal development in India aimed at reforming the appointment of judges in the higher judiciary. However, it was struck down as unconstitutional by the Supreme Court in a landmark judgment in the case of Supreme Court Advocates-on-Record Association v. Union of India (2015).

Arguments in favor of NJAC:

- The collegium system is a closed-door affair without a formal and transparent system and has also been accused of nepotism.
- It is important to have checks and balances to retain public confidence in judicial appointments.
- Democracy being a basic feature of the constitution, requires that no organ of the state, including the judiciary, enjoys absolute freedom.
- It helps in guarding the basic structure of Separation of powers and the Independence of the Judiciary from the executive as the Chairperson of the NJAC is the Chief Justice of India.

Arguments against NJAC:

- NJAC would jeopardize the independence of the judiciary as guaranteed under the existing collegium system because, as a part of the basic structure of the Constitution, it is the sole right of the judiciary to appoint judges.
- The introduction of Article 124 A in itself violates the basic structure of "Primacy of the CJI" as laid down in the second judges' case of 1993.
- It amounts to **complete arbitrariness**. Since the appointment of two eminent persons lacks the process of evaluation and is completely up to the decision of the CJI, the Prime Minister, and the leader of Lok Sabha, it amounts to a violation of Article 14 of the Constitution, which provides for equality and non-arbitrariness in decision making.
- It is cited by critics that the judiciary is the only independent institution left in the country. It is harmful to allow political influence over it.
- NJAC is titled towards executive rather than judiciary; selection of eminent members implies the greater role of executives/veto right can nullify judicial choices but the opposite holds true

Recommendations:

- The Law Commission in its 214th Report on Proposal for Reconsideration of Judges cases I, II, and III recommended the following:
  - To seek a reconsideration of the three judgments before the Supreme Court.

A law to restore the primacy of the CJI and the power of the executive to make appointments.

Question for Practice:

Examine why the National Judicial Appointments Commission (NJAC)was turned down as unconstitutional by the Supreme Court.

ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN CANCER DETECTION AND TREATMENT

GS II –Health

Context: AI methods are being applied to advance knowledge about mechanisms of cancer initiation, progression, and metastasis.

Cancer:

- It is a generic term used for a large group of diseases that can affect any part of the body.
- It is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs.
- According to a report by the Indian Council for Medical Research on the 'Burden of cancers in India', seven cancers accounted for more than 40% of the total disease burden: lung (10.6%), breast (10.5%), esophagus (5.8%), mouth (5.7%), stomach (5.2%), liver (4.6%) and cervix uteri (4.3%).

Artificial intelligence (AI):

- It is the ability of a computer or robot to perform tasks that are typically associated with human intellectual processes.

Role of artificial intelligence (AI) in cancer detection and treatment:

- AI analyses radiological and pathological images, learning from extensive datasets to recognise unique features associated with various cancers. It facilitates early detection by identifying tissue changes and potential malignancies.
- Comprehensive imaging generates longitudinal patient data, aiding in understanding behaviour, treatment response, disease recurrence, and overall survival.AI and machine learning protocols utilise this data to develop predictive models for tumour survival and guide treatment aggressiveness.
- The creation of a tumour image bank allows to developmentof algorithms for different tumours, assessing treatment responses directly from images, and avoiding unnecessary chemotherapy for predicted non-responders.

Future of Artificial Intelligence (AI)in Cancer Treatment:

- AI is expected to tailor treatment approaches based on patient profiles, optimizing therapy outcomes, especially in rural India.
- AI could enable general practitioners to diagnose complex cancers with a simple click, enhancing precision in cancer solutions.
- As AI continuously learns and improves, it promises timely cancer diagnoses, better patient outcomes, and support for healthcare professionals.

The use of AI tools in healthcare raises debates about the potential replacement of human radiologists and faces regulatory scrutiny and resistance from some doctors and health institutions.

National Cancer Grid (NCG):

- It aims to create a network of cancer centres, research institutes, patient groups, and charitable institutions across India to develop uniform standards of patient care for -
  - Prevention, diagnosis, and treatment of cancer;
  - Providing specialised training and education in oncology and
  - Facilitating collaborative basic, translational, and clinical research in cancer.
- It was established in 2012 as a government of India initiative through the Department of Atomic Energy (DAE) and its grant-in-aid institution, the Tata Memorial Centre.

THREE-LANGUAGE FORMULA

GS II –Issues related to Education Sector

Context: Currently, the DMK-led Tamil Nadu government is at loggerheads with the BJP-ruled Centre over its NEP 2020, which has retained the three-language formula with fewer restrictions on the choices of languages.

Three-Language Formula:

- It is a language learning policy introduced in the **1968 National Policy on Education.**
- It mandated that students across India **learn three languages:** their regional language (mother tongue), Hindi, and English.
- **Hindi-speaking states** must study a modern Indian language (preferably from the south) instead of Hindi as their third language.
- **The National Education Policy (NEP) 2020** has retained the three-language formula albeit with a key difference that it doesn't impose any language on any state.It specifies that the languages to be learnt will be the **choice of States, regions, and the students**, so long as at least two of the three languages are native to India.

Importance/Significance of the Three-Language Formula:

- **It e**ncourages students to learn multiple languages, improving cognitive skills and communication.
- **It h**elps bridge the north-south linguistic divide by promoting Hindi in non-Hindi states and regional languages in Hindi-speaking states.
- **It increases employment opportunities as k**nowledge of multiple languages expands career prospects and makes migration for jobs and higher education easier across different states.
- **It e**nsures that regional languages continue to be actively used and preserved.

Issues/Concerns regarding the Three-Language Formula:

- **It is seen as an attempt to impose Hindi by n**on-Hindi-speaking states, especially Tamil Nadu, West Bengal, and Karnataka.
- Many schools lack qualified teachers to teach additional languages.
- Learning an additional language may increase the academic load, particularly for students who struggle with language acquisition.
- **Private schools in northern states** do not prioritize regional languages like Tamil or Punjabi.

Political concerns over language education have remained divisive and often counterproductive.

Question for Practice:

Examine the impact of the Three-Language Formulaon national integration and linguistic diversity in India.

WOMEN IN CORPORATE LEADERSHIP

GS II – Government policies and interventions

Context: Policy changes in the United States highlight the challenges and barriers to increasing women's participation in the corporate workforce; these have global relevance.

Status of Womenin Corporate Leadership:

- According to the World Economic Forum's Global Gender Gap Report 2023, only 32% of leadership roles globally are occupied by women.
- In India, the Economic Survey 2022-23 highlighted that women hold less than 5% of CEO or MD positions in NIFTY 500 companies.

Significance of Womenin Corporate Leadership:

- Women employ participative leadership approaches that foster robust discussion, better decision-making, and greater value creation.
- Women leaders promote empathetic leadership and employee-friendly policies, improving overall productivity.
- Women's considered approach to risk-taking enhances company efficiency, particularly during crises.
- Women leaders often excel at building collaborativeenvironments, emphasizing listening and consensus-building, which can lead to stronger team cohesion.
- Companies with more women in senior roles are more likely to be recognized as ethical, admired, and employee-friendly, this creates a cycle of benefits.

Issues/Challenges Obstructing Women's Participation:

- The double-burden syndrome forces many women to exit mid-career due to inadequate parental leave policies and inflexible work structures.
- A lack of women in middle management positions results in a smaller talent pool for leadership roles.
- Women struggle to secure their first promotion to managerial positions, creating a leadership pipeline issue that limits their advancement to executive roles.

- About 50% of private companies and 30% of public companies in India have only one female board member, indicating tokenism rather than genuine inclusion.
- The Global Gender Pay Report 2023 indicates that women in leadership earn **20-25% less** than their male counterparts.
- Women in leadership positions can face sexual harassment and other forms of discrimination, creating a hostile and unsafe work environment.

Mandates Promoting Women in Leadership:

- India's **Companies Act, 2013** mandates at least one woman director on the boards of certain public limited companies.

The **SEBI mandate** requires at least one independent woman director on the boards of India's top 1000 listed companies.

PAPER 3

CLIMATE CHANGE AND HUMAN RIGHTS

GS III – Environmental Conservation

Context: The Supreme Court of India acknowledged the right to protection from climate change impacts as part of the fundamental rights to life (Article21) and equality
(Article 19) enshrined in the Indian Constitution.

The intersection of climate change and human rights:

- Climate change can directly affect people's right to life by causing extreme weather events like **hurricanes or floods,** which can lead to loss of life and property. For example, in low-lying coastal areas, **rising sea levels due to climate change** can threaten people's homes and livelihoods, forcing them to relocate.
- Climate change can impact water sources, leading to **water scarcity or contamination.** This affects people's right to clean water and sanitation. In regions where droughts are becoming more frequent due to climate change, communities may struggle to access safe drinking water, leading to health issues.
- Climate change can exacerbate health problems, especially for vulnerable populations. For instance, **increased heat waves can lead to heat-related illnesses** and deaths, affecting the right to health.
- Climate change-induced events such as sea-level rise, extreme weather events, or desertification can force people to **migrate or be displaced from their homes**. This intersects with human rights, particularly the **right to residence and the right to seek asylum**.
- Climate change can disproportionately affect indigenous communities that rely heavily on natural resources for their livelihoods and cultural practices. For instance, changes in ecosystems due to climate change can threaten traditional livelihoods like **farming or fishing**, impacting indigenous peoples' rights to land, resources, and cultural heritage.

The Supreme Court's interpretation of constitutional provisions concerning climate change:

- **Article 48A** which mandates environmental protection and **Article 51A(g)** which promotes wildlife conservation, implicitly **guarantee a right to be safeguarded from climate change.**
- **Article 21** recognises the right to life and personal liberty while **Article 14** indicates that all persons shall have equality before the law and the equal protection of laws. These articles are important sources of the **right to a clean environment and the right against the adverse effects of climate change.**
- In **MC Mehta vs Kamal Nath Case, 2000**, the Supreme Court stated that the **right to a clean environment is an extension of the right to life.**

Issues/Challenges in balancing climate change mitigation with human rights protection:

- Some climate mitigation measures may conflict with human rights, such as **restrictions on land use for conservation projects** or displacement due to renewable energy infrastructure development. Finding solutions that minimise negative impacts while maximising benefits is challenging.
- Climate actions like transitioning to renewable energy or implementing carbon pricing can **impact access to essential resources like energy, water, and food**, especially for marginalised communities.
- Climate-induced migration can strain social systems and lead to conflicts over resources and rights in host communities. Managing migration flows in a way that respects the rights of both migrants and host populations is a multifaceted challenge.
- Balancing efforts to reduce greenhouse gas emissions (mitigation) with investments in adaptation to climate impacts can be challenging. Prioritising one over the other can have implications for human rights, particularly **for communities already facing climate-related risks.**

Climate change is a global issue requiring international cooperation. **Balancing national climate goals with global**

responsibilities and ensuring that climate actions do not undermine the rights of vulnerable communities across borders is a complex task.

Implications of the recent ruling:

- It strengthens the legal basis for environmental protection efforts in India and **provides a framework for legal challenges against inaction on climate change.**

It aligns with the growing international recognition of the human rights dimensions of climate change, as outlined by the **UN Environment Programme** and the **UN Special Rapporteur on Human Rights and the Environment.**

DEEP OCEAN MISSION

GS III – Infrastructure

Context: Last month, India completed wet testing of its Matsya-6000 submersible, capable of diving up to 6 km below the surface to look for underwater minerals off the coast. The launch of the first deep-sea manned vehicle is planned for later this year — it will put India in a select group of nations with the capability to send humans to these depths.

Deep Ocean Mission (DOM):

- It is a multi-institutional initiative led by the **Ministry of Earth Sciences (MoES)** to explore deep-sea resources and develop deep-sea technologies for their sustainable use.
- It **aims to contribute over Rs. 100 billion to India's Blue Economy** through explorations in the **Central Indian Ocean Basin.**

Source: Times of India

Significance of Deep Ocean Mission:

- India's unique maritime position with a 7517 km coastline, nine coastal states, and 1,382 islands offers significant potential for marine resource utilization.
- The mission **supports the government's 'New India' vision**, which identifies **Blue Economy** as one of the ten core dimensions of growth. According to CII & NITI Aayog, the Blue Economy can add $1 trillion to India's GDP by 2047.
- **It aims** to ensure the **sustainable utilization of ocean resources** for long-term economic benefits. It will contribute to GDP growth, improved livelihoods, and job creation.
- It focuses on exploring resources like **nickel, cobalt,** and other minerals, including **polymetallic nodules.**
- **It f**acilitates **deep-sea exploration** through a manned submersible, enabling scientists to **observe and study unexplored deep-sea areas directly.**
- **It promotes innovation** in asset inspection, enhancing the safety and maintenance of marine infrastructure.
- **It e**ncourages **public awareness** about marine ecosystems and **opens avenues for marine tourism.**
- Marine genetic resources may yield anti-cancer, anti-microbial, and anti-inflammatory compounds for drug discovery. It facilitates bio-prospecting and biotechnological innovation.

Challenges of Deep Ocean Mission:

- The mission requires specially designed, durable equipment to withstand immense pressure. The**pressure will be approximately 500 times greater than the pressure at sea level, at a depth of 5,000 meters.**
- India has limited trained personnel in deep-sea robotics, submersible operations, and ocean mining.
- Electronics and instruments struggle to function efficiently underwater.
- India lacks a comprehensive National Deep-Sea Mining Policy which can hinder exploitation rights and environmental accountability such as compliance with UNCLOS and ISA frameworks.
- Communication systems face challenges due to waves backscattering, high attenuation, etc.
- The ecological footprint of deep-sea mining disturbs fragile habitats, with potentially irreversible loss of species. WWF warns of sediment plumes, noise pollution, and disruption to carbon sinks.

China's increased presence in deep-sea regions could restrict India's exploration efforts, especially in resource-rich zones like the Southwest Indian Ocean.

DISASTER MANAGEMENT (AMENDMENT) BILL 2024

GS III –Disaster Management

Context: The Lok Sabha passed a Bill to strengthen the working of national and State disaster management authorities, with the Centre stressing that the legislation will help State governments deal with disasters better.

Key Features of the Disaster Management (Amendment) Bill of 2024:

- It seeks to establish an Urban Disaster Management Authority headed by the Municipal Commissioner for large metropolitan cities, which often comprise many districtsthat can help in having a unified and coordinated approach towards city-level disasters such as urban flooding.
- It proposes to make it mandatory for every state to raise and maintain aState Disaster Response Force (SDRF).
- It gives legal status to the **National Crisis Management Committee (NCMC) by making it** the nodal body to deal with disasters with 'serious or national ramifications.'
- It proposes to significantly expand the role and responsibilities of theNational Disaster Management Authority (NDMA)as it will take stock of the entire range of disaster risks to the country, including risks from emerging disasters.
- It makes the National Disaster Management Authority (NDMA) and State Disaster Management Authorities to be responsible for the preparation of disaster plans at the national and state levels.
- According to this bill, the National Disaster Management Authority (NDMA) will be required to create and maintain a national disaster database with information on the assessment of the disaster, fund allocation, expenditure, and preparedness and mitigation plans while the SDMAs will also need to create state-level disaster databases.
- It clarifies that the definition of Disasters does not include man-made disasters caused due to law-and-order situations.
- It proposes that the National Disaster Management Authority (NDMA) should recommend guidelines for minimum standards of relief to be provided to people affected by disasters.

Issues/Concerns associated with the Disaster Management (Amendment) Bill of 2024:

- **It lacks inclusive terms such as supervision and direction by**employing top-down language like monitor and guidelines.
- **It** excludes local communities, which global frameworks like the Yokohama Strategy and Sendai Framework recognize as first responders.
- **It**does not address intersectional discrimination, leaving vulnerable groups such as women, the disabled, lower castes, and LGBTQIA communities exposed to systemic neglect.
- **It** lacks mechanisms for assessing district authorities' preparedness.
- **It has removed** Sections 12 and 13 of the Disaster Management Act 2005, which mandated minimum relief standards and loan repayment assistance.

It completely ignores animal welfare during disasters.

Question for Practice:

Discuss the **key features of the Disaster Management (Amendment) Bill of 2024 along with issues associated with it.**

FISCAL HEALTH INDEX (FHI) REPORT 2025

GS III –Economy

Context: NITI Aayog released Fiscal Health Index (FHI) Report 2025 to throw light on fiscal status at the sub-nationallevel and guide policy reforms for sustainable and resilient economic growth.

Fiscal Health Index 2025:

- It ranks states on the basis of composite fiscal index, which is based on five major sub-indices andnine minor sub-indices.

MAJOR SUB-INDICES	MINOR SUB-INDICES
1. Quality of Expenditure	1.1 Total Developmental Expenditure/Total Expenditure
	1.2 Total Capital Outlay/ GSDP*
2. Revenue Mobilization	2.1 State Own Revenue/ GSDP*
	2.2 State Own Revenue/ Total Expenditure
3. Fiscal Prudence	3.1 Gross Fiscal Deficit/ GSDP*
	3.2 Revenue Deficit/ GSDP*
4. Debt Index	4.1 Interest Payments/Revenue Receipts
	4.2 Outstanding Liabilities/ GSDP*
5. Debt Sustainability	5.1 Growth Rate of GSDP* – Growth Rate of Interest Payments

GSDP at current prices for the year 2022-23

- States have been classified on the basis of the FHI score:
  - Achiever: Greater than 50
  - Front Runner: Greater than 40 & less than equal to50
  - Performer: Greater than 25 & less than equal to 40
  - Aspirational: Less than equal to 25
- It analyses 18 major states using CAG data,excluding special category and Himalayan states.

Key Findings of FHI 2025:

- Odisha leads with the highest overall FHI score of 67.8, followed by Chhattisgarh (55.2), Goa (53.6), Jharkhand (51.6), and Gujarat (50.5), with strengths in Debt Index, Revenue Mobilization, and Fiscal Prudence.
- Goa, Telangana, and Odisha lead in Revenue Mobilization and Fiscal Prudence.
- Madhya Pradesh, Odisha, Goa, Karnataka, and Uttar Pradesh allocate 27% to capital expenditure, enhancing long-term investments.
- West Bengal and Punjab showedconcerning fiscal trends with increasing debt-to-GSDPratios, raising serious questions about their long-termdebt sustainability.

Significance of the FHI Report:

- It can promote healthycompetition among states to align their fiscalstrategies with national objectives, ensuring theircontributions to the goal of a fiscally stable andprosperous India.
- It can promotetransparency in fiscal practices by providing a publicmeasure of how well states manage their finances.

It can helppolicymakers identify where states need to focus reforms or allocate resources for better fiscaloutcomes.

GREAT NICOBAR ISLAND PROJECT

GS III –Infrastructure

Context: Two years after the grant of environment and forest clearance, the Andaman and Nicobar Islands Integrated Development Corporation Limited (ANIIDCO), the proponent of the Great Nicobar Island mega infrastructureproject, recently released minutes of a series of meetings held to discuss the implementation of environmentalconditions under which the project was cleared.

Great Nicobar Island Project:

- It involves **developing a trans-shipment port**, an international airport, a township development,
- **and a 450 MVA gas and solar-based power plant on the island.**
- It is a mega project **to be implemented at the southern end of the Andaman and Nicobar Islands.**
- It is **being implemented by the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO)** and is proposed to include an International Container Trans-shipment Terminal (ICTT), a **greenfield international airport.**
- **It** is **close to the Malacca Strait, the main waterway that connects the Indian Ocean to the Pacific,** and the ICTT is expected to allow Great Nicobar to participate in the regional and global maritime economy by becoming a **major player in cargo transshipment.**
- It can boost high-end tourism like Singapore and the Maldives while ensuring sustainable development.
- **It** is aimed at facilitating the **deployment of additional military forces,** larger and more warships, aircraft, missile batteries, and troops.

Issues/Challenges faced by the Great Nicobar Island Project:

- **It** will put the island's ecology in danger due to the felling of nearly a million trees along with posing threats to **coral reefs** due to the development of ports. It poses a threat to the **terrestrial Nicobar Megapode bird** and **leatherback turtles** that nest in the Galathea Bay area.
- It will destroy 130 sq km of primary tropical rainforest, leading to biodiversity loss and ecological imbalance and the diversion of pristine Nicobar forests is being compensated by land in Haryana and Madhya Pradesh, which does not replicate the biodiversity lost.
- It may cause devastating changes to the lifestyle of indigenous tribes like **Shompen** and Nicobarese who are hunter-gatherers and live **in a tribal reserve on the island.** It **violates the Forest Rights Act (2006),** which holds the **Shompen as the sole legally empowered authority to protect, preserve, regulate, and manage the tribal reserve.**
- **The p**roposed port in the project is located in a **seismically volatile zone**, which experienced permanent subsidence of around 15 feet during the 2004 tsunami which raises concerns about the safety and viability of constructing such a large-scale infrastructure project in a high-risk, disaster-prone area.

There is an accusation against the local administration of not consulting the **Tribal Council of Great and Little Nicobar Islands** adequately, as per legal requirements.

Great Nicobar:

- It is the southernmost and largest of the Nicobar Islands.
- It is a sparsely inhabited 910-sq-km patch of mainly tropical rainforest in the southeastern Bay of Bengal.
- Indira Point on the island, India's southernmost point, is only 90 nautical miles (less than 170 km) from Sabang at the northern tip of Sumatra, the largest island of the Indonesian archipelago.
- Great Nicobar has two national parks, a biosphere reserve, small populations of the Shompen and Nicobarese tribal peoples, and a few thousand non-tribal settlers.

Andaman and Nicobar Islands:

They are a cluster of 836 islands, split into two groups — the Andaman Islands to the north and the Nicobar Islands to the south — by the 150-km wide Ten Degree Channel.

GREEN FINANCE IN INDIA

GS III –Renewable Energy

Context: The Government is working to set up a National Green Financing Institution to support its net-zero target by 2070, as current finance flows for climate initiatives remain much lower than the desired levels, NITI Aayog has said.

Green Finance:

- It is to increase the level of financial flows (from banking, micro-credit, insurance, and investment) from the public, private, and not-for-profit sectors to sustainable development priorities.
- A key part of this is to better manage environmental and social risks, take up opportunities that bring both a decent rate of return and environmental benefit, and deliver greater accountability.

Significance of Green Finance in India:

- It helps to reduce carbon emissions by supporting renewable energy, energy efficiency, and other sustainable practices.
- Climate change could lead to an estimated 10% loss in total economic value and up to 18% of global GDP wiped out by 2050.This economic threat is particularly severe for India, which aims to grow its economy to USD 10 trillion by 2030.
- It helps to reach India's net-zero ambitions as pledged at COP26 UNFCCCto achieve net-zero emissions by 2070 under the Panchamrit strategy that requires over USD 10 trillion in investments.
- India needs USD 1.4 trillion in aggregate investments, or USD 28 billion annually, to reach its 2070 net-zero goal.

Issues/Challenges related to Green Energy Financing in India:

- The projects become financially unviable as green finance is costly due to high interest rates, long gestation periods, and a lack of fiscal incentives for lenders.
- It faces challenges due to limited international finance. At COP29 UNFCCC, developed nations pledged to mobilize at least USD 300 billion annually by 2035 to support climate mitigation which is insufficient compared to the required financing. Several experts highlight that mobilizing USD 1 trillion per year by 2030 is required to help developing countries cope with climate change.
- National Clean Energy and Environment Fund (NCEEF) was created for clean energy initiatives, but much of its funds have been diverted to non-renewable projects like GST compensationandNamamiGange.
- Indiahas yet to institutionalize green banks due to a lack of clear RBI guidelines and legal recognition, impacting their credibility and fund mobilization.

Green Energy Financing Initiatives in India:

- National Clean Energy and Environment Fund (NCEEF) funds clean energy ventures and research through Clean Environment Cess on coal.
- RBI classified renewable energy as a priority sector lending (PSL), requiring banks to allocate up to 40% of net credit.
- Green banks accelerate clean energy financing by funding environmentally sustainable projects.
- Green Bonds are market-based financial instruments for raising capital for environmentally beneficial projects.

Crowdfunding is a decentralized funding model using small private investments for renewable energy.

HIMALAYAN FOREST FIRES

GS III –Disaster Management

Context: Forest fires in the Western Himalayan region increased manifold during the wildfire season (November to June) in 2024, compared to a year ago. Uttarakhand, Himachal Pradesh, and Jammu and Kashmir registered a sharp rise in forest fire incidents, causing extensive damage to forest coverage

Forest Fire:

- It can be described as any **uncontrolled and non-prescribed combustion** or burning of plants in a natural setting such as a forest, grassland, brushland, or tundra, which consumes natural fuels and spreads based on environmental conditions (e.g., wind, topography).

- Three conditions need to be present for a **wildfire to burn - fuel, oxygen, and a heat source.**

Factors responsible for forest fires in the Himalayan region:

- The absence of snowfall and rainfall in the winter months **has left the region dry.** Snowfall and p**recipitation** are crucial for **maintaining soil moisture** and preventing the forest floor from becoming excessively dry.
- The lack of moisture in the soil and vegetation **creates favorable conditions for forest fires**. Dry leaves, combined with dry soil, act as potential fuel for fires.
- Human activities, **such as carelessly discarding cigarettes** or engaging in uncontrolled burning, can trigger forest fires.
- The presence of fire-prone and flammable tree species like **Chir pine increases the risk of forest fires.** About 15% of Himachal's forest area is covered with Chir pine.
- Controlled burning by the forest department may also contribute to the issue if not properly managed.

Impacts of Himalayan Forest Fires:

- The data from the **Indian Council of Agricultural Research (ICAR)** reveal that forest fires contribute significantly to soil erosion and degradation. Loss of topsoil in Uttarakhand, a region prone to forest fires, increased by 15% from 2015 to 2020.
- Data from the Forest Survey of India indicates a steady decline in forest cover in the Himalayan region due to fires. For instance, between 2017 and 2019, Himachal Pradesh reported a loss of approximately 826 square kilometres of forest cover.
- A study by the World Bank highlights that forest-dependent communities in the Himalayan region are disproportionately affected. Loss of livelihoods due to damaged forests and disrupted ecosystems has left around 20% of the population in these areas vulnerable to poverty.
- Air quality data from the Central Pollution Control Board reveals that during peak fire seasons, air quality in regions like Uttarakhand and Himachal Pradesh deteriorates significantly.
- Reports from UNESCO note the cultural impact of forest fires on the Himalayan region. Sacred sites, such as those in the Kedarnath Wildlife Sanctuary, have been damaged, disrupting traditional practices and rituals.

Government interventions and measures to control forest fires in the Himalayan region:

- The **National Disaster Management Authority (NDMA)** data indicates that preventive measures, such as controlled burning and firebreaks, are increasingly being adopted. States like Himachal Pradesh have reported a 30% reduction in forest fire incidents through the implementation of preventive strategies.
- The Forest Survey of India utilizes advanced technologies, including satellite imagery and remote sensing, for real-time monitoring. This technology integration has improved early detection rates by 40%, aiding in prompt response and containment.

The local forest management committees actively participate in fire prevention, demonstrating a reduction in fire incidents by 25% in their managed areas. For example, the Van Panchayats in Uttarakhand showcase the effectiveness of community involvement.

NUCLEAR ENERGY IN INDIA

GS III –Renewable Energy

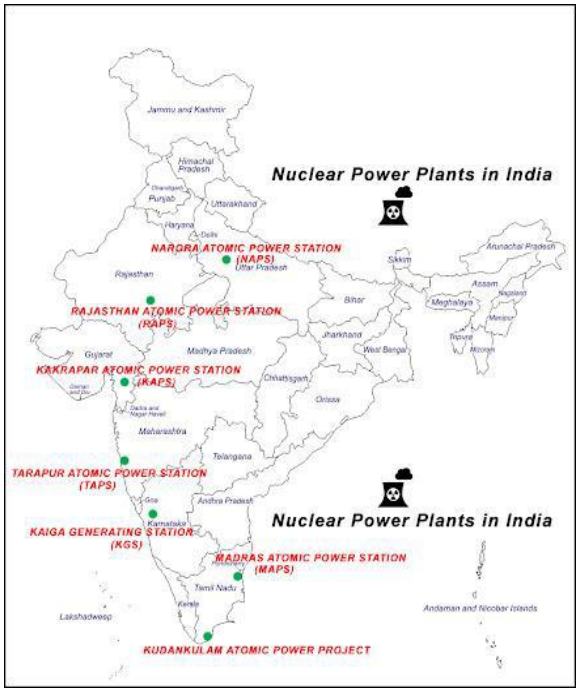
Context : At long last, the government seems to have awakened to the inevitable role of nuclear energy in the realization of 'Viksit Bharat'. The private sector, while it needs to be mobilized to scale up the programme has, at best, a secondary role.

Status of Nuclear Energy in India:

- India has developed INS Arihant, the country's first indigenous nuclear-powered ballistic missile submarine (SSBN), and is working on INS Arighat and additional units.
- India has a range of nuclear-capable missiles, including Agni (I-V), Prithvi, and K-15 (Sagarika).

India has 22 operational nuclear reactors with a total installed capacity of 7,480 MW (as of 2024).

- Several new reactors are under construction, including Kudankulam (Units 3-6), Gorakhpur Haryana Anu Vidyut Pariyojana, and Kaiga Units 5 & 6, expected to add nearly 7,000 MW in the next decade which will add 8,000 MWe by 2031.
- India has developed Pressurized Heavy Water Reactors (PHWRs), Prototype Fast Breeder Reactor (PFBR), and is progressing towards thorium-based Advanced Heavy Water Reactor (AHWR).



Significance/Advantages of Nuclear Energy in India:

- It helps in providing a reliable solution to the country's power demand in contrast to wind and solar, which are not available around the clock.
- **It reduces emissions of greenhouse gasses** or pollutants which could reduce India's contribution to **global Green House Gases (GHGs),** which currently stands at **6.55%,** with the energy sector accounting for slightly more than two-thirds of it.
- It will help the country lead towards a more sustainable and economic future.
- It offers consistent, weather-independent power with a smaller land footprint when compared to other renewable energy such as solar and wind power which face limitations tied to weather conditions and land needs.

Issues/Challenges related to Nuclear Energy in India:

- India has limited private sector participation as it permits private involvement in nuclear plant technology and construction, but operations and fuel management remain under public sector control.
- India's Civil Liability for Nuclear Damage Act of 2010remains an item on the "agenda which was brought in addition to the International Convention on Supplementary Compensation (CSC), is considered excessive by foreign companies, which could be liable to pay hundreds of millions of dollars in the event of a nuclear accident.As a result, despite signing civil nuclear deals with several countries, including the U.S., France and Japan, the only foreign presence in India is that of Russia in Kudankulam, projects that predate the Law.
- The Atomic Energy Regulatory Board faces multiple challenges in regulating dispersed nuclear and radiation facilities, meeting modern safety expectations, and ensuring security for a large number of radioactive sources.
- India's uranium scarcity necessitates regular imports, causing fuel supply uncertainties and placing the country's energy interests in the hands of foreign suppliers.

Institutions of Nuclear Energy in India:

- **The Atomic Energy Commission** is the governing body of the **Department of Atomic Energy (DAE)**. The DAE is under the direct charge of the **Prime Minister. Its function is to** organize research in atomic science in the country, train atomic scientists in the country, and promote nuclear research in the commission's own laboratories in India.
- **The Atomic Energy Regulatory Board (AERB)**was formed in 1983 and comes under the **Atomic Energy Commission**. It oversees **nuclear safety regulations** and their implementation.
- **Nuclear Power Corporation of India (NPCIL)** is the owner and operator of every nuclear power plant in India, except for the **Prototype Fast Breeder Reactor** (**PFBR**).It is responsible for the design, construction, commissioning, and operation of nuclear power reactors.
- **Bhabha Atomic Research Centre**operates under the **DAE** and its core mandate is to sustain peaceful applications of nuclear energy. It oversees every aspect of nuclear power production.

Government Initiatives for the Promotion of Nuclear Energy in India:

- India's three-stage nuclear power programme was formulated by Dr. Homi Bhabha in the 1950s to secure the country's long-term energy independence through the use of uranium and thorium reserves found in the **monazite sands** of the coastal region of **South India.** India is currently in the **second stage** of its ambitious nuclear program.
  - Stage 1: PHWRs using natural uranium.
  - Stage 2: Fast Breeder Reactors using plutonium and thorium.
  - Stage 3: Thorium-based reactors for sustainable energy.
- **Bharat Small Reactors (BSR)** aims to deploy small modular reactors in collaboration with the private sector.

Indo-US Nuclear Deal facilitated access to global uranium markets and advanced technologies.
Civil Nuclear Cooperation Agreements have been signed with Russia, France, USA, Japan, and others for fuel supply and technology transfer.

Question for Practice:

Discuss the significance and issues related to Nuclear Energy in India along with the government measures to enhance nuclear energy production in India.

ROLE OF QUANTUM COMPUTING IN NATIONAL SECURITY

GS III –Science and Technology

Context : To accelerate India's transition into a frontier Tech nation, NITI Aayog has, recently, established the NITI Frontier Tech Hub (NITI-FTH). In partnership with the Data Security Council of India, NITI-FTH has released a strategic paper on the rapid evolution of Quantum Computing, and its implications on National Security and provides strategic perspectives to help India navigate and lead in a transformative era.

Quantum Technology:

- **It** is often used as an umbrella term for technological advancements that are specifically governed by the principles of quantum mechanics at its core. It involves developing necessary hardware, software, algorithms, and protocols for the design and development of quantum computing devices like quantum computers.
- It exploits the principles of quantum mechanics, which include superposition, quantum entanglement, and interference to achieve greater efficiency in large-scale computations.
- Quantum computing uses 'qubit' (or quantum bit) as its fundamental unit and their stability is crucial for harnessing quantum states for computation.

Source: NITI Aayog

Role of Quantum computing in reshaping National Security:

- One of the threats facing the public-key encryption algorithm that can impact modern internet security and online banking is fault-tolerant quantum computer (CRQC). The report suggests that countries implement Post-Quantum Cryptography (PQC), cryptographic algorithms designed to withstand attacks from quantum computers, to ensure improved data security.
- Quantum computing would enhance signals intelligence (SIGINT), allowing nations to intercept, analyze, and decode communications at an unprecedented scale. This would give a country unparalleled intelligence advantages, and reshape espionage and counterintelligence operations.
- Quantum technologies will optimize logistics, resource allocation, and battlefield strategy, making defense

operations more efficient. Autonomous military drones and robotic systems will be enhanced through Quantum-enabled AI (Quantum AI). Topology qubit which promises the scalability of qubit systems to a million would take weaponization to a new level allowing the detection of next-gen stealth aircraft and building robust and resilient control systems for autonomous weapons.

- The ability to break current encryption could destabilize financial markets, compromise banking systems, and endanger digital payment infrastructures. Quantum computers could also be used to steal sensitive intellectual property from corporations and governments, leading to a new era of economic espionage.
- The report points out that the dominance of a country in quantum technology will give it an edge to shape global technology standards and norms, thus shaping international regulations. As topology qubit promises enhancement of stability and scalability, it will also solidify the dominance of leading quantum nations.

Note:

- Superposition refers to the ability of these particlesto exist in multiple locations simultaneously. This phenomenon persists only until the particle is observed. Once observed, the particle appears at one location and ceases to exist in the others.
- Entanglement is another unusual property where particles that have previously interacted can instantaneously influence each other's behavior, regardless of the distance separating them. When one entangled particle is measured, the state of the other particle is immediately determined, even if they are far apart. This intriguing property can help in preventing security breaches in quantum communication by entangling qubits of sender and receiver.

Interference is a wavelike superposition of subatomic particles' states that affect the probabilities of states of these particles when measured. While entanglement is a phenomenon between two particles, interference is an effect of many particles surrounding each other. Interference can be constructive as well as destructive which makes it suitable for use in quantum algorithms for improving accuracies by suppressing less probabilistic outcomes and amplifying high probabilistic outcomes.

RUPEE DEPRECIATION

GS III –Indian Economy

Context : The Indian rupee's exchange rate against the US dollar has breached the 85 mark. The Rupee faced its sharpest depreciation in the last two years.

Rupee Depreciation:

- It refers to the decline in the value of the Indian Rupee (INR) relative to a foreign currency, typically the US Dollar (USD) or other major global currencies.

Factors Responsible for Rupee's Depreciation:

- Modern generations ofcurrency crises seem to be triggered by markets thatconduct value-at-risk assessments of the centralbank's balance sheet which affects investorconfidence.
- Illiquidityarises out of short-term foreign currencydebt becoming larger than liquid foreign currencyassets.
- Higher inflation in India compared to tradingpartners erodes the purchasing power of the Indian Rupeeand adversely affects the exchange rate.
- RBI's interest rate decisions andforeign exchange interventions impact the rupee'sstrength.
- Foreign investors pulling outfunds from Indian markets reduce Forex reserves,leading to depreciation.
- India's traditional demand for high-value imports such as crude oil andgold boosts demand for the dollar andweakens the rupee.
- Global economic factors such as high crude oil prices, US FederalReserve interest rate hikes, or global recessionscan also weaken the rupee.

Positive Impact:

- Goods and services becomemore competitive in international markets due tolower prices in dollar terms.

- NRIs benefit fromhigher rupee value sending money back home.
- A weakeningrupee may also result in domestic investments dueto a rise in exports.

Negative Impact:

- A weaker rupee makes importsmore expensive, particularly for crude oil. It further leadsto the widening of Trade Deficit.
- Higher inflation as some industries areimport-dependent, results in high production costs.
- A weakening rupeemay also trigger capital flight and a decline in foreigndirect investment (FDI) inflow.

It leads to increased cost of foreign debt, reducedpurchasing power, and higher import costs erodeconsumer sentiment, etc.

SUSTAINABLE & INCLUSIVE DEVELOPMENT OF NATURAL RUBBER SECTOR (SIDNRS)

GS III –Agriculture

Context : The financial assistance for the Rubber sector under the 'Sustainable & Inclusive Development of Natural Rubber Sector (SIDNRS)' has been increased by 23% from Rs 576.41 crore to Rs 708.69 crore for the next 2 financial years (2024-25 and 2025-26).

Sustainable & Inclusive Development of Natural Rubber Sector (SIDNRS) Scheme:

- **It** is an initiative by the Government of India to promote the sustainable and inclusive development of the natural rubber sector in India which was launched in the **FY 2017-18.**
- It is implemented by the **Rubber Board,** a statutory body under the **Ministry of Commerce and Industry.**

Objectives:

- To improve the **productivity and quality of natural rubber** production.
- To promote the **adoption of sustainable rubber production** practices.
- To improve the **income and livelihoods of rubber growers.**
- To create employment opportunities in the rubber sector.
- To promote the development of the rubber-based industry.

Components of the Scheme:

- Financial assistance is provided to rubber growers for replanting old and uneconomic rubber trees with high-yielding and disease-resistant varieties.
- Financial assistance was provided to rubber growers for intercropping rubber with other crops such as pineapple, banana, and cocoa. Intercropping helps to improve soil fertility, conserve moisture, and provide additional income to rubber growers.
- Training and extension services provided to rubber growers on best practices in rubber production, processing, and marketing.
- Financial assistance was provided for the development of infrastructure facilities such as roads, water harvesting structures, and processing units in rubber-growing areas.

Financial assistance was provided for the establishment and expansion of rubber-based industries such as tire manufacturing, footwear manufacturing, and latex processing units

Rubber Board:

- It is a **statutory organization** constituted under Section (4) of the **Rubber Act, 1947**, and functions under the administrative control of the **Ministry of Commerce and Industry.**
- The Board is headed by a chairman appointed by the Central Government and has 28 members representing various interests in the natural rubber industry.
- The Board's **headquarters** is located at **Kottayam in Kerala.**

The Board is responsible for the development of the rubber industry in the country by assisting and encouraging research, development, extension, and training activities related to rubber.

TIME-OF-DAY (TOD) TARIFF SYSTEM

GS III –Indian Economy

Context : The Time of Day (ToD) tariff by the distribution licensees to its consumers is as approved by the Appropriate Commission for that particular category of consumer. In most of the States, the ToD tariff is applicable for Commercial and Industrial consumers. In some States,the ToD Tariff appliestoothers.

Time-of-day (ToD) Tariff System:

- They are a set of rules and guidelines that decide how electricity prices vary throughout the day.
- Its primary objective is to disincentive higher energy consumption during the peak demand hours by raising the tariff for the period and lowering the tariff for the lean demand period.
- These norms determine when electricity is cheaper or more expensive based on different time periods, such as peak, off-peak, and sometimes intermediate periods.
- Under it, the tariff during solar hours, a duration of eight hours as specified by the State Electricity Regulatory Commission, will be 10-20% lower than the normal tariff. Conversely, during peak hours, the tariff will be 10-20% higher.
- It would be applicable for Commercial and Industrial consumers **having Maximum demand of 10 KW and above** (from 1st April 2024), and for all other consumers (except agricultural consumers) from 1st April 2025.
- **Smart metres are a prerequisite for ToD tariff systems** and most SERCs have already implemented ToD tariffs for large commercial and industrial categories of consumers.

Advantages of Time-of-day (ToD) Tariff System:

- It will also ensure better grid integration of renewable energy sources thereby facilitating faster energy transition for India.
- It will improve the management of renewable generation fluctuations and thereby increase grid integration of larger quantities of renewable power.
- The ToD tariffs, which are separate tariffs for peak hours, solar hours, and normal hours, send price signals to consumers to manage their load according to the tariff. With awareness and effective utilisation of the ToD tariff mechanism, consumers can reduce their electricity bills.
- The government also expects the ToD tariff structure to lead to better integration of renewable energy sources with the country's electricity grid, which will hopefully expedite India's energy transition.

Limitations of the Time-of-day (ToD) System:

- **It increases complexity in b**illing as users must monitor usage across different times.
- **It needs behavioural changes as c**onsumers must adapt routines, like altering vehicle charging or appliance use.
- Some users might not adjust their consumption habits which may create resistance.
- Inflexible users face elevated costs during high-demand hours.

Its success relies on ample smart meter deployment; India aims for 250M by 2026.

TUNNEL COLLAPSE

GS III –Disaster Management

Context : Three teams of engineers and rescuers have assessed the strength of the Srisailam Left Bank Canal (SLBC) tunnel in Telangana's Nagarkurnool in which eight men are trapped.

Srisailam Left Bank Canal (SLBC) Tunnel:

- It is designed to supply water from the Krishna River to drought-prone areas in the Nalgonda and Mahbubnagar districts in Telangana.
- It is part of the larger Srisailam Lift Irrigation Scheme, which aims to improve water accessibility for agriculture and drinking purposes.
- **It** is approximately 50 km long and runs through the Nallamala Hills in Nagarkurnool district, Telangana.

Reasons behind the Telangana Tunnel Collapse:

- It passes through the Nallamala Hills, which consists of fragile rock formations.Continuous exposure to high water pressure may have weakened the rock structure over time along with the presence of fault linesmade the tunnel section vulnerable to collapse.
- **The** maintenance work was being carried out to fix a leak which indicates pre-existing structural weaknesses due to water seepage and leakage.
- **Due to a l**ack of timely inspections and maintenance, cracks and weak spots go unnoticed, which may have led to the collapse.
- It may be due to structural instability as the caving in of 3-meter section of the tunnel roof suggests weak concrete reinforcement and erosion of support structures.
- **There is a l**ack of real-time monitoring for detecting early warning signs like vibrations or minor cracks, further exacerbating the risk of tunnel collapse.

Methods of Tunnel Excavation used in India:

- **Tunnel-boring machines (TBMs)**bore the rock from the front using a rotating head. The portion of the excavated tunnel is supported by installing precast concrete segments.This method is used when the rock cover is up to 400 metres tall.
- **Drill and Blast Method (DBM)**involves drilling holes into the rock and loading them with explosives. When the explosives are detonated, the rock breaks apart.

Initiatives adopted regardingSafe Tunnel Construction Mechanism in India:

- A tunnel zone departmenthas been created in the *Ministry of Road Transport and Highways*with a mandate to build the capacity for excellence in tunnelling, and preparation of guidelines on the design and construction of the tunnel.
- **The constitution of the Expert Committee on Tunnels** for resolving technical issues that arise in the implementation of Tunnel Projects in the country.
- The Indian Standard CodesIS 15026 (2002) and IS 4756 (1978) whichprescribe the guidelines for tunnel design, lighting, and ventilationhave been issued for tunnel construction.

IRC code of 2019 for tunnels is being implemented to ensure the road tunnels which are constructed, are as per the international standards.

VANADIUM

GS III – Science and Technology- developments and their applications and effects in everyday life

Context : Vanadium is important for its use in producing high-strength steel alloys, as a catalyst in chemical processes, and in vanadium redox-flow batteries for large-scale energy storage.

Vanadium:

- It is a chemical element with the symbol "V" and the atomic number 23 and is classified as a transition metal.
- It is an abundant element in the earth's crust, ranking 22nd in position in the upper continental crust.
- It is listed as one of the 30 critical minerals identified by the Government of India.
- It rarely exists as a free element in nature but can be found in about 65 different minerals, including magnetite, vanadinite, carnotite, and patronite.
- It can be detected spectroscopically in the Sun's rays and occasionally in the light of other stars.

Applications of Vanadium:

- It is used in vanadium redox flow batteries, a type of rechargeable battery used for large-scale energystorage in renewable energy systems.
- It is used as an alloying element in steel production, where it imparts increased strength, toughness, and heat resistance to the steel. The addition of 0.15% vanadium strengthens cast iron by 10-25%.
- Its compounds are used as catalysts in the production of chemicals, plastics, and other materials.
- Its alloys are also used to make nuclearreactors because of their low-neutron-absorbing properties.
- It is used for the treatment of prediabetes and diabetes.
- It is used in the manufacture of aerospace and aviation components due to its high strength, lightweight, and heat resistance properties.

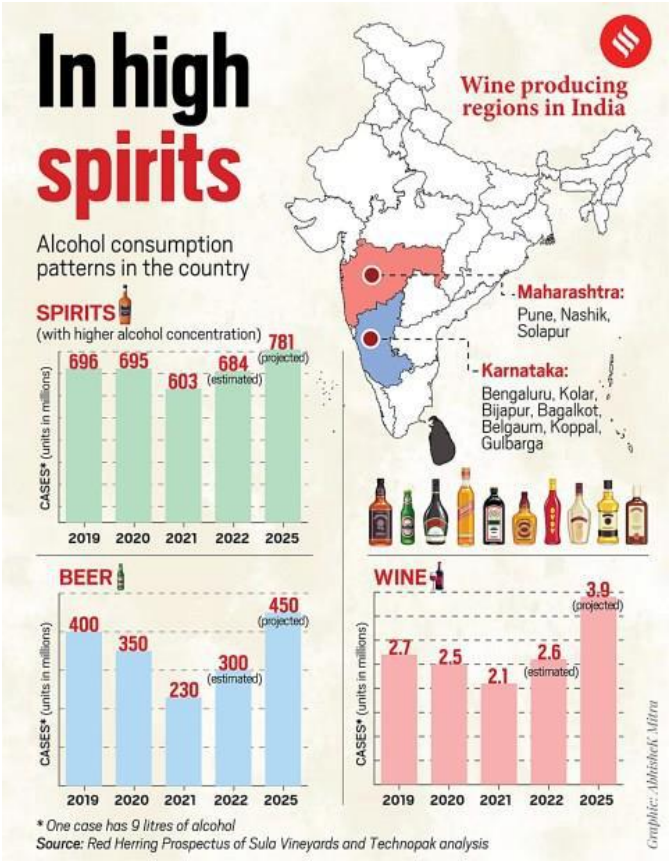
It is used in the production of pigments, and ceramics, and as a reducing agent in metallurgy.

VITICULTURE IN INDIA

GS III –Agriculture

Context : Wine tariffs are a key sticking point in the negotiations for an India-European Union (EU) Free Trade Agreement (FTA), but Italy is already betting big on the Indian market to push its premium wines.

Viticulture:



- It is the cultivation and harvesting of grapes, primarily for winemaking, but also for producing raisins, grape juice, and table grapes.

Significance of Viticulture:

- **It** contributes significantly to the economy by creating employment, boosting tourism, and supporting the beverage industry.
- **It** holds cultural significance in various regions, linked to tradition and heritage.
- Grapes are a source of antioxidants and vitamins, offering health benefits that make them a valuable addition to a balanced diet.
- **It** provides a diversification option for farmers, allowing for profitable agriculture even on marginal lands.

Key Regions for Viticulture in India:

- **Nashik, Maharashtra is k**nown as India's wine capital. It is home to numerous vineyards and wineries, supported by the state government's wine policy.
- The Nandi Hills region in Karnataka has an ideal climate for grape cultivation and is another hub for Indian wineries.
- **T**amil Nadu also has wineries and is known for its grape cultivation.
- **Himachal Pradesh**has potential for viticulture due to its unique cold climate, which can support certain grape varieties.

Challenges in Viticulture:

- Climate change poses a significant threat as grapevines are sensitive to temperature fluctuations, drought,

and rainfall.

- **It is prone to f**ungal diseases like powdery and downy mildew which can harm crops.
- **It requires a high initial investment for** infrastructure, labour, and pest control.
- Wine production and distribution are subject to stringent excise laws, varying by state, which complicates business operations for winemakers.

Indian wine producers face competition from established global wine brands, making it challenging to establish a strong foothold in international markets.

News:

Vinitaly is Italy's flagship roadshow that focuses on niche, luxury wines. It brought a host of exhibitors from the country's top wine-producing regions, such as Apulia, Tuscany, Veneto, Campania, and Abruzzo, to seek business opportunities and collaborations.

WASTE SEGREGATION AT SOURCE

GS III –Environmental Pollution

Context : The Supreme Court said segregation of garbage starts at home and it is a practice that is of vital importance for the well-being of the environment.

Waste Segregation at Source:

- It refers to the process of identifying, classifying, dividing, and sorting waste at the point of generation to facilitate proper disposal, recycling, and management.
- The Solid Waste Management Rules of 2016 categorizes waste into three categories as below:
  - Biodegradablesinclude organic waste that can be degraded by micro-organisms into simpler stable compounds like food scraps, soiled wrappers, paper, etc.
  - Non-biodegradablesinclude recyclable/non-recyclable items like plastic, glass, metal, etc.
  - Domestic hazardous waste includes diapers, napkins, mosquito repellents, cleaning agents, etc.

Significance of Waste Segregation at Source:

- It prevents pollution by eliminating hazardous and non-hazardous waste separately.
- It reduces landfill waste by sending only non-recyclable waste to landfills.
- It enhances recycling by enabling composting, recycling, and waste treatment which improves resource recovery and reduces raw material use.
- It minimizes health risks by preventing diseases caused by medical and hazardous waste.
- It promotes responsibility by encouraging community participation in waste management.

Issues/Challenges related to Waste Segregation at Source:

- **Due to limited knowledge and understanding, m**any citizens are not aware of the importance of waste segregation and how to properly categorize different waste materials.
- Most cities lack a robust infrastructure for collecting segregated waste, with a single collection bin for all waste, making it difficult to separate waste at the source.
- **There are issues related to in**adequate facilities to process different waste types like dry recyclables, organic waste, and hazardous materials, leading to inefficient recycling.

The implementation related to waste segregation at sourceis often weak, leading to non-compliance by residents and businesses.

Question for Practice:

Discuss the significance of Waste Segregation at the Source.

WETLAND CONSERVATION

GS III –Environmental Pollution

Context : The suo motu public interest litigation by the Meghalaya High Court very recently, to monitor the conservation of wetlands in the State brings the focus back on this important ecosystem.

Wetlands:

- They are defined as "lands transitional between terrestrial and aquatic ecosystems where the water table is usually at or near the surface or the land is covered by shallow water".

Status of Wetlands in India:

- Wetlands cover 18.4% of India's land area (excluding rivers); 70% of these are used for paddy cultivation. India has 89 Ramsar Sites (wetlands of international importance), covering 1.34 million hectares. However, this represents only a fraction of the total wetland area.
- 50% of India's wetlands have been lost due to encroachment, land-use change, and pollution. For example, Pallikaranai Marsh and East Kolkata Wetlands have shrunk drastically due to urbanization.

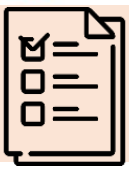
Significance of Wetlands:

- Wetlands play an integral role in the ecology of the watershed. The combination of shallow water, and high levels of nutrients is ideal for the development of organisms that form the base of the food web and feed many species of fish, amphibians, shellfish, and insects.
- Wetlands are a vital source of food, raw materials, genetic resources for medicines, and hydropower.
- Wetlands are highly productive ecosystems that provide the world with nearly two-thirds of its fish harvest.
- Wetlands function as natural barriers that trap and slowly release surface water, rain, snowmelt, groundwater, and flood waters.
- Wetland vegetation slows the speed of flood waters lowering flood heights and reducing soil erosion.
- Wetlands are critical to human and planet life. More than one billion people depend on them for a living and 40% of the world's species live and breed in wetlands.
- Wetlands play an important role in transport, tourism, and the cultural and spiritual well-being of people.

Threats to Wetlands:

- Wetlands near urban centres are under increasing developmental pressure for residential, industrial, and commercial facilities.
- The construction of a large number of reservoirs, canals, and dams to provide for irrigation significantly altered the hydrology of the associated wetlands.
- **Wetlands** can only clean up the fertilizers and pesticides from agricultural runoff but not mercury from industrial sources and other types of pollutionthataffectthe biological diversity of wetlands.
- Increased air temperature, shifts in precipitation, increased frequency of storms, droughts, and floods, increased atmospheric carbon dioxide concentration, and sea level rise could also affect wetlands.
- Dredging of streams lowers the surrounding water table and dries up adjacent wetlands.
- Water is drained from wetlands by cutting ditches into the ground which collect and transport water out of the wetland which lowers the water table and dries out the wetland.

Indian wetlands are threatened by exotic introduced plant species such as water hyacinth and salvinia that clog waterways and compete with native vegetation.



Practice Questions

Q1.) Consider the following statements about Quantum chips in news

1. Ocelot is a first-generation quantum computing chip developed by Amazon.
2. Ocelot uses "cat qubits" to enhance error correction efficiency.
3. Microsoft introduced quantum chip named 'Majorana 1'.

Which among the statements given above is/are correct ?:

(A) 1, 2, and 3
(B) 1 and 3 only
(C) 2 only
(D) 1 only

Q2.) Consider the following statements regarding Amir Khusrau:

1. He is credited with developing Hindavi, a precursor to modern Hindi and Urdu.
2. He served in the courts of five Delhi Sultans.
3. He was a disciple of Shaikh Nizamuddin Auliya.
4. He exclusively wrote in Persian and never used Hindavi.

Which of the statements are correct?

(A) 1, 2, and 3 only
(B) 1 and 3 only
(C) 2 and 4 only
(D) 1, 2, 3, and 4

Q3.) Why is methane release from Arctic glaciers a cause for concern?

1. Methane is around 25 times more effective than carbon dioxide at trapping heat.
2. Methane contributes significantly to the formation of ground-level ozone, which is harmful to human health.
3. The released methane comes exclusively from microbial activity beneath the ice.

Select the correct answer using the codes below:

(A) 1, 2, and 3
(B) 1 and 2 only
(C) 2 only
(D) 2 and 3 only

Q4.) Consider the following statements regarding Tantric Buddhism (Vajrayana Buddhism):

1. It emerged as a distinct form of Mahayana Buddhism around the 7th century CE in India.
2. The practice of Deity Yoga is a significant feature, where practitioners visualize themselves as divine beings.
3. The Vajra (thunderbolt) and Ghanta (bell) in Vajrayana Buddhism symbolize wisdom and compassion, respectively.
4. Unlike Theravada and Mahayana Buddhism, Tantric Buddhism does not require a Guru or teacher for spiritual progress.

Which of the statements given above are correct?

(a) 1, 2, and 3 only
(b) 2 and 4 only
(c) 1 and 3 only
(d) 1, 2, 3, and 4

Q5.) Consider the following statements about avalanches:

1. Slab avalanches are dangerous as they involve a large mass of snow breaking away suddenly.
2. Natural causes of avalanches include heavy snowfall, temperature variations, and seismic activity.
3. The Snow and Avalanche Study Establishment (SASE), under ISRO, provides real-time forecasts for avalanche-prone regions.
4. Avalanche mitigation strategies include afforestation, controlled blasting, and structural barriers.

Which of the statements given above are correct?

(a) 1 and 2 only
(b) 1, 2, and 4 only
(c) 2, 3, and 4 only
(d) 1, 2, 3, and 4

Q6.) The Gangetic Dolphin is classified under various conservation lists. Which of the following correctly states its status?

1. IUCN Red List: Critically Endangered
2. Wildlife Protection Act, 1972: Schedule I

3. CITES: Appendix II
4. CMS (Bonn Convention): Appendix II

Select the correct answer using the codes below:
A) 1 and 2 only
B) 2 and 4 only
C) 2, 3, and 4 only
D) 1, 2, and 4 only

Q7.) Which of the following statements regarding Virtual Digital Assets (VDAs) in India is correct?
A) VDAs are classified as legal tender in India.
B) Gains from VDAs are not taxed in India.
C) VDAs are treated as capital assets.
D) Mining costs can be deducted while calculating taxable income from VDAs.

Q8.) Which of the following statements regarding Rare Earth Elements (REEs) is correct?
A) Rare Earth Elements are found only in China.
B) India has no reserves of Rare Earth Minerals.
C) Rare Earth Elements are critical for the renewable energy sector.
D) Rare Earth Elements are not used in defense applications.

Q9.) Consider the following statements regarding Majuli River Island:
1. Majuli is the largest river island in the world, located on the Brahmaputra River in Assam.
2. It is known for its unique Vaishnavite culture and the presence of several Satras (monastic institutions).
3. Majuli has been recognized as a UNESCO World Heritage Site for its rich biodiversity and cultural significance.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q10.) Which of the following is the largest ocean current in the world?
a) Gulf Stream
b) Antarctic Circumpolar Current
c) Kuroshio Current
d) North Atlantic Drift

Q11.) Which of the following statements regarding the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) Yojana is correct?
a) It is a mandatory pension scheme for all unorganised sector workers.
b) The scheme provides a minimum assured pension of ₹5,000 per month after 60 years of age.
c) The Government of India contributes an equal amount to the beneficiary's contribution.
d) The scheme is applicable to individuals covered under the Employees' Provident Fund (EPF) and National Pension Scheme (NPS).

Q12.) Which of the following statements regarding the Real Estate Regulatory Authority (RERA) is correct?
a) RERA registration is mandatory for all real estate projects, regardless of size.
b) Developers must deposit at least 70% of the buyers' funds into an escrow account to prevent fund diversion.
c) RERA is applicable only to residential real estate projects and excludes commercial properties.
d) The decisions of RERA are final and cannot be challenged in any tribunal.

Q13.) With reference to Capital Account Convertibility (CAC), consider the following statements:
1. CAC allows unrestricted exchange of domestic currency for foreign currency in financial transactions like investments and loans.
2. The S.S. Tarapore Committee (1997) recommended an immediate and full adoption of CAC in India.
3. India currently follows a policy of full capital account convertibility.

Which of the statements given above is/are correct?
(a) 1 only
(b) 1 and 2 only
(c) 1 and 3 only
(d) 2 and 3 only

Q13.) Which of the following statements regarding the Convention on Cluster Munitions (CCM) is correct?
(a) It allows the use of cluster munitions for self-defense.
(b) It mandates the destruction of stockpiles within 15 years.

(c) India, the USA, Russia, and China have not signed the treaty.
(d) It was adopted in 2001 and entered into force in 2005.

Q14.) With reference to the Sharavathi Pumped Storage Project, consider the following statements:
1. It is located on the Sharavathi River in Karnataka.
2. The project uses the Talakalale and Gerusoppa reservoirs for energy storage.
3. It is located outside any ecologically sensitive zone and does not impact wildlife.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q15.) Dulcibella camanchaca, recently discovered in the Atacama Trench, belongs to which of the following groups of marine organisms?
(a) Mollusks
(b) Amphipods
(c) Echinoderms
(d) Cnidarians

Q16.) The North Sea is strategically and economically important for several reasons. Which of the following statements about the North Sea is/are correct?
1. It is bordered by the United Kingdom, Germany, the Netherlands, and Norway, among other countries.
2. It is one of the world's major offshore oil and gas-producing regions.
3. It connects to the Mediterranean Sea through the Suez Canal.

Select the correct answer using the codes given below:
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q17.) With reference to the e-Shram Portal, consider the following statements:
1. It is an initiative of the Ministry of Labour and Employment to create a national database of unorganized workers.
2. Only construction workers and agricultural laborers are eligible for registration under this portal.
3. Registered workers receive a Universal Account Number (UAN) and are eligible for various social security benefits.

Which of the statements given above is/are correct?
(a) 1 and 3 only
(b) 2 and 3 only
(c) 1 and 2 only
(d) 1, 2, and 3

Q18.) Consider the following statements regarding Venture Capital (VC):
1. Venture capital is primarily invested in well established traditional corporate firms than in startups.
2. Venture capitalists provide funding in exchange for an equity stake in the company.
3. Venture capital in India is regulated by the Securities and Exchange Board of India (SEBI).

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q19.) With reference to Overseas Citizens of India (OCI), consider the following statements:
1. OCI status grants individuals full citizenship rights, including voting and holding constitutional offices in India.
2. An OCI cardholder can undertake multiple entries and lifelong visa-free travel to India.
3. The OCI scheme was introduced through the Citizenship (Amendment) Act, 2005.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q20.)Consider the following statements regarding the Great Nicobar Island Development Project:

1. The project is being implemented by the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO).
2. It includes the construction of an International Container Transshipment Terminal (ICTT) and a greenfield international airport.
3. The project aligns with India's Maritime Vision 2030 and Amrit Kaal Vision 2047.
4. Great Nicobar Island is located to the north of the Ten Degree Channel.

Which of the statements given above are correct?
(a) 1 and 2 only
(b) 1, 2, and 3 only
(c) 2, 3, and 4 only
(d) 1, 2, 3, and 4

Q21.) With reference to the Automated Permanent Academic Account Registry (APAAR) ID, consider the following statements:
1. APAAR ID is a part of the "One Nation, One Student ID" initiative aligning with National Education Policy (NEP) 2020.
2. It provides a unique 12-digit academic identity to students for storing academic achievements.
3. The APAAR ID is mandatory for all school students in India.
4. It integrates with DigiLocker for secure digital storage of academic credentials.

Which of the statements given above are correct?
(a) 1 and 2 only
(b) 1, 2, and 4 only
(c) 2, 3, and 4 only
(d) 1, 2, 3, and 4

Q22.)Consider the following statements regarding CAR T-Cell Therapy:
1. It is mainly used for treating solid tumors like lung and breast cancer.
2. In this therapy, a patient's T-cells are genetically modified to attack cancer cells.
3. India’s first CAR T-cell therapy was developed by AIIMS, New Delhi.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 only
(c) 2 and 3 only
(d) 1, 2, and 3

Q23.) With reference to the End-Permian Mass Extinction, consider the following causes:
1. Large-scale volcanic eruptions.
2. Sudden increase in oxygen levels in the oceans.
3. Release of greenhouse gases, leading to global warming.
4. Methane hydrate release from ocean sediments.

Which of the above factors contributed to the End-Permian Mass Extinction?
(a) 1 and 3 only
(b) 1, 3, and 4 only
(c) 2 and 4 only
(d) 1, 2, 3, and 4

Q24.)With reference to Coronal Mass Ejections (CMEs), consider the following statements:
1. CMEs are massive eruptions of plasma and magnetic fields from the Sun’s corona.
2. CMEs travel at speeds up to 3,000 kilometers per second and can impact Earth's magnetosphere.
3. The Aditya-L1 mission has been designed specifically to study the Sun and its CMEs, with the Visible Emission Line Coronagraph (VELC) playing a key role.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q25.) Which of the following correctly describes the UN80 Initiative?
(a) A United Nations effort to reform its internal structures and improve operational efficiency as it approaches its 80th anniversary.
(b) A global economic cooperation framework aimed at strengthening trade among developing nations.
(c) A UN Security Council initiative for peacekeeping and conflict resolution worldwide.
(d) A new climate agreement focusing on carbon neutrality by 2080.

Q26.)With reference to the Comptroller and Auditor General (CAG) of India, consider the following statements:

1. The CAG is appointed by the President and holds office for a fixed term of 6 years or until the age of 65, whichever is earlier.
2. The CAG submits audit reports on the Union and State Governments directly to the Supreme Court of India.
3. The removal process of the CAG is similar to that of a Supreme Court judge.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

Q27.) Consider the following statements regarding wheat production in India:
1. India is the largest producer of wheat in the world.
2. The highest wheat-producing state in India is Uttar Pradesh.
3. Wheat is primarily grown as a kharif crop in India.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q28.)Consider the following statements regarding the IUCN Green List:
1. It is a global initiative that promotes effective and equitable management of protected areas.
2. It sets a standardized benchmark for conservation success.
3. India currently has five sites listed under the IUCN Green List.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q29.)Consider the following statements regarding Dara Shikoh:
1. He authored Majma-ul-Bahrain and Sirr-i-Akbar, which sought to establish a connection between Hinduism and Islam.
2. He translated the Upanishads from Sanskrit to Persian.
3. He defeated Aurangzeb in the War of Succession but was later executed on Shah Jahan's orders.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q30.) With reference to the Betwa River, consider the following statements:
1. It originates in the Vindhya Range in Madhya Pradesh.
2. It is a tributary of the Ganga River.
3. The Ken-Betwa River Linking Project aims to transfer surplus water from the Betwa River to the Ken River.

Which of the statements given above is/are correct?
(a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

Q31.) Consider the following statements about Kamba Ramayan:
1. It was written in Tamil by the poet Kamban.
2. It is a retelling of Valmiki's Ramayana with Dravidian influences.
3. Unlike Valmiki's version, Kamba Ramayan completely omits the story of Ravana.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q32.)Consider the following statements regarding Equinox:
1. During an equinox, the Sun is directly overhead at the Tropic of Cancer.

2. Day and night are approximately equal in duration across the globe during an equinox.
3. Equinoxes occur twice a year, in March and September.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q33.) With reference to Iguanas, consider the following statements:
1. Iguanas are exclusively found in the tropical forests of South America.
2. The Marine Iguana is the only lizard species adapted to a marine habitat.
3. Fiji and Tonga have native iguana species that are believed to have arrived via floating vegetation from the Americas.

Which of the above statements is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q34.)Consider the following statements regarding the Collegium system in India:
1. The Supreme Court collegium is headed by the President of India.
2. The government has the power to reject collegium recommendations if it disagrees with them.
3. The collegium system was established through constitutional amendments.

Which of the statements given above is/are correct?
(A) 1 and 2 only
(B) 2 and 3 only
(C) 3 only
(D) None of the above

Q35.) Okjökull Glacier, recently in the news, is significant because:
(A) It was the first glacier to be declared "dead" due to climate change.
(B) It is the largest glacier in Iceland.
(C) It is the world's first glacier to completely regenerate after melting.
(D) It is located on the Arctic ice shelf and has experienced the fastest ice growth in history.

Q36.) Consider the following statements regarding the Jnanpith Award:
1. It is India's highest literary honor, awarded for outstanding contributions to Indian literature.
2. The award was instituted in 1961 and initially given for a specific literary work.
3. It is conferred upon writers of Indian languages included in the Eighth Schedule of the Constitution.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q37.) Consider the following statements regarding Lapis Lazuli:
1. It is primarily composed of the mineral lazurite, along with calcite and pyrite.
2. The best-quality Lapis Lazuli is found in Chile.
3. Lapis Lazuli was traded via the Silk Road and reached the Harappan cities.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

Q38.) With reference to the Urban Heat Island (UHI) effect, consider the following causes:
1. Increased vegetation cover in urban areas
2. High-rise buildings obstructing natural wind flow
3. Excessive use of concrete and asphalt in cities
4. Emission of waste heat from industries and vehicles

Which of the above factors contribute to the Urban Heat Island effect?
(a) 1, 2, and 3 only
(b) 2, 3, and 4 only
(c) 1, 3, and 4 only
(d) 1, 2, 3, and 4

Q39.) With reference to the impeachment of judges in India, consider the following statements:
1. A judge of the Supreme Court or High Court can be removed from office only on grounds of "proven misbehavior" or "incapacity."
2. The process of impeachment is mentioned under Article 356 of the Indian Constitution.
3. For a motion of impeachment to be successful, it must be passed by a simple majority in both Houses of Parliament.

Which of the statements given above is/are correct?
(a) 1 only
(b) 1 and 2 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q40.) Consider the following statements regarding the Blue Flag Certification:
1. It is awarded by the United Nations Environment Programme (UNEP).
2. The certification is valid for a period of five years.
3. India's BEAMS program is linked to Blue Flag Certification.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 3 only
(d) 1, 2, and 3

Q41.) Which Sultan of Delhi did Rana Sanga defeat in the Battle of Khatoli (1518)?
a) Alauddin Khilji
b) Ibrahim Lodi
c) Balban
d) Sher Shah Suri

Q42.) Consider the following statements regarding the GAIA Mission:
1. It was launched by NASA to create a 3D map of the Milky Way galaxy.
2. The spacecraft was positioned at the Lagrange point 2 (L2).
3. The European Space Agency (ESA) has shut down Gaia recently.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q43.) With reference to the Doctrine of Eminent Domain, consider the following statements:
1. It allows the state to acquire private property for public purposes, provided fair compensation is given.
2. In India, the right to property is a Fundamental Right under Article 31 of the Constitution.
3. The Land Acquisition Act of 1894 is currently the governing law for land acquisition in India.

Which of the statements given above is/are correct?
(a) 1 only
(b) 1 and 2 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q44.) The term Green Grabbing refers to:
(A) A method of organic farming to enhance green cover.
(B) The use of renewable energy for industrial growth.
(C)The appropriation of land and natural resources in the name of environmental conservation.
(D) A strategy used to reforest degraded land.

Q45.) The Parker Solar Probe, launched by NASA, is primarily designed to study:
(A) The possibility of human settlement on Mars
(B) The Earth's magnetic field and its effects
(C) The Sun's corona and solar wind
(D) The asteroid belt between Mars and Jupiter